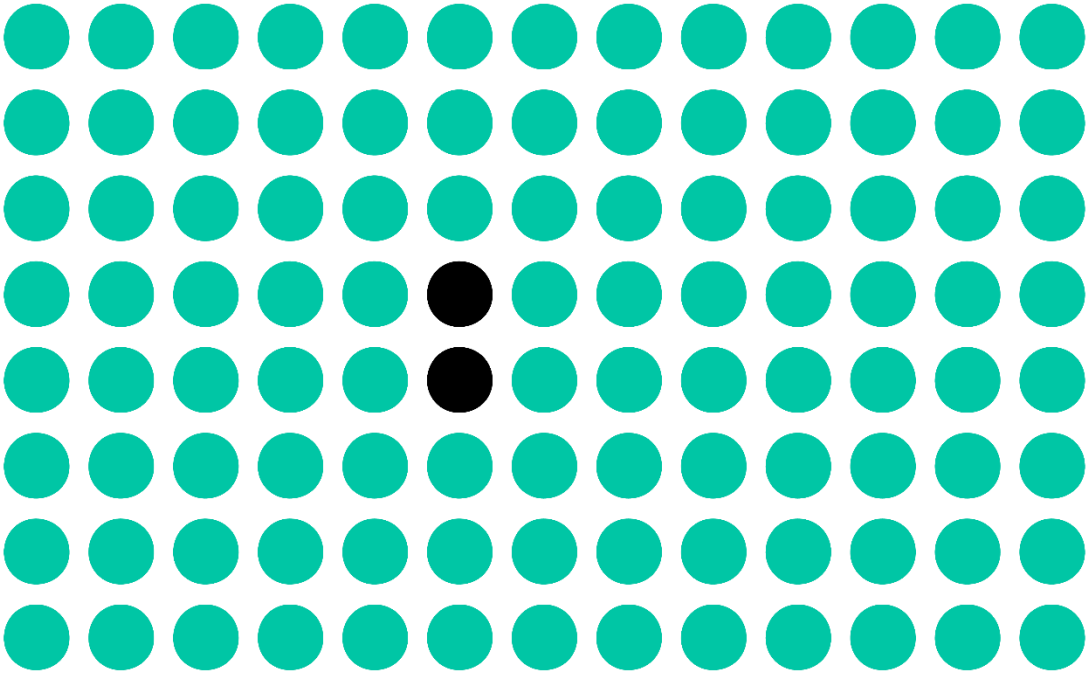
Instituto de Medicina Molecular | João Lobo Antunes

Scientific Report 2020



Lisbon, March 2021

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Structure & Organisation

Research and development in the Biomedical Sciences plays a central role in generating knowledge and in the application of this knowledge to improving the quality of life.

The mission of the Instituto de Medicina Molecular João Lobo Antunes (iMM) is to foster basic, clinical and translational biomedical research with the aim of contributing to a better understanding of disease mechanisms, developing novel predictive tests, improving diagnostics tools and developing new therapeutic approaches.

Located on the campus of the Faculdade de Medicina da Universidade de Lisboa (FMUL), iMM is a Research Unit of the National Ministry of Science and Higher Education. iMM is mainly supported by national public funds and European Union funds. The research expenditure includes additional funds obtained from peer-reviewed competitive grants, private donations and industrial partnerships.

Created in December 2002, iMM results from the association of five former research units from FMUL: The Biology and Molecular Pathology Center, the Lisbon Neurosciences Center, the Microcirculation and Vascular Pathobiology Center, the Gastroenterology Center and the Nutrition and Metabolism Center. The institute is a Private, Non-profit Association.

iMM Associated Members

Universidade de Lisboa

Faculdade de Medicina da Universidade de Lisboa

Hospital de Santa Maria

Associação para a Investigação e o Desenvolvimento da Faculdade de Medicina

Fundação Oriente

Board of Trustees

The Board of Trustees is composed by representatives of the Associated Members and meets at least once per year to analyse the scientific and finance report and to approve the plan of activities and budget for the next year.

Board of Directors

M. Carmo-Fonseca, MD, PhD	Maria M. Mota, PhD	Bruno Silva-Santos, PhD
President	Executive Director	Vice-Director

Council of Scientists

The Council of Scientists is composed by all Group Leaders. It meets at least once per year to discuss the scientific strategies and plan of actions proposed by the Board of Directors. This council elects two representatives to participate in the meetings of the Board of Trustees.

Scientific Advisory Board

Undertake periodic evaluations to the iMM specific programmes and include international experts of scientific fields.

Carlos Caldas, MD, PhD, *Chairman* – Cancer Research UK Cambridge Institute, Cambridge Cancer Center UK

Caetano Reis e Sousa, PhD, – Francis Crick Institute, London, UK

Elaine Mardis, PhD – Institute for Genomic Medicine at NationWide Children's Hospital, USA

Paul Peter Tak, MD, PhD – University of Amsterdam, Netherlands

Yasmine Belkaid, PhD – National Institutes of Health, USA

Industry Advisory Board

The Industry Advisory Board will provide assistance to the Technology Transfer Office team in the definition of a strategy and action plan to drive innovation at iMM.

Daniela Couto – Biogeneration Ventures Fund

David Malta – Vesalius Biocapital

Isabel Ferreira – Versameb

Miguel Forte – Zelluna Immunotherapy

Pascale Redig – Janssen

Societal Advisory Board

António Barreto, *Chairman*

Graça Franco

Paula Martinho da Silva

Diogo Lucena

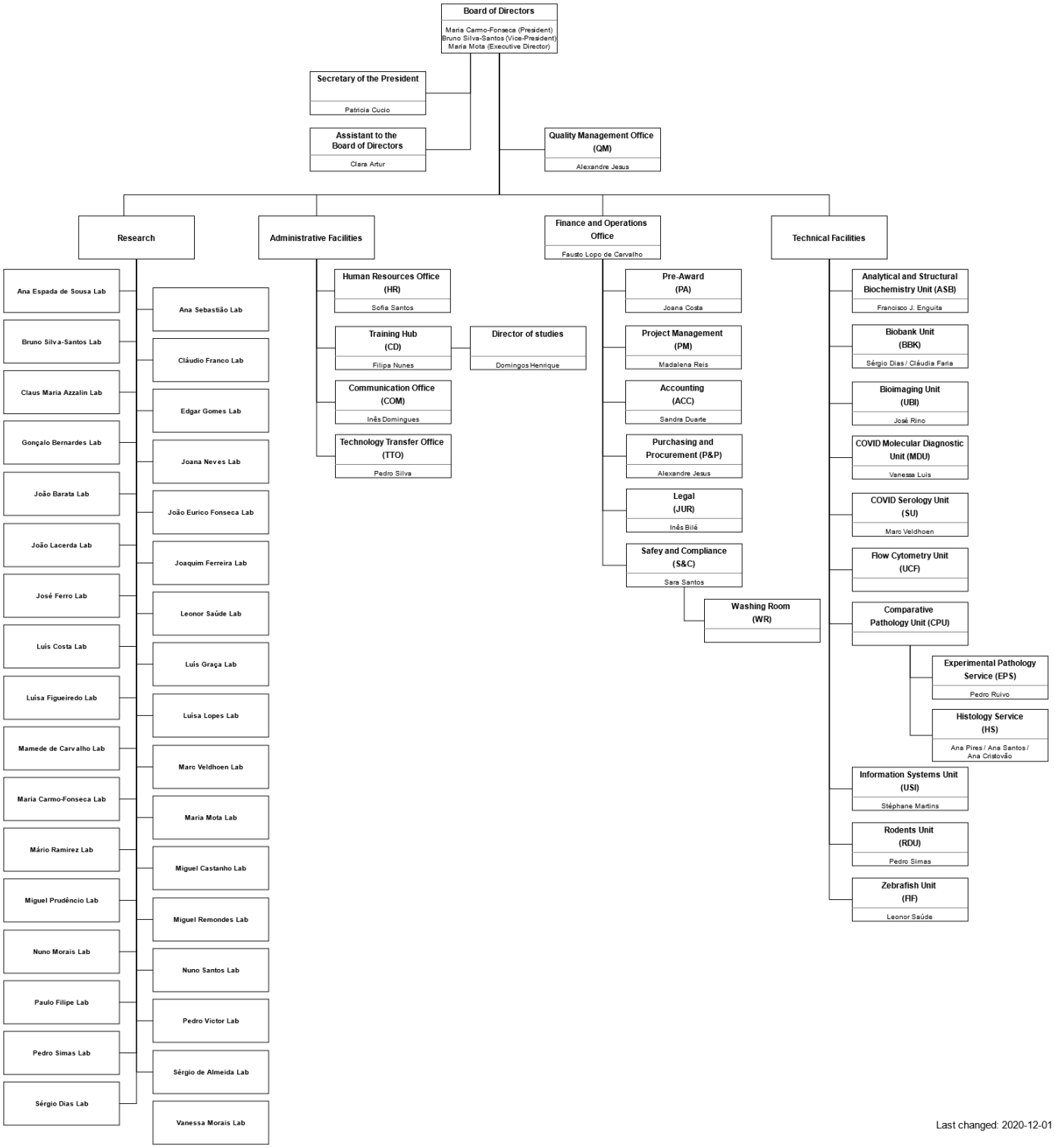
João Filipe Queiro

Henrique Leitão

Pedro Norton

Domítilia dos Santos

Organigram


Board of Directors
Maria Carmo-Fonseca (President)
Bruno Silva-Santos (Vice-President)
Maria Mota (Executive Director)
Secretary of the President
Patrícia Cucio
Assistant to the Board of Directors
Clara Artur
Quality Management Office (QM)
Alexandre Jesus
Research
Administrative Facilities
Finance and Operations Office
Fausto Lopo de Carvalho
Technical Facilities
Ana Espada de Sousa Lab
Bruno Silva-Santos Lab
Claus Maria Azzalin Lab
Gonçalo Bernardes Lab
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Marc Veldhoen Lab
Maria Mota Lab
Miguel Castanho Lab
Miguel Remondes Lab
Nuno Santos Lab
Pedro Victor Lab
Sérgio de Almeida Lab
Vanessa Morais Lab
Human Resources Office (HR)
Sofia Santos
Training Hub (CD)
Filipa Nunes
Director of studies
Domingos Henrique
Communication Office (COM)
Inês Domingues
Technology Transfer Office (TTO)
Pedro Silva
Pre-Award (PA)
Joana Costa
Project Management (PM)
Madalena Reis
Accounting (ACC)
Sandra Duarte
Purchasing and Procurement (P&P)
Alexandre Jesus
Legal (JUR)
Inês Bilé
Safey and Compliance (S&C)
Sara Santos
Washing Room (WR)
Analytical and Structural Biochemistry Unit (ASB)
Francisco J. Enguita
Biobank Unit (BBK)
Sérgio Dias / Cláudia Faria
Bioimaging Unit (UBI)
José Rino
COVID Molecular Diagnostic Unit (MDU)
Vanessa Luís
COVID Serology Unit (SU)
Marc Veldhoen
Flow Cytometry Unit (UCF)
Comparative Pathology Unit (CPU)
Experimental Pathology Service (EPS)
Pedro Ruivo
Histology Service (HS)
Ana Pires / Ana Santos / Ana Cristovão
Information Systems Unit (USI)
Stéphane Martins
Rodents Unit (RDU)
Pedro Simas
Zebrafish Unit (RF)
Leonor Saúde
Last changed: 2020-12-01

Evaluation Reports 2020

2013 FCT Evaluation of R&D Units

Period of Evaluation:

2008 – 2012: Scientific and technological activities (performance indicators);

2015 – 2020: Research strategies and planned work consolidated as a strategic programme.

Evaluation Panel:

Panel 3: Health and Life Sciences Final Classification: Excellent

Panel's overall comments (Stage 2 – Site visit):

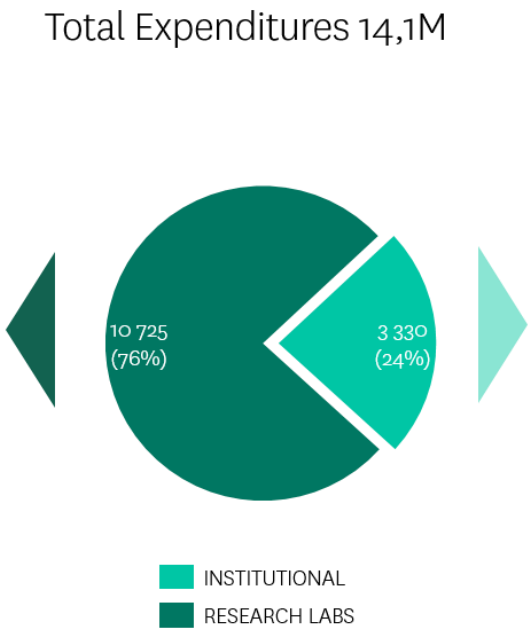
The site visit confirmed to a large extent the conclusions of the initial assessment that the unit has an excellent overall standing. It pointed out to some insufficiencies in the scientific output of a significant fraction of the integrated members listed in the initial application, and in the intensity of technology transfer that were openly discussed with both the unit leaders and the active group of students and postdocs. The site visit team recommended (i) a redefinition of the role of the less productive integrated members in research, teaching or management tasks that should lead to a reduction in the number of integrated members and independent groups; (ii) increased efforts in securing substantial financial resources through contracts with industry. It was satisfied with the clarification of the novel management and governance processes that have been established and praised Prof Maria Carmo-Fonseca, the Principal Investigator of the proposal and the Executive Director of iMM since 2002, to have promoted Dr. Maria Mota as the unit Director. Prof Maria Carmo-Fonseca now serves as iMM President in an oversight role with veto power on strategic decisions, and a focus on international development. Dra. Maria Mota is supported on her role as Executive Director by two Vice Directors, Dr. Henrique Veiga-Fernandes and Bruno Silva-Santos, and an experienced Finance Director, Mrs. Margarida Pinto-Gago[1]. In order to achieve this in a transition period of reorganization of its staff dedicated to research and a context of potential shortage of public funding, the new iMM Board of Directors will require strong financial and managerial support from the University of Lisbon and the Faculty of Medicine. The Panel considered that the proposed strategic programme provides a solid basis for the future development of the unit in the next period, and that the budget requested was adequate, but recommended that the full executive power should be endowed to the coordinator during her term for its implementation, while the former director and President takes charge of international cooperation.

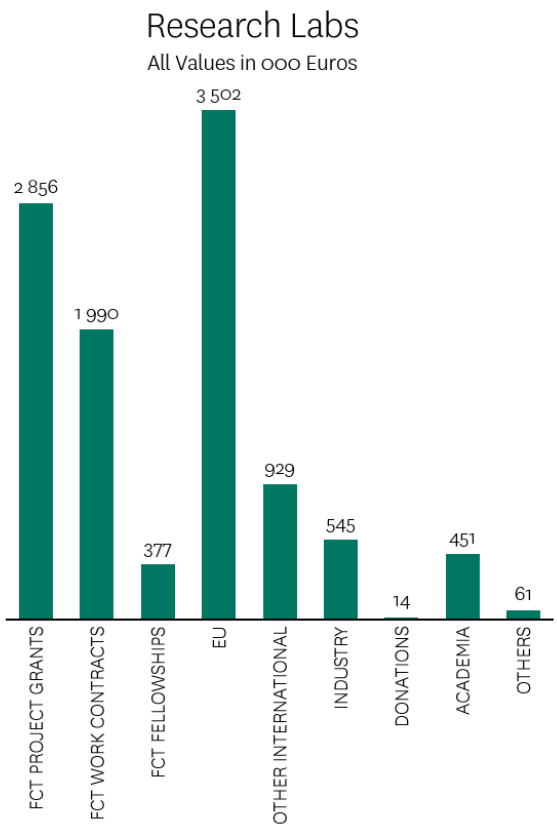
[1] Since 2017, Dra. Maria Mota is supported on her role as Executive Director by one Vice-Director, Dr. Bruno Silva-Santos, and a Finance and Operations Director, Dr. Fausto Lopo de Carvalho.

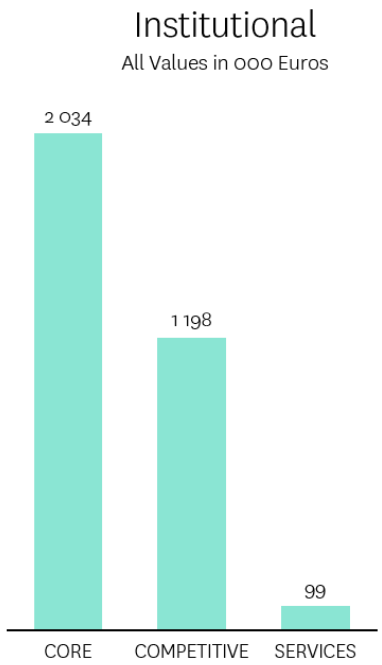
Research Funding

Expenditure in 2020 by Funding Source

Total Expenditure: € 14 055 104[2]







[2] Figures for this exercise only consider costs registered in the exercise of 2020, from Jan 1 to Dec 31. In previous reports the numbers presented also took in consideration payments occurred in the exercise of the report but referring to expenses from the previous year. In order to reflect the yearly operations of iMM, this change in the referential was put in place from 2020 onwards.

2020 Expenditure

			(EUROS)
INSTITUTIONAL	CORE	2 034 028	
	COMPETITIVE	1 197 589	
	SERVICES	98 635	3 330 252
RESEARCH LABS	FCT PROJECT GRANTS	2 856 185	
	FCT WORK CONTRACTS	1 989 911	
	FCT FELLOWSHIPS	377 135	
	EU	3 501 878	
	OTHER INTERNATIONAL	928 838	
	INDUSTRY	545 118	
	ACADEMIA	13 830	
	DONATIONS	450 582	
	OTHERS	61 375	10 724 852
TOTAL			14 055 104[3]

[3] Figures for this exercise only consider costs registered in the exercise of 2019, from Jan 1 to Dec 31. In previous reports the numbers presented also took in consideration payments occurred in the exercise of the report but referring to expenses from the previous year. In order to reflect the yearly operations of iMM, this change in the referential was put in place from 2019 onwards. Note: All expenditures regarding COVID-19 diagnostic testing operation were excluded from the relation above.

Number of Ongoing Research Grants in 2020

209 Research Grants:

Public National FCT: 97

Public National Other: 2

Public European Commission: 31

Public International Other: 0

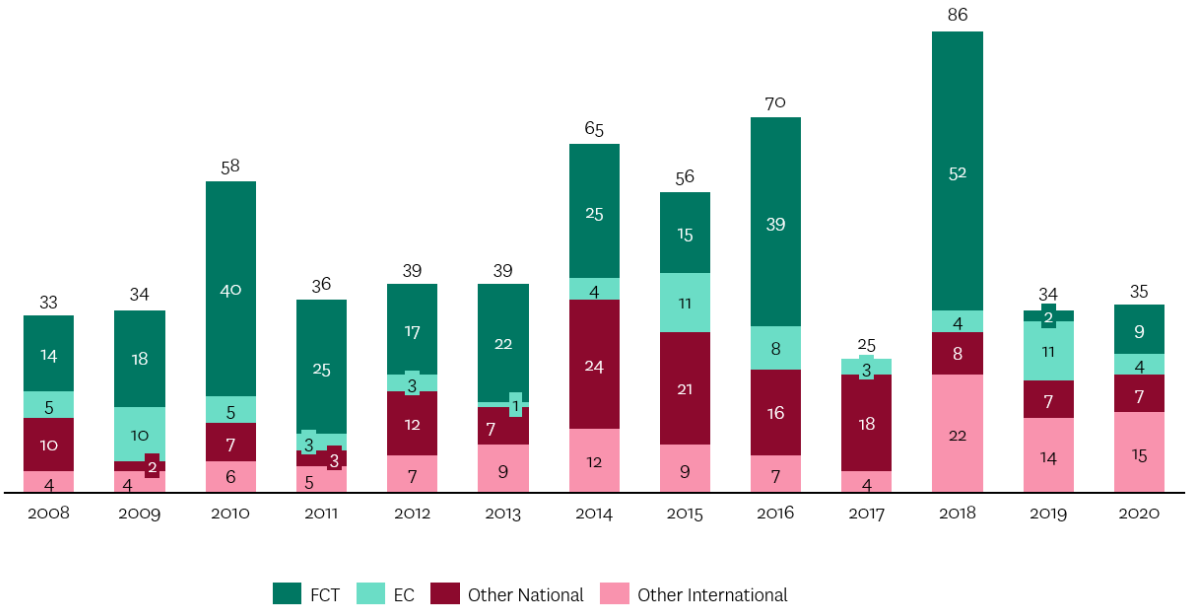
Private National: 25

Of which with the industry – 4

Private International: 54

Of which with the industry – 34

Number of Research Grants Initiated at iMM from 2008 to 2020



Number of Research Funding Grants Initiated in 2020

Research Grants (35):

National Public: 9

International Public: 4

National Private: 7

International Private: 15

Projects Initiated in 2020 through Competitive Funds

FUNDING AGENCY	RESEARCHER	iMM BUDGET
Fundação para a Ciência e a Tecnologia (FCT)	Pedro Simas	100 000,00€
	Luís Graça	150 000,00€
	Luís Graça	30 000,00€
	Luís Graça	40 000,00€
	Luís Graça	40 000,00€
	Maria Mota	300 000,00€
	Amelia Trombetta	40 000,00€
	Susana Fernandes	30 000,00€
	Miguel Castanho	40 000,00€
	Nuno Santos	74 613,50€
	Nuno Santos	82 192,87€
	Vanessa Luís	30 000,00€
	Marc Veldhoen	29 696,22€
	Marc Veldhoen	39 800,00€
	Marc Veldhoen	35 300,00€
European Commission	João Barata	150 000,00€
	Maria Carmo-Fonseca	147 815,04€
	Pedro Silva	440 000,00€
	Ana Sebastião	597 500,00€
“la Caixa” Foundation	Maria Carmo-Fonseca	572 596,50€
Programa Gilead GÉNESE	Maria Carmo-Fonseca	26 500,00€
	João Lacerda	39 125,00€
	Amelia Trombetta	23 215,00€

Protocols, Donations & Awards[4]

FUNDING AGENCY	RESEARCHER	iMM BUDGET
Sociedade Portuguesa de Pediatria	João Eurico da Fonseca	6 000,00€
Novartis Farma, S.A.	João Eurico da Fonseca	5 000,00€
Associação Portuguesa contra a Leucemia	Diogo Silva	15 000,00€
Pharma Mar, S.A.; CTI Clinical Trial & Consulting Services	Sandra Casimiro	10 000,00€
Janssen-Cilag Farmacêutica,Lda	Ana Espada de Sousa	7 175,84€
Janssen-Cilag Farmacêutica,Lda	Paulo Filipe	11 321,40€
Merck Sharp & Dohme	João Lacerda	95 083,00€
Fundo Laço	Ana Magalhães	50 000,00€
Prémio Santa Casa	Leonor Saúde	118 079,88€
FAZ_PremioCiencia_2020 - Fundação AstraZeneca	Bruno Silva-Santos	35 000,00€
Lymphact	Bruno Silva-Santos	163 986,00€
European Molecular Biology Organization	Pedro Sousa-Victor	150 000,00€
Prémio Pfizer	Miguel Prudêncio	20 310,00€
Bolsa de Angelman da Fundação Amélia de Mello	Simão Rocha	25 000,00€
PREMIO SPH - Sociedade Portuguesa de Hematologia	João Lacerda	25 000,00€
Bolsa de Investigação - Sociedade Portuguesa de Hematologia	Joana Infante	9 200,00€
Daiichi Sankyo Portugal Unipessoal, Lda.; Lilly Portugal; GMVIS SKYSOFT, SA; Edit Set Go, Lda; PENGUIN RANDOM HOUSE GRUPO EDITORIAL UNIPESSOAL, L; Takeda Farmacêuticos Portugal, Lda.; Codipor - Associação Portuguesa de Identificação; Boehringer Ingelheim, Unipessoal, LDA; Manuel Rui Azinhais Nabeiro, Lda	Pedro Simas	11 700,00€
Associação Portuguesa contra a Leucemia	Luís Monteiro	10 000,00€
AbbVie Inc	Maria Carmo-Fonseca	108 000,00€
Tessellate Bio BV	Claus Azzalin	123 600,00€
Genentech, Inc.	Joana Neves/Pedro Sousa-Victor	42 200,00€
Embaixada Britânica	Miguel Prudêncio	6 510,06€
LIMM Therapeutics SA	Nuno Morais	79 896,00€

[4] Considered protocols, donations and awards that fund projects, infrastructures and seminars.

FUNDING AGENCY	INSTITUTION	BUDGET
iMM - COVID-19 - CVP - Sociedade de Gestão Hospitalar do Hospital; Devan Chemicals N.V.,; Faculdade Medicina Un. Lisboa; Guarda Nacional Republicana; Sociedade Francisco Manuel dos Santos II, SA; FUNDAÇÃO FRANCISCO MANUEL DOS SANTOS; Unilever FIMA, Lda; Gallo Worldwide, Lda.; Cruz Vermelha Portuguesa; Força Quinze; Oceanário de Lisboa; Fundação Oceano Azul; SIEOCEAN - Siemens & Oceanário, ACE; Espaço do Tempo; miMed – Cuidados de Saúde, S.A.; Hydraplan – Manutenção e Comércio de Veículos, S.A; Fabio Alexandre Ferreira Carlos; Technophage; Vânia Patricia Jorge Martins; Teatro Nacional D. Maria II, EPE; Centro Cultural e Social de Santo Adrião; Guimarães Rugby UFC; MODALFA - Comércio e Serviços, S.A.; PDS Smart Fabric Textiles Ltd	iMM	2 149 632,68€
COVID-19 Testing Phase 1 - Garrafeira Soares SA; Associação Urban Sketchers Portugal, USKP; Associação Teroconsult; Hemendra Kumar Hari; CVP - Sociedade de Gestão Hospitalar do Hospital; Biosurfit ,SA;	iMM	382 524,03€
SFMS - Restart Phase 1 - COVID-19 - Francisco Manuel do Santos SGPS, SE	iMM	199 978,67€
SFMS - Restart Phase 2- COVID-19 - Francisco Manuel do Santos SGPS, SE	iMM	826 621,31€
MTSS Fase II - Instituto da Segurança Social, IP	iMM	810 240,00€

iMM Applications and Secured Competitive Funding

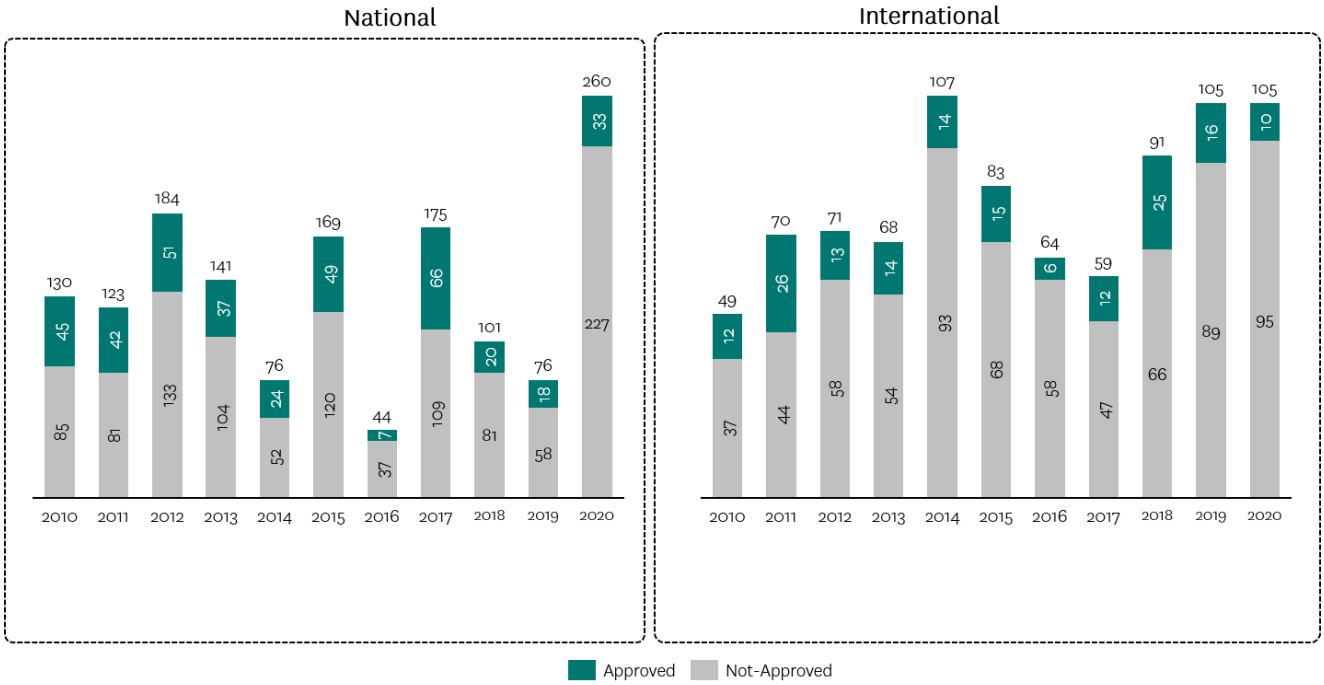


Figure 1: Submitted and approved applications to national and international competitive funding schemes since 2010. The number of submitted applications corresponds to those effectively communicated to the Pre-Award. The number of approved applications for 2020 corresponds to those with known results as of January 2021.

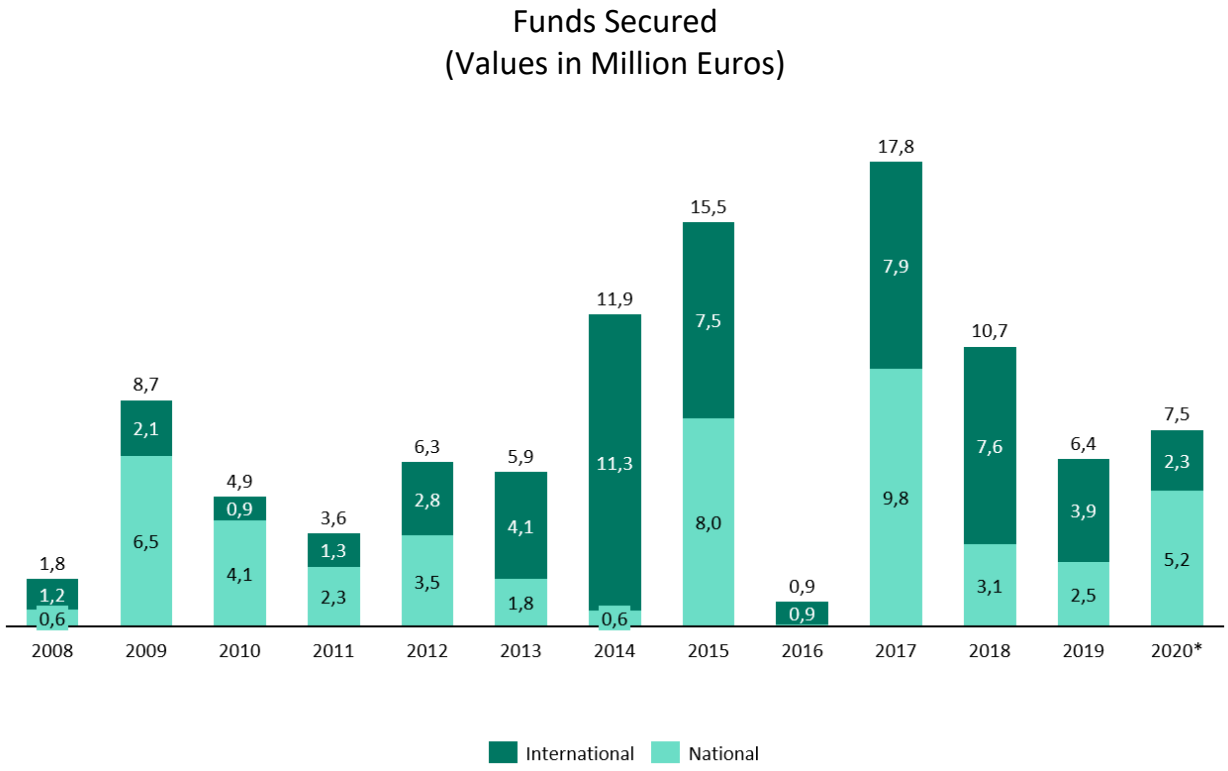


Figure 2: Total funds secured by iMM (in millions of €) in international and national competitive funding schemes since 2008. Secured funds per year correspond to the sum of the iMM budget of the approved applications submitted in the corresponding year (irrespectively to the project starting date). Information for 2020 corresponds to known results as of January 13, 2021.

Funding Sources of iMM Applications

In 2020, iMM researchers and staff have submitted grants to the following funding schemes:

<table>
<tr><th colspan="6">INTERNATIONAL</th></tr>
<tr><th colspan="2">PRIVATE</th><th colspan="4">PUBLIC</th></tr>
<tr><td>Alzheimer's Association</td><td>amfAR</td><td rowspan="11">European Commission - Horizon 2020</td><td rowspan="6">Excellent Science</td><td rowspan="4">European Research Council</td><td rowspan="4">Advanced Grant</td></tr>
<tr><td>Boehringer Ingelheim Fonds</td><td>Brain & Behaviour Research Foundation</td></tr>
<tr><td>British Heart Foundation</td><td>Cancer Research Institute</td></tr>
<tr><td>CURE</td><td>EMBO Long-Term Fellowship</td></tr>
<tr><td>ESCMID</td><td>European Hematology Association</td><td rowspan="3">Marie Skłodowska-Curie Actions</td><td>Individual Fellowships</td></tr>
<tr><td>Gilead</td><td>Human Frontier Science Program</td><td rowspan="2">Innovative Training Networks</td></tr>
<tr><td>International Brain Research Organization</td><td>International Society for Neurochemistry</td></tr>
<tr><td>Johnson&Johnson</td><td>Leducq Foundation</td><td rowspan="2">Industrial Leadership</td><td colspan="2" rowspan="2">ICT, Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing and Biotechnology</td></tr>
<tr><td rowspan="4">la Caixa</td><td>Junior Leader Fellowship</td></tr>
<tr><td>Health Research projects</td><td>Societal Challenges</td><td colspan="2">Health, demographic change and well-being</td></tr>
<tr><td>CaixaImpulse Consolidate</td><td colspan="4">Innovative Medicines Initiative (IMI) EU Public-Private Partnership</td></tr>
<tr><td>CaixaImpulse COVID-19</td><td colspan="4">EU Programme for Employment and Social Innovation (EaSI)</td></tr>
<tr><td>Mercatus' Emergent Ventures</td><td>Merck</td><td colspan="4">National Institute for Health (NIH), US</td></tr>
<tr><td>Michael J. Fox Foundation</td><td>Pablove Foundation</td><td colspan="4">US Department of Defense</td></tr>
<tr><td>Paul G. Allen Frontier Group</td><td>Rotary Club</td></tr>
<tr><td>When Everyone Survives</td><td>Worldwide Cancer Research</td></tr>
<tr><td>Mercatus' Emergent Ventures</td><td>Merck</td></tr>
<tr><td>Michael J. Fox Foundation</td><td>Pablove Foundation</td></tr>
<tr><td>Paul G. Allen Frontier Group</td><td>Rotary Club</td></tr>
<tr><td>When Everyone Survives</td><td>Worldwide Cancer Research</td></tr>
</table>

NATIONAL			
PRIVATE		PUBLIC	
Bial Foundation	Bluepharma	Fundação para a Ciência e Tecnologia	Scientific Employment Stimulus
Fundo iMM-Laço	Foundation L'Oreal		R&D Project Grants in all Scientific Domains
FLAD - Fundação Luso Americana para o Desenvolvimento			Special support for rapid implementation projects for innovative response solutions to COVID-19 pandemic
LPCC	LPCC - Terry Fox		International Cooperation SR&TD Projects Portugal-India
	Bolsa LPCC / Ausónia		International Cooperation European Joint Programme on Rare Diseases (EJP RD)
Fundação Manuel António da Mota	Fundação Amélia de Mello		International Partnerships UTA-Portugal
MSD Portugal	Pfizer | Sociedade das Ciências Médicas de Lisboa		Associate Laboratories
Sociedade Portuguesa de Hematologia		Portugal 2020	Programa “Testar com Ciência e Solidariedade” – COVID-19
Santa Casa da Misericórdia de Lisboa			Sistema de Incentivos a Atividades de Investigação e Desenvolvimento e ao Investimento em Infraestruturas de Ensaio e Otimização (upscaling) no contexto da COVID -19

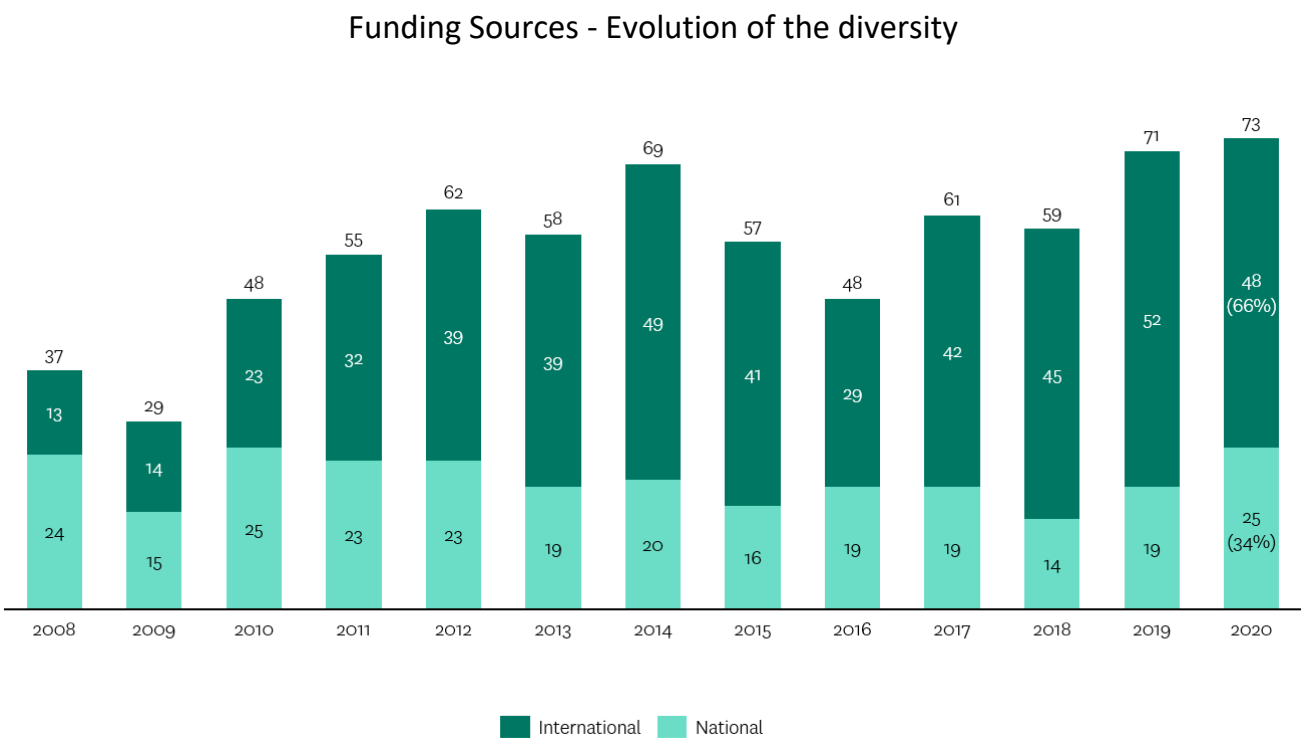


Figure 3: Evolution of the diversity of international and national funding schemes for which iMM researchers submitted applications from 2008 to 2020.

2020 iMM Activities Highlights

Human Resources 2020

		2019	2020
Researchers	PhD	231	242
	PhD Students	139	127
	MSc Students	64	112
	Master	52	44
	Graduate	21	21
	Other	6	7
		513	553
Technical Staff	PhD	8	8
	Master	61	58
	Graduate	19	21
	Other	11	14
		99	101
Administrative Staff	PhD	11	12
	Master	15	17
	Graduate	17	16
	Other	9	9
		52	54
	TOTAL	664	708

Selection of Prizes and Awards

"la Caixa" Foundation – Health Research 2020

M. Carmo-Fonseca (Group Leader)

Luísa Figueiredo (Group Leader)

2020 Whitman Fellowships and Early Career Investigator Awards (Marine Biological Laboratory)

Edgar Gomes (Group Leader)

25 Most Influential Women of Portugal Award (2019 Edition - Announced in 2020)

M. Carmo-Fonseca (Group Leader)

Banco Carregosa/SRNOM Award – Seção Regional Norte da Ordem dos Médicos | Honorable Mention

Ana Catarina Fonseca (José Ferro Lab)

Consagração de Carreira Award – Dona Antónia Adelaide Ferreira Awards

Maria Mota (Group Leader)

European Molecular Biology Organization (EMBO) Installation Grant - Young Investigator Network

Pedro Sousa-Víctor (Group Leader)

European Molecular Biology Organization (EMBO) Long Term Fellowship

Valentina Riva (Claus Azzalin Lab)

Fundo iMM-Laço: A Caminho da Cura (2019 Edition – Announced in 2020)

Ana Magalhães (Sérgio Dias Lab)

H2020 Twinning: Epileptogenesis and Epilepsy Network (EpiEpiNet)

Ana Sebastião (Group Leader)

iMM Best Master Thesis Award (2019/2020 Edition - Announced in 2021)

Tajda Klobucar (M. Carmo-Fonseca Lab)

Gonçalo Nogueira (Miguel Prudêncio Lab)

Sara Pereira (Bruno Silva-Santos Lab)

Marie Curie Innovative Training Network (ITN) ENLIGHT-TEN+

Luís Graça and Marc Veldhoen (Group Leaders)

Melo e Castro Award – Santa Casa Neurocências Awards

Leonor Saúde (Group Leader)

Pedro Maria José de Mello Costa Duarte Grant (Fundação Amélia de Mello)

Evguenia Bekman and Simão Rocha (M. Carmo-Fonseca Lab)

Pfizer Award 2020 – Clinical Research

Miguel Prudêncio (Group Leader)

Pfizer Award 2020 – Basic Research

Julie Ribot (Bruno Silva-Santos Lab)

RNA Society President Election

M. Carmo-Fonseca (Group Leader)

Sartorius & Science Prize for Regenerative Medicine & Cell Therapy

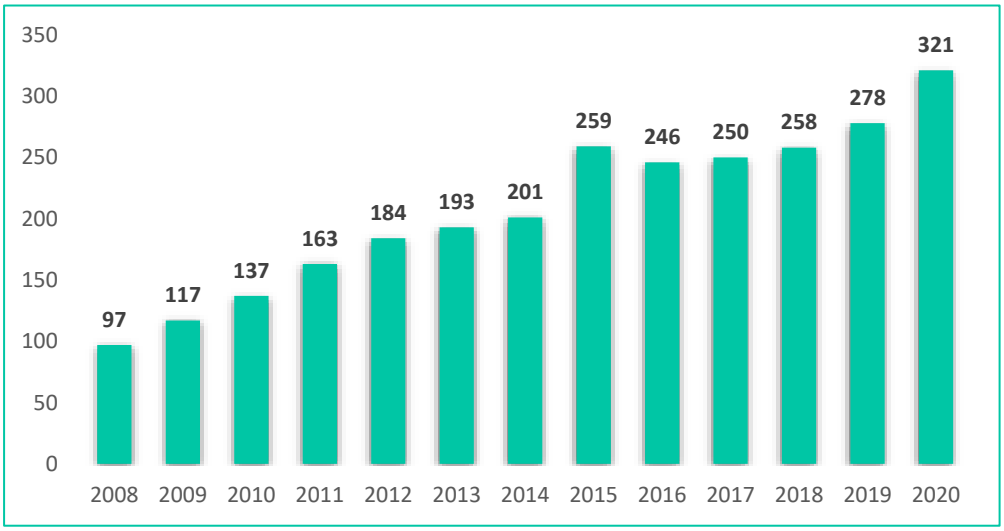
Joana Neves (Group Leader)

Productivity at a Glance

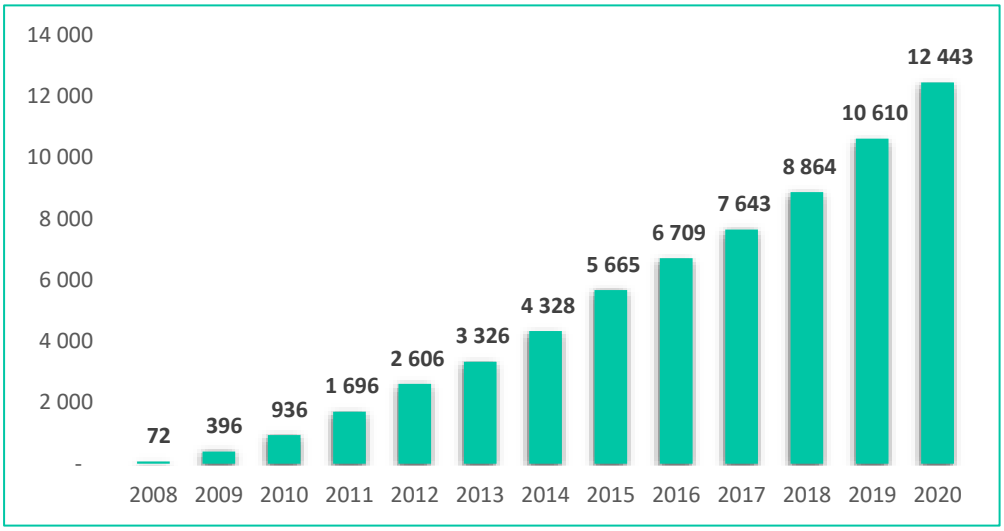
	2019	2020
Total Publications International Journals	278	321
Communications in International Conferences	411	296
Communications in National Conferences	374	157
Seminars and Invited Lectures	414	250
Organisation of Conferences	102	47
PhD Thesis Completed	23	29
MSc Thesis Completed	84	45
Prizes, Honours and Awards	107	63

iMM Publications in International Journals

(Source: Web of Science™)



Published Items in Each Year: 2008-2020



Citations in Each Year: 2008-2020

Papers in 2020: 321
Sum of the times cited: 66.833
Average citations per item: 24,72
h-index: 102

Query: ADDRESS: (Inst Med Molec SAME Portugal) OR ADDRESS: (Mol Med Inst SAME Portugal) OR ADDRESS: (Inst Mol Med SAME Portugal) OR ADDRESS: (Inst Med Mol SAME PORTUGAL)
Refined by: [excluding] DOCUMENT TYPES=(EDITORIAL MATERIAL OR CORRECTION OR MEETING ABSTRACT OR BOOK CHAPTER OR REVIEW)
Timespan: 2008-2020. Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC.

Note: This data is based on the information available on the Web of Science; hence, it is not an exhaustive analysis of the iMM publications.

10 Most Cited Articles 2002-2019

(Source: Web of Science™)

Ostrowski M, Carmo NB, Krumeich S et al (2010). Rab27a and Rab27b control different steps of the exosome secretion pathway. Nature Cell Biology 12(1):19-30. *(IF: 20.042, Citations: 1 107)*.

Lefaucheur J, Andre-Obadia N, Antal A et al (2014). Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS). Clinical Neurophysiology 125(11):2150- 2206. *(IF: 3.214, Citations: 881)*.

Healy DG, Falchi M, O'Sullivan SeanS et al (2008). Phenotype, genotype, and worldwide genetic penetrance of LRRK2-associated Parkinson's disease: a case-control study. Lancet Neurology 7(7):583-590. *(IF: 30.039, Citations: 857)*.

Henry DH, Costa L, Goldwasser F et al (2011). Randomized, Double-Blind Study of Denosumab Versus Zoledronic Acid in the Treatment of Bone Metastases in Patients with Advanced Cancer (Excluding Breast and Prostate Cancer) or Multiple Myeloma. Journal of Clinical Oncology 29(9):1125-1132. *(IF: 32.956, Citations: 675)*.

Ratziu V, Bellentani S, Cortez-Pinto H et al (2010). A position statement on NAFLD/NASH based on the EASL 2009 special conference. Journal of Hepatology 53(2):372-384. *(IF: 20.582, Citations: 621)*.

Klose CSN, Flach M, Moehle L et al (2014). Differentiation of Type 1 ILCs from a Common Progenitor to All Helper-like Innate Lymphoid Cell Lineages. Cell 157(2):340-356. *(IF: 38.637, Citations: 603)*.

Colombo M, Moita C, van Niel G et al (2013). Analysis of ESCRT functions in exosome biogenesis, composition and secretion highlights the heterogeneity of extracellular vesicles. Journal of Cell Science 126(24):5553-5565. *(IF: 4.573, Citations: 578)*.

Hansen C, Angot E, Bergstrom AL et al (2011). alpha-Synuclein propagates from mouse brain to grafted dopaminergic neurons and seeds aggregation in cultured human cells. Journal of Clinical Investigation 121(2):715-725. *(IF: 11.864, Citations: 532)*.

Barbosa-Morais NL, Irimia M, Pan Q et al (2012). The Evolutionary Landscape of Alternative Splicing in Vertebrate Species. Science 338(6114):1587-1593. *(IF: 41.846, Citations: 499)*.

Zerr I, Kallenberg K, Summers DM et al (2009). Updated clinical diagnostic criteria for sporadic Creutzfeldt-Jakob disease. Brain 132:2659- 2668. *(IF: 11.337, Citations: 472)*.

Note: This data is based on the information available on the Web of Science; hence, it is not an exhaustive analysis of the iMM publications.

Selected Publications

Abrams EM, McGill G, Bhopal SS, Sinha I, Fernandes RM (2020). COVID-19, asthma, and return to school. Lancet Respiratory Medicine 8(9):847-849.

Aguiar de Sousa D, Lucas Neto L, Arauz A, Sousa AL, Gabriel D, Correia M, Gil-Gouveia R, Penas S, Carvalho Dias M, Correia MA, Carvalho M, Canhão P, Ferro JM (2020). Early Recanalization in Patients with Cerebral Venous Thrombosis Treated with Anticoagulation. Stroke 51(4):1174-1181.

Alves M, Caldeira D, Ferro JM, Ferreira JJ (2020). Does Parkinson's disease increase the risk of cardiovascular events? A systematic review and meta-analysis. European Journal of Neurology 27(2):288-296.

Aroeira RI, Castanho MARB (2020). Can citation metrics predict the true impact of scientific papers? The FEBS Journal 287(12):2440-2448.

Belo RF, Martins MLF, Shvachiy L, Costa-Coelho T, de Almeida-Borlido C, Fonseca-Gomes J, Neves V, Vicente Miranda H, Outeiro TF, Coelho JE, Xapelli S, Valente CA, Heras MI, Bardaji E, Castanho MARB, Diógenes MJ, Sebastião AM (2020). The Neuroprotective Action of Amidated-Kyotorphin on Amyloid β Peptide-Induced Alzheimer's Disease Pathophysiology. Frontiers in Pharmacology 11:985.

Bordone MC, Barbosa-Morais NL (2020). Unraveling Targetable Systemic and Cell-Type-Specific Molecular Phenotypes of Alzheimer's and Parkinson's Brains with Digital Cytometry. Frontiers in Neuroscience 14:607215.

Caldeira D, Marques A, Almeida J, Rodrigues T, Alves M, David C, Gonçalves N, Costa J, Ferreira JJ, Pinto FJ (2020). Recommendations and levels of evidence in the guidelines of the European Society of Cardiology: current scenario and time trends. European Heart Journal - Cardiovascular Pharmacotherapy 6(2):122-124.

Cavaco M, Andreu D, Castanho MARB (2020). The Challenge of Peptide Proteolytic Stability Studies: Scarce Data, Difficult Readability, and the Need for Harmonization. Angewandte Chemie International Edition 132:2-5.

Coleman RE, Croucher PI, Padhani AR, Clézardin P, Chow E, Fallon M, Guise T, Colangeli S, Capanna R, Costa L (2020). Bone metastases. Nature Reviews Disease Primers 6(1):83. Review.

Coutinho JM, Zuurbier SM, Bousser MG, Ji X, Canhão P, Roos YB, Crassard I, Nunes AP, Uyttenboogaart M, Chen J, Emmer BJ, Roosendaal SD, Houdart E, Reekers JA, van den Berg R, de Haan RJ, Majoie CB, Ferro JM, Stam J; TO-ACT investigators (2020). Effect of endovascular treatment with medical management vs standard care on severe cerebral venous thrombosis: The TO-ACT Randomized Clinical Trial. JAMA Neurology 77(8):966-973.

Déjardin T, Carollo PS, Sipieter F, Davidson PM, Seiler C, Cuvelier D, Cadot B, Sykes C, Gomes ER, Borghi N (2020). Nesprins are mechanotransducers that discriminate epithelial-mesenchymal transition programs. Journal of Cell Biology 219(10):e201908036.

Faustino PR, Duarte GS, Chendo I, Castro Caldas A, Reimão S, Fernandes RM, Vale J, Tinazzi M, Bhatia K, Ferreira JJ (2020). Risk of Developing Parkinson Disease in Bipolar Disorder: A Systematic Review and Meta-analysis. Jama Neurology 77(2):192-198.

Ferreira C, Barros L, Baptista M, Blankenhaus B, Barros A, Figueiredo-Campos P, Konjar S, Laine A, Kamenjarin N, Stojanovic A, Cerwenka A, Probst HC, Marie JC, Veldhoen M (2020). Type 1 Treg cells promote the generation of CD8(+) tissue-resident memory T cells. Nature Immunology 21:766-776.

Ferro JM, Coutinho JM, Jansen O, Bendszus M, Dentali F, Kobayashi A, van der Veen B, Miede C, Caria J, Huisman H, Diener HC; RE-SPECT CVT Study Group (2020). Dural Arteriovenous Fistulae after Cerebral Venous Thrombosis. Stroke 51(11):3344-3347.

Figueira TN, Domingues MM, Illien F, Cadima-Couto I, Todorovski T, Andreu D, Sagan S, Castanho MARB, Walrant A, Veiga AS (2020). Enfuvirtide-Protoporphyrin IX Dual-Loaded Liposomes: In Vitro Evidence of Synergy against HIV-1 Entry into Cells. ACS Infectious Diseases 6(2):224-236.

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Gomes I, de Almeida BP, Dâmaso S, Mansinho A, Correia I, Henriques S, Cruz-Duarte R, Vilhais G, Félix P, Alves P, Corredeira P, Barbosa-Morais N, Costa L, Casimiro S (2020). Expression of receptor activator of NFkB (RANK) drives stemness and resistance to therapy in ER+HER2- breast cancer. Oncotarget 11 (19):1714-1728.

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Li H, Conde J, Guerreiro A, Bernardes GJL (2020). Tetrazine carbon nanotubes for pre-targeted in vivo 'click-to-release' bioorthogonal tumour imaging. Angewandte Chemie International Edition 59(37):16023–16032.

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Neves J**, Sousa-Victor P** (2020). Regulation of inflammation as an anti-aging intervention. FEBS Journal 287(2020):43–52. Perspective.

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Ramos JLB, Duarte GS, Bouça-Machado R, Fabbri M, Mestre TA, Costa J, Ramos TLB, Ferreira JJ (2020). The Role of Architecture and Design in the Management of Parkinson's Disease: A Systematic Review. Journal of Parkinson´s Disease 1-14.

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Reker D, Hoyt EA, Bernardes GJL*; Rodrigues T* (co-senior authors) (2020). Adaptive optimization of chemical reactions with minimal experimental information. Cell Reports Physical Science 2(1):100316.

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Romão VC, Polido-Pereira J, Barros R, Luís R, Vidal B, Vieira-Sousa E, Vitorino E, Humby F, Kelly S, Pitzalis C, Saraiva F, Fonseca JE (2020). Efficacy, Safety, and Sample Quality of Ultrasound-Guided Synovial Needle Biopsy in Clinical Practice and Research: A Prospective Observational Study. Arthritis Care Research (Hoboken) 72(10):1497-1505.

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Skalska J, Andrade VM, Cena GL, Harvey PJ, Gaspar D, Mello ÉO, Henriques ST, Valle J, Gomes VM, Conceição K, Castanho MARB, Andreu D (2020). Synthesis, Structure, and Activity of the Antifungal Plant Defensin PvD1. Journal of Medicinal Chemistry 63(17):9391–9402.

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Vieira-Sousa E, Alves P, Rodrigues AM, Teixeira F, Tavares-Costa J, Bernardo A, Pimenta S, Pimentel-Santos FM, Gomes JL, Aguiar R, Pinto P, Videira T, Catita C, Santos H, Borges J, Sequeira G, Ribeiro C, Teixeira L, Ávila-Ribeiro P, Martins FM, Canhão H, McInnes IB, Ribeiro RM, Fonseca JE (2020). GO-DACT: a phase 3b randomised, double-blind, placebo-controlled trial of GOlimumab plus methotrexate (MTX) versus placebo plus MTX in improving DACTylitis in MTX-naive patients with psoriatic arthritis. Annals of Rheumatology Disease 79(4):490-498.

Seminars, Workshops & Events

Computational Biology and Bioinformatics Seminar

January 8
"Capturing pathogen genetic diversity directly from clinical samples"
Vítor Borges – INSA

January 22
"Exploring the impact of LINE-1 repeats expression using NGS in the context of pluripotency and X-chromosome inactivation"
Anne-Valerie Gendrel – Sérgio de Almeida Lab

February 5
"Chewie-NS: Enabling the use of gene-by-gene typing methods through a public and centralized service"
Pedro Vila-Cerqueira – Mário Ramirez Lab

February 12
"Inferring population divergence and past migrations from modern and ancient genomes"
Vítor Sousa – Faculdade de Ciências da Universidade de Lisboa (FCUL)

March 5
"The Computational Roles of Dopamine and Serotonin in Tourette Syndrome and Obsessive-Compulsive Disorder"
Vasco Conceição – Mamede de Carvalho Lab

April 15 (Zoom Seminar)
"The steps towards global harmonization and all things meta"
Emma Griffiths
Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver

April 29 (Zoom Seminar)
"Q&A with the Information Systems Unit"
Stéphane Martins – Information Systems Unit

May 20 (Zoom Seminar)
"Computational approaches to study lymphocytes regulation"
Saumya Kumar – Luís Graça Lab

May 27 (Zoom Seminar)
"GenomePT iMM: let's make Bioinformatics great again"
Arthur Schneider, Marta Bica & Rita Belo – Nuno Morais Lab

November 11 (Zoom Seminar)
"Membrane-active peptides interacting with bioenergetic membranes: lessons from molecular dynamics simulations"
Marcin Makowski – Nuno Santos Lab

November 25 (Zoom Seminar)
"POINT technology illuminates the processing of polymerase-associated intact nascent transcripts"
Rui Luís – Carmo-Fonseca Lab

December 9 (Zoom Seminar)
"Impact of different bioinformatic workflows on cluster identification of bacterial outbreaks: a Dutch multicentre proficiency testing study"
Casper Jamin – Maastricht University Medical Center+ (MUMC+)

EXCELLtoINNOV Seminar

January 30
"Heterologous immunity and the impact of infection history on inflammatory diseases"
Nicole Joller – Institute of Experimental Immunology - University of Zurich
Host: Marc Veldhoen

Immunology Club

January 29
"The role of AhR-interacting protein in T cell biology"
Silvia Ariotti – Marc Veldhoen Lab

February 12
"Common Variable Immunodeficiency: taking advantage of being common and variable"
Susana Lopes da Silva – Ana Espada de Sousa Lab

November 11 (Zoom Seminar)
"Maturation of T follicular regulatory cells in human tissue"
Filipa Ribeiro – Luís Graça Lab

November 25 (Zoom Seminar)
"Meningeal γδ T cells: Impact on cognition in health and disease"
Julie Ribot – Bruno Silva-Santos Lab

December 9 (Zoom Seminar)
"TRM: What's lung got to do with it?"
Leandro Barros – Marc Veldhoen Lab

Internal Seminar

January 8
Maria Mota – Group Leader

February 26
"Alternative routes towards curing ALT cancers"
Claus Azzalin – Group Leader

March 18 (Zoom Seminar)
“Q&A: COVID-19”
Pedro Simas – Group Leader

March 25 (Zoom Seminar)
“Of mice and men: in the quest for the best model”
Tânia Carvalho – Comparative Pathology Unit
Host: Luísa Lopes

April 1 (Zoom Seminar)
“Nuclear stiffness and senescence in γδ T cells at single-cell level”
Cláudio Franco – Group Leader
Host: Luísa Lopes

April 8 (Zoom Seminar)
“A role for nuclear positioning in the propagation of action potentials and mRNA distribution in skeletal muscle”
Edgar Gomes – Group Leader
Host: Luísa Lopes

April 13 (Zoom Seminar)
“Strategies for targeted drug design against Covid19 main protease”
Francisco J. Enguita – iMM, FMUL

April 15 (Zoom Seminar)
“Severe Malaria - What's Liver got to do with it?”
Ângelo Chora – Maria Mota Lab
Host: Nuno Morais

April 22 (Zoom Seminar)
“Breaking and entering: following the Trypanosoma brucei voyage within living mammalian hosts”
Mariana De Niz – Luísa Figueiredo Lab
Host: Luísa Lopes

May 6 (Zoom Seminar)
“Post-Translation Modification and Viral Oncogenesis”
Pedro Simas – Group Leader

May 13 (Zoom Seminar)
“It’s about time: clocks and memory”
Luísa Lopes – Group Leader
Host: Nuno Morais

May 20 (Zoom Seminar)
“A long non-coding RNA controls parasite differentiation in African trypanosomes”
Fabien Guegan – Luísa Figueiredo Lab
Host: Luísa Lopes

May 27 (Zoom Seminar)
“Fibrinogen-erythrocyte interactions as a biomarker for the early detection of (cardio)vascular thrombotic events”
Nuno Santos – Group Leader
Host: Nuno Morais

June 3 (Zoom Seminar)
“Exploring the impact of LINE-1 transposable elements expression in the context of pluripotency and X-chromosome inactivation”
Anne-Valerie Gendrel – Sérgio de Almeida Lab
Host: Luísa Lopes

June 17 (Zoom Seminar)
“BDNF and Adenosine A2A receptors: an intimate interaction regulating adult neurogenesis”
Sara Xapeli – Ana Sebastião Lab

June 24 (Zoom Seminar)
“Rheumatology struck by COVID-19 - a case study representative of the impact of SARS-CoV-2 on medical care”
João Eurico da Fonseca – Group Leader
Host: Luísa Lopes

July 1 (Zoom Seminar)
“A satellite cell-independent muscle regenerative mechanism”
William Roman – Edgar Gomes Lab
Host: Nuno Morais

July 8 (Zoom Seminar)
“COVID-19 Serology at iMM; from planning to execution and results”
Marc Veldhoen – Group Leader
Host: Luísa Lopes

July 22 (Zoom Seminar)
“RNA in precision medicine”
M. Carmo Fonseca – Group Leader
Host: Luísa Lopes

September 9 (Zoom Seminar)
“Bioinformatic analyses of human transcriptomes made intelligible to biologists”
Nuno Morais – Group Leader
Host: Luísa Lopes

September 21 (Zoom Seminar)
“Preclinical development of anti-SARS-CoV-2 drugs at IMM: whither are we bound?”
Miguel Castanho – Group Leader
Host: Nuno Morais

October 7 (Zoom Seminar)
"Small Molecule-driven Targeted RNA Degradation”
Gonçalo Bernardes – Group Leader
Host: Nuno Morais

November 4 (Zoom Seminar)
"TBA - T cells, B cells, and Antibodies"
Luís Graça – Group Leader
Host: Nuno Morais

November 18 (Zoom Seminar)
"It's Really all About Timing"
Miguel Remondes – Group Leader
Host: Nuno Morais

December 2 (Zoom Seminar)
"Mechanisms of nuclear positioning during cell migration"
Edgar Gomes – Group Leader
Host: Luísa Lopes

December 16 (Zoom Seminar)
"*Plasmodium* liver infection and anti-malarial strategies"
Miguel Prudêncio – Group Leader

Metabolism Club

January 9
"Glucose metabolism of gamma-delta T cell subsets within tumors"
Noella Lopes – Bruno Silva-Santos Lab

March 5
"Metabolic reprogramming of IELs during activation"
Spela Konjar – Marc Veldhoen Lab

Monday Lecture

January 6
"cryo-EM studies of the TMEM16 family: The flips and flops of a scramblase story"
Cristina Paulino – University of Groningen
Host: Gonçalo Bernardes

January 20
"Discovering Functional Genome Structures in Flaviviruses"
Roland Huber – Bioinformatics Institute
Host: Nuno Santos

January 27
"A time and a place for R-loop resolution"
Brian Luke – IMB Mainz
Host: Claus Azzalin

February 3
"Single cell epigenome landscape of development and ageing"
Wolf Reik – Babraham Institute, Cambridge
Host: Alexandre Raposo (Ana Espada de Sousa Lab)

February 10
"Animating Molecular Machines"
Janet Iwasa – University of Utah
Host: Nuno Morais

February 17
"Macrophages: Bad Actors in Cancer"
Jeff Pollard – MRC Centre for Reproductive Health, University of Edinburgh
Host: Sérgio Dias

March 2
"The curious case of telomerase RNA: are there differences between young and old?"
Raymund Wellinger – Faculty of Medicine and Health Sciences, Université de Sherbrooke
Host: Claus Azzalin

March 30 (Zoom Seminar)
"Dynamics of cell populations in cancer and pre-cancer at single cell resolution"
Samuel Aparício – Dept. Molecular Oncology, Univ British Columbia, Vancouver
Host: Domingos Henrique

April 6 (Zoom Seminar)
"Drug-Microbe-Host interactions in Cancer and Ageing"
Filipe Cabreiro – Imperial College London
Host: Cláudio Franco

April 27 (Zoom Seminar)
"The uncertainty around COVID-19: lessons of Encephalitis Lethargica 100 years after the pandemic"
Joaquim Ferreira – Group Leader

May 11 (Zoom Seminar)
"Unconventional T cells; targets and therapeutic potential"
Dale Godfrey – Immunology, Doherty Institute. Dept Microbiology and Immunology. University of Melbourne
Host: Luís Graça

May 18 (Zoom Seminar)
"Spatial transcriptomics of mammalian tissues"
Shalev Itzkovitz – Weizmann Institute of Science, Israel
Host: Maria Mota

June 8 (Zoom Seminar)
"Retinal Lamination: generating order out of (pseudo)-chaos"
Care Norden – Instituto Gulbenkian de Ciência
Host: Edgar Gomes

June 15 (Zoom Seminar)
"Systems biology approaches reveal different requirements for host microRNAs in Salmonella and Shigella infection"
Ana Eulálio – CNC
Host: Sérgio de Almeida

June 22 (Zoom Seminar)
"Metabolic needs and capabilities during Toxoplasma gondii encystation"
Dominique Soldati-Favre – Department of Microbiology and Molecular Medicine, Faculty of Medicine, University of Geneva
Host: Miguel Prudêncio Lab

June 29 (Zoom Seminar)
"How mutant stem cells colonise normal tissues"
Philip H. Jones – Wellcome Sanger Institute, Hinxton CB10 1SA, UK
Host: Domingos Henrique

July 6 (Zoom Seminar)
"Mechanical Control of Morphogenesis- from tissue interactions to cytoskeleton dynamics"
Elias Barriga – Instituto Gulbenkian de Ciência
Host: Cláudio Franco

July 20 (Zoom Seminar)
"Phase separation enables heterochromatin domains to do mechanical work to antagonize nuclear deformation"
Megan C. King – Boyer Center for Molecular Medicine, Yale School of Medicine
Host: Claus Azzalin

September 21 (Zoom Seminar)
"Mechanisms of onset and guidance of collective cell migration in vivo"
Elias Barriga – Instituto Gulbenkian de Ciência
Host: Cláudio Franco

September 28 (Zoom Seminar)
"Diet, microbes, cytokines, and disease: it takes three to tango"
Sérgio Lira – Icahn School of Medicine, Mount Sinai
Host: Marc Veldhoen

October 26 (Zoom Seminar)
"Harnessing Direct Cell Reprogramming for Cancer Immunotherapy"
Filipe Pereira – Lund University
Host: Sérgio de Almeida

November 2 (Zoom Seminar)
"Telomere driven regulation of proliferative boundaries"
Jan Karlseder – Salk Institute of Biological Studies, La Jolla, California
Host: Claus Azzalin

November 16 (Zoom Seminar)
"Rotating ATP synthases in lipid bilayers: diffusion, energy dissipation and membrane fluctuations"
Ivan López-Montero – Universidad Complutense, Madrid
Host: Nuno Santos

November 23 (Zoom Seminar)
"A tale of two genomes DNA repair in the mitochondria and the nucleus"
Agnel Sfeir – Skirball Institute, NYU School of Medicine
Host: Claus Azzalin

December 21 (Zoom Seminar)
"Decoding tissue-specific mechanisms of cancer dormancy"
Ana Correia – University of Basel
Host: Bruno Silva-Santos

NeuroSeS Seminar

January 14
"Goal-directed behavior in health and disease"
Bruno Miranda - FMUL

Neurosciences Seminar

January 6
"Nature of the astrocytic GABA Transporter Type 1 malfunction"
Tatiana Morais – Cardiff University

January 13
"Nature of the astrocytic GABA Transporter Type 1 malfunction"
Sodikdzhon Kodirov – Ana Sebastião Lab

January 20
"Interplay of cannabinoid and adenosine receptors in astrocytes"
Joana Ribeiro – Ana Sebastião Lab

January 27
"Role of SEPT5 on synaptic vesicle exocytosis: molecular and functional analysis"
Catarina Beatriz Ferreira – Ana Sebastião Lab

February 10
"BDNF receptor cleavage: what was done in 4 years?"
João Gomes – Ana Sebastião Lab

February 17
"The importance of chronobiology to the sleep field"
Cátia Reis – Luísa Lopes

June 1 (Zoom Seminar)
"Unveiling the link between BDNF alterations and cognitive deficits in schizophrenia"
Sara Tanqueiro – Ana Sebastião Lab

June 8 (Zoom Seminar)
"Dissecting sensory processing dysfunctions in Autism"
Jorge Cardoso – Miguel Remondes Lab

June 15 (Zoom Seminar)
"An adenosine A1R agonist with anticonvulsant properties but devoid of effect on excitatory hippocampal synaptic transmission"
Anwesha Ghosh – Ana Sebastião Lab

June 22 (Zoom Seminar)
“Tripartite Synapses: Astrocyte control of synaptic transmission and plasticity”
Alfonso Araque – University of Minnesota

June 29 (Zoom Seminar)
“Mapping the interactions between circadian rhythms and memory”
Inês Morgado – Luísa Lopes Lab & Miguel Remondes Lab

July 6 (Zoom Seminar)
“The involvement of cingulate cortex in memory-dependent choices”
Ana Sofia Cruz – Miguel Remondes Lab

July 14 (Zoom Seminar)
“Astrosome: Use of artificial astrocytes as a novel therapeutic to amyotrophic lateral sclerosis”
Sara Pinto – Ana Sebastião Lab

July 20 (Zoom Seminar)
“Modulation of NMDA receptors by amyloid precursor protein”
Joana Saraiva – Luísa Lopes Lab

July 27 (Zoom Seminar)
“Parkinson’s Disease: the role of PINK1 in different neural cells”
Elvira Leites – Vanessa Morais Lab

September 14 (Zoom Seminar)
“Mapping the encoding and retrieval of contextual cues in drug-seeking behavior”
Joana Gomes Ribeiro – Luísa Lopes Lab & Miguel Remondes Lab

September 21 (Zoom Seminar)
“Unconventional neurogenic niches and where to find them”
Sara Paulo – Ana Sebastião Lab

September 28 (Zoom Seminar)
“How Our Brain Solves Dilemmas”
Bárbara Correia – Miguel Remondes Lab

October 12 (Zoom Seminar)
“Mitochondrial Dynamics: a target for neural stem cell fate modulation”
Rita Soares – Ana Sebastião Lab & Vanessa Morais Lab

October 19 (Zoom Seminar)
“Neuroimaging Studies on Familiarity of Music in Children with Autism Spectrum Disorder”
Carina Freitas – SESARAM, Hospital do Funchal and Universidade da Madeira

October 26 (Zoom Seminar)
“Disfluency and cognitive control: when it's better to make it worse”
Gonçalo Aires de Oliveira – Miguel Remondes Lab

November 2 (Zoom Seminar)
“Cell antioxidant mechanisms mimicry: two generations of microreactors”
Oksana Savchak – Ana Sebastião Lab

November 9 (Zoom Seminar)
"Modulating A2ARs: mechanisms to boost postnatal oligodendrogenesis"
Joana Mateus – Ana Sebastião Lab

November 23 (Zoom Seminar)
"The effect of a putative antiepileptic drug on GABA uptake in the rat hippocampus"
Nádia Rei – Ana Sebastião Lab

December 14 (Zoom Seminar)
"Good times, bad times: Exploring the contextual dependency of drug effects"
Miguel Ferreira – Ana Sebastião Lab

December 21 (Zoom Seminar)
Pitch Presentations by Master Students
"Role of SNARE-dependent gliotransmitters release in Alzheimer's disease: from astrocytes to circuits"
Daniela Abreu – Ana Sebastião Lab
"The role of Cingule Cortex in working memory-based decisions"
Sara Cruz – Miguel Remondes Lab

Oncobiology Club

January 8
"CO-conjugated proteins in cancer immunotherapy"
Carlos Labão-Almeida – Gonçalo Bernardes Lab

January 22
"Targeting RAC1-signaling to enhance radioiodide therapy in thyroid cancer"
Márcia Faria – Research Group on Endocrine Tumors and Signaling, Hospital de Santa Maria

February 5
"Promotion of anti-tumor γδ T cell responses via cellular and metabolic regulation of effector subsets in the tumor microenvironment"
Noella Lopes – Bruno Silva-Santos Lab

February 19
"Transcriptomics of IL-7-mediated signaling in T-cell Acute Lymphoblastic Leukemia"
Daniel Ribeiro – João Barata Lab

April 8 (Zoom Seminar)
"hERV/retro-transposon transactivation as a potential prognostic biomarker"
Marta Martins – Luís Costa Lab

April 22 (Zoom Seminar)
"Systemic cholesterol and metastasis"
Ana Magalhães – Sérgio Dias Lab

May 20 (Zoom Seminar)
"Patient-derived models of brain metastases: an opportunity to study the human disease and to develop novel therapies"
Cláudia Faria – João Barata Lab

October 7 (Zoom Seminar)
"Re-purposing Delta One T cells for immunotherapy of solid tumours: Colon cancer as proof-of-principle"
Sofia Mensurado – Bruno Silva-Santos

November 4 (Zoom Seminar)
"Approaches to study breast cancer metabolism"
Teresa Serafim – Sérgio Dias Lab

November 18 (Zoom Seminar)
"RCC CTC detection by Imaging Flow Cytometry"
Tito Leitão – Luís Costa Lab

December 2 (Zoom Seminar)
"From prostate cancer to B-cell malignancies: The importance of selectively targeting a cysteine"
Bárbara B. Sousa – Gonçalo Bernardes Lab

December 16 (Zoom Seminar)
"IL-7 signaling in acute lymphoblastic leukemia: The importance of proteomics and the role of lipids in tumorigenesis"
Luís Monteiro – João Barata Lab

Other Events

January 24
Juntos pelo Fernando
Menno Witter, Maria de Sousa, Teresa Paiva and Pedro Guedes de Oliveira

February 11
iMM Postdoc Meeting

February 18
CAML Rheumatology Series
"Monogenic Autoinflammatory Diseases"
Marc Gattorno – Autoinflammatory Diseases and Immunodeficiencies Centre, Pediatric Rheumatology Clinic, IRCCS Giannina Gaslini Institute, University of Genova

March 9-10
Inside iMM

March 26 (Zoom Event)
Vamos Falar de Ciência: SARS-CoV-2
Pedro Simas and Luís Graça
Host: Luísa Lopes

April 8 (Zoom Event)
Vamos Falar de Ciência: Números, vírus e o nosso sistema imunitário
Ana Espada de Sousa, Miguel Castanho and Ruy Ribeiro
Host: Luísa Lopes

April 29 (Zoom Event)
COLife Webinar
Sharing Information Together: Vamos Falar de Vacinas
Catarina Martins, Jorge Carneiro and Miguel Prudêncio
Host: Luísa Lopes

May 13 (Zoom Seminar)
"Agendo: a single platform for managing scientific and non-scientific resources"
Nuno Moreno – CKLO, Ldt

May 28 (Zoom Seminar)
"Strategies for managing our well-being during COVID times"
Desiree Dickerson

June 17 (Zoom Event)
Q&A | Master in Biomedical Research
Luís Graça, Luísa Lopes, Pedro Simas and Edgar Gomes
Host: Filipa Nunes

September 24 (Zoom Seminar)
COLife Community Webinar
Meet COLife – The collaboration for Life Sciences in Lisbon & Oeiras.
Mariana Silva (COLife Coordinator), Joe Paton (Champalimaud Research), Paulo Pereira (CEDOC – NMS), Paula Alves (iBET), Bruno Silva-Santos (iMM), Cláudio Soares (ITQB Nova) & Mónica Bettencourt-Dias (IGC)

October 21 (Zoom Event)
Computational Biology & Bioinformatics Day – CBB Day

October 22 (Zoom Seminar)
Out of Our Box
"Utilizing Earth Observations to Enhance Public Health Surveillance: Focus on the One Health Approach"
Helena Chapman – Associate Program Manager, Health and Air Quality Applications, NASA Applied Sciences Program (Booz Allen Hamilton), Washington, DC

October 27 (Zoom Seminar)
CAML Rheumatology Series
"STAT signaling in SLE and implications for clinical therapy"
Tadej Avcin
Department of Allergology, Rheumatology and Clinical Immunology, University Children's Hospital, University Medical Center Ljubljana

November 19 (Zoom Seminar)
COLife Community Webinar
"Get to know the Research Facilities at COLife"

November 24 (Zoom Event)
LisbonBioMed | Q&A Session
Domingos Henrique, Filipa Nunes, Mafalda Pimental & Pedro Papotto
Host: Inês Domingues

November 26 (Zoom Seminar)
Out of Our Box
“Seeing the invisible universe with gravitational waves”
Vítor Cardoso – CENTRA – Centro de Astrofísica e Gravitação (Center for Astrophysics and Gravitation), Instituto Superior Técnico

November 27 (Zoom Event)
European Researchers’ Night 2020 | A Scientist in the Making
Adriana Temporão, Carolina Cunha, Carlos Almeida, Filipe Figueiredo, Isaura Martins, Mariana Ferreira, Marco Domingues & Sofia Marques
Host: Leonor Saúde

December 15 (Zoom Seminar)
CAML Rheumatology Series
“From rare CTD clinics (SSc) and rare translational tools (capillaroscopy) to holistic standardised approach to rare CTD and pan-european allied rare CTD research”
Vanessa Smith – Department of Rheumatology, Ghent University Hospital

December 16 (Zoom Seminar)
Clarke Modet Workshop
“What and how to patent? Biotechnological Inventions”
Miguel Duarte – Clarke Modet

Parasitology Club

January 7
“3D hepatic models – an innovative platform for the screening of anti-plasmodial drugs”
Diana Fontinha – Miguel Prudêncio Lab

January 14
"'Microbiota' A new player in Host-*Plasmodium* affair"
Debanjan Mukherjee – Maria Mota Lab

January 21
“WHO, WHERE AND WHY? *Plasmodium* Circumsporozoite Protein Interaction with the Host UPS”
Sara Baptista – Maria Mota Lab

January 28
Idálio Viegas – Luís Figueiredo Lab

February 4
Raquel Azevedo – Miguel Prudêncio Lab

March 3
“Host-*Plasmodium* endosomal dynamics during liver stage malarial infection”
Aparajita Lahree – Maria Mota Lab

May 26 (Zoom Seminar)
"Studying rDNA transcription in T. brucei: from many copies to one (inconvenient) clean outcome"
Juan Macedo – Luísa Figueiredo Lab

June 16 (Zoom Seminar)
"Vascular sequestration of Trypanosoma congolense"
Sara Pereira – Luísa Figueiredo Lab

June 23 (Zoom Seminar)
"Establishing a blood-stage infection: The role of methionine metabolism in Plasmodium development"
Inês Marreiros – Maria Mota Lab

June 30 (Zoom Seminar)
"Rational design of highly effective whole organism pre-erythrocytic malaria vaccines"
António Mendes – Miguel Prudêncio Lab

July 7 (Zoom Seminar)
"Exploiting innate immune responses to enhance whole-sporozoite antimalarial vaccination"
Diana Moita – Miguel Prudêncio Lab

July 14 (Zoom Seminar)
"Optimization of Anopheles mosquitos infection with *Plasmodium falciparum*"
Denise Francisco – Miguel Prudêncio Lab

July 21 (Zoom Seminar)
Ângelo Chora – Maria Mota Lab

July 28 (Zoom Seminar)
"Malaria vaccination in the context of malnutrition: can the immune system cope with the challenge?"
Helena Nunes Cabaço – Miguel Prudêncio Lab

September 1 (Zoom Seminar)
"G6PD deficiency: what are ROS doing to *Plasmodium's* liver-stage infection?"
Soraia Caetano – Maria Mota Lab

September 15 (Zoom Seminar)
"A long non-coding RNA controls parasite differentiation in African trypanosomes"
Fabien Guegan – Luísa Figueiredo Lab

September 29 (Zoom Seminar)
"Extracellular vesicles in malaria infection"
Sonali Setua – Maria Mota Lab

October 6 (Zoom Seminar)
"SARS-CoV-2/COVID-19: a clinical microbiologist's (and a physician's) perspective"
Thomas Hanscheid – FMUL

October 13 (Zoom Seminar)
"*Plasmodium* exploitation of liver-specific methionine metabolism"
Vanessa Zuzarte-Luís – Maria Mota Lab

October 20 (Zoom Seminar)
"*Trypanosoma brucei*: New ally in the fight against malaria?"
Adriana Temporão – Miguel Prudêncio Lab & Luísa Figueiredo Lab

November 3 (Zoom Seminar)
"Imaging the *trypanosoma brucei* voyage within a living host -seasons 1 and 2"
Mariana De Niz – Luísa Figueiredo Lab

November 10 (Zoom Seminar)
"Sirtuin mediated energy sensing in *Plasmodium*"
Yash Pandya – Maria Mota Lab

November 17 (Zoom Seminar)
"A novel role for EXP2 in invasion by Plasmodium sporozoites – a practice before the PhD Viva"
João Vieira – Maria Mota

November 24 (Zoom Seminar)
"A nuclear enterprise: a subnuclear factory for singular antigen expression in trypanosomes"
Joana Faria – Wellcome Centre for Anti-infectives Research, Biological Chemistry and Drug Discovery, School of Life Sciences, University of Dundee

December 15 (Zoom Seminar)
Journal Club | Andrade CM et al, Increased circulation time of Plasmodium falciparum underlies persistent asymptomatic infection in the dry season, Nat Med. 2020 Dec;26(12):1929-1940
Silvia Portugal & Carolina Andrade – Heidelberg University Hospital & Max Planck Institute for Infection Biology

Pizza Seminar

January 7
"The life cycle of mitochondria at the synapse"
Carlos Ramos – Vanessa Morais Lab

January 21
"The effect of non-psychotomimetic cannabinoids on neural stem cells"
Diogo Lourenço – Ana Sebastião Lab
"*Plasmodium* cross-stage interplay modulates parasite virulence"
Sónia Pereira – Maria Mota Lab

February 4
"Consequences of the instability of X-inactivation in female hiPSCs"
Ana Raposo – Carmo-Fonseca Lab
"Single-molecule imaging of transcription dynamics"
Alda Silva – GenoMed

February 18
"Mapping the interactions between circadian rhythms and memory"
Ana Inês Morgado – Luísa Lopes Lab & Miguel Remondes Lab
"A click-chemistry approach for protein acetylation"
Cláudio Afonso – Gonçalo Bernardes Lab

March 3
"PINK1: Linking mitochondrial dysfunctions to Parkinson's Disease"
Filipa Gonçalves – Vanessa Morais Lab

September 8 (Zoom Seminar)
"Adenosinergic system as a novel therapeutic target in Rett Syndrome"
Catarina Lourenço – Ana Sebastião Lab

October 6 (Zoom Seminar)
"*Plasmodium* transmission blocking strategies"
Raquel Azevedo – Miguel Prudêncio Lab
"How do rats use memory to guide choices?"
Ana Sofia Cruz – Miguel Remondes Lab

October 20 (Zoom Seminar)
"Microbiota influence the proliferative capacity of Intraepithelial Lymphocytes (IELs) during small intestine infection"
Patrícia Campos – Marc Veldhoen Lab
"Designing novel tools to detect and quantify non-canonical DNA structures"
Eduardo Gameiro – Sérgio de Almeida Lab

November 3 (Zoom Seminar)
"Functional and Metabolic Characterization of Anti-Tumour Myeloid cells"
Afonso Mota – Bruno Silva-Santos Lab
"Mapping the encoding and retrieval of contextual cues in drug-seeking behavior"
Joana Ribeiro – Luísa Lopes Lab & Miguel Remondes Lab

November 17 (Zoom Seminar)
"How Our Brain Solves Dilemmas"
Bárbara Correia – Miguel Remondes Lab
"PC4 as a new regulator of telomere stability"
Beatriz Moleirinho – Claus Azzalin Lab

November 15 (Zoom Seminar)
"PlCγ1 and SHP2: new biding partners mediating Cetuximab resistance in RAS WT metastatic colorectal cancer"
Raquel Duarte – Luís Costa Lab
"Regulation of DELLA rice protein interactions and its influence on growth control during salinity stress"
Telma Fernandes – ITQB

RiboMed Seminar Series

May 4 (Zoom Seminar)
“Sphingolipids in health and disease”
Tony Futerman – Weizmann Institute of Science, Israel
Host: M. Carmo-Fonseca

Special Seminar

January 23
“Emerging Mechanism of Cell Junction Dynamics”
Arie Horowitz – Thomas Jefferson University
Host: Cláudio Franco

February 4
“Nanolive long term label-free live cell imaging at high resolution”
Thibault Courtheoux – Nanolive
Host: José Henriques (Bioimaging Unit)

February 20
“The dark side of the INK4a/ARF locus: dual role of the alternative reading frame ARF protein in cancer”
Maria Vivo – Dipartimento di Chimica e Biologia "A. Zambelli", Università degli Studi di Salerno
Host: M. Carmo-Fonseca Lab

February 28
“Protein glycosylation at the interface of inflammation and cancer”
Salomé Pinho – i3S
Host: João Barata

iMM Training Hub

The iMM is strongly committed to provide the best training for researchers to succeed in internationally competitive environments of academia, industry and clinical medicine. The Training Hub works closely with early career researchers at iMM to maximize career prospects, ensuring the full running of ongoing Master, PhD and Postdoctoral Programs.

Team

Director of Studies: Domingos Henrique, PhD

Executive Manager: Filipa Nunes, PhD

Executive Committee: Leonor Saúde, PhD (Chair); Vanessa Morais, PhD; Claus M. Azzalin, PhD

Advanced Training in Numbers

	2020
Postdoctoral Fellows	145
Started in 2020	31
PhD Students	151
Started in 2020	15
MSc Students	130
Started in 2020	75

Together with Faculdade de Medicina da Universidade de Lisboa (FMUL) and with Hospital de Santa Maria (HSM), iMM is part of the Lisbon Academic Medical Center (CAML), a consortium that provides an integrated form of education and training in Biomedicine and Clinical Research, combining multidisciplinary and internationalization.

In pair with high-level research-centered training, our MSc/PhD students and Postdoctoral researchers benefit from a varied curricular offer organized into several Advanced Courses – scientific and transversal skills courses and workshops - distributed along each academic year.

The majority of iMM PhD students belong to the CAML PhD Programme that runs in the campus since 2010. In addition, iMM also hosts students from other PhD programmes (e.g. GABBA).

In 2013, iMM was awarded FCT funding to create the Lisbon Biomedical and Clinical Research PhD Programme – LisbonBioMed.

Furthermore, iMM is a partner in five other multi-institutional FCT PhD Programmes: the PhD Programme in Bioengineering - Cell Therapies and Regenerative Medicine (CTRM), the PhD Programme in Molecular Biosciences - Biology at the Host Microbe Interface (B@HMI, or INTERFACE), the Lisbon University Doctoral Programme in Integrative Neuroscience (NeurULisboa), the Medicinal Chemistry PhD Programme (MedChemTrain), and the Medical Biochemistry and Biophysics (M2B-PhD) Doctoral Programme.

In 2020, iMM hosted students enrolled in 9 different FCT PhD Programmes:

- LisbonBioMed: 36
- INTERFACE: 5
- M2B-PhD: 12
- NeurULisboa: 15
- CTRM: 3
- MedChemTrain: 1
- GABBA: 1
- PGCD (Graduate Program Science for Development): 3
- MIT-Portugal: 2

iMM was chosen by 1 PhD student awarded with the “la Caixa” Foundation INPhINIT – Incoming doctoral fellowship.

Four Innovative Training Networks (ITN) from the European Commission programme Marie Skłodowska-Curie Actions (MSCA) anchorage 4 PhD students at iMM.

Besides CAML PhD students, iMM hosted 9 PhD students from other Institutions/Universities: Universidade do Porto (1), Universidade de Coimbra (1), Universidade do Algarve (1), Universidade NOVA de Lisboa (1), Instituto Superior Técnico da Universidade de Lisboa (5).

In the 2020 FCT Call for PhD Scholarships, 17 doctoral fellowships were granted to iMM as host institution, and 1 doctoral fellowship was granted under the extraordinary FCT Call “Doctorates 4 COVID-19”.

In 2020, 23 iMM students concluded their PhD theses, 20 of which were attributed by Faculdade de Medicina da Universidade de Lisboa (FMUL).

Advanced Courses

A total of 9 Advanced Courses were organized

5 Courses organized under the CAML PhD Programme in 2020

LisbonBioMed Course: Towards a Creative and Critical Mind

Organizer: Domingos Henrique

Date: January 27-31; March 2-6

The course aims to promote student integration, creates an informal welcoming, fosters team bonding, interaction with putative supervisors, introduces complementary skills training, and raises awareness to transversal competences needed for a successful scientific career.

Research ethics and scientific misconduct (Workshop)

Organizer: Filipa Nunes

Date: January 30

Speaker: João Valente Cordeiro, Research Ethics, Bioethics and Health Law Invited Professor at National School of Public Health, NOVA University of Lisbon (ENSP-UNL).

During this hands-on session participants critically analyse and discuss different research ethics case studies and learn how to identify, manage and evaluate the impact of scientific misconduct, all the way from experimental design to publication and communication of results. During this session, participants are also encouraged to reflect on the specific challenges and pressures of the scientific career, as well as the impact of new technologies and current social trends on research ethics and scientific misconduct and discuss their ideas on how to build adequate codes of conduct to regulate research activity.

Graphic Design: Creating Effective Figures for Scientific Publications (Workshop)

Organizer: Workshop group of the PhD Students Committee

Date: March 4-5

Speaker: Christof De Bo, Bioinformatician at VIB Bioinformatics Core, Belgium

The aim of this workshop is to provide insight into the visual and graphic characteristics of scientific publication and outreach. Students have the opportunity to learn technical skills on how to improve scientific illustrations using adequate software, better present their research and hypothesis, and also communicate with society through the aid of graphical support.

Introduction to Data Management Plans – Ready for BioData Management?

Organizer: Domingos Henrique

Date: March 6

Speakers: Daniel Faria and João Cardoso, BioData.pt

"Ready For BioData Management?" is an introductory one-day course aiming at disseminating Data Management best practices and teaching the basics of making and using Data Management Plans (DMPs) in the context of research activities. The workshop features two introductory lectures on Research Data Management and DMPs, followed by a hands-on DMP exercise where participants form groups to fill in a DMP for a mock research project. The produced DMPs are then reviewed and discussed.

Science Careers Sessions

Organizer: Workshop group of the PhD Students Committee

Date: January 30; May 21 (videoconference); June 4 (videoconference); July 16 (videoconference); September 21 (videoconference); October 8 (videoconference); October 22 (videoconference); November 4 (videoconference); November 25 (videoconference); December 16 (videoconference)

Speakers: Janete Cunha Santos, Medical Advisor at Sanofi Genzyme; Diana Ferreira, Medical Value Manager at Roche; Marcos Mariz, CEO and co-founder of INEYE PHARMA; Mariana Temido Ferreira, Medical Writing and Pharmacovigilance Officer at Pharsolution – Pharmaceutical Consulting; Patrícia Silva, Consulting at IQVIA; Mafalda Ramos de Matos, Personalised Healthcare Customer Partner in Oncology at Roche Foundation Medicine; Joana Vindeirinho, Senior Assistant Editor at the Lancet; Amélia Vieira, Formulation Scientist at Bial; Gil Costa, Scientific Designer and Illustrator; João Freire, Senior Scientist at Janssen, The Netherlands

"Science Careers" is a series of talks to get to know jobs in science beyond academia. During the sessions participants have the opportunity to know more about the daily work of the speakers, how they got there, the pros and cons of their work, and to ask questions about their path.

Other iMM Courses

Scientific Writing Course: "Writing your grant proposal" (Hands-on Course)

Organizer: Filipa Nunes

Date: January 15-21

Speaker: Marcia Triunfol, Science Writer

This is a hands-on course in which participants write their own grant proposals. They learn about important aspects that are specific to grant proposals and others that can also be applied to different types of scientific documents such as theses and manuscripts for publication in specialized research journals. Besides the lectures, participants write their grant proposals in class where they receive one-on-one assistance from the instructor.

Laboratory Animal Science Course for Functions A+D (Performing procedures + euthanasia in animals)

Organizer: Iolanda Moreira and Lara Carvalho

Date: November 1-16

The course was organized under the CONGENTO-harmonized programme and was targeted to Function A (former FELASA Category B) and D. The course provides theoretical and practical training for the use of animal models (rodents and fish) in scientific research. This course is a requirement to be able to work with animal models.

Resilience & Well-being in Academia: Workshop (Online)

Organizer: Training Hub

Date: November 12

Speaker: Desiree Dickerson, Neuroscientist and Clinical Psychologist

This workshop provides participants with the tools to increase resilience to stress, anxiety and burnout, and to enhance overall well-being. It explores: i) the self-critical inner voices that sabotage motivation and enjoyment for work; ii) how mindset can help or hinder day-to-day life and future career prospects; iii) how certain maladaptive coping strategies (e.g. procrastination and avoidance) maintain these self-sabotaging thought and behaviour cycles; iv) how to reshape participants' thinking and behaviour patterns to work for them in pursuit of their goals.

Portuguese Course (Foreign Language)

Organizer: Training Hub and Postdoctoral Association (PDA)

Dates: Levels A1 and A2/B1 (4th edition): December 2019 to June 2020 (45h, 1 class/level/week). Levels A1 and B1/B2 (5th edition): November 2020 to June 2021 (45h, 1 class/level/week)

Teaching Staff: Linguagest - Escola de Línguas para Comunicação Empresarial, CRL

Other Events

PostDoc Day

Organizer: Postdoctoral Association (PDA)

Date: February 11

The PostDoc Day is the opportunity for postdoctoral researchers to share their work with the iMM community. In 2020, the program included also a Funding Workshop, and Out-of-the-Box Lecture.

Webinar: Strategies for managing our well-being during COVID times

Organizer: Training Hub

Date: May 28

Speaker: Desiree Dickerson, Neuroscientist and Clinical Psychologist

In this webinar we will explore some of the many experiences academics are facing during this pandemic. We will highlight: i) the need to set a solid foundation; ii) how to manage our own expectations and the expectations of those around us; iii) how to identify our red flags (our first signs of stress); iv) how to de-escalate our thoughts, sensations, and emotions when we feel overwhelmed or stressed; and iv) how to press reset when your day isn't going to plan.

Research Activity

The mission of *Instituto de Medicina Molecular João Lobo Antunes* is to foster basic, clinical and translational biomedical research with the aim of contributing to a better understanding of disease mechanisms, developing novel predictive tests, improving diagnostics tools and developing new therapeutic approaches.

Research Labs:

Ana Espada de Sousa Lab
Ana Sebastião Lab
Bruno Silva-Santos Lab
Cláudio Franco Lab
Claus Azzalin Lab
Edgar Gomes Lab
Gonçalo Bernardes Lab
Joana Neves Lab
João Barata Lab
João Eurico da Fonseca Lab
João Lacerda Lab
Joaquim Ferreira Lab
José Ferro Lab
Leonor Saúde Lab
Luís Costa Lab
Luís Graça Lab
Luísa Figueiredo Lab
Luísa Lopes Lab
Mamede de Carvalho Lab
Marc Veldhoen Lab
Maria Carmo-Fonseca Lab
Maria Mota Lab
Mário Ramirez Lab
Miguel Castanho Lab
Miguel Prudêncio Lab
Miguel Remondes Lab
Nuno Morais Lab
Nuno Santos Lab
Paulo Filipe Lab
Pedro Simas Lab
Pedro Sousa-Víctor Lab
Sérgio de Almeida Lab
Sérgio Dias Lab
Vanessa Morais Lab

Ana Espada de Sousa Lab

Major Interests/Objectives

- We investigate immune regulation and human T-cell homeostasis with the ultimate goal of identifying new strategies for immunological reconstitution and targets for immune-based therapies.

- An important part of our Lab research effort is centred on HIV/AIDS immunopathogenesis, mainly through the study of HIV-2 infection, a naturally attenuated form of HIV disease, and on Inborn Errors of Immunity leading to Human Immunodeficiency.

- We prioritise the "bedside to the bench" approach and, given the transversal nature of Clinical Immunology, our Lab brings together physician/clinical researchers, from different medical areas, and basic researchers.

Head of Laboratory

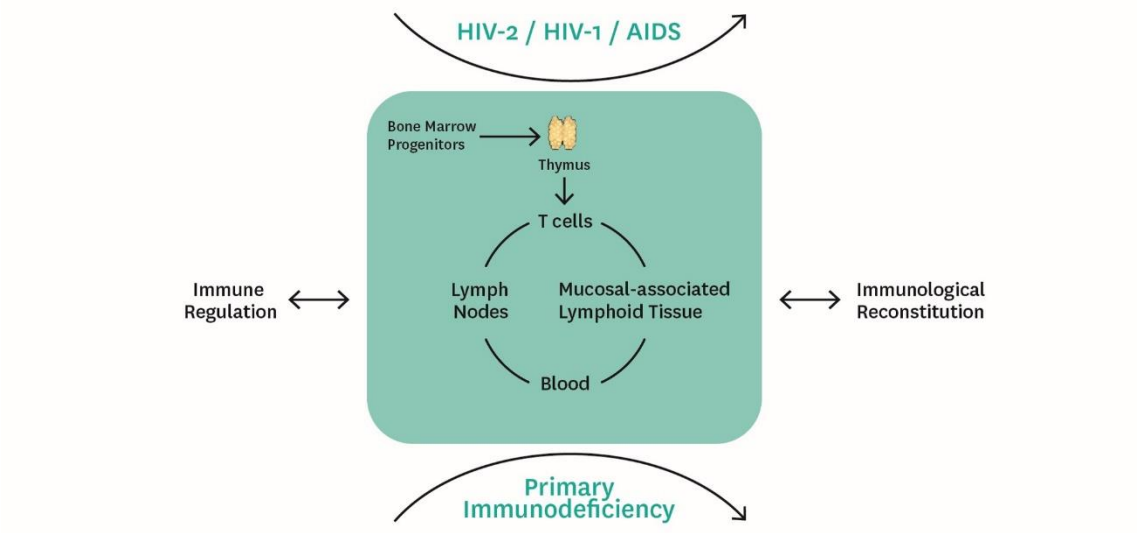
Ana Espada de Sousa, MD, PhD – Investigadora Coordenadora e Professora Catedrática Convidada da Faculdade de Medicina da Universidade de Lisboa

Team

Adriana Motta Raymundo	MSc Student
Afonso Rocha Martins de Almeida	Senior Postdoctoral Researcher
Alexandre Augusto da Silva Figueiredo e Raposo	Senior Postdoctoral Researcher
Amelia Chiara Trombetta	Postdoctoral Researcher
Ana Berta da Fonseca Vieira Álvares e Sousa Ferrand de Almeida	Clinical Researcher
Ana Catarina Taborda Godinho dos Santos	Postdoctoral Researcher
Ana Cláudia Viseu Varandas	Trainee
Ana Cristina Costa Santos Ferreira de Oliveira Dias	Clinical Researcher
Ana Filipa Potes Semião	Lab Technician (Left January)
Ana Isabel Gouveia Costa da Fonseca Lopes	Clinical Researcher
André Lopes Reis Gomes Pires	Trainee (Started August)
André Miguel Carapinha Gomes	Lab Technician (Started June. Left August) PhD Student (Started September)
Carolina Marques Martins	Trainee (Started November)
Carolina Martins da Conceição	Lab Technician (Started June)
Diana Isabel Feliciano dos Santos	Lab Manager
Diogo Karim Hassam Carmali	Trainee
Emília de Jesus da Encarnação Valadas	Clinical Researcher

Gonçalo Miguel Pinto Batista e Sá Vieira	BSc Student (Started January. Left July)
Guilherme Borlido de Carvalho Farias	MSc Student (Started September)
Henrique José Atalaia Barbacena	Trainee (Started July)
Inês Moranguinho Bastardo Moura	PhD Student
Isabel Cristina e Castro de Menezes Esteves	Clinical Researcher
Joana Merciano Labisa	MSc Student (Left July)
José Gonçalo Duque Pereira Monteiro Marques	Clinical Researcher
Júlio Joel Laia Henriques	Lab Technician (Left October)
Manuel António Freire Dias da Silva	MSc Student (Started June)
Maria Adão Serrano de Sousa Uva	Clinical Researcher
Maria Catarina Mota da Silva	Clinical Researcher
Maria da Conceição Galvão Barata Pinto Pereira dos Santos	Clinical Staff Scientist
Maria Inês Tostão Neiva	MSc Student (Started July)
Pedro Mota Prego Rosmaninho	Postdoctoral Researcher
Raquel Canuto Rato Guerreiro	Trainee (Started September. Left December)
Rita Diniz de Moura	MSc Student (Started July)
Robert Alfred Badura	Clinical Researcher
Rui Manuel Martins Victorino	Clinical Staff Scientist (Left December)
Sara Branco Pereira da Silva Fialho	Clinical Researcher
Susana Clara Barão Lopes da Silva dos Anjos	Clinical Staff Scientist
Susana Maria Santos do Paço	MSc Student
Susana Mendes Fernandes	Clinical Staff Scientist
Zoe-Isabella Junginger	MSc Student (Started June)

Graphical Abstract



Laboratory Keywords/Research Areas

Keywords: Human Immunology, Thymus, Regulatory T Cells, HIV-2, Inborn Errors of Immunity.

Research Areas: Human T-cell Homeostasis, HIV/AIDS Immunopathogenesis, Immunological Reconstitution.

Major Scientific Achievements

This year our main focus was the immune pathogenesis of Sars-CoV2 infection. Patients with an aggressive course are the bottleneck of COVID-19 pandemic management, leading us to set-up a longitudinal immunologic study, with the ultimate goal of finding targets to modulate disease progression. Our data favor an alternative view of a beneficial role of suppressive/regulatory myeloid responses in coping with Covid-19 pathogenesis, and support an association of recovery with the expansion of innate lymphoid cells expressing CCR10, which potential role in lung repair is currently under investigation.

We published the first report of HIV-2 infection of follicular helper CD4 T-cells, showing that this subset supports productive viral replication and is a major viral reservoir in HIV-2-infected individuals.

We also pursued our goal of identifying the main gene regulatory networks defining the signature of human FOXP3-expressing CD4 T-cells, as well as the investigation of genotype-phenotype relationships in complex inborn errors of immunity.

Selected Publications

Markert ML, Marques JG, Neven B, Devlin BH, McCarthy EA, Chinn IK, Albuquerque AS, Silva SL, Pignata C, de Saint Basile G, Victorino RM, Picard C, Debre M, Mahlaoui N, Fischer A, Sousa AE (2011). First use of thymus transplantation therapy for FOXN1 deficiency (nude/SCID): a report of 2 cases. Blood 117(2):688-696. *(IF: 17.794, Citations: 47. Source: Web of Science).*

Azevedo RI, Soares MV, Barata JT, Tendeiro R, Serra-Caetano A, Victorino RM, Sousa AE (2009). IL-7 sustains CD31 expression in human naive CD4+ T cells and preferentially expands the CD31+ subset in a PI3K-dependent manner. Blood 113(13):2999-3007. *(IF: 17.794, Citations: 55. Source: Web of Science).*

Pereira-Santos MC, Baptista AP, Melo A, Alves RR, Soares RS, Pedro E, Pereira-Barbosa M, Victorino RMM, Sousa AE (2008). Expansion of circulating FoxP3+CD25bright CD4+ T cells during specific venom immunotherapy. Clinical & Experimental Allergy 38(2):291-297. *(IF: 4.217, Citations: 61. Source: Web of Science).*

Sousa AE, Carneiro J, Meier-Schellersheim M, Grossman Z, Victorino RM (2002). CD4 T cell depletion is linked directly to immune activation in the pathogenesis of HIV-1 and HIV-2 but only indirectly to the viral load. Journal of Immunology 169(6):3400-3406. *(IF: 4.886, Citations: 380. Source: Web of Science).*

Grossman Z, Meier-Schellersheim M, Sousa AE, Victorino RM, Paul WE (2002). CD4+ T-cell depletion in HIV infection: are we closer to understanding the cause? Nature Medicine 8(4):319-323. *(IF: 36.130, Citations: 363. Source: Web of Science).*

Publications in Peer Reviewed Journals

Godinho-Santos A, Foxall RB, Antão AV, Tavares B, Ferreira T, Serra-Caetano A, Matoso P, Sousa AE (2020). Follicular Helper T Cells Are Major Human Immunodeficiency Virus-2 Reservoirs and Support Productive Infection. Journal of Infectious Diseases 221(1):122-126. *(IF: 5.022, Citations: 2. Source: Web of Science).*

Baptista RJ, Costa JMSS, Badura RA (2020). Severe cavitary pneumonia caused by Bordetella bronchiseptica in an HIV-infected patient. Enfermedades Infecciosas Y Microbiologia Clinica 38(8):404-405 *(IF: 1.654, Citations: 0. Source: Web of Science).*

De Smedt R, Morscio J, Reunes L, Roels J, Bardelli V, Lintermans B, Van Loocke W, Almeida A, Cheung LC, Kotecha RS, Mansour MR, Uyttebroeck A, Vandenberghe P, La Starza R, Mecucci C, Lammens T, Van Roy N, De Moerloose B, Barata JT, Taghon T, Goossens S, Van Vlierberghe P (2020). Targeting cytokine-and therapy-induced PIM1 activation in preclinical models of T-cell acute lymphoblastic leukemia and lymphoma. Blood 135(19):1685-1695. *(IF: 17.794, Citations: 1. Source: Web of Science).*

Gullo I, Costa C, Silva SL, Ferreira C, Motta A, Silva SP, Ferreira RD, Rosmaninho P, Faria E, Costa JTD, Câmara R, Gonçalves G, Santos-Antunes J, Oliveira C, Machado JC, Carneiro F, Sousa AE (2020). The Dysfunctional Immune System in Common Variable Immunodeficiency Increases the Susceptibility to Gastric Cancer. Cells 9(6):1498. *(IF: 4.366, Citations: 0. Source: Web of Science).*

Grossman Z, Singh NJ, Simonetti FR, Lederman MM, Douek DC, Deeks SG; Contributing authors (2020). 'Rinse and Replace': Boosting T Cell Turnover To Reduce HIV-1 Reservoirs. Trends in Immunology41(6):466-480. Epub 2020 May 12. Review. *(IF: 13.422, Citations: 0. Source: Web of Science).*

Badura R, Foxall RB, Ligeiro D, Rocha M, Godinho-Santos A, Trombetta AC, Sousa AE (2020). Early ART in Acute HIV-1 Infection: Impact on the B-Cell Compartment. Frontiers in Cellular and Infection Microbiology 10:347. eCollection 2020. *(IF: 4.123, Citations: 0. Source: Web of Science).*

Limão R, Spínola Santos A, Araújo L, Cosme J, Inácio F, Tomaz E, Ferrão A, Santos N, Sokolova A, Môrete A, Falcão H, Cunha L, Ferreira A, Bras A, Ribeiro F, Lozoya C, Leiria Pinto P, Prates S, Plácido J, Coimbra A, Taborda-Barata L, Pereira Santos MC, Pereira Barbosa M, Pineda F (2020). Molecular Sensitization Profile to Dermatophagoides pteronyssinus Dust Mite in Portugal. Journal of Investigational Allergology & Clinical Immunology. *(IF: 5.172, Citations: 0. Source: Web of Science).*

Pereira Santos MC, Lourenço T, Pereira Barbosa M, Branco Ferreira M (2020). Evolution of Api m10 Specific IgE and IgG4 After One Year of Bee Venom Immunotherapy. European Annals of Allergy and Clinical Immunology 52(4):175-181. *(IF: 2.000, Citations: 1. Source: Scopus).*

Nobre de Jesus G, Carvalho T, Caldeira A, Fernandes SM (2020). Austrian Syndrome: a report of an exceptionally rare and deadly syndrome. Medicina (Ribeirão Preto) 53(4):468-71. *(IF: 0.300, Citations: 0. Source: Scopus).*

Cassetta L, Bruderek K, Skrzeczynska-Moncznik J, Osiecka O, Hu X, Rundgren IM, Lin A, Santegoets K, Horzum U, Godinho-Santos A, Zelinskyy G, Garcia-Tellez T, Bjelica S, Taciak B, Kittang AO, Höing B, Lang S, Dixon M, Müller V, Utikal JS, Karakoç D, Yilmaz KB, Górka E, Bodnar L, Anastasiou OE, Bourgeois C, Badura R, Kapinska-Mrowiecka M, Gotic M, Ter Laan M, Kers-Rebel E, Król M, Santibañez JF, Müller-Trutwin M, Dittmer U, de Sousa AE, Esendağlı G, Adema G, Loré K, Ersvær E, Umansky V, Pollard JW, Cichy J, Brandau S (2020). Differential expansion of circulating human MDSC subsets in patients with cancer, infection and inflammation. Journal for Immunotheraphy of Cancer 8(2):e001223. *(IF: 10.252, Citations: 0. Source: Web of Science).*

Lhermitte L, Barreau S, Morf D, Fernandez P, Grigore G, Barrena S, de Bie M, Flores-Montero J, Brüggemann M, Mejstrikova E, Nierkens S, Burgos L, Caetano J, Gaipa G, Buracchi C, da Costa ES, Sedek L, Szczepański T, Aanei CM, van der Sluijs-Gelling A, Delgado AH, Fluxa R, Lecrevisse Q, Pedreira CE, van Dongen JJM, Orfao A, van der Velden VHJ; EuroFlow Consortium (2020). Automated identification of leukocyte subsets improves standardization of database-guided expert-supervised diagnostic orientation in acute leukemia: a EuroFlow study. Modern Pathology. *(IF: 5.988, Citations: 0. Source: Web of Science).*

Aguiar de Sousa D, Pereira-Santos MC, Serra-Caetano A, Lucas Neto L, Sousa AL, Gabriel D, Correia M, Gil-Gouveia R, Oliveira R, Penas S, Carvalho Dias M, Correia MA, Carvalho M, Sousa AE, Canhão P, Ferro JM (2021). Blood biomarkers associated with inflammation predict poor prognosis in cerebral venous thrombosis: a multicenter prospective observational study. European Journal of Neurology 28(1):202-208. *(IF: 4.516, Citations: 0. Source: Web of Science).*

Kori M, Le Thi TG, Werkstetter K, Sustmann A, Bontems P, Lopes AI, Oleastro M, Iwanczak B, Kalach N, Misak Z, Cabral J, Homan M, Cilleruelo Pascual ML, Pehlivanoglu E, Casswall T, Urruzuno P, Martinez Gomez MJ, Papadopoulou A, Roma E, Dolinsek J, Rogalidou M, Urbonas V, Chong S, Kindermann A, Miele E, Rea F, Cseh Á, Koletzko S; Helicobacter pylori Working Group of ESPGHAN (2020). Helicobacter pylori Infection in Pediatric Patients Living in Europe: Results of the EuroPedHP Registry 2013 to 2016. Journal of Pediatric Gastroenterology and Nutrition 71(4):476-483. *(IF: 2.937, Citations: 0. Source: Web of Science).*

Figueiredo-Campos P, Blankenhaus B, Mota C, Gomes A, Serrano M, Ariotti S, Costa C, Nunes-Cabaço H, Mendes AM, Gaspar P, Pereira-Santos MC, Rodrigues F, Condeço J, Escoval MA, Santos M, Ramirez M, Melo-Cristino J, Simas JP, Vasconcelos E, Afonso Â, Veldhoen M (2020). Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to 6 months post disease onset. European Journal of Immunology 50(12):2025-2040. *(IF: 4.404, Citations: 4. Source: Web of Science).*

Picão de Carvalho C, Castro C, Graça IS, Lorenzo C, Rodrigues AB, Inácio R, Prata F, Mouzinho A, Pinto S, Marques JG (2020). Série de Casos de 103 Crianças com Infeção por SARS-CoV-2 em Portugal. Acta Médica Portuguesa 33(12):795-802. *(IF: 0.628, Citations: 1. Source: Web of Science).*

Carvalho S, Marcelino J, Duarte F, Costa C, Pereira Barbosa M, Pereira Santos MC (2020). Role of Recombinant Parvalbumin Gad c 1 in the Diagnosis and Prognosis of Fish Allergy. Journal of Investigational Allergology and Clinical Immunology 30(5):340-345. *(IF: 5.172, Citations: 0. Source: Web of Science).*

Sousa, AE (2020). Imunologia. Revista de Ciência Elementar V8(03):037.

Other National Publications

Varandas C, Paulino M, Duarte F, Pedro E, Falcão P, Lopes da Silva S (2020). Angioedema por processionária – Um caso clínico atípico. Revista Portuguesa de Imunoalergologia 28(4):247-248. *(IF:--, Citations: 0. Source: Scopus).*

Baptista R, Santos C, Badura R (2020). Tratamento de infeções por Enterobacteriaceae multirresistentes. Treatment of multiresistant Enterobacteriacea Infections. Infecção e Sepsis 2(1):33-38.

Carreira P, Badura R, Santos C, Valadas E (2020). Relevância clínica de Small Colony Variants de Staphylococcus aureus. Clinical Relevance of Small Colony Variants of Staphylococcus aureus. Infecção e Sepsis 2(1):39-46.

Baptista R, Santos C, Badura R (2020). Encurtamento do tratamento antibiótico – Uma estratégia crucial no combate à multirresistência. Shortening Antibiotic Treatment – a crucial strategy fighting multiresistance. Infecção e Sepsis 2(1):47-50.

Ongoing Research Projects

2020/2021: Contributo dos monócitos/macrófagos para a patogénese distinta da infeção por VIH-2 em comparação com VIH-1: correlações clínicas e perspetivas terapêuticas. Coordinator: Amelia Trombetta. Funding Agency: Gilead Sciences. Reference: Programa Gilead GÉNESE 2019. Amount: 23 215,00€. Total Amount: 23 215,00€.

2020/2020: COVID-19 Prognosis: innate immune determinants. Coordinator: Amelia Trombetta. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT Research4Covid-19. Amount: 40 000,00€. Total Amount: 40 000,00€.

2020/2020: COVID-19 Pneumonia Outcome: an immunological approach. Coordinator: Susana Fernandes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT Research4Covid-19. Amount: 30 000,00€. Total Amount: 30 000,00€.

2019/2020: Revealing lung repair after ARDS through the IL-22 path. Coordinator: Susana Fernandes. Funding Agency: Sociedade Portuguesa de Medicina Interna. Reference: Prémio Bolsa Investigação 2019. Amount: 10 000,00. Total Amount: 10 000,00.

2018/2021: HIV2CURE: Células T foliculares no cerne da infeção HIV. Coordinator: Ana Espada de Sousa. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: HIV2CURE - LISBOA-01-0145-FEDER-030474. Amount: 239 999,01€. Total Amount: 239 999,01€.

2018/2020: Transmissão VIH-1 na infeção aguda: evolução dos reservatórios em casais com terapêutica precoce. Coordinator: Robert Badura. Funding Agency: Gilead Sciences. Reference: Programa Gilead GÉNESE. Amount: 32 000,00€. Total Amount: 32 000,00€.

Other Projects

2018/2021: Estudos quantitativos de latência no VIH. Coordinator: Ruy Ribeiro. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MAT-APL/31602/2017. Amount: 52 500,00€. Total Amount: 239 766,06€.

2018/2021: Explorando o papel de microRNAs na função de células T e defesa anti-HIV. Coordinator: Maria Gama-Carvalho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-CEL/29257/2017. Amount: 41 187,50€. Total Amount: 239 911,12€.

2017/2020: ONEIDA: Plataforma Ómica para prevenção e controlo de infeções e de resistência aos antimicrobianos. Coordinator: Mário Ramirez. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: LISBOA-01-0145-FEDER-016417. Amount: 696 698,00€. Total Amount: 2 459 635,55€.

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Silva SL. Workshop. Diagnostic challenges in antibody deficiencies. XLI Annual Meeting Sociedade Portuguesa de Alergologia e Imunologia Clinica (SPAIC), September 24-26, 2020.

Marques JG. Novas opções na terapêutica da Gripe. 1as Jornadas Digitais de Pediatria, October 29-30, 2020.

Marques JG. Principais desafios ao PNV em tempo de pandemia e Estratégias de recuperação de esquemas em atraso. Simpósio MSD, 1as Jornadas Digitais de Pediatria, October 29-30, 2020.

Pereira Santos MC. O diagnóstico de alergia na prática clínica. Webinar Sociedade Portuguesa de Alergologia e Imunologia Clínica, November 4, 2020.

Marques JG. SARS-CoV-2 na Criança. Encontro Regional Das UCFs de Lisboa e Vale do Tejo 2020, Lisbon, Portugal, November 10, 2020.

Fernandes SM. Can we foster lung recovery in ARDS? The role of new therapies. Symposium 2020, Lisbon, Portugal, 2020.
Fernandes SM. COVID-19 – Doente crítico. Webinar da Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Communications in International Conferences

Almeida A, Silva A, Demeyer S, Cachucho A, Hogan T, Meijerink J, Cools J, Grosso AR, Seddon B, Barata JT. High IL-7- IL-7Rα signals promote T-cell acute lymphoblastic leukemia in mice and humans overexpressing wild type IL-7Rα. EACR-AACR-ASPIC Conference on Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. (*Oral Abstract Presentation*)

Brás R, Mendes A, Caiado J, Lopes A, Pedro E, Pereira Dos Santos MC, Pereira Barbosa M. Omalizumab in immunotherapy with hymenoptera venom – Experience of a portuguese tertiary centre. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Varandas C, Caiado J, Silva Sl, Pereira Santos MC, Pereira Barbosa M. When a mislabelled celiac disease is found: case report of wheat-dependent exercise-induced anaphylaxis. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Paulino M, Ferreira RD, Castillo M, Costa C, Pedro E, Pereira-Barbosa M, Pineda F, Pereira Santos MC. Bumblebee allergy: double sensitization or cross reactivity. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Silva MI, Paulino M, Costa C, Duarte FC, Pereira Barbosa M, Pereira Santos MC. LTP syndrome: Characterization of the sensitization profile – ALEX macroarray method. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Limão R, Lopes A, Spínola Santos A, Pereira Santos MC, Pereira-Barbosa M. An unusual IgE mediated Hypersensitivity – two case reports of acetaminophen allergy. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Coutinho C, Neto M, Pereira-Barbosa M, Pereira Santos MC. Basophil activation test in anaphylsxis to non-steroidal anti-inflammatory druga-is it useful?. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Paulino M, Costa C, Pereira-Barbosa M, Pereira Santos MC. Molecular sensitization profile of patients with lipid transfer protein syndrome and associated clinical characteristics. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Silva MI, Fernandes NP, Polo B, Andrés MP, Silva SL, Barbosa MP. Cutaneous mastocytosis and selective IgM deficiency – case report. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Varandas C, Caldeira L, Silva SL, Costa C, Limão R, Silva MI, Lopes A, Caiado J, Pedro E, Cosme J, Alonso E, Marcelino J, Duarte F, Fernandes NP, Neto M, Ferreira MB, Santos AS, Barbosa MP. Hereditary Angioedema: 24 years of experience in a Portuguese Reference Centre. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Paulino M, Varandas C, Silva S, Barbosa F, Silva SL, Pereira-Barbosa M. Merging quality of life and clinical severity in CVID. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Varandas C, Paulino M, Silva S, Barbosa F, Silva SL, Pereira-Barbosa M. The complexity of assessing clinical severity in CVID. XXXIX Congress of the European Academy of Allergy and Clinical Immunology, London, UK, June 6-8, 2020. *(Poster Presentation)*

Pais-de-Lacerda A, Lira A, Soares F, Badura R, Valadas E, Simões Coelho P, Oliveira V. Transcranial Doppler pulsatility index as a marker of endothelial dysfunction, especially useful when before persistently low CD4+ /CD8+ ratios. HIV-Glasgow virtual, October 5-8, 2020. (*Poster and Oral Presentation*)

Le Thi TG, Werkstetter K, Cabral J, Kotilea K, Bontems P, Barrio J, Cilleruelo Pascual ML, Homan M, Kori M, Urruzuno P, Kalach N, Misak Z, Lima R, Tavares M, Miele E, Urbonas V, Chiaro A, Papadopoulou A, Sykora J, Krahl A, Matusiewics K, Ugras MK, Rea F, Roma E, Casswall T, Klemenak M, Cseh Á, de Laffolie J, Rogalidou M, Lopes AI, Banoub H, Koletzko S, on behalf of the Helicobacter pylori Working Group of ESPGHAN. Excellent Performance of 2-Weeks Tailored Triple Therapy in H. Pylori Infected Children: Interim Results of the New Europedhp Registry. H. Pylori: What is The Best Treatment in 2020? Abstract-based Session 11.10. *2020.* UEG ABSTRACT BOOK, Amsterdam, the Netherlands*,* October 10-14, 2020. *(Oral Presentation*)

Rosmaninho P, Paço S, Ângelo-Dias M, Godinho-Santos A, Tokunaga Y, Nunes-Cabaço H, Serra-Caetano A, Sousa AE, Raposo A. The signature of human CD4 regulatory thymocytes and its modulation by the chromatin landscape. 19th Biennial Meeting of the European Society for Immunodeficiencies, October 14-17, 2020. (*Oral Presentation*)

Silva SL, Gullo I, Costa C, Ferreira C, Motta A, Silva SP, Ferreira RD, Rosmaninho P, Faria E, Torres-Costa J, Câmara R, Gonçalves G, Antunes J, Oliveira C, Machado JC, Carneiro F and Sousa AE The dysfunctional immune system in Common Variable Immunodeficiency increases the susceptibility to gastric cancer. 19th Biennial Meeting of the European Society for Immunodeficiencies, October 14-17, 2020. *(Poster Presentation)*

Raymundo A, Rosmaninho P, Santos DF, Ferreira RD, Silva SP, Ferreira C, Sousa AE, Silva SL. Modulation of the common variable immunodeficiency (CVID) clinical and immunological profile by Helicobacter pylori infection and the underlying genetic landscape. 19th Biennial Meeting of the European Sciety for Immunodeficiencies, October 14-17, 2020. (*Poster Presentation*)

Rosmaninho P, Paço S, Ângelo-Dias M, Godinho-Santos A, Tokunaga Y, Serra-Caetano A, Nunes-Cabaço H, Junginger ZI, Almeida ARM, Sousa AE, Raposo AASF. Thymic-Committed Regulatory T Cells: The Signature of Human Regulatory Cd4sp and Its Modulation by the Chromatin Landscape. ThymUS 2020, Online Event, November 3-4, 2020.

Marcelino J, Baumann K, Per Stahl Skov MD, Pereira Santos MC, Wyroslak I, Scheffel J, Altrichter S, Woetmann A, Pereira-Barbosa M, Costa C, Maurer M. What basophil testing tells us about CSU patients – results of the CORSA study. 5th Ga2Len Global Urticaria Forum (GUF), Berlim, Germany, December 1-2, 2020. *(Oral Presentation)*

Mata A, Monteiro P, Silva D, Fernandes SM, Raposo J, Ribeiro J. Short- and long-term survival and functional assessment of critically ill patients with hematologic malignancies. 33th Anual Congress of European Society of Intensive Care Medicine, Online Event, December 2020. (*Poster Presentation*)

Communications in National Conferences

Badura R. Seroconversão – o que há de novo? 40º ciclo de Conferências sobre Doenças Infecciosas, Centro Hospitalar Universitário Lisboa Norte – Hospital de Santa Maria EPE, Lisbon, Portugal, February 28, 2020. (*Oral Presentation*)

Coutinho C, Neto M, Pedro E, Pereira Santos MC. Teste de Ativação de basófilos na anafilaxia com anti-inflamatórios não esteroides-será útil? XLI Reunião Anual da Sociedade Portuguesa de Alergologia e Imunologia Clinica (SPAIC), September 24-26, 2020. *(Oral Presentation)*

Silva MI, Coutinho C, Lourenço T, Pineda F, Pedro E, Pereira Santos MC. Perfil de sensibilização molecular em doentes alérgicos ao veneno de abelha e possível associação com reação durante o ultra-rush. XLI Reunião Anual da Sociedade Portuguesa de Alergologia e Imunologia Clinica (SPAIC), September 24-26, 2020. *(Poster Presentation)*

Varandas C, Paulino M, Coutinho C, Caldeira L, Santos G, Coelho PS, Lobato M, Pita J, Spínola Santos A, Martins P, Lopes da Silva S, Pedro E, Branco Ferreira M. Check-up alergológico 2020 – Imunoalergologia de olhos postos na comunidade. XLI Reunião Anual da Sociedade Portuguesa de Alergologia e Imunologia Clinica (SPAIC), September 24-26, 2020. (*Oral Presentation*)

Varandas C, Paulino M, Silva I, Brás R, Gregório E, Silva SL, Mendes A, Pedro E. Terapêutica biológica Anti-IL5/IL5R na Asma Grave Eosinofílica. XLI Reunião Anual da Sociedade Portuguesa de Alergologia e Imunologia Clinica (SPAIC), September 24-26, 2020. (*Oral Presentation*)

Badura R. Terapêutica dirigida a Coronavírus. Doenças Infeciosas Emergentes 2020 – COVID-19. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online Event, October 21, 2020. (*Oral Presentation*)

Claro AR, Graça I, Sousa AB, Robalo B, Ferrão A, Marques JG, Esteves I. Associação Clínica-Genética na Síndrome Wiskott-Aldrich. 1as Jornadas Digitais de Pediatria, October 29-30, 2020. (*Poster Presentation*)

Castro C, Picão De Carvalho C, Rodrigues AB, Lorenzo C, Inácio R, Graça IS, Prata F, Mouzinho A, Pinto S, Marques JG. COVID-19, 130 dias, 134 casos em idade pediátrica. 1as Jornadas Digitais de Pediatria, October 29-30, 2020. (*Oral Presentation*)

Rodrigues AB, Carneiro L, Alves M, Azevedo I, Zarcos MM, Pedro M, Gaspar M, Mesquita A, Costa A, Condessa L, Cirurgião FF, Braz M, Shchomak Z, Romana A, Banganho D, Grilo RD, Carlos MM, Virtuoso MJ, Dias S, Andrade A, Marques JG. Doença Invasiva Bacteriana Em Idade Pediátrica – Estudo Nacional 2010-2019 (Resultados Preliminares). 1as Jornadas Digitais de Pediatria, October 29-30, 2020. (*Oral Presentation*)

Rodrigues AB, Carneiro L, Araújo D, Gaspar M, Albino V, Shchomak Z, Serôdio M, Costa A, Brito I, Moreira B, Figueiredo C, Marques JG. Doença Invasiva Fúngica Em Idade Pediátrica – Estudo Nacional 2010-2019 (Resultados Preliminares). 1as Jornadas Digitais de Pediatria, October 29-30, 2020. (*Oral Presentation*)

Organization of Conferences

Lopes AI. Presidente das Jornadas Anuais do Departamento de Pediatria, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal, February 2020.

Lopes AI. Membro da Comissão Científica e Organizadora da Semana Digestiva Digital, November 2020.

Fernandes SM. Co-Organizer. Faculty of the 4th LISBON INTENSIVE CARE MEDICINE SYMPOSIUM, Serviço de Medicina Intensiva, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal.

Internationalization

Sousa AE, Silva Susana SL. Part of the EuroFlow International Consortium on Primary Immunodeficiency.

Sousa AE, Member of the Board of the EuroFlow Consortium. http://euroflow.org/

Sousa AE. Member of the EFIS-Immunology Letters (IL) Study Group titled "T_CELL_CONNECT_EUROPE", European Federation of Immunology Societies (EFIS). https://www.efis.org/efis-support/efis-il-study-groups/index.html

Sousa AE, Silva SL, Marques JG. Member of a Reference Center of the ERN-RITA – European Reference Network for Rare or Low Prevalence Complex Diseases – Network Immunodeficiency, Autoinflammatory and Autoimmune Diseases. https://ern-rita.org/

Sousa AE. Expert panel member for the Norway Research Council for grant reviews in the area of Immunology and Infection.

Lopes AI. Member of the Helicobacter Pylori Interest Group. European Society of Pediatric Gastroenterology and Nutrition (ESPGHAN).

Industry Contract Research

Badura R. Advisory board of VIIV.

Marques JG. PI no CHULN do ensaio clínico TMC278HTX2002 A Phase 2, Open-label, Single-arm, Multicenter Study to Evaluate the Pharmacokinetics, Safety, Tolerability, and Efficacy of Switching to RPV Plus Other ARVs in HIV-1-infected Children (Aged 2 to <12 years) who are Virologically Suppressed.

Government/Organization Contract Research

Sousa AE. Member of the National Ethics Committee for Clinical Research (CEIC).

Sousa AE. Member of the Executive Committee of the National Ethics Committee for Clinical Research (CEIC).

Sousa AE. Member of the "Comissão de Avaliação de Tecnologias de Saúde (CATS)". Autoridade Nacional do Medicamento e Produtos de Saúde, I. P. (INFARMED, I.P.).

Sousa AE. Coordinator of the GAPIC - Department for the promotion of scientific research for medical students and MDs. Faculdade de Medicina da Universidade de Lisboa.

Sousa AE. Member of the Board of the FCT PhD program LisbonBioMed, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa.

Sousa AE. Member of the "Comissão Científica de Biociências da Santa Casa da Misericórdia de Lisboa".

Sousa AE, Lopes AI. Members of the Scientific Council. Faculdade de Medicina da Universidade de Lisboa.

Fernandes SM. Head of the Clinica Universitária de Medicina Intensiva. Faculdade de Medicina da Universidade de Lisboa.

Fernandes SM. Member of the GAPIC - Department for promotion of scientific research for medical students and MDs. Faculdade de Medicina da Universidade de Lisboa.

Fernandes SM. – Member of the direction of Grupo de Infecção e Sepsis. Porto.

Silva SL, Marques JG. Members of the Comissão Técnica de Vacinação da Direção-Geral de Saúde.

Silva SL – Member of the Editorial Board – Revista Portuguesa de Imunoalergologia.

Victorino RMM. Member of the Scientific Council of the Fundação Pulido Valente.

Marques JG. Member of the Comissão Nacional de Verificação da Eliminação do Sarampo e da Rubéola.

Marques JG. Member of the Centro Hospital Lisboa Norte Local Coordination Group of the Program for the Prevention and Control of Infections and Resistance to Antimicrobials.

Marques JG. Coordination of the *Haemophilus influenzae* Invasive Disease Study Group in the Child.

Marques JG. Membro do Grupo Operativo - COVID-19 do Centro Hospitalar Universitário Lisboa Norte.

Marques JG. Coautor do Programa Nacional de Vacinação 2020.

Marques JG. Colaborador na elaboração da Norma 016/2020, de 25-09-2020, "Vacinação contra a gripe. Época 2020/2021".

Marques JG. Colaborador na elaboração da Norma nº 021/2020 de 23/12/2020 Campanha de Vacinação contra a COVID-19 Vacina COMIRNATY®.

Lopes AI. Member of the Ethical Committee of Hospital Santa Maria and Lisbon Academic Medical Centre.

Lopes AI. Member of the Working Group for Clinical Curriculum Review. Faculdade de Medicina da Universidade de Lisboa.

Lopes AI. Member of the Commission for Assessment of Teaching Performance, Faculdade de Medicina da Universidade de Lisboa.

Lopes AI. Pedagogical Year Coordinator (5th Year), Faculdade de Medicina da Universidade de Lisboa.

Lopes AI. Head of Pediatric Department and of the Pediatric Gastroenterology Unit, University Hospital Santa Maria, Centro Hospitalar Universitário Lisboa Norte.

Lopes AI. President of Election Committee (Conselho de Escola e Conselho Pedagógico) 26 November 2020.

Lopes AI. Efetive Member of Faculty Council (Conselho de Escola da Faculdade de Medicina da Universidade de Lisboa) 2020-2024.

Lopes AI. Member of Medical Education Department (Departamento de Educação Médica), Faculdade de Medicina da Universidade de Lisboa.

Lopes AI. Expert reviewer - Concurso para Atribuição de Bolsas de Investigação para Doutoramento – 2020, Fundação para a Ciência e a Tecnologia (FCT).

Lopes AI. Juri Member. Pfizer Prize 2020. Sociedade de Ciências Médicas.

Lopes AI. Juri Member of Comittee for Nomination of Prize Professor Gomes Pedro, Faculdade de Medicina da Universidade de Lisboa.

Lopes AI. Member of the Lisbon University College "Food, Farming and Forestry" (F3).

Lopes AI. Member of Scientific Committee of Doctoral Program in Sustainability Sciences. Lisbon University College "Food, Farming and Forestry" (F3).

Lopes AI. Member of the Working Group for Leadership Training in Health Management, University Hospital Santa Maria, Centro Hospitalar Universitário Lisboa Norte.

Lopes AI. Vogal of Endoscopy Pediatric Section of Portuguese Endoscopy Society (SPED).

Lopes AI. Coordination of the *Anemia and Pediatric IBD* Study Group of Pediatric Society of Gastroenterology

Lopes AI. Member of the Board of the Pediatric Gastroenterology College - Portuguese Medical Association (Ordem dos Médicos).

Advanced Teaching

Marques JG. Tuberculose em Portugal na era de BCG para grupos de Risco. 15º Curso de Infeciologia Pediátrica, Coimbra, Portugal, January 30, 2020.

Marques JG. Herpes simplex - Manifestações clínicas graves e terapêutica. Curso "Infeções virais - Manifestações clínicas graves e terapêutica". Curso satélite das XXVI Jornadas de Pediatria, Departamento de Pediatria do Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal, February 12, 2020.

Marques JG. Varicela-zoster. - Manifestações clínicas graves e terapêutica. Curso "Infeções virais - Manifestações clínicas graves e terapêutica". Curso satélite das XXVI Jornadas de Pediatria, Departamento de Pediatria do Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal, February 12, 2020.

Marques JG. Antivíricos: Aciclovir e Oseltamivir. Curso de Antimicrobianos da Sociedade de Infeciologia Pediátrica da SPP, Online Event, June 19, 2020

Silva SL. Teaching on the course on Inflamatory Bowel Disease of Grupo de Estudos de Doença Intestinal Inflamatória. Porto, Portugal, September 25, 2020.

Badura R & Valadas E. Organizers of Doenças Infeciosas Emergentes 2020 – COVID-19. Curso Pós-Graduado de Atualização – Curso a distância. Clinica Universitária de Doenças Infeciosas da Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 6-29, 2020.

Marques JG. Vacinas extra-PNV. 3º Curso de Pós-Graduação em Infeciologia Pediátrica, Videoconferência, October 12, 2020.

Marques JG. COVID na Criança. I Curso Pós-Graduado de Atualização, Doenças Infeciosas Emergentes 2020, COVID-19, Videoconferência, October 14, 2020.

Marques JG. Infeção SARS-CoV-2 na Criança. Sessão clínica do Departamento de Pediatria, Centro Hospitalar Universitário Lisboa Norte, October 28, 2020.

Marques JG. Doenças infeciosas exantemáticas da criança. 15º Curso de Pós-Graduação em Doenças Infeciosas, Videoconferência, November 17, 2020.

Marques JG. Impacto da COVID-19 no PNV. 4º Curso Básico de Vacinas. Hospital pediátrico de Coimbra, Videoconferência, December 2, 2020.

Marques JG. Hesitação em Vacinar. 4º Curso Básico de Vacinas. Hospital Pediátrico de Coimbra, Videoconferência, December 2, 2020.

Sousa AE, Pereira-Santos MC, Victorino RMM, Silva SL, Fernandes SM, Almeida A, Trombetta AC. Clinical Immunology teaching in the core curriculum for Medical Students, Area: Medicine 2, 5th year. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Sousa AE, Pereira-Santos MC, Silva SL, Almeida A, Fernandes SM, Mota C, Victorino RMM, Godinho-Santos A, Trombetta AC. Teaching of the optional discipline of Clinical Immunology of the 4th and 5th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Pereira-Santos MC, Silva SL. Teaching of the optional discipline of Immunoallergology of the 4th and 5th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Almeida A, Sousa AE. Organization and Teaching of the area of Infection and Immunity in the Master-course of Biomedical Research. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Sousa AE, Silva SL, Fernandes SM, Mota C, Godinho-Santos A, Almeida A, Trombetta AC, Valadas E, and Badura R. Collaboration and Lectures in Master-course Clinical Microbiology and Emerging Infectious Diseases. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Pereira Santos MC. Specialty in Immunoallergology: Supervision of the Clinical Immunology Laboratory training period for the final degree (Ordem dos Médicos/Ministry of Health).

Sousa AB, Sousa AE. Collaboration in the teaching of Immunology in the core curriculum for Medical Students, 2nd year. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Fernandes SM. Regency and teaching of the Discipline of Intensive Care Medicine of the 4th and 5th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Lopes AI. Chair of Pediatrics University Clinic (3 Disciplines of Pediatrics (Introduction to Childhood Medicine, Module VI I, Module VI II), core curriculum, 2nd, 4th and 5th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Marques JG. Teaching of the Discipline of Pediatrics (Module VI II), core curriculum, 5th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Marques JG. Coordination of the Seminar on Vaccination of the Discipline of Pediatrics (Module VI II), core curriculum, 4th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Esteves I. Teaching of the Discipline of Pediatrics (Module VI I), core curriculum, 4th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Badura R. Clinical teaching and Lectures of Infectious Diseases in the core curriculum for Medical Students, Area: Medicine 2, 5th year and 2nd year. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Badura R. Lectures of the optional disciplines Tropical Medicine, and Neglected Diseases 4th year of the Degree in Medicine. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Badura R. Collaboration and Lectures in Post-graduate course in Update of Infectious Diseases Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Fernandes SM. Teatching on the course on Antibiotics of Grupo de Infecção e Sépsis, Porto, Portugal.

Lopes AI. Regency and teaching of Module Nutrition and Maternal-Child Health. Master in Clinical Nutrition, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Lopes AI. Juri President of Concurso de Ciclo de Estudos Especiais em Neonatologia, Departamento de Pediatria, Hospital Santa Maria – Centro Hospitalar Universitário Lisboa Norte, 2020.

Lopes AI. Juri President of Concurso Ciclo de Estudos Especiais em Medicina do Adolescente, Departamento de Pediatria, 2020.

Science and Society

Silva SL. Medical Advisor for Associação Portuguesa de Doentes com Imunodeficiências Primárias.

Silva SL. Recomendações COVID a doentes com IDP – SPAIC & CHULN.

Godinho-Santos C, Rosmaninho P, Almeida A. Participation in the Instituto de Medicina Molecular João Lobo Antunes task force for PCR diagnosis of COVID-19 patients.

Mota C, Fernandes SM, Sousa AE. Participation in the Instituto de Medicina Molecular João Lobo Antunes task force for the establishment in the iMM Biobank of a collection of biological samples from COVID-19 patients.

Pereira-Santos MC. Participation in the Instituto de Medicina Molecular João Lobo Antunes task force for the development of serological tests for COVID-19.

Sousa AE. Participation in several public activities related to the SARS-CoV-2 pandemic in the press, secondary schools and in online platforms.

MSc Theses

Joana Merciano Labisa, 29/07/2020, Modelling strategies to assess the role of monocytes and macrophages in HIV/AIDS pathogenesis – Optimisation of protocols for ex-vivo monocyte/macrophage phenotyping, isolation, and in-vitro differentiation, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Amelia Chiara Trombetta.

Internships:

Clinical Immunology Laboratory training period for the final degree (Ordem dos Médicos/Ministry of Health):

Rita Brás, MD, Interna da Especialidade de Imunoalergologia, Centro Hospitalar Universitário Lisboa Norte, Hospital Santa Maria, January (2020) - Project: IgE Específica e Teste de Ativação de Basófilos: Papel no Diagnóstico de Hipersensibilidade e na Avaliação da Reatividade Cruzada entre Carboplatina e Oxaliplatina. Supervisor: M. Conceição Pereira-Santos.

M. Inês Silva, MD, Interna da Especialidade de Imunoalergologia, Centro Hospitalar Universitário Lisboa Norte, Hospital Santa Maria, July (2020) - Project: Caracterização clínica da população de doentes com alergia ao pêssego e respetivo perfil molecular de sensibilização. Supervisor: M. Conceição Pereira-Santos.

Cláudia Varandas, MD, Interna da Especialidade de Imunoalergologia, Centro Hospitalar Universitário Lisboa Norte, Hospital Santa Maria, October (2020) - Project: Atopic Dermatitis and Dupilumab. Supervisor: M. Conceição Pereira-Santos.

Other Internships:

Gonçalo Vieira. Project: Preliminary optimization of an in-vitro model to generate follicular helper T cells. Traineeship Programme for Undergraduated students from Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Portugal. Supervisor: Ana Godinho-Santos. January 2020 to April 2020.

Beatriz Pereira. Project: Expressão dos recetores das citocinas da família γc em diferentes tecidos e após ativação in vitro. Traineeship Programme for Undergraduated students from Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Portugal. Supervisor: Afonso Almeida. January 2020 to April 2020.

Emil Johansson. Traineeship in HIV infection of Tonsil Organ Cultures. PhD student from Lund University, Sweden. Supervisor: Ana Godinho-Santos. Co-Supervisor: Ana Espada de Sousa. January 20, 2020 to February 16, 2020.

Bruno Domingos. Project: Validação de inibidores da proteína EZH2 e o seu efeito na reativação do VIH-1. Traineeship Programme for Undergraduated students from Escola de Psicologia e Ciências da Vida, Universidade Lusófona de Humanidades e Tecnologias, Portugal. Supervisor: Ana Godinho-Santos. Co-supervisor: Helena Nunes-Cabaço. June 1, 2020 to July 23, 2020.

Rita Moura. Traineeship Programme for Master students from Mestrado em Microbiologia clínica e doenças infeciosas emergentes, Faculdade de Medicina da Universidade de Lisboa, Portugal. The role of SAMHD1 in antiretroviral responses. Supervisor: Ana Godinho-Santos. September 30, 2020 to October 28, 2020.

Raquel Canuto Rato Guerreiro. Traineeship Programme for Master students from Mestrado em Microbiologia clínica e doenças infeciosas emergentes, Faculdade de Medicina da Universidade de Lisboa, Portugal. Selective IgA deficiency: evidence against benignity. Supervisor: Susana Lopes da Silva. September 30, 2020 to October 28, 2020.

Ana Sebastião Lab

Major Interests/Objectives

Correction of abnormal synaptic function is a main challenge to Neurosciences. It impacts in the possibility to fight neurologic and psychiatric diseases. Our team aims to elucidate how the neuronal and glial components of the tripartite synapse are fine-tuned under normal and dysfunctional situations. How endogenous modulators affect synaptic signaling, neuronal excitability, neuronal and glial maturation, degeneration, renewal and repair, under normal and pathological conditions, are our current goals of research. We focus on neurotrophic factors, on adenosine and on endocannabinoids, as major endogenous neuromodulators. As exogenous substances we focus on psychoactive drugs (caffeine, cannabinoid receptor ligands, psilocybin and other serotonergic receptor ligands) aiming to know how they influence endogenous neuromodulation at synapses. As disease models we have been interested on those involving neurodegeneration and/or dysregulated excitability, from newborn to aging.

Head of Laboratory

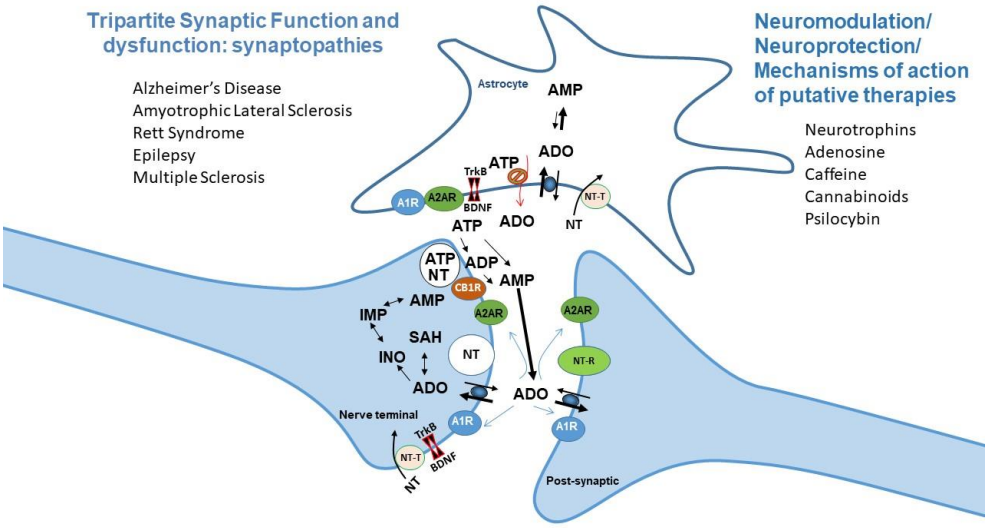
Ana Maria Sebastião, Habilitation in Neurosciences, Full Professor, Faculdade de Medicina da Universidade de Lisboa, Vice-Dean of the Faculdade de Medicina da Universidade de Lisboa, Member of the Scientific Council of the Faculdade de Medicina da Universidade de Lisboa, Member of the Executive Council of the Mind-Brain College of the Universidade de Lisboa, Member of the Scientific Board of the Master and PhD Programmes in Neuroscience, Faculdade de Medicina da Universidade de Lisboa, Director of the PhD Programme 'Integrative Neuroscience' (NeurULisboa), involving several School of Universidade de Lisboa, Member of the Scientific Board of the Master and PhD Programmes in Cognitive Sciences, Universidade de Lisboa, Member of the Coordinating Board of the Biomedical Engineering Integrated Master Course, Universidade de Lisboa

Team

Adam Ioshua d'Armada Moreira	PhD Student (Left September)
Ana Filipa Ferreira da Cunha Ribeiro	Postdoctoral Researcher
Ana Rita Carreira Baptista Gomes	PhD Student
Anwesha Ghosh	PhD Student
Armando Dulcídio da Silva Cruz	Postdoctoral Researcher (Left September)
Carolina de Almeida Borlido	MSc Student
Carolina de Campos Pina	MSc Student (Left August)
Catarina Beatriz Silva Ferreira	PhD Student
Catarina Miranda Lourenço	PhD Student

Céline Felicidade Freitas	MSc Student
Cláudia Alexandra dos Santos Valente de Castro	Senior Postdoctoral Researcher
Cristina Maria de Oliveira Varandas	Administrative Technician
Daniela Cristina Melo Magalhães	PhD Student
Daniela Sofia da Costa Abreu	MSc Student (Started August)
Diana Sousa Correia	MSc Student (Started December)
Diogo André Mendonça Dias	MSc Student
Diogo Miguel da Palma Lourenço	PhD Student
Diogo Miguel Santos Rombo	Postdoctoral Researcher
Francisco José Gonçalves Meda	MSc Student
Francisco Melo Albuquerque Saraiva Mouro	Postdoctoral Researcher (Left March)
Hugo Rafael Marques Simões	MSc Student (Started October)
Joana Filipa Gonçalves Ribeiro	PhD Student
Joana Isabel Ferreira da Graça Gomes	MSc Student (Left May)
Joana Moura Mateus	PhD Student
Joana Simão Correia Nunes	MSc Student (Started October)
João Baptista Moreira	Trainee
João Filipe Fonseca Gomes	Postdoctoral Researcher (Left December)
Joaquim Alexandre Ribeiro	Staff Scientist
Jorge Miguel Farinha Ferreira	PhD Student
Leonor Pedro Oliveira Ribeiro Rodrigues	PhD Student
Mafalda Cagica Pinto de Carvalho	MSc Student
Mafalda Ferreira Manso	MSc Student
Maria Alexandra Pereira Botelho	Administrative Technician
Maria Filipa Soares Mila Porfírio	MSc Student (Started September)
Maria José de Oliveira Diógenes Nogueira	Staff Scientist
Mariana Fernandes Van Zeller da Silva Campos	MSc Student
Mariana Serra de Sequeira Neuparth Sottomayor	MSc Student (Started August)
Miranda Mele	Postdoctoral Researcher (Left June)
Nádia Raquel Henriques Rei	Postdoctoral Researcher (Left December)
Oksana Savchak	MSc Student
Pedro Guilherme Alves Dias	Pre-graduate Student (MIM)
Ricardo Silva dos Santos Viais	Project Manager (Started December)
Rita Abrunhosa Soares	PhD Student
Rita Alexandra Figueira Belo	PhD Student (Left March)
Rui Miguel Silva Rodrigues	PhD Student
Sandra Cristina Henriques Vaz	Senior Postdoctoral Researcher
Sara Alves Xapelli	Staff Scientist
Sara Filipa Castro da Costa Pinto	PhD Student
Sara Inteiro de Oliveira	MSc Student (Started November)
Sara Luísa Ramalho Tanqueiro	PhD Student
Sara Raquel Landeira Nabais do Paulo	PhD Student
Sodikdzhon Kodirov	Senior Postdoctoral Researcher
Svitlana Zavalko	MSc Student
Tatiana Pinto Morais	PhD Student
Tiago Rodrigo da Costa Coelho	MSc Student

Graphical Abstract



Laboratory Keywords/Research Areas

Research Areas:

Tripartite Synapse Modulation, Neuronal Excitation/Inhibition Balance, Synaptopathies.

Keywords:

Neuroinflammation, Adult Neurogenesis, Neurotrophins, Synaptic Plasticity, Psychoactive Agents.

Major Scientific Achievements

1. Neuroprotective strategies/novel therapeutic approaches: The neuroprotective action of a kyotorphin in an animal model of Alzheimer's disease was identified (Belo et al., Front. Pharmacol). By using a cell mimicry approach, we put into evidence the neuroprotective capacity of lab engineered microreactors (Armada-Moreira et al, Advanced Biosystems). In the search for appropriate ways to deliver drugs to targeted organs, we identified the biodistribution of lipid-based nanoparticles (Fonseca-Gomes et al, Int J Nanomedicine). Electrically active cerebellar neurons generated from human pluripotent cells differentiated through a novel differentiation strategy were identified and characterized, paving the way for the development of autologous replacement strategies for treating cerebellar degenerative diseases (Silva et al., Front. Bioeng. Biotech). Neuropharmacological functional assays allowed identifying the mechanism underneath absence of action of chemically modified amphetamine in the CNS while keeping their antiobesity potential (Mahú et al., Cell Metabolism).

2. On the pathophysiological mechanisms of neuronal dysfunction: A clear unbalance of the adenosinergic system in Rett Syndrome (RTT) was shown allowing a step forward in the understanding of this devastating neurodevelopmental disease (Miranda-Lourenço et al., Neurobiol of Disease). Forebrain human organoids as a model of RTT were obtained and characterized (Gomes et al., Front-Cell Devel Biol). A dual action of the adenosine receptor antagonist, caffeine, on the activity of the NMDA receptors, known to be dysfunctional in many degenerative diseases, was identified (Martins et al., Purinergic Signalling). Synaptic plasticity changes in non-motor neurons were identified in an animal model of ALS (Rei et al., Neuropharmacology). Adenosine and cannabinoid receptors heteromers were identified in the striatum being responsible for the control of glutamate release therefore with a potential role in excitotoxicity and plasticity (Kofalvi et al. BMC Biol.). Cannabinoid-induced alterations in maturation and excitability after differentiation of human induced pluripotent stem cells were identified allowing to understand the synaptic dysfunctions induced by pre-natal exposure to cannabinoids (Bekman et al Front Molec Neurosc). The molecular links between microglia activity and neuronal degeneration (Socodato et al., Cell Reports) or neuronal plasticity (Sá de Almeida et al., Front Neurosci) were identified. The antiproliferative potential of adenosine was disclosed and the mechanism put into evidence (Marcelino et al., J Neurochem).

Selected Publications

Tanqueiro SR, Ramalho RM, Rodrigues TM, Lopes LV, Sebastião AM, Diógenes AM (2018). Inhibition of NMDA receptors prevents the loss of BDNF function induced by amyloid β. Frontiers of Pharmacology 9:237. eCollection. *(IF: 4.227, Citations: 17. Source: Web of Science).*

Mouro FM, Rombo DM, Dias RB, Ribeiro JA, Sebastião AM (2018). Adenosine A2A receptors facilitate synaptic NMDA currents in CA1 pyramidal neurons. British Journal of Pharmacology 175:4386-4397. *(IF: 7.73, Citations: 13. Source: Web of Science).*

Magalhães DM, Pereira N, Rombo DM, Beltrão-Cavacas C, Sebastião AM, Valente CA (2018). Ex vivo model of epilepsy in organotypic slices-a new tool for drug screening. Journal of Neuroinflammation 15:203. *(IF: 5.793, Citations: 9. Source: Web of Science).*

Rodrigues RS, Ribeiro FF, Ferreira F, Vaz SH, Sebastião AM, Xapelli S (2017). Interaction between Cannabinoid Type 1 and Type 2 Receptors in the Modulation of Subventricular Zone and Dentate Gyrus Neurogenesis. Frontiers of Pharmacology 8:516. eCollection. *(IF: 4.227, Citations: 17. Source: Web of Science).*

Rombo DM, Dias RB, Duarte ST, Ribeiro JA, Lamsa KP, Sebastião AM (2016). Adenosine A1 receptor suppresses Tonic GABAA receptor currents in hippocampal pyramidal cells and in a defined subpopulation of interneurons. Cerebral Cortex 26:1081-1095. *(IF: 5.043, Citations 33. Source: Web of Science).*

Jerónimo-Santos A, Vaz SH, Parreira S, Rapaz-Lérias S, Caetano AP, Buée-Scherrer V, Castrén E, Valente CA, Blum D, Sebastião AM, Diógenes MJ (2015). Dysregulation of TrkB Receptors and BDNF Function by Amyloid-β Peptide is Mediated by Calpain. Cerebral Cortex 25:3107-3121. *(IF: 5.043, Citations: 42. Source: Web of Science).*

Rocha, MC, Pousinha PA, Correia AM, Sebastião AM, Ribeiro JA (2013). Early changes of neuromuscular transmission in the SOD1 (G93A) mice model of ALS start long before motor symptoms onset. PLOS ONE 8:e73846. *(IF: 2.74, Citations: 78. Source: Web of Science)*.

Ribeiro JA, Sebastião AM (2010). Caffeine and adenosine. Journal of Alzheimers Disease 20 Suppl 1:S3-15. *(IF: 3.309, Citations 198. Source: Web of Science).*

Publications in Peer Reviewed Journals

Armada-Moreira A, Coelho JE, Lopes LV, Sebastião AM, Städler B, Vaz SH (2020). Multicompartment Microreactors Prevent Excitotoxic Dysfunctions In Rat Primary Cortical Neurons. Advanced Biosystems 4(10):e2000139. Original Paper. *(IF:--, Citations: 0. Source: Web of Science).*

Armada-Moreira A, Gomes JI, Pina CC, Savchak OK, Joana Gonçalves-Ribeiro J, Rei N, Pinto S, Morais TP, Martins R, Ribeiro FF, Sebastião AM, Crunelli V, Vaz SH (2020). Going the extra (synaptic) mile: excitotoxicity as the road toward neurodegenerative diseases. Frontiers in Cellular Neuroscience 14:90. Review. *(IF: 3.900, Citations: 3. Source: Web of Science).*

Bekman EP, Miranda CC, Barata T, Vaz SH, Ferreira CF, Quintas A (2020). hiPSC-based model of prenatal exposure to cannabinoids: effect on neuronal differentiation. Frontiers in Molecular Neuroscience 13:119. Original Paper. *(IF: 3.720, Citations: 0. Source: Web of Science).*

Belo RF, Martins MLF, Shvachiy L, Costa-Coelho T, Almeida-Borlido CD, Fonseca-Gomes J, Neves V, Miranda HV, Outeiro TF, Coelho JE, Xapelli S, Valente CA, Heras M, Bardaji ER, Castanho MARB, Diógenes MJ, Sebastiao AM (2020). The Neuroprotective Action of Amidated-Kyotorphin on Amyloid β Peptide-Induced Alzheimer's Disease Pathophysiology. Frontiers in Pharmacology Neuropharmacology 11:985. *(IF: 4.225, Citations 0. Source: Web of Science).*

do Vale FM, Diógenes MJ, Barbacena HA (2020). Controversies about the cardiovascular effects of OM3FA. Did inappropriate placebos skew clinical trial results? Pharmacological Research 11:105368. Opinion paper. *(IF: 5.893, Citations: 0. Source: Web of Science*).

Fonseca-Gomes J, Loureiro JA, Tanqueiro SR, Mouro FM, Ruivo P, Carvalho T, Sebastião AM, Diógenes MJ, Pereira MC (2020). In vivo Bio-Distribution and Toxicity Evaluation of Polymeric and Lipid-Based Nanoparticles: A Potential Approach for Chronic Diseases Treatment. International Journal of Nanomedicine 15:8609-8621. *(IF: 4.471, Citations 1. Source: Google Scholar).*

Gomes AR, Fernandes TG, Vaz SH, Silva TP, Bekman E, Xapelli S, Duarte S, Ghazvini M, Gribnau, J, Muotri AR, Trujillo CA, Sebastião AM, Cabral JMS, Diogo MM (2020). Modelling Rett Syndrome with Human Patient-Specific Forebrain Organoids. Frontiers in Cell and Developmental Biology 8:610427. Original paper. *(IF: 5.186, Citations: 1. Source: Clarivate Analytics).*

Gomes JI, Farinha-Ferreira M. Rei N, Gonçalves-Ribeiro, Ribeiro JA, Sebastião AM, Vaz SH (2020). Of adenosine and the blues: the adenosinergic system in the pathophysiology and treatment of major depressive disorder. *Pharmacological Research* 163:105363. Review. *(IF: 5.893, Citations: 0. Source: Web of Science).*

Köfalvi A, Moreno E, Cordomí A, Cai NS, Fernández-Dueñas V, Ferreira SG, Guixà-González R, Sánchez-Soto M, Yano H, Casadó-Anguera V, Cunha RA, Sebastião AM, Ciruela F, Pardo L, Casadó V, Ferré S (2020). Control of glutamate release by complexes of adenosine and cannabinoid receptors. BMC Biology 18:9. *(IF: 6.765, Citations: 7. Source Web of Science).*

Lourenço DM, Ribeiro-Rodrigues L, Sebastião AM, Diógenes MJ, Xapelli S (2020). Neural Stem Cells and Cannabinoids in the Spotlight as Potential Therapy for Epilepsy. International Journal of Molecular Sciences 21(19):E7309. Review. *(IF: 4.556, Citations: 0. Source: Web of Science).*

Mahú I, Barateiro A, Martinéz-Sánchez N, Cal PMSD, Vaz SH, Rial-Pensado E, Costa MF, Pereira MMA, Cordeiro C, Seixas E, Temporão C, Gres V, Mendes R, Morris I, Kubasova N, Arús BA, López M, Sebastião AM, Bernardes GJL, Domingos AI (2020). Brain-sparing sympathofacilitators mitigate obesity without adverse cardiovascular effects. Cell Metabolism S1550-4131(20)30195-9. Original paper. *(IF: 22.415, Citations: 2. Source: Web of Science).*

Marcelino H, Nogueira VC, Santos CRA, Quelhas P, Carvalho TMA, Fonseca-Gomes J, Tomás J, Diógenes MJ, Sebastião AM, Cascalheira JF (2020). Adenosine inhibits human astrocyte proliferation independently of adenosine receptor activation. Journal of Neurochemistry 153(4):455-467. Original paper. *(IF: 4.870, Citations 1, Source: Web of Science).*

Martins RS, Rombo DM, Gonçalves-Ribeiro J, Meneses C, Borges-Martins VPP, Ribeiro JA, Vaz SH, Kubrusly RCC, Sebastião AM (2020). Caffeine has a dual influence on NMDA receptor mediated glutamatergic transmission at the hippocampus. Purinergic Signalling Online ahead of print. Original paper. *(IF: 3.065, Citations: 0. Source: Web of Science).*

Miranda-Lourenço C*, Ribeiro-Rodrigues L*, Fonseca-Gomes J*, Tanqueiro SR*, Belo RF*, Ferreira CB*, Rei N*, Ferreira-Manso M, de Almeida-Borlido C, Costa-Coelho T, Freitas CF, Zavalko S, Mouro FM, Sebastião AM, Xapelli S, Rodrigues TM, Diógenes MJ (2020). Challenges of BDNF-based therapies: from common to rare diseases. Pharmacology Research 162:105281. Review. *(IF: 5.893, Citations: 0. Web of Science).*

Miranda-Lourenço C, Duarte ST, Palminha C, Gaspar C, Rodrigues TM, Magalhães-Cardoso T, Rei N, Colino-Oliveira M, Gomes R, Ferreira S, Rosa J, Xapelli S, Armstrong J, García-Cazorla À, Correia-de-Sá P, Sebastião AM, Diógenes MJ (2020). Impairment of adenosinergic system in Rett syndrome: Novel therapeutic target to boost BDNF signalling. Neurobiology of Disease 145:105043. Original paper. *(IF: 5.332, Citations: 1. Source: Web of Science).*

Rei N, Rombo DM, Baqi Y, *Müller* CE, Ribeiro JA, Sebastião AM, Vaz SH (2020). Neuronal Plasticity changes in non-motor synapses of an Amyotrophic Lateral Sclerosis mouse model ($SOD1^{G93A}$) along disease progression. Neuropharmacology 171:108106. Original paper. *(IF: 4.367, Citations: 2. Source: Web of Science).*

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Sá de Almeida J, Vargas M, Fonseca-Gomes J, Tanqueiro SR, Belo RF, Miranda-Lourenço C, Sebastião AM, Diógenes MJ, Pais TF (2020). Microglial Sirtuin 2 Shapes Long-Term Potentiation in Hippocampal Slices. Frontiers in Neuroscience 14:614. Original paper. *(IF: 3.707, Citations: 0. Source: Web of Science).*

Silva TP, Bekman E, Fernandes TG, Vaz SH, Rodrigues CAV, Diogo MM, Cabral JMS, Carmo-Fonseca M (2020). Maturation of human pluripotent stem cell-derived cerebellar neurons in the absence of co-culture. Frontiers in Bioengineering and Biotechnology 8:70. Original paper. *(IF: 5.122, Citations: 4. Source: Web of Science).*

Soares R, Ribeiro FF, Lourenço DM, Rodrigues RS, Moreira JB, Sebastião AM, Morais VA, Xapelli S (2020). Isolation and Expansion of Neurospheres from Postnatal (P1–3) Mouse Neurogenic Niches. Journal of Visualized Experiments 159:e60822. Original paper. *(IF: 1.163, Citations: 0. Source: Web of Science).*

Socodato R, Portuga CC, Canedo T, Henriques JF, Vaz SH, Magalhães J, Silva CM, Baptista FI, Alves RL, Nogueira J, Coelho-Santos V, Silva AP, Paes-de-Carvalho R, Magalhães A, Summavielle T, Brakebusch C, Sebastião AM, Ambrósio AF, Relvas JB (2020). Microglia dysfunction caused by the loss of Rhoa disrupts neuronal physiology and leads to neurodegeneration. Cell Reports 31(12):107796. Original paper. *(IF: 8.046, Citations: 5. Source: Web of Science).*

Tescarollo FC, Rombo DM, DeLiberto LK, Fedele DE, Alharfoush E, Tomé ÂR, Cunha RA, Sebastião AM, Boison D (2020). Role of Adenosine in Epilepsy and Seizures. Journal of Caffeine and Adenosine Research 10(2):45-60. Epub 2020 Jun 4. Original paper. (IF: NA, PubMed listed).

Valente CA, Meda F, Carvalho M, Sebastião AM (2020). A Model of Epileptogenesis in Rhinal Cortex-Hippocampus Organotypic Slice Cultures. Journal of Visualized Experiments e61330. Original paper. *(IF: 1.163, Citations: 0. Source: Web of Science).*

Other International Publications

Editorial:

Xapelli S, Diógenes MJ, Crunelli V, Fitzsimons CP, Vaz SH (2020). Editorial: Glial and Neural Stem Cells as New Therapeutic Targets for Neurodegenerative Disorders. Frontiers Cellular Neuroscience 14:71. *(IF: 3.921, Citations: 1. Source: Thomson Reuters).*

Abstracts published (whenever published, the communication was included here and not in the list of communications, to avoid repetition):

Lourenço DM, Soares R, Rodrigues RS, Sebastião AM, Xapelli S (2020). Not just nociception: regulation of postnatal neurogenesis by TRPV1. ScienceOpen. Conference Abstract: 12th FENS Forum of Neuroscience, Glasgow, United Kingdom, July 11-15. doi: 10.14293/S2199-1006.1.SOR-.PPBBXOH.v1

Soares R, Lourenço DM, Verduyckt J, Sebastião AM, Xapelli S, Morais VA (2020) Mitochondrial Dynamics: impact on adult neural stem cell fate ScienceOpen. Conference Abstract: 12th FENS Forum of Neuroscience, Glasgow, United Kingdom, July 11-15. doi: 10.14293/S2199-1006.1.SOR-.PPVI8US.v1

Rodrigues RS, Moreira, JB, Sebastião AM, Fitzsimons CP, Xapelli S (2020) Shaping hippocampal neurogenesis: exercising the brain with cannabinoids. ScienceOpen. Conference Abstract: 12th FENS Virtual Forum of Neuroscience, July 11-15. doi: 10.14293/S2199-1006.1.SOR-.PPVGY4P.v1

Mateus JM, Gomes MA, Soares R, Paulo SL, Chora ÂF, Sebastião AM, Xapelli, S. Boosting postnatal oligodendrogenesis in a mouse model of Multiple Sclerosis. ScienceOpen. Conference Abstract: 12th FENS Virtual Forum for Neuroscience, July 11-1. doi: 10.14293/S2199-1006.1.SOR-.PPEIPFK.v1

Paulo SL, Ribeiro-Rodrigues L, Rodrigues RS, Mateus JM, Fonseca-Gomes J, Diógenes MJ, Solá S, Sebastião AM, Ribeiro FF, Xapelli S. Adult hippocampal neurogenesis and amyloid-ß: reproducibility of a sporadic Alzheimer's disease model. ScienceOpen. Conference Abstract: 12th FENS Virtual Forum for Neuroscience, July 11-1. doi: 10.14293/S2199-1006.1.SOR-.PP5MOIH.v1

Rodrigues RS, Moreira, JB, Sebastião AM, Fitzsimons CP, Xapelli S (2020) From cannabinoids to physical exercise: regulators of postnatal neurogenesis as antidepressant targets? European Neuropsychopharmacology 31:S1-S2. Conference Abstract: ECNP Workshop for Junior Scientists in Europe, Nice, France, March 5-8. doi: 10.1016/j.euroneuro.2019.12.002

Other National Publications

Ribeiro JA (2020). Neurociências, neuroética e inteligência artificial. In: Entrecruzares Bioéticos, pp 105-115, Colecção Bioética, ed. A Barbosa e I Fernandes, Faculdade de Medicina da Universidade de Lisboa, Lisboa, ISBN 978-972-9349-43-0, ISSN 2183-2609.

Ongoing Research Projects

2020/2023: "Twinning - EpiEpeNet - Epileptogenesis and Epilepsy Network: from genes, synapses and circuits to pave the way for novel drugs and strategies". Coordinator: Ana Sebastião. Funding Agency: European Commission. Reference: Twinning EpiEpinet - Grant number:952455. Amount: 587 500,00. Total Amount: 900 000,00€.

2018/2021: Restabelecimento dos níveis de Adenosina: nova abordagem para o tratamento da Sindrome de Rett. Coordinator: Maria José Diógenes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: AdoRett - LISBOA-01-0145-FEDER-031929. Amount: 208 541,35€. Total Amount: 239 791,35€.

2018/2021: Astrossomas: Astrócitos Artificiais como reguladores da comunicação neuronal. Coordinator: Sandra Vaz. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BTM-SAL/32147/2017. Amount: 239 677,82€. Total Amount: 239 677,82€.

2018/2021: Na procura do mecanismo de ação de um novo e seletivo fármaco antiepiléptico. Coordinator: Ana Sebastião. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-FAR/30933/2017. Amount: 239 867,80€. Total Amount: 239 867,80€.

2018/2021: Regulação da homeostase e polarização pró-inflamatória da microglia Rac1. Coordinator: Ana Sebastião. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: POCI-01-0145-FEDER-031318. Amount: 15 000,00€. Total Amount: 224 179,81€.

2018/2021: Titanic- CYP46A1 as new Therapeutic Target in Niemann-Pick Type-C disease. Coordinator: Maria José Diógenes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-NEU/29455/2017- TITANIC. Amount: 12 500,00€. Total Amount: 237 017,12€.

2018/2021: Controlo mecanístico e optogenético da astroglia para reparação neuronal. Coordinator: Ana Sebastião. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-NEU/31417/2017. Amount: 21 250,00€. Total Amount: 239 884,80€.

2018/2020: Novel therapeutic strategy and new biomarker for Alzheimer´s Disease based on BDNF receptor cleavage. Coordinator: Maria José Diógenes. Funding Agency: Santa Casa da Misericórdia de Lisboa. Reference: Prémio Santa Casa Mª José Diógenes. Amount: 152 388,90€. Total Amount: 198 951,40€.

Invited Lectures and Seminars

Costa-Coelho T. Unveiling paracrine dissemination and toxicity of neuronal TrkB-ICD via secretome/exosome signalling in Alzheimer's disease. Jornadas Intercalares das Dissertações Anuais dos Mestrados do DQ e DCV, FCT-UNL, Caparica, Portugal, February 14, 2020.

Rodrigues RS. Neural stem cells as targets in depression: the role of cannabinoid type 2 receptor. Stem Cell Club, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, February 20, 2020.

Sebastião AM. Epileptogenesis and Epilepsy Network: from genes, synapses and circuits to pave the way for novel drugs and strategies. EpiCluster Meeting, June 17, 2020. (Online meeting organized by European Brain Research Area (EBRA).

Xapelli S. Cannabinoid Actions on Neural Stem Cells: Implications for Pathophysiology. XV Annual CICS-UBI Symposium, October 2, 2020.

Sebastião AM, Silva-Cruz A, Mouro FM, Ribeiro JA. Influence of cannabinoids on neuronal connectivity and synaptic plasticity. Workshop Neuroplasticity and Neuroimaging in Psychedelics, October 27, 2020.

Diógenes MJ. Development of a novel therapeutic strategy to prevent the loss of BDNF signalling in Alzheimer's disease. 1st International CAPES Print Symposium in Neurosciences, Online Event, December 2-3, 2020.

Communications in International Conferences

Ghosh A, Domingos C, Ribeiro JA, Jacobson KA, Sebastião. AM An adenosine A_1R agonist with anticonvulsant properties but devoid of effect on excitatory hippocampal synaptic transmission. FENS 2020 Virtual Forum, July 11-15, 2020. *(Poster Presentation)*

Gomes J, Fonseca-Gomes J, Vicente Miranda H, Sebastião AM, Diógenes MJ, Vaz SH. On the role of astrocytes upon Aβ-mediated neurotoxicity. FENS 2020 Virtual Forum, July 11-15, 2020. *(Poster Presentation)*

Magalhães DM, M Mampay, GK Sheridan, CA Valente (2020). Immunomodulatory effects of FTY720 in a Social Isolated mice model. FENS 2020 Virtual Forum, July 11-15, 2020. *(Poster Presentation)*

Ribeiro FF, Armada-Moreira A, Sebastião AM, Xapelli S, Vaz SH. Testing Platinum nanoparticle-based microreactors to overcome excitotoxicity in subventricular zone-derived cultures. FENS 2020 Virtual Forum, July 11-15, 2020. *(Poster Presentation)*

Ribeiro-Rodrigues L, Tosh DK, Valente CA, Jacobson KA, Ribeiro JA, Sebastião AM. The effect of A1R agonist on epileptiform activity in organotypic slices. FENS 2020 Virtual Forum, July 11-15, 2020. *(Poster Presentation)*

Rodrigues RS, Moreira JB, Sebastião AM, Fitzsimons CP, Xapelli S. From cannabinoids to physical exercise: regulators of postnatal neurogenesis as antidepressant targets? 33rd ECNP Congress Virtual, September 12-15, 2020. *(Poster Presentation)*

Rodrigues RS. Running on cannabinoids: boosting adult hippocampal neurogenesis as an antidepressant strategy? ECNP's Got Talent, 33rd ECNP Congress of Applied and Translational Neuroscience Virtual, September 12-15, 2020. *(Oral Presentation)*

Ferreira MF, Rei N, Fonseca-Gomes J, Gomes JI, Mouro FM, Sebastião AM. Do not judge a rat by its (forced) swimming: exploring the contradictory affective behavioral effects of chronic adolescent HU-210 exposure. Workshop Neuroplasticity and Neuroimaging in Psychedelics, Prague, Czech Republic, October 2020. (*ePoster Presentation)*

Venillo S, Soares R. Showcase of Nanolive imaging results from demonstrations with researchers and imaging facilities from the Iberian Peninsula. Spanish & Portuguese Advanced Optical Microscopy Meeting 2020, November 24-27, 2020. *(Oral Presentation)*

Communications in National Conferences

Ferreira MF, Rei N, Fonseca-Gomes J, Gomes JI, Mouro FM, Sebastião AM. Do not judge a rat by its (forced) swimming: exploring the contradictory affective behavioral effects of chronic adolescent HU-210 exposure. Juntos pelo Fernando Meeting, Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 24, 2020. (*Oral Presentation)*

Ferreira MF, Rei N, Fonseca-Gomes J, Gomes JI, Mouro FM, Sebastião AM. Do not judge a rat by its (forced) swimming: exploring the contradictory affective behavioral effects of chronic adolescent HU-210 exposure. L Meeting of the Portuguese Society for Pharmacology (SPF), Coimbra, Portugal, February 5-7, 2020. *(Oral Presentation)*

Rodrigues RS, Moreira JB, Sebastião AM, Fitzsimons CP, Xapelli S. Exercising neural stem cells: exploring the effects of cannabinoids and neurotrophic factors in adult hippocampal neurogenesis. L Meeting of the Portuguese Society for Pharmacology (SPF), Coimbra, Portugal, February 5-7, 2020. *(Oral Presentation)*

Savchak OK, Armada-Moreira A, Ribeiro FF, Sebastião AM, Vaz SH. Nanotechnology approach to neuroinflammation: cell-like reactors in three-dimensional inflammation models. L Meeting of the Portuguese Society for Pharmacology (SPF), Coimbra, Portugal, February 5-7, 2020. *(Oral Presentation)*

Gomes J, Fonseca-Gomes J, Vicente-Miranda H, Sebastião AM, Diógenes MJ, Vaz SH. Astrocytic dn-SNARE expression abolishes acute Aβ effects in synaptic plasticity. L Meeting of the Portuguese Society for Pharmacology (SPF), Coimbra, Portugal, February 5-7, 2020. *(Oral Presentation)*

Lourenço DM, Soares R, Rodrigues RS, Sebastião AM, Xapelli S. TRPV1 activation by Cannabidivarin and Capsaicin as modulators of neural stem cell fate. L Meeting of the Portuguese Society for Pharmacology (SPF), Coimbra, Portugal, February 5-7, 2020. *(Oral Presentation)*

de Almeida-Borlido C. Searching for a new biomarker for Alzheimer's Disease based on BDNF receptor cleavage. 2º Encontro do Mestrado em Bioquímica, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, February 13, 2020. *(Oral Presentation)*

Ferreira-Manso M. The impact of BDNF receptor cleavage in Alzheimer's disease-associated neuroinflammation. 2º Encontro do Mestrado em Bioquímica, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, February 13, 2020. *(Oral Presentation)*

Miranda-Lourenço C, Duarte ST, Palminha C, Rodrigues TM, Magalhães-Cardoso T, Rei N, Rosa J, Colino-Oliveira M, Correia-de-Sá Paulo, Sebastião AM, Diógenes MJ. Adenosinergic system impairment as a new therapeutic avenue to rescue BDNF signalling in Rett Syndrome. Congresso de Neurologia 2020, Coimbra, Portugal, Online Event, November 18, 2020. *(Oral Presentation)*

Organization of Conferences

Xapelli S. Organizer. 3rd Management Committee and Working Group Meeting of COST Action CA18116: Aniridia: networking to address an unmet medical, scientific, and societal challenge. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, February 27-28, 2020. (Co-Organizer: Susana Solá).

Xapelli S. Member of Organizing Committee. PhD Advanced Course: Stem Cell Technologies, Faculdade de Farmácia da Universidade de Lisboa and Champalimaud Foundation, Lisbon, Portugal, October 19-23, 2020. (Course Coordinator: Susana Solá and Christa Rhiner).

Diógenes MJ. Member of the Organizing Committee. 7th BeyondMEd. Faculdade de Medicina da Universidade de Lisboa, Portugal, November 10, 2020 (Online event).

Internationalization

Participation in European Research Networks: Sebastião AM. Coordinator of the European Twinning Action 'Epileptogenesis and Epilepsy Network: from genes, synapses and circuits to pave the way for novel drugs and strategies' (EpiEpiNet, Project Nº 952455), which besides iMM (coordinator) involves the University of Rome la Sapienza (Institutional coordinator Eleonora Palma), the University of Amsterdam (Institutional coordinator Eleonora Aronica), and the University of Lund (Institutional coordinator Merab Kokaia).

Xapelli S. Management Committee member of Cost Action CA18116, "Aniridia: networking to address an unmet medical, scientific, and societal challenge".

Xapelli S. Inclusiveness Target Country (ITC) Conference Grant Coordinator of COST Action CA18116.

Collaborations in Scientific Projects:

1) On the action of psychoactive drugs (cannabinoids, psilocybin and other serotonergic agents, caffeine and other adenosinergic agents) on synaptic excitability and cognition (Ana Sebastião projects): Karl Jacobson (NIH, Bethesda, USA), Luzia Sampaio (Rio de Janeiro, Brasil), Regina Kubrusly (Niterói, Brasil), Milena Viana (S. Paulo, Brasil); Tomáš Páleníček (Klecany, Czech Republic); Serge Ferré (Baltimore, USA); Robin Carhart-Harris (London, UK, involving co-supervision of a PhD Student); Zsolt Lenkei (INSERM, Paris).

2) On pathophysiological mechanisms in Alzheimers' disease, Rett Syndrome and schizophrenia (Maria José Diógenes projects): Annakaisa Haapasalo (Kuopio, Finland), Christopher Parsons (Frankfurt, Germany), David Blum (Université Lille-Nord de France), Detlev Boison (Portland, USA), Eero Castren (Helsinki, Finland), Mikko Hiltunen (Kuopio, Finland, co-supervision of a PhD Student), Neil Dawson (Lancaster, England, co-supervision of a PhD Student), Tiago Outeiro (Göttingen, Germany).

3) On the role of neurogenesis and oligodendrogenesis in neurologic and psychiatric dysfunctions (Sara Xapelli projects): Carlos Fitzsimons (University of Amsterdam, co-supervision of a PhD Student), Helena Mira (IBV-CSIC, Valencia, Spain), Jorge Valero (Ikerbasque - Basque Foundation for Science, co-supervision of a PhD Student), Neil Dawson (Lancaster, England, co-supervision of a PhD Student).

4) On the role of neuroinflammation in CNS diseases (Cláudia Valente projects): Graham Sheridan, (University of Brighton, England, co-supervision of a PhD Student), Eleonora Aronica (University of Amsterdam, Amsterdam, Netherlands), Erwin Van Vliet (University of Amsterdam, Amsterdam, Netherlands).

5) On the influence of astrocytes in neuronal function (Sandra Vaz projects): Brigitte Städler - (Aarhus, Denmark, co-supervision of a PhD Student), Vincent Crunelli (Cardiff, UK, co-supervision of a PhD Student), Alfonso Araque (University of Minnesota), Gareth Miles (St. Andrews University), Rafael Franco (University of Barcelona).

Participation in international reviewing committees:

Sebastião AM: Expert evaluator of Austrian Science Fund.

Sebastião AM: Expert evaluator of Fondazione Italiana di Ricerca per la SLA – Sclerosi Laterale Amiotrofica (AriSLA).

Sebastião AM: Expert evaluator of Medical Research Council Research proposal.

Sebastião AM: Expert evaluator of Research Foundation, Flanders – Basic (SBO) projects – FWO.

Sebastião AM: Expert Evaluator of the Oregon Tax Checkoff for Alzheimer's Research Fund and Oregon Partnership for Alzheimer's Research (OPAR).

Sebastião AM: Handling Editor of Journal of Neurochemistry.

Xapelli S: Expert evaluator of Czech Science Foundation.

Xapelli S: Expert evaluator of Marie Sklodowska-Curie (Call: H2020-MSCA-IF-2020 - LIF panel).

Xapelli S: Review Editor of Frontiers in Neuroscience section Neurogenesis.

Xapelli S: Topic Editor of International Journal of Molecular Sciences.

Diogenes MJ: Topic Editor of Pharmacological research.

Diógenes MJ. Evaluator of Marketing European decentralized authorisation applications of drugs as expert on Pharmacokinetics (bioavailability and bioequivalence).

Diógenes: Topic Editor of International Journal of Molecular Sciences.

Vaz S: Expert evaluator of National Science Centre Poland.

Prizes, Honors and Awards

Rodrigues RS. Fee waiver from European College of Neuropsychopharmacology (ECNP) – scholarship attributed by ECNP to attend the ECNP Workshop on Neuropsychopharmacology for Early Career Scientists in Europe, March 5-8, 2020. (Cancelled due to COVID-19 pandemic).

Fonseca-Gomes J. Selection for Building Tomorrow Together initiative, organized by Roche Pharmaceuticals and iMatch, Portugal, April 2020.

Ribeiro FF. Travel Award from Portuguese Society for Neuroscience (SPN) to attend the FENS 2020 Virtual Forum, July 11-15, 2020.

Ribeiro-Rodrigues L, Lourenço DM, Rodrigues RS, Paulo SL. FENS Grant and Voucher Programme grant. FENS 2020 Virtual Forum, July 11-15, 2020.

Soares R. Travel Award from FENS-IBRO/PERC to attend the FENS 2020 Virtual Forum, July 11-15, 2020.

Patents/Prototypes

Applicants:	Instituto de Medicina Molecular João Lobo Antunes Universidade de Coimbra Faculdade de Medicina da Universidade de Lisboa
Filing date:	1 April 2020
Title:	Therapeutic Agents, Pharmaceutical Compositions, and Associated Biomarkers
Provisional Application No:	GB2004832.8

Advanced Teaching

Directive Roles:

Sebastião AM. Member of the Executive Council of the Mind-Brain College 'Mind and Brain', Universidade de Lisboa, which integrates 7 Schools (Faculdade de Ciências (FCUL), Faculdade de Farmácia (FFUL), Faculdade de Letras (FLUL), Faculdade de Medicina (FMUL), Faculdade de Psicologia (FPUL), Instituto Superior Técnico (IST) e Instituto de Ciências Socias (ICS), and their corresponding research centres, to promote the interaction between scientific, technical and formative valences to further understand brain and cognition as well as to communicate with and for the main achievements to the society.

Sebastião AM. Director of the Integrated Neurociences PhD Programme (Supported by FCT) which involves 6 Schools (Faculdade de Ciências (FCUL), Faculdade de Farmácia (FFUL), Faculdade de Letras (FLUL), Faculdade de Medicina (FMUL), Faculdade de Psicologia (FPUL), Instituto Superior Técnico (IST).

Sebastião AM. Member of the Scientific Board of the MScs/PhD in Neurosciences, Faculdade de Medicina da Universidade de Lisboa.

Sebastião AM. Member of the Scientific Board MSc/PhD Programme in Cognitive Sciences, Universidade de Lisboa, which involves 4 Schools (Faculdade de Ciências (FCUL), Faculdade de Letras (FLUL), Faculdade de Medicina (FMUL), Faculdade de Psicologia (FPUL).

Sebastião AM. Member of the Coordination Board of the Master in Biomedical Engineering, IST/FMUL.

Ribeiro JA. Coordinator of the Module on Neuroethics, Ms/PhD in Neurosciences.

Sebastião AM. Coordinator of the following modules of the MSc/PhD in Neurosciences: 'Cellular and Molecular Neurosciences', 'Neuronal Networks', 'Neuronal Degeneration and Regeneration'.

Sebastião AM. Coordinator of the Curricular Unit 'Principles of Neuroscience' of the Master in Biomedical Research (Co-Coordination with Luisa Lopes).

Vaz S. Coordinator of the 'Neurosciences Seminars'.

Organization and Teaching at Practical Workshops:

Vaz S. Organizer. Recordings of synaptic potentials from hippocampal slices. October 16, 2020.

Valente C. Organizer. Methodological approaches for neuroinflammation research. October 26-27, 2020.

Xapelli S. Organizer. Neural stem cells and its potential for neuroregeneration. October 29, 2020.

Ferreira MF. Organizer. Behaviour assessment in laboratory animals. November 27, 2020.

Invited Lectures from Abroad:

Araque A, PhD (University of Minnesota) "Tripartite Synapses: Astrocyte control of synaptic transmission and plasticity." June 22, 2020.

Neuroscience Seminars

These seminars run once per week on Mondays, constituting a forum for discussion of scientific achievements, projects to start or running, as well as to invite members from other institutions to share their ideas on different topics. These seminars are open to the iMM community, but are particularly designed for training of Master and PhD students at the Unit. The seminars are also open to Medical students as well as to members of the Mind-Brain College of the University of Lisbon. Seminars given by members of other iMM Units are not listed to avoid repetition with other Unit reports.

06/01 – Tatiana Morais (PhD student, Cardiff University) "Nature of the astrocytic GABA Transporter Type 1 malfunction in absence epilepsy."

13/01 – Sodikdzhon Kodirov (PhD) "Autologous transmission."

20/01 – Joana Ribeiro (PhD student) "Interplay of cannabinoid and adenosine receptors in astrocytes."

27/01 – Catarina Beatriz Ferreira (PhD student)"Role of SEPT5 on synaptic vesicle exocytosis: molecular and functional analysis."

10/02 – João Gomes (PhD student)"BDNF receptor cleavage: what was done in 4 years?"

18/05 – Diogo Lourenço (PhD Student) “TRPV1 activation by Cannabidivarin and Capsaicin as modulators of neural stem cell fate.”

25/05 – Rui Rodrigues (PhD Student) “Targeting cannabinoid type 2 receptors in depression: adult neural stem cells as hubs of plasticity”

01/06 – Sara Tanqueiro (PhD Student) "Unveiling the link between BDNF alterations and cognitive deficits in schizophrenia."

15/06 – Anwesha Ghosh (PhD student) “An adenosine A1R agonist with anticonvulsant properties but devoid of effect on excitatory hippocampal synaptic transmission.”

13/07 – Sara Pinto (PhD student) “Astrosome: Use of artificial astrocytes as a novel therapeutic to amyotrophic lateral sclerosis."

21/09 – Sara Paulo (PhD student) “Unconventional neurogenic niches and where to find them."

12/10 – Rita Soares (PhD Student, Ana Sebastão Lab and Vanessa Morais lab) “Mitochondrial Dynamics: a target for neural stem cell fate modulation.”

19/10 – Carina Freitas (PhD, SESARAM, Hospital do Funchal and Universidade da Madeira) "Neuroimaging Studies on Familiarity of Music in Children with Autism Spectrum Disorder."

09/11 – Joana Mateus (PhD student) “Modulating A2ARs: mechanisms to boost postnatal oligodendrogenesis”.

23/11 – Nádia Rei (PhD) "The effect of a putative antiepileptic drug on GABA uptake in the rat hippocampus."

14/12 – Miguel Ferreira (PhD student) “Good times, bad times: Exploring the contextual dependency of drug effects.”

21/12 – Daniela Abreu (Master student) “Role of SNARE-dependent gliotransmitters release in Alzheimer’s disease: from astrocytes to circuits.”

<u>Seminars and Lectures at Non CAML Post-graduation Courses/Events</u>:

Xapelli S. Neural Stem cells and its neuroregenerative potential. Master in Biomedical Engineering Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, April 14, 2020.

Valente CA. Lecture. Neurobiology of inflammation: concepts and relevance in neurological disorders. Master in Molecular and Genetic Biology. Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal. May 8, 2020.

Vaz SH. Neuronal function: Basics of neuronal excitability and neuronal communication. PhD Advanced Course Advances in Neuropharmaceutics, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, July 6, 2020.

Diógenes MJ. Pharmacokinetic considerations for drugs acting in the Central Nervous System. PhD Course - Advances in Neuropharmaceutic, Universidade de Lisboa, Lisbon, Portugal, July 9, 2020.

Diógenes MJ. Mechanisms of Neuronal degeneration and neuroprotection. Curricular Unit Neuroengineering, Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, September 2020.

Diógenes MJ. Neurotrophic factors: key molecules for neuronal survival and plasticity-new drug and new biomarker. Mestrado integrado em Ciências Farmacêuticas, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, September 29, 2020.

Sebastião AM. Neuronal Communication and Plasticity. Curricular Unit Neuroengeneering. Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, September 2020.

Vaz SH. Glial Cells. Physiology curricular unit of Biochemistry basic degree, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, October 7, 2020.

Xapelli S. Cannabinoid Actions on Neural Stem Cells: Implications for Pathophysiology. PhD Advanced Course: Stem Cell Technologies, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, October 20, 2020.

Sebastião AM. (Alguns) métodos de estudo do cérebro: abordagem *ex vivo*. Universidade Católica Portuguesa, Lisbon, Portugal, October 2020.

Sebastião AM. Técnicas microelectrofisiológicas. Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, 2020.

<u>iMM Pizza Seminars</u> (by Unit Members):

Lourenço DM. The effect of non-psychotomimetic cannabinoids on neural stem cells. Pizza Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 21, 2020.

Miranda-Lourenço C. Adenosinergic system as a novel therapeutic target for Rett Syndrome, Pizza Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, September 8, 2020.

Seminars/Lectures at the PhD and at the Master Courses in Neuroscience:

(The list below refers to the seminars presented by Unit members or, whenever indicated, by those invited from outside iMM. Seminars given by members of other iMM Units are not listed to avoid repetition with other Unit reports):

22/9 – Basics of neuronal excitability: electrochemical gradients and equilibrium potential; membrane potential, action potential (Ana M Sebastião) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

23/9 – Imaging molecules by immunofluorescence – Applications to neuroscience (Claudia Valente)

23/9 – Receptor quantification assays: relevance for the study of neurodegenerativediseases (Nádia Rei/Rita Belo)

24/9 – Basics of neuronal communication: synaptic potential, inhibitory vs excitatory transmission, synaptic integration. Ionotropic receptors vs metabotropic receptors (Ana M Sebastião) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

29/9 – Metabotropic receptors, G proteins and transducing pathways (Sandra Vaz) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

30/9 – Molecular Anatomy of the Blood Brain Barrier (Alexandra Brito, FFUL)

01/10 – Ion channels and ion transporters; comparison with ionotropic receptors; glutamatergic and GABAergic transmission – receptors and inactivation mechanisms (Ana M Sebastião) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

6/10 – Cholinergic, noradrenergic and dopaminergic transmission; receptors and inactivation mechanisms. Concept of neuromodulation and main neuromodulators; concept of co-transmission (Ana M Sebastião) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

7/10 – Evaluation of synaptic activity through electrophysiological recording techniques (Diogo Rombo)

8/10 – Modulation of GABAergic transmission (Diogo Rombo) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

13/10 – Plasticity of glutamatergic synaptic transmission (Raquel Dias, FMUL) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

14/10 – Modulation of AMPA receptor recycling: molecular aspects (Dominique Fernandes, FCTUC, CNC)

15/10 – Glial Cells and their ability to control synaptic activity (Sandra Vaz) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

20/10 – Neurotrophic factors: key molecules for neuronal survival and plasticity (Maria José Diógenes).

21/10 – Genetic approaches to fight neurodegenerative diseases (Luis Pereira de Almeida, FFUC)

21/10 – Synaptic dysfunction in Rett Syndrome (Catarina Lourenço)

22/10 – The role of glial cells in neuroinflammation (Cláudia Valente)

27/10 – Neural Stem cells and its neuroregenerative potential (Sara Xapelli)

28/10 – Modulation of neuronal maturation and differentiation by adenosine (Ana Filipa Ribeiro)

28/10 – Modulation of postnatal neurogenesis by cannabinoids (Rui Rodrigues)

28/10 – Purinergic signaling and brain development – (Ricardo Rodrigues, FMUC, CNC)

28/10 – Driving Cell Death Machinery towards Neural Differentiation (Susana Solá, FFUL)

28/10 – BDNF receptor cleavage: relevance for Alzheimer's Disease pathophysiology (João Fonseca-Gomes)

28/10 – Molecular dysfunctions in multiple sclerosis (Adelaide Fernandes, FFUL).

29/10 – Apoptosis and neuronal death (Cecília Rodrigues, FFUL).

3/11 – Neuronal regeneration (Mónica Sousa, UP).

4/11 – The ubiquitin/proteosome system and control of neuronal death (Carlos Duarte, FCTUC, CNC)

5/11 – Neuroinflammation and Microglia: functions and dysfunction in neurodegenerative diseases (Dora Brites, FFUL).

10/11 – Major neurotransmitter pathways and their role in brain function (Ana Sebastião) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

11/11 – Neuroimaging: an overview (Eduardo Ducla-Soares, FCUL)

11/11 – Optogenetic manipulation of neuronal circuits (João Peça, CNC)

12/11 – Neuronal correlates of psychiatric diseases (Frederico Couto, FMUL) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

17/11 – Behavioural testing in laboratory animals to evaluate actions of psychoactive substances upon memory, anxiety, depression (Miguel Ferreira) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

18/11 – Synaptic plasticity dysfunction in an animal model of schizophrenia (Sara Tanqueiro)

18/11 – Animal models of epilepsy (Sara Xapelli)

19/11 – Neurobiological basis of reward (Ana João Rodrigues, ICVS, Univ Minho) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

24/11 – Mechanisms of drug dependence (Alexandre Ribeiro) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

25/11 – Circuitry dysfunction in absence epilepsy (Tatiana Morais)

3/12 – Nociceptive pathways and Mechanisms involved in the genesis of pain (Fani Neto, FMUP) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

9/12 – Artificial Intelligence: a view on Morality, or artificial agents with qualities (Helder Coelho, FCUL)

9/12 – Ethics and legislation in animal research – Carla Fonseca (FMUL)

10/12 – Ethics of Neurosciences and Neurosciences of Ethics (J. Alexandre Ribeiro) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

15/12 – Role of an Ethics Committee in a University Hospital (Luisa Figueira, FMUL/HSM) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

16/12 – Conscious States (Luis Madeira, FMUL/HSM)

16/12 – The ethics in neurological research (Alexandre de Mendonça)

16/12 – Reciprocal inputs between Neuroscience and Robotics (José Santos Victor, IST)

17/12 – Advanced Directives (Abel García Abejas, FMUL/HSM) (Lecture also for the Master and PhD Courses for Cognitive Sciences of the ULisboa)

<u>Lectures/Seminars for the Master of Biomedical Research:</u>

22/11 – Basics in Excitability and Neuronal Communication (Ana M Sebastião).

Science and Society

Diógenes MJ, Fonseca-Gomes J, Miranda-Lourenço C. Palestra “Posso ser cientista em Portugal? Como?, Escola Secundária do Bocage, Setúbal, Portugal, April 27, 2020.

Rodrigues RS. Virtual Lecture at Agrupamento de Escolas Josefa de Óbidos entitled “Principles of the developing brain”, October 14, 2020. Brain Awareness Week, October 11-17. Audience: 160 high-school students.

Diógenes MJ. Webinar “Síndrome de Rett, Saúde e Sociedade” organizado pela Associação de Pais e Amigos RETT (ANPAR). Investigação em Síndroma de Rett, ANPAR, Lisbon, October 18, 2020.

MSc Theses

Joana Isabel Ferreira da Graça Gomes, 03/03/2020, Role of SNARE-dependent gliotransmitters release by astrocytes upon Aβ-mediated excitotoxicity, Master in Neurosciences, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Sandra Vaz. Co-Supervisor: Maria José Diógenes.

Daniel Mateus Correia, 29/05/2020, Sensorimotor integration in Caenorhabditis elegans, Master in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, in collab Research Institute of Molecular Phatology (Vienna, Austria). Supervisor: Manuel Zimmer. Co-Supervisor: Sandra Vaz.

Beatriz Soromenho, 05/06/2020, Role of *S100B* in EAE pathogenesis, Master of Neurosciences, Faculdade de Medicina da Universidade de Lisboa. Supervisor. Adelaide Fernandes. Co-Supervisor: Sara Xapelli.

Ana Rita Colaço, 30/06/2020, Dissecting neuronal miRNA-124 modulation – Effects on secretome-mediated microglia deregulation in mSOD1-associated amyotrophic lateral sclerosis, Master in Neurosciences, Faculdade de Medicina da Universidade de Lisboa. Supervisor. Dora Brites. Co-Supervisor: Cláudia Valente.

Carolina de Almeida Borlido, 30/10/2020, Searching for a new biomarker for Alzheimer's Disease based on BDNF receptor cleavage, Faculdade de Ciências da Universidade de Lisboa. Supervisor: Maria José Diógenes. Co-Supervisor: Federico Herrera.

PhD Theses

João Fonseca-Gomes, 03/09/2020, BDNF receptor cleavage: Relevance for Alzheimer's disease pathophysiology, Doutoramento em Ciências Biomédicas, Especialidade em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Maria José Diógenes.

Armando Silva-Cruz, 04/09/2020, Cannabinoid CB1 Receptors Modulation of Hippocampal Synaptic Plasticity and the Cross Talk with Adenosine A1 Receptors, Doutoramento em Ciências Biomédicas, Especialidade em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Ana M Sebastião.

Nádia Rei, 30/09/2020, Characterization of the Neuromodulatory Dysfunction in Amyotrophic Lateral Sclerosis, Doutoramento em Ciências Biomédicas, Especialidade em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Ana M Sebastião.

Adam Ioshua D'Armada Moreira, 21/10/2020, Astrosomes: a novel approach for the regulation of neuronal communication, Doutoramento em Ciências Biomédicas, Especialidade em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Sandra Vaz. Co-Supervisor: Brigitte Städler.

Bruno Silva-Santos Lab

Major Interests/Objectives

We are interested in the pleiotropic roles of immune cells in tissue (patho)physiology. Within our major research line of Immuno-Oncology, we study T lymphocytes and macrophages, using *in vitro* and *in vivo* models, for the identification of molecular mechanisms involved in their differentiation, activation and functions in cancer, with the ultimate goal of designing novel immunotherapy strategies.

In a more recent area in our lab – Neuroimmunology – we explore the crosstalk between the immune system, particularly T cells that populate the meninges, and the brain – either in health (cognition) or in disease (neurodegeneration).

We have a particular focus on the less studied gamma-delta T cell lineage, with a marked interest in their differentiation, starting with the earliest steps of development in the thymus. On the other hand, we investigate their activities in inflamed tissues, including tumors or infected organs, but also sterile inflammation in murine models of tissue degeneration.

Head of Laboratory

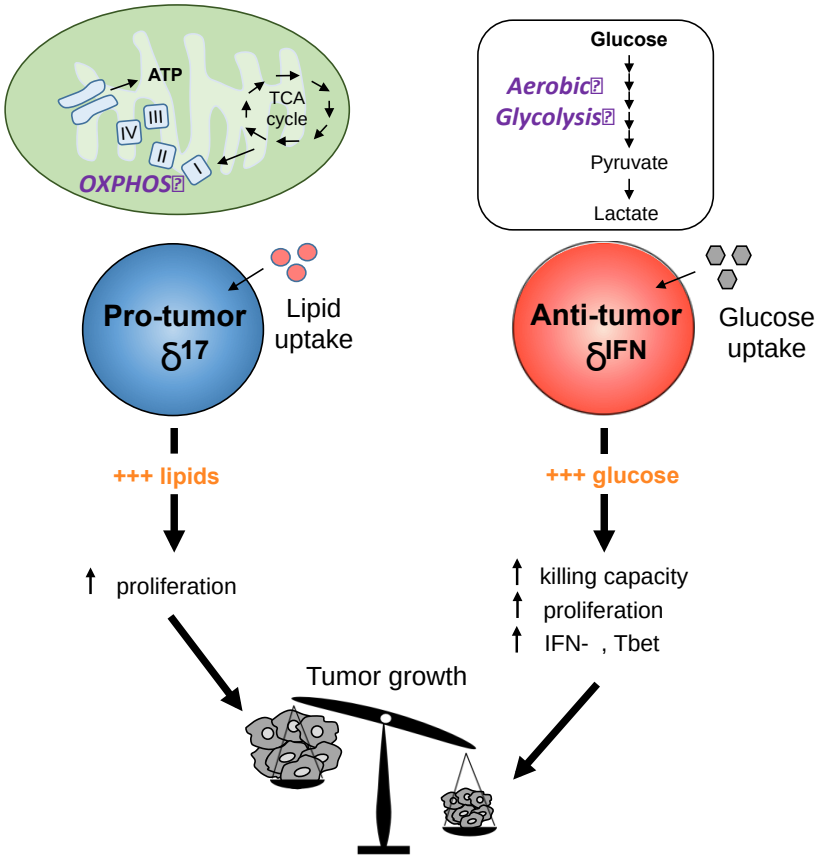
Bruno Silva-Santos, Associate Professor at Faculdade de Medicina da Universidade de Lisboa, Vice-Director at Instituto de Medicina Molecular João Lobo Antunes

Team

Afonso Maria Douwens da Costa Teixeira da Mota	MSc Student
Ana Maria de Amarante Pamplona Dias Santos	Senior Postdoctoral Researcher
Ana Teresa da Silva Pais	MSc Student
Anita Raquel Quintal Gomes	Senior Postdoctoral Researcher
Carolina Emanuel Carreira Gomes Jardim	PhD Student
Daniel Pereira Inácio	PhD Student
Daniel Vargas Correia	Senior Postdoctoral Researcher (Left January)
Gina Jasmin Fiala	Postdoctoral Researcher (Left August)
Gisela da Silva Gordino	PhD Student
Joana Carolina Marinho Cunha	Postdoctoral Researcher
Julie Cécile Caroline Ribot	Staff Scientist
Julie Darrigues	Postdoctoral Researcher
Karine Marie Serre	Staff Scientist
Madalena Frota de Carvalho	Trainee (Left June)
Maria Helena Cristiano Brigas	PhD Student (Left May)

Mariana Reis Sobreiro	Senior Postdoctoral Researcher
Marta Gaspar Rodrigues da Silva	MSc Student (Started September)
Marta Maria Curado Avelar	MSc Student (Started February)
Miguel Alves Rovisco Ribeiro	Lab Technician (Left February)
Natacha Maria Gonçalves Silva Sousa	Lab Manager
Noella Lopes Pappalardo	Postdoctoral Researcher
Pedro Afonso Galrão Batalha	MSc Student (Started February. Left November)
Sara Alexandra da Costa Pereira	BSc Student (Left September)
Sara Coelho Dias O'Connor Shirley	MSc Student (Started January)
Sara Félix Dâmaso	MSc Student (Left March)
Sofia Mensurado Santos	Postdoctoral Researcher
Tiago Filipe Serrano Constantino	MSc Student (Started August)
Tomás Miguel Custódio dos Santos	MSc Student (Started October)

Graphical Abstract



Laboratory Keywords/Research Areas

Keywords:

Thymocyte Development, Gamma-delta T cells, Leukocyte Differentiation, Tumor Microenvironment, Meningeal Immune System.

Areas: Immuno-Oncology, Neuroimmunology, Lymphocyte Differentiation.

Major Scientific Achievements

In 2020, we graduated 2 PhD and 3 MSc students; and published 9 papers in international peer-reviewed journals, including the seminal description of an IL-17-producing gamma-delta T cell population in the male reproductive tract (Wilharm, Brigas et al. Mucosal Immunology 2020), and a landmark review on the roles of gamma-delta T cells in tissue physiology and surveillance (Ribot et al. Nature Reviews Immunology 2020).

Our major breakthrough in 2020 was the discovery of a metabolic dichotomy in subpopulations of gamma-delta T cells with opposite functions in tumor immunity: whereas anti-tumoral interferon-gamma producers are fueled by glucose uptake and its metabolism through aerobic glycolysis, interleukin-17 producers incorporate lipids to boost their proliferation and pro-tumoral activities (Lopes et al. Nature Immunology: in press). These findings open a new, metabolism-based, exciting avenue to explore towards the application of gamma-delta T cells in cancer immunotherapy.

Selected Publications

Ribeiro M, Brigas HC, Temido-Ferreira M, Pousinha PA, Regen T, Santa C, Coelho JE, Marques-Morgado I, Valente CA, Omenetti S, Stockinger B, Waisman A, Manadas B, Lopes LV, Silva-Santos B*, Ribot JC* (2019). Meningeal γδ T cell-derived IL-17 controls synaptic plasticity and short-term memory. Science Immunology 4(40). *Co-corresponding authors. *(IF: 13.440, Citations: 23. Source: Thomson Reuters).*

Schmolka N, Papotto PH, Romero PV, Amado T, Enguita FJ, Amorim A, Rodrigues AF, Gordon KE, Coroadinha AS, Boldin M, Serre K, Buck AH, Gomes AQ*, Silva-Santos B* (2018). MicroRNA-146a controls functional plasticity in γδ T cells by targeting NOD1. Science Immunology 3(23):pii: eaao1392. *Co-corresponding authors. *(IF: 10.551, Citations: 10. Source: Thomson Reuters).*

Almeida AA, Correia DV, da Silva CL, da Silva MG, Anjos DR, Silva-Santos B (2016). Delta One T cells for immunotherapy of chronic lymphocytic leukemia: clinical-grade expansion/ differentiation and preclinical proof-of-concept. Clinical Cancer Research 22(23):5795-5804. *(IF: 10.107, Citations: 49. Source: Thomson Reuters).*

Muñoz-Ruiz M, Ribot JC, Grosso AR, Gonçalves-Sousa N, Pamplona A, Pennington DJ, Regueiro JR, Fernandez-Malavé E, Silva-Santos B (2016). TCR signal strength controls thymic differentiation of discrete proinflammatory γδ T cell subsets. Nature Immunology 17(6):721-7. *(IF: 21.506, Citations: 59. Source: Thomson Reuters).*

Silva-Santos B*, Serre K*, Norell H (2015). γδ T cells in cancer. Nature Reviews Immunology 15(11):683-91. Review. *Co-corresponding authors. *(IF: 39.416, Citations: 228. Source: Thomson Reuters).*

Publications in Peer Reviewed Journals

Darrigues J, Ribot JC (2020). γδ T cells, Tregs and epithelial cells: they take IL-33 to tango in the lung. Cellular and Molecular Immunology, *in press*. *(IF: 8.484, Citations: 0. Source: Thomson Reuters).*

Meireles P, Brás D, Fontinha D, Chora ÂF, Serre K, Mendes AM, Prudêncio M (2020). Elimination of Hepatic Rodent Plasmodium Parasites by Amino Acid Supplementation. iScience 23(12):101781. *(IF: 4.447, Citations: 0. Source: Thomson Reuters).*

Coffelt SB, Kabelitz D, Silva-Santos B, Kuball J, Born W, Bank I (2020). Editorial: γδ T Cells in Cancer. Frontiers in Immunology 20(11):602411. *(IF: 5.085, Citations: 0. Source: Thomson Reuters).*

Bonavita E, Bromley CP, Jonsson G, Pelly VS, Sahoo S, Walwyn-Brown K, Mensurado S, Moeini A, Flanagan E, Bell CR, Chiang SC, Chikkanna-Gowda CP, Rogers N, Silva-Santos B, Jaillon S, Mantovani A, Reis E Sousa C, Guerra N, Davis DM, Zelenay S (2020). Antagonistic Inflammatory Phenotypes Dictate Tumor Fate and Response to Immune Checkpoint Blockade. Immunity 53(6):1215-1229. *(IF: 22.553, Citations: 1. Source: Thomson Reuters).*

Fiala GJ, Gomes AQ, Silva-Santos B (2020). From thymus to periphery: Molecular basis of effector γδ-T cell differentiation. Immunological Reviews 298(1):47-60. Review. *(IF: 13.939, Citations: 2. Source: Thomson Reuters).*

Lopes N, Silva-Santos B (2020). Functional and metabolic dichotomy of murine γδ T cell subsets in cancer immunity. European Journal of Immunology, *in press*. Review. *(IF: 4.404, Citations: 0. Source: Thomson Reuters).*

Ribot JC, Lopes N, Silva-Santos B (2020). γδ T cells in tissue physiology and surveillance. Nature Reviews Immunology, *in press.* Review. *(IF: 40.358, Citations: 2. Source: Thomson Reuters).*

Wilharm A, Brigas HC, Sandrock I, Ribeiro M, Amado T, Reinhardt A, Demera A, Hoenicke L, Strowig T, Carvalho T, Prinz I, Ribot JC (2020). Microbiota-dependent expansion of testicular IL-17-producing Vγ6+ γδ T cells upon puberty promotes local tissue immune surveillance. Mucosal Immunology 14(1):242-252. *(IF: 6.726, Citations: 4. Source: Thomson Reuters).*

Castro F, Pinto ML, Pereira CL, Serre K, Barbosa MA, Vermaelen K, Gärtner F, Gonçalves RM, De Wever O, Oliveira MJ (2020). Chitosan/γ-PGA nanoparticles-based immunotherapy as adjuvant to radiotherapy in breast cancer. Biomaterials 257:120218. *(IF: 10.317, Citations: 1. Source: Thomson Reuters).*

Pamplona A, Silva-Santos B (2020). γδ T cells in malaria: a double edged sword. FEBS Journal, *in press*. Review. *(IF: 4.392, Citations: 2. Source: Thomson Reuters).*

Edwards SC, Sutton CE, Ladell K, Grant EJ, McLaren JE, Roche F, Pradyot D, Apiwattanakul N, Awad W, Miners KL, Lalor SJ, Ribot JC, Baik S, Mora B, Mc Ginley A, Pivorunas V, Dowding L, Macoritto M, Paez-Cortez J, Slavin A, Anderson G, Silva-Santos B, Price D, Thomas PG, McLoughlin RM and Mills KHG (2020). A population of proinflammatory T cells coexpresses ab and γδ T cell receptors in mice and humans. Journal of Experimental Medicine 217(5). *(IF: 11.743, Citations: 3. Source: Thomson Reuters).*

Amado T, Amorim A, Enguita FJ, Romero PV, Inácio D, de Miranda MP, Winter SJ, Simas JP, Krueger A, Schmolka N, Silva-Santos B, Gomes AQ (2020). MicroRNA-181a regulates IFN-γ expression in effector CD8+ T cell differentiation. Journal of Molecular Medicine (Berl) 98(2):309-320. *(IF: 4.750, Citations: 1. Source: Thomson Reuters).*

Other International Publications

Book Chapter - Schmolka N, Silva-Santos B, Gomes A (2020). Epigenetic mechanisms in the regulation of lymphocyte differentiation. In: Kabelitz D, Bhat J., editors. Epigenetics of the Immune System. Tollefsbol T, editor. Translational Epigenetics series, vol. 16. San Diego: Academic Press p. 77-116.

Alves NL, Carvalho A, Serre K, Martins VC, Saraiva M (2020). The Portuguese Society for Immunology (SPI): history and mission. European Journal Immunology 50(7):918-920.

Ongoing Research Projects

2020/2021: Cellular and molecular regulators of multifaceted γδ T-cells in the tumor microenvironment. Coordinator: Bruno Silva-Santos. Funding Agency: Fundação AstraZeneca. Reference: FAZ_PremioCiencia_2020. Amount: 35 000,00€. Total Amount: 35 000,00€.

2020/2021: GDT - Research Agreement. Coordinator: Bruno Silva-Santos. Funding Agency: Lymphocyte Activation Technologies SA. Reference: GDT - Research Agreement. Amount: 163 986,00€. Total Amount: 163 986,00€.

2019/2022: Next-generation CAR-DOT cells for allogeneic adoptive cancer immunotherapy. Coordinator: Bruno Silva-Santos. Funding Agency: "la Caixa" Foundation. Reference: HEALTH RESEARCH 2018 - HR18-00069 - ALLO_CAR_DOT. Amount: 499 999,51€. Total Amount: 999 997,00€.

2018/2021: PROMISE: Programação de células mielóides anti-tumorais para aplicação em imunoterapia do cancro. Coordinator: Karine Serre. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PROMISE - LISBOA-01-0145-FEDER-030948. Amount: 239 896,60€. Total Amount: 239 896,60€.

2018/2021: Impacto das células T gd17 residentes nas meninges em funções cognitivas num contexto fisiológico e neuropatológico. Coordinator: Julie Ribot. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: iMMunoCOGNITION - LISBOA-01-0145-FEDER-028241. Amount: 239 679,45€. Total Amount: 239 679,45€.

2018/2020: Tracking γδ T cell development and TCRγδ proximal signalling — DevoSignGammaDelta. Coordinator: Bruno Silva-Santos. Funding Agency: European Commission. Reference: DevoSignGammaDelta – 752932. Amount: 160 635,60€. Total Amount: 160 635,60€.

2015/2021: DevoTed_miR: MicroRNA determinants of the balance between effector and regulatory T cells in vivo. Coordinator: Bruno Silva-Santos. Funding Agency: European Commission. Reference: ERC CoG 646701. Amount: 2 000 000,00. Total Amount: 2 000 000,00.

2015/2020: Lineage-specific molecular networks that control pro-inflammatory cytokine production. Coordinator: Karine Serre. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: IF/0004/2014/CP1236/CT0006. Amount: 50 000,00€. Total Amount: 50 000,00€.

2015/2020: Deciphering the outside-in mechanisms of human gd T Cell differentiation. Coordinator: Julie Ribot. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: IF/00013/2014/CP1236/CT0004. Amount: 50 000,00€. Total Amount: 50 000,00€.

Other Projects

2018/2021: Magiciam: um sistema imunodelador de macrófagos para prevenir a invasão e metastização das células tumorais. Coordinator: Maria José Oliveira (INEB). Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: MAGICIAM - POCI-01-0145-FEDER-031859. Amount: 12 500,00€. Total Amount: 238 554,80€.

2018/2021: Sub-therapeutic doses of ionizing radiation modulate the pre-metastatic niche and induce metastasis. Coordinator: Susana Constantino (AIDFM). Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-OUT/31118/2017. Amount: 48 750,00€. Total Amount: 239 925,00€.

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Silva-Santos B. Differentiation of effector T cell subsets: microRNAs and metabolic programming. University of Toulouse, Toulouse, France, January 23, 2020.

Silva-Santos B. Differentiation of effector gamma-delta T cell subsets: focus on metabolic programming. EMBO YIP Immunology Sectorial Meeting, Malaga, Spain, February 20, 2020.

Serre K. Bringing new allies to cancer therapy: How to instruct myeloid cells to fight cancer? Universidade de Aveiro, Aveiro, Portugal, February 26, 2020.

Ribot J. Unconventional functions for unconventional T cells. TKI Internal Seminar, invited by Britta Engelhardt, Bern, Switzerland, March 10, 2020.

Silva-Santos B. Differentiation of gamma-delta T cell effector subsets: implications for Neuro- and Onco-Immunology. Karolinska Institute, Online Event, Stockholm, Sweden, April 2, 2020.

Silva-Santos B. Next generation CAR-DOT cells for allogeneic adoptive cell cancer immunotherapy. Sessão Fundação la Caixa, Fundação para a Ciência e Tecnologia, Lisbon, Portugal, June 17, 2020.

Silva-Santos B. Molecular signatures of effector gamma-delta T cell subsets. Gamma-delta T cell Workshop FOR 2799, Online Event, German Research Funding Agency, Hannover, Germany, September 9, 2020.

Ribot J. Meningeal γδ T cells: Impact on cognition in health and disease. Keynote lecture, Gamma-delta T cell Workshop FOR 2799, Online Event, German Research Funding Agency, Hannover, Germany, September 9, 2020.

Silva-Santos B. Vdelta1 T cell expansion, differentiation and tumour targeting. Gamma-Delta T cell Therapies Summit, Online Event, London, UK, September 30, 2020.

Silva-Santos B. Delta One T cells: developing a novel adoptive cell therapy for cancer. BioTechHealth Conference, Online Event, Universidade do Porto, Porto, Portugal, October 22, 2020.

Communications in International Conferences

Reis-Sobreiro M, Lopes R*, Pinto M *, Mensurado S, Boekhoff H, Scolaro T, Teixeira da Mota A, Kubo H, Silva-Santos B, Serre K. Characterization of macrophages with anti-tumour functions in vivo. Tumor microenvironment. EACR-AACR Basic and Translational Research Conference, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Silva-Santos B. Maternal gamma-delta T cells shape offspring pulmonary type-2 immunity in a microbiota-dependent manner. XIV World Immune Regulation Meeting, Online Event, Davos, Switzerland, October 4, 2020. *(Oral Presentation)*

Silva-Santos B. Distinct metabolic programs determine the developmental fate and effector functions of pro-inflammatory gamma-delta T cell subsets. XIV World Immune Regulation Meeting, Online Event, Davos, Switzerland, October 5, 2020. *(Oral Presentation)*

Amado T, Amorim A, Enguita FJ, Romero PV, Inácio D, Miranda MP, Winter SJ, Simas PJ, Krueger A, Schmolka N, Silva-Santos B, Gomes AQ. MicroRNA 181a regulates IFN-γ expression in effector CD8+ T cell differentiation. Gene Expression and Signaling in the Immune System Virtual Meeting, Online Event, Cold Spring Harbour Laboratory, October 13-16, 2020. *(Poster Presentation)*

Lobo-Martins S, Corredeira P, Alves PB, Antunes M, Rodrigues A, Quintela A, Filipe P, Ribeiro L, Teixeira de Sousa R, Pinto C, Abreu C, Gordino G, Ribot J, Serre K, Martins M, Cavaco A, Casimiro S, Silva-Santos B, Costa L. Immune Cell Populations in Peripheral Blood of Metastatic Breast Cancer Patients Under CDK4/6 Inhibitors. SABCS – San Antonio Breast Cancer Symposium, Online Event, San Antonio, Texas, USA, December 8-11, 2020. *(Poster Presentation)*

Communications in National Conferences

Inácio D, Amado T, Sobral D, Enguita F, Cunha C, Silva-Santos B, Gomes AQ. Uncovering the role of microRNAs in the production of proinflammatory cytokies by gd T cells. II BootCamp H&TRC 2020, Convento de Nossa Senhora da Arrábida, Setúbal, Portugal, January 16, 2020.

Prizes, Honors and Awards

Pfizer Award in Basic Research 2020 awarded to the study:
Ribeiro M, Brigas HC, Temido-Ferreira M, Pousinha PA, Regen T, Santa C, Coelho JE, Marques-Morgado I, Valente CA, Omenetti S, Stockinger B, Waisman A, Manadas B, Lopes LV, Silva-Santos B*, Ribot JC* (2019). Meningeal γδ T cell-derived IL-17 controls synaptic plasticity and short-term memory. Science Immunology 4(40). Portugal, November 12, 2020.

Advanced Teaching

Serre K. Tumour immunity: focus on myeloid cells. LisbonBioMed PhD Program, Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 28, 2020.

Silva-Santos B. Inflammation in Cancer. Thinking Lab: Tumor-promoting inflammation. Novartis, Online, Lisbon, Portugal, September 25, 2020.

Serre K. Immunotherapeutic Strategies Against Cancer. Mestrado Integrado em Ciências Farmacêuticas - “Alvos Terapêuticos e Biomarcadores” and “Oncobiologia e Medicina de Precisão”. Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, October 20, 2020.

Silva-Santos B. Immuno-Oncology: targets and selection. Immuno-Oncology Iberic Course, Online, Madrid, Spain, October 21, 2020.

Silva-Santos B. Translational Research in Cancer Immunotherapy. Masterclass of the Annual International Medical Students Meeting, Online, Lisbon, Portugal, November 7, 2020.

Silva-Santos B. Terapia Celular: Bases e Princípios. Simpósio Satélite Gilead sobre Terapia Celular – do conceito à prática clínica. Immersive Virtual Congress da Associação Portuguesa de Farmacêuticos Hospitalares, Online, Lisbon, Portugal, November 25, 2020.

Science and Society

Silva-Santos B. Press article. Consórcio português cria um teste para imunidade à COVID-19. Jornal Público, April 19, 2020.

Silva-Santos B. TV news. COVID-19: O ensaio para aferir imunidade da população portuguesa. SIC, Paço de Arcos, Portugal, April 21, 2020.

Silva-Santos B. TV news. Serology4COVID: desenvolvimento de um teste serológico nacional. RTP, Lisbon, Portugal, April 22, 2020.

Silva-Santos B. Press article. A Imunologia ao Leme da Pandemia. Jornal Público, June 11, 2020.

Silva-Santos B. Online conference. Portugal, um exemplo de sucesso da Ciência contra a COVID-19. Canal YouTube da Universidade Federal do Rio de Janeiro, June 29, 2020.

Silva-Santos B. TV news. Lançamento do Painel Serológico Nacional. RTP, Lisbon, Portugal, September 8, 2020.

Silva-Santos B. Radio news. Lançamento do Painel Serológico Nacional. Rádio Renascença, Portugal, September 8, 2020.

Silva-Santos B. TV news. Lançamento do Painel Serológico Nacional. SIC, Paço de Arços, Portugal, September 8, 2020.

Silva-Santos B. Radio news. Lançamento do Painel Serológico Nacional. Antena 1, Portugal, September 8, 2020.

Silva-Santos B. TV news. Jornal das 8. Lançamento do Painel Serológico Nacional. TVI, Lisbon, Portugal, September 9, 2020.

Mensurado S. Interview. Sofia Mensurado, investigadora, fala-nos sobre o cancro da mama e os mais recentes avanços na luta contra esta doença. Activa, October 6, 2020.

Mensurado S. Press Interview. Todos os dias se formam tumores dentro de nós. Rádio Observador, October 6, 2020.

Mensurado S. Interview. Pink Ribbon Talks. Instagram Nestlé Fitness, October 30, 2020.

Silva-Santos B. Press article. COVID-19: Estudo revela que jovens das cidades têm a maior proporção de seropositivos. Jornal Público, December 18, 2020.

Silva-Santos B. TV news. Resultados do Painel Serológico Nacional. RTP, Lisbon, Portugal, December 18, 2020.

Silva-Santos B. Radio news. Resultados do Painel Serológico Nacional. TSF, Portugal, December 18, 2020.

Silva-Santos B. TV news. Jornal da 1. Resultados do Painel Serológico Nacional. TVI, Lisbon, Portugal, December 18, 2020.

Afonso Mota, Ana Pamplona, Anita Gomes, Carolina Cunha, Daniel Inácio, Karine Serre, Mariana Sobreiro, Natacha Sousa, Sara Pereira, Sara Shirley, Sofia Mensurado volunteered in COVID-19 Diagnostic Task Force, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March-April 2020.

MSc Theses

Sara Shirley, 24/08/2020, Dissecting the Molecular Mechanisms of Cancer Cell Recognition by Delta One T (DOT) cells in Acute Myeloid Leukemia and Colon Cancer, Wageningen University & Research. Supervisor: Sofia Mensurado. Co-Supervisor: Bruno Silva-Santos.

Sara Pereira, 09/10/2020, Regulation of meningeal IL-17+ immune cell homeostasis: (patho)physiological implications, Faculdade de Ciências e Tecnologia da Universidade de Lisboa. Supervisor: Julie Ribot. Co-Supervisor: Margarida Gama Carvalho.

Pedro Batalha, 11/12/2020, Re-purposing Delta One T cells for immunotherapy of solid tumours: Colon cancer as proof-of-principle, Instituto Superior Técnico da Universidade de Lisboa. Supervisor: Sofia Mensurado. Co-Supervisor: Bruno Silva-Santos.

PhD Theses

Sofia Mensurado, 19/06/2020, Regulation of T cell fitness and functions in tumour response, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Karine Serre. Co-Supervisor: Bruno Silva-Santos.

Helena Brigas, 26/06/2020, IL-17-producing gamma delta T cells in the pathophysiology of the Central Nervous System, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Julie Ribot. Co-Supervisor: Luisa Lopes.

Cláudio Franco Lab

Major Interests/Objectives

Appropriate blood supply in multicellular organisms is essential for development, growth and regeneration. Several diseases arise from dysfunction of blood vessels, e.g. diabetic retinopathy, stroke, or tumor angiogenesis. The formation of a functional vascular network requires two distinct processes – SPROUTING ANGIOGENESIS (which expands the network) and VASCULAR REMODELING (which generates a hierarchical network) – both driven by endothelial rearrangements.

Our Lab aims to understand the molecular mechanisms regulating coordinated endothelial cell behavior. Our work targets:

- Regulators of endothelial cell migration and cell polarity;
- Mechanobiology in endothelial cells in response to hemodynamic forces;
- Novel model organism to understand physiology of blood vessels in health and disease;
- Novel anti-angiogenic therapies.

Head of Laboratory

Cláudio Areias Franco, PhD

Team

Ana Isabel Prim Padilha	Postdoctoral Researcher (Left October)
Ana Raquel Martins Figueiredo Fonseca	Postdoctoral Researcher
André Brás Gonçalves	Postdoctoral Researcher (Started December)
Andreia Alexandra Santos de Areosa Pena	PhD Student
Catarina Gonçalves Fonseca	PhD Student
Cátia Alexandra da Silva Janota	PhD Student (Started January)
Daniela Maria Grou Ramalho	Lab Technician
Francisca Ferreira de Vasconcelos	Postdoctoral Researcher
Hemaxi Narotamo	Lab Technician (Started July)
João Manuel Coelho Carreira	PhD Student
Lenka Henao Mišíková	Lab Technician (Started December)
Maria Clara Barreto Carromeu Gomes	Lab Technician (Started January)
Marie Ouarné	Postdoctoral Researcher
Marta Filipa Alves Fidalgo	Lab Technician
Pedro Jorge Sequeira Costa de Jesus Campinho	Senior Postdoctoral Researcher (Started September)
Pedro Miguel Branco Barbacena	Postdoctoral Researcher
Rita Joana Rodrigues da Silva Rua Ferreira	Postdoctoral Researcher (Left July)
Yulia Carvalho	Lab Technician (Left November)

Laboratory Keywords/Research Areas

Angiogenesis, Cell Migration and Polarity, Vascular Patterning, Tumor Angiogenesis, Vascular Malformations.

Major Scientific Achievements

In 2020, we worked closely with Dr. Katie Bentley to establish a new method for visualization the mouse retina (Prahst C *et al*., eLIFE 2020). Finally, we successfully graduated 2 PhD students and 1 master student.

Selected Publications

Franco CA, Jones M, Geudens I, Bernabeu MO, Ragab A, Collins RT, Phng LK, Coveney PV, Gerhardt H (2015). Dynamic endothelial cell rearrangements drive developmental vessel regression. PLoS Biology 13(5):e1002163. *(IF: 9.797, Citations: 162-105. Sources: Google Scholar/Publons).*

Bentley K, Franco CA, Philippides A, Blanco R, Dierkes M, Gebala V, Stanchi F, Jones J, Cagna G, Kutschera S, Claesson-Welsh L, Vestweber D, Gerhardt H (2014). The role of differential VE-cadherin dynamics in cell rearrangement during angiogenesis. Nature Cell Biology 16(4):309-21. *(IF: 20.06, Citations: 264-182. Sources: Google Scholar/Publons).*

Guarani V, Deflorian G*, Franco CA*, Krüger M, Phng LK, Bentley K, Toussaint L, Dequiedt F, Mostoslavsky R, Schmidt MH, Zimmermann B, Brandes RP, Mione M, Westphal CH, Braun T, Zeiher AM, Gerhardt H, Dimmeler S, Potente M *co-second (2011). Acetylation-dependent regulation of endothelial Notch signalling by the SIRT1 deacetylase. Nature 473(7346):234-8. *(IF: 40.137, Citations: 327-243. Sources: Google Scholar/Publons).*

Stenzel D*, Franco CA*, Estrach S, Mettouchi A, Sauvaget D, Rosewell I, Schertel A, Armer H, Domogatskaya A, Rodin S, Tryggvason K, Collinson L, Sorokin L, Gerhardt H *co-first (2011). Endothelial basement membrane limits tip cell formation by inducing Dll4/Notch signalling in vivo. EMBO Reports 12(11):1135-43. *(IF: 8.568, Citations: 124-193. Sources: Google Scholar/Publons).*

Jakobsson L, Franco CA, Bentley K, Collins RT, Ponsioen B, Aspalter IM, Rosewell I, Busse M, Thurston G, Medvinsky A, Schulte-Merker S, Gerhardt H (2010). Endothelial cells dynamically compete for the tip cell position during angiogenic sprouting. Nature Cell Biology 12(10):943-53. *(IF: 20.06, Citations: 818-514. Sources: Google Scholar/Publons).*

Publications in Peer Review Journals

Edgar LT, Franco CA, Gerhardt H, Bernabeu MO. On the preservation of vessel bifurcations during flow-mediated angiogenic remodelling. PLOS Computational Biology. In press. *(IF: 4.43, Citations: 0/0. Sources: Google Scholar/Publons).*

Fonseca CG, Barbacena P, Franco CA. Endothelial cells on the move: dynamics in vascular morphogenesis and disease (2020). Vascular Biology 2(1):H29-H43. Review. *(IF:--, Citations: 0/0. Sources: Google Scholar/Publons).*

Figueiredo AM, Villacampa P, Diéguez-Hurtado R, Lozano JJ, Kobialka P, Cortazar AR, Martinez-Romero A, Angulo-Urarte A, Franco CA, Claret M, Aransay AM, Adams RH, Carracedo A, Graupera M (2020). PI3Kβ-Regulated Pericyte Maturation Governs Vascular Remodeling. Circulation 142(7):688-704. *(IF: 23.60, Citations: 2/1. Sources: Google Scholar/Publons).*

Prahst C, Ashrafzadeh P, Harrington K, Venkaraman L, Richards M, Russo AR, Cho KS, Karen Chang, Mead T, Chen DF, Richardson D, Claesson-Welsh L, Franco CA, Bentley K (2020). Mouse retinal cell behaviour in space and time using light sheet fluorescence microscopy. eLIFE9:e49779. *(IF: 7.08, Citations: 9/5. Sources: Google Scholar/Publons).*

Ongoing Research Projects

2019/2021: ADAPT2FLOW: Adaptive and maladaptive endothelial cell dynamics. Coordinator: Maria Ourné. Funding Agency: European Commission. Reference: MSCA-IF 842498. Amount: 147 815,04€. Total Amount: 147 815,04€.

2019/2020: VeCare: Selective retention of VEGF for cancer and retinopathies therapeutics. Coordinator: Cláudio Franco. Funding Agency: European Commission. Reference: ERC PoC 825508. Amount: 150 000,00€. Total Amount: 150 000,00€.

2018/2022: ATTRACT: Arterial flow as attractor for endothelial cell migration. Coordinator: Cláudio Franco. Funding Agency: Fondation Leducq. Reference: ATTRACT. Amount: 25 424,99€. Total Amount: $5 000 000,00.

2018/2022: Flow(in)DR: Deregulated Endothelial Blood Flow Response as a cause of Diabetic Retinopathy. Coordinator: Francisca Vasconcelos. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-PAT/31639/2017. Amount: 235 365,31€. Total Amount: 235 365,31€.

2018/2021: Invasiveless: Identify the mechanisms of endothelial tip cell invasive behavior in order to inhibit physiological and pathological sprouting angiogenesis. Coordinator: Cláudio Franco. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-CEL/32180/2017. Amount: 238 865,33€. Total Amount: 238 865,33€.

2016/2021: AXIAL.EC: Principles of Axial Polarity-Driven Vascular Patterning. Coordinator: Cláudio Franco. Funding Agency: European Commission. Reference: ERC StG 679368. Amount: 1 618 750,00€. Total Amount: 1 618 750,00€.

Other Projects

2018/2022: MyoChip: Building a 3D innervated and irrigated muscle on a chip. Coordinator: Edgar Gomes. Funding Agency: European Commission. Reference: MyoChip 801423. Amount: 1 266 861,25€. Total Amount: 3 153 553,74€.

Invited Lectures and Seminars

Franco CA. Endothelial Cell Orienteering. Quantitative Morphogenesis Interest Group, CEDOC, Lisbon, Portugal. Invited by: Elias Barriga.

Franco CA. How do endothelial cells invade into tissues? DFG Research Training Group/GRK1873, University of Bonn, Germany. Invited by: Bernd K. Fleischmann.

Franco CA. How do endothelial cells invade into tissues? European Vascular Biology Organization Webinar Series. Invited by: Lena Claesson-Welsh.

Franco CA. Cell polarity and cell migration in vascular morphogenesis. I3S, Porto, Portugal, October 2020. Invited by: Eurico de Sá.

Communications in International Conferences

Franco CA. Tip cell invasive behaviour is controlled by myosin IIA-dependent inhibition of Arp2/3 activit. XXI International Vascular Biology Meeting, Seoul, South Korea, August 2020. *(Invited Speaker).*

Franco CA. Endothelial Cells on the Move. XX Kloster Seeon Meeting on Angiogenesis, Seeon, Germany, October 2020. *(Invited Speaker)*

Patents/Prototypes

Cláudio Franco and Pedro Barbacena. GNREP MOUSE: A TRANSGENIC REPORTER MOUSE LINE FOR FRONT-REAR CELL POLARITY. Provisional Patent application (Portugal) id: 20191000006333. January, 2019.

Advanced Teaching

Franco CA. Jury of the PhD thesis of Nadine Vasconcelos Conchinha, "Endothelial cell metabolism in health and aging". Department of Oncology, Katholieke Universiteit Leuven, Belgium.

Franco CA. Jury of the PhD thesis of Mayank Bansal, "Using CRISPR/Cas9 based genetic screen to understand the role of Flk1 in the specification of endothelial and blood lineages". Universidad Autónoma de Madrid, Faculty of Medicina, Spain.

Franco CA. Theoretical classes. Mestrado Integrado em Engenharia Biomédica, Instituto Superior Técnico, Lisbon, Portugal. Supervisor: Professor Cláudia Lobato and Margarida Diogo.

Franco CA. Theoretical classes. Mestrado Integrado em Medicina, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal. Supervisor: Professor Carlos Eugénio Plancha Santos.

Claus Azzalin Lab

Major Interests/Objectives

Telomeres are nucleoprotein structures 'capping' the ends of linear eukaryotic chromosomes. Dysfunctional telomeres cause severe chromosome instability, which unleashes cellular reactions that are common hallmarks of human diseases including cancer and premature aging. We employ molecular biology, cell biology and biochemistry to understand how telomeres execute their protective functions and how telomeric dysfunctions are mechanistically linked to pathological conditions. In particular, we study how the telomeric long noncoding RNA TERRA regulates telomere structure and functions in both normal and diseased human cells. In 2020, our research largely focused on: i) how TERRA supports telomere maintenance in human cancer cells elongating their telomeres through the so-called 'Alternative Lengthening of Telomeres' (ALT) pathway; and ii) how TERRA regulates the proper assembly of the telomeric protective cap in telomerase-positive and primary human cells.

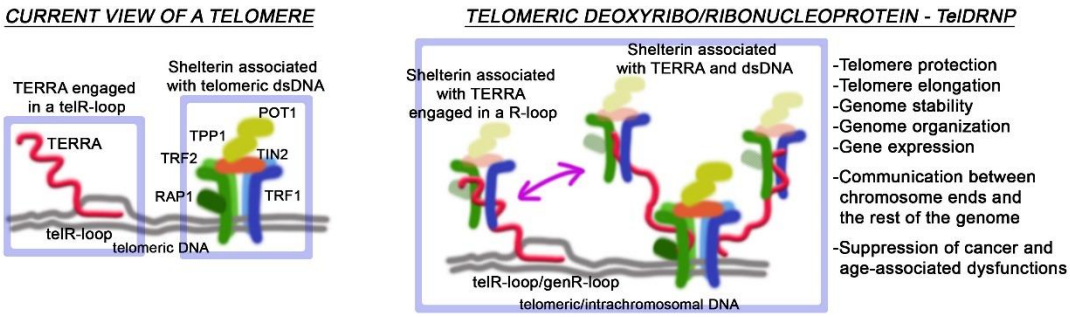
Head of Laboratory

Claus Maria Azzalin, PhD

Team

Ana Beatriz Domingues Silva	Lab Technician
Ana Margarida da Silva Figueira	Administrative Technician (Left March)
Beatriz Pedrosa Moleirinho	Lab Technician
Bruno Adriano de Sousa Silva	Senior Postdoctoral Researcher
Joana Cristina Pedro Rodrigues	Postdoctoral Researcher
João Pedro Abreu Pessoa	Postdoctoral Researcher
Leonardo Amaro Gaio	MSc Student (Left June)
Miguel Filipe Martins Louro Alves	MSc Student (Left December)
Patrícia Alexandra Lona Abreu	PhD Student
Sara Barros Salgado	MSc Student (Started September)
Valentina Riva	Postdoctoral Researcher (Started October)

Graphical Abstract



Laboratory Keywords/Research Areas

TERRA, Telomeres, ALT, Cancer, Aging, Genome Stability.

Major Scientific Achievements

To further explore the roles of the translocase FANCM in ALT cancer cells, we applied a mass spectrometry-based method for quantification of telomeric chromatin components to FANCM-depleted ALT cells. FANCM depletion induces telomeric accumulation of DNA repair factors, as well as of centromeric proteins and macroautophagy effectors. This suggests the existence of unexpected mechanisms supporting ALT telomere integrity. We also identified a novel regulator of ALT telomere stability, the single stranded DNA binding protein PC4. ALT cells depleted of PC4 experience telomeric DNA damage and stop proliferating. Moreover, we discovered that TERRA inhibits the binding of the telomeric proteins TRF1 and TRF2 to telomeric double stranded DNA, suggesting a novel mechanism of nucleoprotein assembly regulated by noncoding RNAs. Finally, we showed that the large majority of mouse TERRA is not produced from telomeres, as it is the case in humans, but from the PAR region of sex the chromosomes.

Selected Publications

Silva B, Pentz R, Figueira AM, Arora R, Lee YW, Hodson C, Wischnewski H, Deans AJ, Azzalin CM (2019). FANCM limits ALT activity by restricting telomeric replication stress induced by deregulated BLM and R-loops. Nature Communications 10:e2253. *(IF: 12.121, Citations: 23. Source: Web of Science).*

Lee YW, Arora R, Wischnewski H, Azzalin CM (2018). TRF1 participates in chromosome end protection by averting TRF2-dependent telomeric R-loops. Nature Structural & Molecular Biology 25(2):147-153. *(IF: 11.98, Citations: 19. Source: Web of Science)*.

Moravec M, Wischnewski H, Bah A, Hu Y, Liu N, Lafranchi L, King MC, Azzalin CM (2016). TERRA promotes telomerase-mediated telomere elongation in *Schizosaccharomyces pombe*. EMBO Reports 17(7):999-1012. *(IF: 7.497, Citations: 42. Source: Web of Science)*.

Lorenzi LE, Bah A, Wischnewski H, Shchepachev V, Soneson C, Santagostino M, Azzalin CM (2015). Fission yeast Cactin restricts telomere transcription and elongation by controlling Rap1 levels. EMBO Journal 34(1):115-129. *(IF: 9.889, Citations: 13. Source: Web of Science)*.

Arora R, Lee YW, Wischnewski H, Brun CM, Schwarz T, Azzalin CM (2014). RNaseH1 regulates TERRA-telomeric DNA hybrids and telomere maintenance in ALT tumour cells. Nature Communications 5:e5220. *(IF: 12.121, Citations: 160. Source: Web of Science)*.

Shchepachev V, Wischnewski H, Missiaglia E, Soneson C, Azzalin CM (2012). Mpn1, Mutated in Poikiloderma with Neutropenia Protein 1, Is a Conserved 3 '-to-5 ' RNA Exonuclease Processing U6 Small Nuclear RNA. Cell Reports 2(4):855-865. *(IF: 8.109, Citations: 43. Source: Web of Science)*.

Chawla R, Redon S, Raftopoulou C, Wischnewski H, Gagos S, Azzalin CM (2011). Human UPF1 interacts with TPP1 and telomerase and sustains telomere leading-strand replication. EMBO Journal 30(19):4047-4058. *(IF: 9.889, Citations: 60. Source: Web of Science)*.

Azzalin CM, Reichenback P, Khoriauli L, Giulotto E, Lingner J (2007). Telomeric Repeat Containing RNA and RNA surveillance factors at mammalian chromosome ends. Science 318(5851):798-801. *(IF: 41.846, Citations: 780. Source: Web of Science)*.

Publications in Peer Reviewed Journals

Viceconte N, Loriot A, Abreu PL, Scheibe M, Sola AF, Butter F, De Smet C, Azzalin CM, Arnoult N, Decottignies A (2020). PAR-TERRA is the main contributor to telomeric repeat-containing RNA transcripts in normal and cancer mouse cells. RNA 27(1):106-121. (*IF: 4.32, Citations: 0. Source: Web of Science*).

Ongoing Research Projects

2020/2021: Tessellate Bio. Coordinator: Claus Azzalin. Funding Agency: Tessellate Bio. Reference: Tessellate Bio. Amount: 123 600,00€. Total Amount: 123 600,00€.

2018/2021: Mecanismos de recombinação telomérica mediada por R-loops na via de alongamento alternativo de telómeros com vista ao desenvolvimento de novas terapias contra o cancro. Coordinator: Bruno de Sousa Silva. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-ONC/28282/2017. Amount: 239 854,03€. Total Amount: 239 854,03€.

2018/2021: Alongamento dos telómeros mediado por TERRA e por telomerase: o desvendar de novas vias moleculares para o desenvolvimento de inovadoras abordagens terapêuticas contra o cancro. Coordinator: Claus Azzalin. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-MOL/29352/2017. Amount: 239 789,17€. Total Amount: 239 789,17€.

2017/2021: TERRA and telomere transcription: towards therapies for healthy aging. Coordinator: Claus Azzalin. Funding Agency: European Molecular Biology Organization. Reference: EMBO IG 3576. Amount: 200 000,00€. Total Amount: 200 000,00€.

2016/2021: TERRA and telomere transcription at the crossroads of cancer and aging. Coordinator: Claus Azzalin. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: IF/01269/2015. Amount: 50 000,00€. Total Amount: 50 000,00€.

Other Projects

2019/2022: RNA in disease — RiboMed. Coordinator: M. Carmo-Fonseca. Fundig Agency: European Commission. Reference: RiboMed - GA 857119. Amount: 424 750,00€. Total Amount: 799 750,00€.

Organization of Conferences

Azzalin CM. Co-Organizer. EMBO workshop 'Telomere function and evolution in health and disease', Tróia, Portugal, May 4-9, 2020. (Postponed to 2022 due to the COVID-19 pandemic).

Internationalization

Our group is collaborating with several laboratories in Europe, USA and Australia. Additionally, members of our laboratory regularly attend and present at international conferences on genomic stability and telomere biology and participate in international schools and courses. These last activities were however not implemented during 2020 due to the COVID-19 pandemic.

Main collaborators in 2020:

- Alexander Leitner, ETH Zürich, Switzerland: cross-linking/mass spectrometry-based analysis of TERRA binding to TRF1 and TRF2.
- Jack Griffith, Lineberger Cancer Center, Chapel Hill NC, USA: electron microscopy-based analysis of TERRA inhibition of TRF1 and TRF2 binding to double stranded telomeric DNA.
- Anabelle Decottignies, Insitut de Duve, Brussels, Belgium: analysis of TERRA origin in mouse cells.

- Jerome Dejardin, Institut de Génétique Humaine, University of Montpellier, France: mass spectrometry-based analysis of ALT telomeres depleted of FANCM.

Prizes, Honors and Awards

Riva V. EMBO long term fellowship, December 2020.

Industry Contract Research

Claus M. Azzalin co-founded TessellateBio, a startup company for precision oncology located in Naarden, Netherlands. Our lab signed a research contract with the TessellateBio.

Advanced Teaching

Silva B. Lecture. Role of Telomeric Transcription in Cancer and Aging. Fronteiras da Investigação em Biologia. Course of the MSc programme in Molecular Biology and Genetics, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, April 7, 2020.

Azzalin CM. Lecture and practical course. FANCM functions in ALT cells. Curso livre experimental Introdução à investigação científica em biologia molecular da célula (unidade curricular optativa), Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, September 20-25, 2020.

Azzalin CM. Lecture. Telomeres and Telomerase: from the discovery to the clinics. Mestrado Integrado em Medicina, 1º ano, Módulo Biologia Molecular, Celular e do Desenvolvimento Humano e Genética, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal. Lecture recorded on October 21, 2020.

MSc Theses

Leonardo Amaro Gaio, 01/06/2020, The roles of telR-loops in the stability of telomeres in primary and telomerase-positive cancer cells, Faculdade de Farmácia da Universidade de Lisboa. Supervisor: Claus M. Azzalin. Co-Supervisor: Susana Solá.

Edgar Gomes Lab

Major Interests/Objectives

The cell nucleus is linked to the cytoskeleton and this connection is relevant for multiple cellular processes. Disruption of these connections result in several pathologies. Nuclear positioning within cell cytoplasm requires the connection between the nucleus and the cytoskeleton. We are interested in understanding the processes involved in these connections and the role for nuclear positioning in cell function. We study cell migration and skeletal myofiber formation, which involves the connection between the nucleus and the cytoskeleton and precise nuclear positioning. We also study the formation and maintenance of muscle triads, membrane structures that comprise the connection of a plasma membrane tubule with two sarcoplasmic reticulum cisternae, contiguous with the nuclear envelope. We use different molecular and cellular approaches in combination with time-lapse imaging analysis to address these questions.

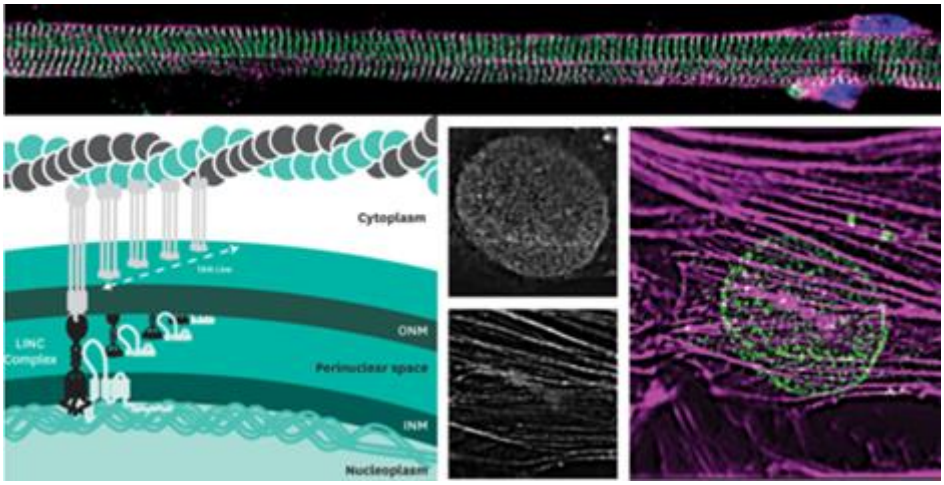
Head of Laboratory

Edgar Rodrigues Almeida Gomes, PhD, Associate Professor, Faculdade de Medicina da Universidade de Lisboa, Director of Instituto de Histologia e Biologia do Desenvolvimento, Faculdade de Medicina da Universidade de Lisboa

Team

Ana Margarida da Rosa Soares	Postdoctoral Researcher (Started November)
Ana Raquel Ramos Pereira	Postdoctoral Researcher (Started September)
Ana Sofia Carvalho Marques	Lab Technician (Left August)
Bruno Filipe Gonçalves Freitas	Lab Technician (Started January)
Catarina Antunes Sequeira	Lab Technician (Started July)
David Miguel Baião Barata	Postdoctoral Researcher
Francisco Javier Calero Cuenca	Postdoctoral Researcher
Graciano da Silva Leal	Senior Postdoctoral Researcher
Helena Alexandra Ribeiro de Carvalho Pinheiro	PhD Student
Hélia Cristina de Oliveira Neves	Senior Postdoctoral Researcher
Inês Isabel Baltazar Belo Martins	Lab Technician
Isabel da Conceição Alves Alcobia Principe Henriques	Senior Postdoctoral Researcher
João Pedro Nunes Paulo da Silva Martins	PhD Student
Katharina Hennig	Postdoctoral Researcher
Luís Manuel Farinha Bernardino de Oliveira	Lab Technician
Maria Judite Sousa da Costa	Lab Manager
Sara Sofia Gasalho Ferreira	Lab Technician
William Roman	Postdoctoral Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

Skeletal Muscle, Nucleus, Cell Migration, Cell Biology, Cytoskeleton.

Major Scientific Achievements

We are making progress towards developing a 3D muscle chip irrigated with blood vessels, controlled by motor neurons. We have successfully differentiated iPSCs into motor neurons and have optimized their co-culture with primary muscle myofibers. We have observed functional but immature neuromuscular junctions. We generated microdevices for the organization of endothelial cells into large vessels and for muscle attachment. In addition we differentiated iPSCs from ALS patients into motor neurons for future in silico disease modelling. (Myochip FET-OPEN project, in collaboration with CFranco Lab)

We found that mRNAs are differentially distributed within multinucleated muscle cells, depending on their size. We also found that transcription regulates mRNA localization. (Manuscript under revision)

We found a mechanism to generate asymmetric nuclear-cytoskeleton interactions for nuclear movement (manuscript under revision) and a complex between a nuclear envelope phosphatase (Ctdnep1) and a actin binding protein (Eps8L2) are involved in nuclear movement (Calero-Cuenca *et al. Current Biol* 2021).

Selected Publications

Déjardin T, Carollo PS, Sipieter F, Davidson PM, Seiler C, Cuvelier D, Cadot B, Sykes C, Gomes ER, Borghi N (2020). Nesprins are mechanotransducers that discriminate epithelial-mesenchymal transition programs. Journal of Cell Biology 219(10):e201908036. *(IF: 8.811, Citations: 3. Source: Google Scholar).*

Roman W, Martins J, Gomes ER (2018). Local arrangement of fibronectin by myofibroblasts governs peripheral nuclear positioning in muscle cells. Developmental Cell (1):102-111.e6. *(IF: 9.6, Citations: 1.Source: Web of Science).*

Gimpel P, Lee YL, Sobota RM, Calvi A, Koullourou V, Patel R, Mamchaoui K, Nédélec F, Shackleton S, Schmoranzer J, Burke B, Cadot B, Gomes ER (2017). Nesprin-1α-Dependent Microtubule Nucleation from the Nuclear Envelope via Akap450 Is Necessary for Nuclear Positioning in Muscle Cells. Current Biology 27(19):2999-3009.e9. *(IF: 8.9, Citations: 39. Source: Web of Science)*.

Roman W, Martins J, Carvalho FA, Voituriez R, Abella JVG, Santos NC, Cadot B, Way M, Gomes ER (2017). Myofibril contraction and cross-linking drive nuclear movement to the periphery of skeletal muscle. Nature Cell Biology 1189–1201. *(IF: 20.1, Citations: 22.Source: Web of Science).*

Janota CS, Calero-Cuenca FJ, Costa J, Gomes ER (2017). SnapShot: Nucleo-cytoskeletal Interactions. Cell 169(5):970-970.e1. *(IF: 31.4, Citations: 7. Source: Web of Science).*

Vilmont V, Cadot B, Ouanounou G, Gomes ER (2016). A system to study mechanisms of neuromuscular junction development and maintenance. Development 143:2464-2477. *(IF: 5.8, Citations: 9. Source: Web of Science).*

Falcone S, Roman W, Hnia K, Gache V, Didier N, Lainé J, Aurade F, Marty I, Nishino I, Charlet-Berguerand N, Romero N, Marazzi G, Sassoon D, Laporte J, Gomes ER (2014). N-WASP is required for Amphiphysin-2/BIN1 dependent nuclear positioning and triad organization in skeletal muscle and is involved in the pathophysiology of centronuclear myopathy. EMBO Molecular Medicine 6:1455–1475. *(IF: 10.3, Citations: 38. Source: Web of Science).*

Metzger T, Gache V, Xu M, Cadot B, Folker E, Richardson B, Gomes ER*, Baylies MK* (2012). MAP and Kinesin dependent nuclear positioning is required for skeletal muscle function. Nature 484:120–124, *co-last and corresponding author. *(IF: 41.6, Citations: 125. Source: Web of Science).*

Cadot B, Gache V, Vazyutina E, Falcone S, Birchmeier C, Gomes ER (2012). Nuclear movement during myotube formation is microtubule and dynein dependent and is regulated by Cdc42, Par6 and Par3. EMBO Reports 13(8):741-9. *(IF: 8.6, Citations: 62. Source: Web of Science).*

Luxton GW*, Gomes ER*, Folker ES, Vintinner E, Gundersen GG (2010). Linear arrays of nuclear envelope proteins harness retrograde actin flow for nuclear movement. Science 329(5994): 956-9. *co-first author. *(IF: 37.2, Citations: 259. Source: Web of Science).*

Publications in Peer Reviewed Journals

Déjardin T, Carollo PS, Sipieter F, Davidson PM, Seiler C, Cuvelier D, Cadot B, Sykes C, Gomes ER, Borghi N. (2020) Nesprins are mechanotransducers that discriminate epithelial-mesenchymal transition programs. Journal of Cell Biology 219(10):e201908036. *(IF: 8.8, Citations: 3. Source: Google Scholar).*

Janota CS, Calero-Cuenca FJ, Gomes ER (2020). The role of the cell nucleus in mechanotransduction. Current Opinion in Cell Biology 63:204-211. Review. (IF: 8.2, Citations: 7. Source: Google Scholar).

Janota CS, Calero-Cuenca FJ, Gomes ER (2020). Methods to Measure Perinuclear Actin Dynamics during Nuclear Movement in Migrating Cells. Methods in Molecular Biology 2101:371-385. *(IF: 10.71, Citations: 0. Source: Google Scholar).*

Ongoing Research Projects

2019/2025: ArpComplexity: Defining the role of Arp2/3 complex diversity at multiple scales of biology. Coordinator: Edgar Gomes. Funding Agency: European Commission. Reference: ERC SyG 810207. Amount: 3 207935,00€. Total Amount: 10 715 153,00€.

2018/2022: MyoChip: Building a 3D innervated and irrigated muscle on a chip. Coordinator: Edgar Gomes. Funding Agency: European Commission. Reference: MyoChip 801423. Amount: 1 266 861,25€. Total Amount: 3 153 553,74€.

2018/2021: Posicionamento do núcleo das células musculares esqueléticas. Coordinator: Edgar Gomes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: 031075/2017. Amount: 239 999,86€. Total Amount: Amount: 239 999,86€.

2018/2020: EnvironF: A role for the microenvironment on nuclear positioning in myofibers. Coordinator: Edgar Gomes. Funding Agency: AFM-Téléthon. Reference: AFM Telethon 21661. Amount: 51 000,00€. Total Amount: 51 000,00€.

2014/2020: Positioning the Cell Nucleus. Coordinator: Edgar Gomes. Funding Agency: European Molecular Biology Organization. Reference: EMBO IG EGomes. Amount: 250 000,00€. Total Amount: 250 000,00€.

Communications in International Conferences

Hennig K, Barata D, Martins IB, Costa J, Franco CA, Gomes ER, Roman W. Building an innervated and irrigated muscle-on-chip. EMBL-Ibec Winter Conference on Tissue Biology, Barcelona, February 2020. *(Poster Presentation)*

Calero-Cuenca FJ, Osório D, Carvalho-Marques S, Sridhara SC, Oliveira LM, Jiao Y, Diaz J, Janota CS, Cadot B, Gomes ER. Ctdnep1 and Eps8L2 regulate dorsal actin cables for nuclear positioning and cell migration, 2020 ASCB|EMBO Cell Bio Virtual, December 2-16, 2020. *(Poster Presentation)*

Pinheiro H, Pimental M, Oliveira L, Pezzarossa A, Roman W, Gomes ER. mRNA distribution in skeletal muscle is associated with mRNA size and microtubule-dependent. 2020 ASCB|EMBO Cell Bio Virtual, December 2-16, 2020. *(Poster Presentation)*

Barata D, Hennig K, Martins IB, Costa J, Franco CA, Gomes ER, Roman W. Instructive surface engineering for alignment and differentiation of muscle tissue. World Biomaterials Congress 2020, Glasgow, UK, Online Event, December 2020. *(Oral Presentation)*

Pinheiro H. Size-related mRNA distribution in skeletal muscle. 2020 EMBO YIP virtual RNA/Structural Biology Sectoral Meeting. *(Short Talk)*

Internationalization

Gomes ER. Coordinates a European FET OPEN project “Generating a 3D in vitro innervated and vascularized muscle”. Partners: Institut Curie, Fluigent and University of Edinburgh.

ERC Synergy grant “Defining the role of Arp2/3 complex diversity at multiple scales of biology”, together with Michael Way (Crick, London) and Carlyn Moores (Birkbeck, London)

Prizes, Honors and Awards

Gomes ER. Whitman Center Fellowship, Marine Biological Laboratory, University of Chicago, Chicago, USA (postponed due to Covid-19 pandemic travel limitations).

Advanced Teaching

Gomes ER. Lecture. Introdução à Engenharia Biomédica. Mestrado Integrado em Medicina, Instituto Superior Técnico, Lisbon, Portugal, September 2020.

Gomes ER. Lecture. Engenharia de Células e Tecidos. Mestrado Integrado Engenharia Biomédica, Instituto Superior Técnico, Lisbon, Portugal, October 2020.

Science and Society

We continue to actively work on outreach initiatives not only our own initiatives but also supporting iMM's institutional Initiatives.

Edgar was part of the last panel of the Horizontes iMM: Uma Pergunta a Três in Porto.

Edgar´s Group joined the "Clube de Ciência" initiative with Hospital de Santa Maria (HSM) by both receiving the participants with their family and educators at iMM, and joining the activities that took place at HSM itself.

We also had the opportunity to receive at iMM several schools from different ages and different parts of the country.

Finally we custom built a “MyoChip themed” memory game. It contains several illustrations about the project, the techniques used and the cell types and tissues involved. We gave away the first games (video), and we are working in a campaign for 2021, the goal is to reach muscle disorders associations and schools all over the country. Our partners Institut Curie, Fluigent and University of Edinburgh decided to join us and give away these games in France and UK too.

PhD Theses

Cátia Janota, 26/11/2020, Unraveling new mechanisms for nuclear positioning prior to cell migration, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Edgar Gomes.

Gonçalo Bernardes Lab

Major Interests/Objectives

Gonçalo Bernardes has made world-leading contributions to the field of chemical biology at the interface of chemistry and cancer biology and works across a number of important, cross-disciplinary projects. His laboratory uses chemistry principles to address important questions in life sciences and molecular medicine. At the core of his research program is the development of new chemoselective methods that are compatible with biological systems, and their use to redesign the structure & function of proteins of biological & therapeutic interest, with the aim of understanding & influencing human disease.

The research group is interested in developing strategies for site-selective protein modification that can be used for different applications, such as protein labelling in live cells, with the aim of monitoring disease-associated proteins under native conditions without interfering with the protein's innate structure, function, activity and localization, and cellular functions. The site-selective protein modification strategies under investigation, can be used for the conjugation of cytotoxic molecules to antibodies to improve efficacy and reduce side effects of cancer treatments and the construction of homogenous glycoproteins as vaccines candidates.

Another immensely important, core strand of research is the design of new chemistries for site-selective bioconjugation of therapeutic antibodies and disease–associated proteins in cells. The Bernardes group also explores conceptually new bioorthogonal approaches — the use of chemical reactions in cells — to control specific processes. Here, a successful method to bioorthogonally turn-on the activity of small-molecule drugs in vivo through the use of platinum activators has been developed. The platinum salts can be used in two ways; either to cleave the bond of an antibody-drug conjugate to release the drug, or to decage a pro-drug.

Another area of interest is the use of CO-releasing molecules to safely deliver therapeutic amounts of CO to diseased tissues, by controlling CO release *in vivo* in a spatial and temporal manner. Finally, the group investigates potential mRNA degrader molecules against Sars-Cov-2.

Head of Laboratory

Gonçalo José Lopes Bernardes, D. Phil

Team

Alexandra Isabel Freitas Rosa	Project Manager
Ana Maria dos Santos Guerreiro	PhD Student
Bárbara Beatriz da Costa Botelho Sousa	PhD Student
Bruno Luís Jesus Pinto de Oliveira	Senior Postdoctoral Researcher
Carlos Diogo Labão Alpiarça Sousa de Almeida	PhD Student
Cláudia Filipa Martins Afonso	PhD Student
Cong Tang	Project Manager (Started September)
Eloah Latocheski	PhD Student (Started August)
João Daniel da Silva Seixas	Staff Scientist
João Diogo Osório de Castro Conde	Postdoctoral Researcher (Left January)
Luís Miguel Afonso Ramos de Carvalho	Postdoctoral Researcher (Started April)
Maria Inês Sousa de Albuquerque	Project Manager
Maria Sousa Rebelo	Postdoctoral Researcher (Started May)
Marta Franco Coimbra Marques	Postdoctoral Researcher
Pedro Miguel Saraiva Duarte Cal	Postdoctoral Researcher
Rafaela Carvalho Martins	MSc Student (Started September)
Ravikumar Govindan	Postdoctoral Researcher
Tiago Correia de Oliveira Rodrigues	Staff Scientist (Left December)
Unnikrishnan Vickraman Nair Bindu	PhD Student (Left May)
Vera Filipa Cerqueira Ferreira	PhD Student (Left November)

Graphical Abstract

Laboratory Keywords/Research Areas

Chemical Biology, Biorthogonal Chemistry, Nucleic Acid Degradation, Targeting, Translational Chemistry.

Major Scientific Achievements

Our research group has made significant advances in the areas of reaction engineering for protein modification, antibody therapeutics and mRNA modification. Recent highlights include: publishing a small molecule-based tool to edit and analyse RNA modifications, named meCLICK-Seq. The method hijacks RNA methyltransferase activity and identifies methylated transcripts to reliably map modification sites, which influence many biological functions and human diseases. Unlike other methods available, meCLICK-Seq works in such a way that RNA modifications throughout the transcriptome can be studied, including regions of low abundance. This potentially transformative method is also modular, so can be exploited to study any RNA modification; optimization of chemical reactions with minimal experimental information, which led to the development of the LabMate platform; development of biorthogonal tumor imaging strategies; development of a successful method to bioorthogonally turn-on the activity of small-molecule drugs in vivo through the use of platinum activators. The platinum salts are either cleaved to release the drug or decaged. Importantly, this method uses water-promoted activation, which is simple and means it can be used in cells; and the designing of a bone-marrow tyrosine kinase inhibitor with single-digit nanomolar potency with unexploited topological pharmacophore patterns.

Selected Publications

Mikutis S, Gu M, Sendinc E, Hazemi M, Kiely-Collins H, Aspris D, Vassiliou G, Shi Y, Tzelepis K, Bernardes GJL (2020). meCLICK-Seq – a substrate-hijacking and RNA degradation strategy for the study of RNA methylation. ACS Central Science 6(12):2196–2208 (*IF: 12.685, Citations: 3. Source: Google Scholar)*.

See First Reactions in ACS Central Science: Global Detection of RNA Methylation by Click Degradation, ACS Cent. Sci. 2020. 6 (12), 2126–2129.

See highlight in C&EN, New system cuts RNA using only small molecules by Fernando Gomollón-Bel.

Reker D, Hoyt EA, Bernardes GJL*; Rodrigues T* (co-senior authors) (2020). Adaptive optimization of chemical reactions with minimal experimental information. Cell Reports Physical Science 2(1):100316. *(IF:--, Citations: 0. Source: Google Scholar)*.

See highlight in *Chemistry World*, Machine-learning software competes with human experts to optimise organic reactions by Tom Metclafe Selected as one of the best papers from 2020 in Cell Rep. Phys. Sci.: Best of 2020.

Li H, Conde J, Guerreiro A, Bernardes GJL (2020). Tetrazine carbon nanotubes for pre-targeted in vivo 'click-to-release' bioorthogonal tumour imaging. Angewandte Chemie International Edition 59(37):16023–16032. (*IF: 12.959, Citations: 1. Source: Wiley Online Library*).
Selected as a Very Important Paper.

Oliveira BL, Stenton BJ, Unnikrishnan VB, de Almeida CR, Conde J, Negrão M, Schneider FSS, Cordeiro C, Ferreira MG, Caramori GF, Domingos JB, Fior R, Bernardes GJL (2020). Platinum-triggered bond-cleavage of pentynoyl amide and N-propargyl handles for drug-activation. Journal of the American Chemical Societal 142(24):10869–10880. (*IF: 14.612, Citations: 12. Source: Google Scholar).*
Featured on a Supplementary Cover Art.

Seixas JD*, Sousa BB, Marques MC, Guerreiro A, Traquete R, Rodrigues T, Albuquerque IS, Sousa MFQ, Lemos AR, Sousa PMF, Bandeiras TM, Wu D, Doyle SK, Robinson CV, Koehler NA, Corzana F, Matias PM, Bernardes GJL* (2020). Structural and biophysical insights into the mode of covalent binding of rationally designed potent BMX inhibitors. RSC Chemical Biology 1:251–262. (*IF:--, Citations: 0. Source: Google Scholar).*

Mahú I, Barateiro A, Rial-Pensado E, Martinéz-Sánchez N, Vaz SH, Cal PMSD, Jenkins B, Rodrigues T, Cordeiro C, Costa MF, Mendes R, Seixas E, Pereira MMA, Kubasova N, Gres V, Morris I, Temporão C, Olivares M, Sanz Y, Koulman A, Corzana F, Sebastião AM, López M, Bernardes GJL*, Domingos AI*(*co-senior authors) (2020). Brain-sparing sympathofacilitators mitigate obesity without adverse cardiovascular effects. Cell Metabolism 31(6):1120–1135. (*IF: 20.565, Citations: 2. Source: Google Scholar).*
See preview in Cell Metab. 2020, 31, 1043–1045 "A Sympathetic Treatment for Obesity" by Jung Dae Kim and Sabrina Diano
Highlighted in Nat. Rev. Endocrinol. 2020, 16, 343 "Unravelling novel weight loss mechanisms" by Alan Morris

Publications in Peer Reviewed Journals

Ferreira VFC, Oliveira BL*, D'Onofrio A, Farinha CM, Gano L, Paulo A, Bernardes GJL*, Mendes F* (co-senior authors) (2021). In vivo pretargeting based on cysteine-selective antibody modification with IEDDA bioorthogonal handles for click chemistry. Bioconjugate Chemistry (32):121-132.

Kitowski A, Corzana F, Bernardes GJL* (2020). Precise protein conjugation technology for the construction of homogenous glycovaccines. Drug Discovery Today: Technologies. (Accepted).

Macías-León J, Bermejo IA, Asín A, García-García A, Compañón I, Jiménez-Moreno E, Coelho H, Mangini V, Albuquerque IS, Marcelo F, Asensio JL, Bernardes GJL, Joshi HJ, Fiammengo R, Blixt O, Hurtado-Guerrero R, Corzana F (2020). Structural characterization of an unprecedented Lectin-like antitumoral anti-MUC1 antibody. Chemical Communications 56(96):15137–15140. (*IF: 5.996, Citations: 0. Source: Google Scholar).*
Featured on the front cover

Henriques P, Dello Iacono L, Gimeno A, Biolchi A, Rosaria Romano M, Ardá A, Bernardes GJL, Jimenez-Barbero, J Berti F, Rappuoli R, Adamo R (2020). Structure of a protective epitope reveals the importance of acetylation of Neisseria meningitidis serogroup a capsular polysaccharide. Proceedings of the National Academy of Sciences of the United States of America 117(47):29795–29802. *(IF: 9.412, Citations: 0. Source: Crossref).*

Vantourout JC, Adusumalli SR, Knouse KW, Flood D, Ramirez A, Padial NM, Istrate A, Maziarz K, deGruyter JN, Merchant RR, Qiao JX, Schmidt MA, Deery MJ, Eastgate MD*, Dawson PE*, Bernardes GJL*, Baran PS* (*co-senior authors) (2020). Serine-Selective Bioconjugation. Journal of the American Chemical Society 142(41):17236−17242. (*IF: 14.612, Citations: 2. Source: Google Scholar).*

Matos MJ, Brown L, Bernardim B, Guerreiro A, Jiménez-Osés G, Bernardes GJL* (2020). Sequential dual site-selective protein labelling enabled by lysine modification. Bioorganic & Medicinal Chemistry 28(20):115783. (*IF: 2.793, Citations: 0. Source: Google Scholar).*

Geeson MB, Bernardes GJL* (2020). Protein−protein conjugates: Tyrosine delivers. ACS Central Science 6(9):1473−1475. (*IF: 12.685, Citations: 0. Source: Google Scholar).*

Latocheski E, Dal Forno GM, Ferreira TM, Oliveira BL, Bernardes GJL, Domingos JB (2020). Mechanistic insights into transition metal-mediated bioorthogonal uncaging reactions. Chemical Society Reviews 49(21):7710–7729. (*IF: 40.443, Citations: 1. Source: Google Scholar).*

Hakala T, Bialas F, Toprakcioglu Z, Bräuer B, Baumann KN, Levin A, Bernardes GJL*, Becker CFW*, Knowles TPJ* (*co-senior authors) (2020). Continuous flow reactors from microfluidic compartmentalization of enzymes within inorganic microparticles. ACS Applied Materials & Interfaces 12(29):32951–32960. (*IF: 8.758, Citations: 1. Source: Google Scholar).*

Levin A, Hakala T, Schnaider L, Bernardes GJL, Gazit E, Knowles TPJ (2020). Biomimetic peptide self-assembly for functional materials. Nature Reviews Chemistry 4(11):615–634. (*IF: 8.758, Citations: 1. Source: ACS).* (*IF: 25.59, Citations: 2. Source: Nat. Rev Chem).*

Bernardim B, Dunsmore L, Li H, Hocking B, Nuñez-Franco R, Navo CD, Jiménez-Osés G, Burtoloso ACB, Bernardes GJL* (2020). Precise installation of diazo-tagged side-chains on proteins to enable in vitro and in cell site-specific labeling. Bioconjugate Chemistry 31(6):1604–1610. (*IF: 4.349, Citations: 1. Source: Google Scholar).*
ACS Editors' Choice.

Kitowski A, Bernardes GJL* (2020). A sweet galactose transfer: Metabolic oligosaccharide engineering as a tool to study glycans in plasmodium infection. ChemBioChem 21(18):2696–2700. (*IF: 2.576, Citations: 1. Source: Google Scholar).*

McAulay K, Hoyt EA, Thomas M, Schimpl M, Bodnarchuk MS, Lewis HJ, Barratt D, Bhavsar D, Robinson DM, Deery MJ, Ogg D, Bernardes GJL, Ward RA, Waring MJ, Kettle JG (2020). Alkynyl benzoxazines and dihydroquinazolines as cysteine targeting covalent warheads and their application in identification of selective irreversible kinase inhibitors. Journal of the American Chemical Society 142(23):10358−10372. (*IF: 14.612, Citations: 2. Source: Google Scholar).*

Bernardes GJL*, Rodriguez R (2020). Editorial overview: Toward smart medicines. Current Opinion in Chemical Biology 56:A1–A2. *(IF: 9.689, Citations: 0. Source: Google Scholar).*
This review comes from a themed issue on Next Generation Therapeutics
Edited by Gonçalo Bernardes and Raphaël Rodriguez

Sousa BB, Sousa MFQ, Marques MC, Seixas JD, Brito JA, Matias PM, Bernardes GJL, Roldão A (2021). A scalable insect cell-based production process of the human recombinant BMX for in-vitro covalent ligand high- throughput screening. Bioprocess and Biosystems Engineering 44(1):209-215. (*IF: 2.419, Citations: 0. Source: Google Scholar).*

Amorim AL, Guerreiro A, Glitz VA, Coimbra DF, Bortoluzzi AJ, Caramori GF, Braga AL, Neves A, Bernardes GJL*, Peralta RA (co-senior authors) (2020). Synthesis, characterization and photoinduced CO-release by manganese(i) complexes. New Journal of Chemistry 44(26):10892–10901. (*IF: 3.288, Citations: 0. Source: Google Scholar).*

Hakala T, Davies SD, Toprakcioglu Z, Bernardim B, Bernardes GJL*, Knowles TPJ* (*co-senior authors) (2020). A microfluidic co-flow route for human serum albumin-drug-nanoparticle assembly. Chemistry-A European Journal 26(27):5965–5969. (*IF: 4.857, Citations :0. Source: Google Scholar).*

Bermejo IA, Navo CD, Castro-Lopez J, Guerreiro A, Jimenez-Moreno E, Fernández SEM, Martín FG, Hinou H, Nishimura S, Fernández JMG, Mellet CO, Avenoza A, Busto JH, Bernardes GJL, Hurtado-Guerrero R, Peregrina JM, Corzana F (2020). Synthesis, conformational analysis and in vivo assays of an anti-cancer vaccine that features an unnatural antigen based on an sp2-iminosugar fragment. Chemical Science 11(15): 3996–4006. (*IF: 9.346, Citations: 4. Source: Google Scholar).*

Gil de Montes E, Istrate A, Navo CD, Jiménez-Moreno E, Hoyt EA, Corzana FC, Robina I, Jiménez-Osés G, Moreno-Vargas AJ, Bernardes GJL* (2020). Stable pyrrole-linked bioconjugates through tetrazine-triggered azanorbornadiene fragmentation. Angewandte Chemie International Edition 59(15):1329–1334. (*IF: 12.959, Citations: 5. Source: Google Scholar).*

Rocha RF, Rodrigues T, Menegatti ACO, Bernardes GJL*, Terenzi H (2020). The antidiabetic drug Lobeglitazone has the potential to inhibit PTP1B activity. Bioorganic Chemistry 100:103927–103932. (*IF: 4.831, Citations: 1. Source: Google Scholar).*

Toprakcioglu Z, Hakala TA, Levin A, Becker CFW, Bernandes GJL, Knowles TPJ (2020). Multi-scale microporous silica microcapsules from gas-in water-in oil emulsions. Soft Matter 16(12):3082–3087. (*IF: 3.399, Citations: 1. Source: Crossref).*

Alcock LJ, Langini M, Stühler K, Remke M, Perkins MV, Bernardes GJL*, Chalker JM* (*co-senior authors) (2020). Proteome-wide survey of cysteine oxidation using a norbornene probe. ChemBioChem 21(9):1329–1334. (*IF: 2.576, Citations: 4. Source: Google Scholar).*

Rodrigues T, Bernardes GJL* (2020). Machine learning for target discovery in drug development. Current Opinion in Chemical Biology 56:16–22. (*IF: 9.689, Citations: 9. Source: Google Scholar).*

Ongoing Research Projects

2020/2023: Ligand Directed NIR-based Theranostic Prodrugs for Prostate Cancer — ClickandTreatCancer. Coordinator: Ravikumar Govindan. Funding Agency: European Commission. Reference: ClickToTreatCancer - GA891251- MSCA-H2020-ITN-2019. Amount: 238 356,36€. Total Amount: 3 554 499,69€.

2020/2021: ACE2 PROTEIN DECOYS. Coordinator: Gonçalo Bernardes. Funding Agency: Neoleukin. Reference: Neoleukin. Amount: 55 076,40€. Total Amount: 55 076,40€.

2019/2022: Site-selective protein-modification chemistries for antibody-drug conjugates (ADCs). Coordinator: Bruno Oliveira. Funding Agency: European Commission. Reference: Twinning-SIMICA. Amount: 353 750,00€. Total Amount: 800 000,00.

2018/2021: Libertação controlada de agentes bioactivos por reacção químca selectiva. Coordinator: Marta Marques. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: TzDD - LISBOA-01-0145-FEDER-028333. Amount: 238 166,90€. Total Amount: 238 166,90€.

2018/2021: Entrega intracelular de fármacos usando conjugados entre pequenas células e fármacos para terapia do Cancro da Próstata. Coordinator: Gonçalo Bernardes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-QUI/28764/2017. Amount: 239 960,32. Total Amount: 239 960,32.

2018/2021: Nanoparticle-Based Therapeutic Applications and Detection of Carbon Monoxide Releasing. Coordinator: Marta Marques. Funding Agency: European Commission. Reference: Twinning-ACORN. Amount: 353 750,00€. Total Amount: 1 000 000,00€.

2017/2021: ALBUMEDIx. Coordinator: Gonçalo Bernardes. Funding Agency: ALBUMEDIx. Reference: ALBUMEDIx. Amount: 168 810,32€. Total Amount: 168 810,32€.

2015/2020: GLYCOVAX: A training network for the rational design of the next generation of well-defined glycoconjugate vaccines. Coordinator: Gonçalo Bernardes. Funding Agency: European Commission. Reference: MSCA ITN 675671. Amount: 238 356,36€. Total Amount: 3 554 499,69€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Keynote and Prize Lectures:

Bernardes GJL. EMBL Conference "Expanding the Druggable Proteome with Chemical Biology", Heidelberg, Germany, February 2020.

Bernardes GJL. ACS Fall 2020 Virtual Meeting & Expo, Chemistry from Bench to Market (Speaker & Session Organizer), August 2020.

Bernardes GJL. EMBL Workshop Chemical Biology 2020, Heidelberg, Germany, September 2020.

Bernardes GJL. International Chemical Biology Society 2020 Conference: Rising stars session. 2020 Young Chemical Biologist Award, November 2020.

Invited Seminars:

Bernardes GJL. Seattle Genetics, Bothell, US – Host: Dr Peter Senter, January 2020.

Bernardes GJL. Institute for Protein Design, University of Washington, Seattle, US – Host: Prof David Baker, January 2020.

Bernardes GJL. 4ème Journée Ligation Chimique, Orléans, France, January 2020.

Bernardes GJL. 1st ChemBioChem Virtual Symposium, May 2020.

Bernardes GJL. ACS #ChemistsLive, ACS Cross-Division Virtual, Protein Chemistry and RNA Therapeutics (Speaker & Session Organizer), September 2020.

Bernardes GJL. Chemical Biology Society 2020 Conference: ICBS2020 Virtual, Addressing Therapeutic Challenges Together with Chemical Biology (Speaker & Session Organizer), November 2020.

Communications in International Conferences

Almeida C. CO-proteins in Cancer Immunotherapy. Next Gen Immunology 2020 Conference, Weizmann Institute of Technology, Israel, February 2-5, 2020. *(Poster Presentation)*

Sousa B. Rationally designed potent BMX inhibitors reveals mode of covalent binding at the atomic level. Virtual EMBO Workshop: Chemical Biology 2020, Heidelberg, Germany, September 3–5, 2020. *(Poster Presentation)*

Govindan R. Cancer Targeted Drug Delivery with a Fluorescence Reporter. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Carvalho L. Targeting Serine Hydrolases via Cysteine Modulation. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Afonso C. A click-chemistry approach for protein acetylation. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Almeida C. Targeting. CO-proteins in Cancer Immunotherapy. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Albuquerque I. Unnatural glycopeptides and proteins and their use in antigen detection and immunization. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Tang C. E3-hijacking molecular glues of RNA binding protein IGF2BP1 in ovarian cancer. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Rebelo M. RNA degraders: A novel small-molecule approach to treat COVID-19. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Martins A. X-ray crystal structure of Human Liver GAPDH with a selective Inhibitor. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Guerreiro A. Novel MUC1-based glycoconjugate vaccines against cancer. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Oliveira B. Cysteine-selective antibody modification with IEDDA bioorthogonal handles for in vivo click reaction. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Marques M. Tumour-Targeting Proteins for Cancer Therapy. ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Communications in National Conferences

Sousa B. From Prostate Cancer to B-cell malignancies: The importance of selectively targeting a cysteine. Oncobiology Club, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, December 2, 2020. *(Oral Presentation)*

Organization of Conferences

Bernardes GJL, Marques MC, Co-Organizer. ACORN Summer School and Workshop, Praia Verde Portugal, October 19–22, 2020.

Internationalization

The internationalization of the laboratory research was achieved through the visit of some members of the group to other laboratories, namely:

- Latocheski E. Cambridge University, UK, September-December 2020.
- Rebelo M. Cambridge University, UK, October-December 2020.
- Almeida C. Cambridge University, UK, March 2020.

These short stays allowed these members of the group to learn new techniques and to disseminate the work from the lab.

Additionally, the many lectures given by Gonçalo Bernardes and the participation of other investigators in international conferences allowed dissemination of the results of our research work to the wider scientific community and enabled new collaborations.

Furthermore, G. Bernardes Lab has established a new collaboration with Neoleukin, a NASDAQ quoted company from Seattle, USA.

Prizes, Honors and Awards

Bernardes GJL. Commissions of Trust: ERC Advanced Grant Expert Reviewer (PE5), 2019-to date; *Ad hoc* Reviewer, Dutch Research Council (NWO); Member of the Commonwealth Science Conference Committee, Royal Society, UK; *Ad hoc* Reviewer, Medical Research Council, UK; ERC Starting Grant expert reviewer (PE5), *Ad hoc* Reviewer, Swiss National Science Foundation, Switzerland; *Ad hoc* Reviewer, Endeavour Fund, New Zealand; *Ad hoc* Reviewer, Czech Science Foundation, Czech Republic; *Ad hoc* Reviewer, Japan Society for the Promotion of Science, Japan; ERC Consolidator Grant expert reviewer (PE5, LS6); Member of The International Exchanges Panel of the Royal Society, UK; Ad hoc Reviewer, BBSRC, UK; Ad hoc Vice-Chair of

Future Emerging Technologies within H2020; Ad hoc Evaluator EU Research and Mobility Programs (Marie Sklodowska-Curie) within H2020; College Member, EPSRC, UK.

Bernardes GJL. International Chemical Biology Society (ICBS) Young Chemical Biologist Award, 2020.

Govindan R. Marie Skłodowska-Curie Actions-Individual Fellowships (H2020-MSCA-IF-2019), April 1, 2020.

Sousa B. 1. EMBO Travel Grant. EMBO Workshop: Chemical Biology 2020, Germany.

Sousa B. ACORN Travel Grant for international conferences. European Commission.

Rebelo M. Winner of best turbo talk at the ACORN Summer School and Thematic Workshop, Praia Verde, Portugal, October 19-22, 2020.

Industry Contract Research

Research Project in collaboration with Albumedix Ltd, which explores the use of albumin proteins to deliver cytotoxic drugs in the context of cancer.

Research Project in collaboration with Neoleukin, which aims to determine the *in vivo* antiviral activity of NL-CVX1, which is a de novo decoy protein that bind to the spike protein of SARS-CoV2, in a mouse model of SARS CoV-2 infection.

Patents/Prototypes

Treatment of Immunosuppressive Cancer; Labão–Almeida C; Bernardes GJL.

GB Patent Application No: 2004514.2; filled 27 March 2020.

Status: Pending.

Advanced Teaching

Bernardes GJL. Director of Studies in chemistry. Trinity Hall College, Cambridge, UK, 2019–to date.

Marques M. Biochemistry Practical Classes. Escola Superior de Ciências da Saúde, Lisbon, Portugal, September 2019-to date.

Bernardes GJL. Supervisor of organic and biological chemistry courses. Trinity Hall, Cambridge, UK, 2017–to date.

Bernardes GJL. Part III Course Internal Examiner. University of Cambridge, Cambridge, UK, 2014–to date.

Bernardes GJL. Lecturer - Chemical Biology & Drug Discovery - undergraduate course. University of Cambridge, Cambridge, UK, 2014–to date.

Bernardes GJL. Lecturer - Chemical Biology of Nucleic Acids - undergraduate course. University of Cambridge, Cambridge, UK, 2013–to date.

Bernardes GJL. Lecturer - Targeted Anti-Cancer Therapeutics - graduate course. University of Cambridge, Cambridge, UK, 2013–to date.

Rodrigues T. Lecturer. Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal.

Science and Society

In the context of the ACORN Summer School and Thematic Workshop, a social activity was organized for the participants that attended the meeting on site, which included a meeting between Dr. Gonçalo Bernardes and a representative of Castro Marim's City Hall and the Director of the Regional Public Health Department.

European Researchers' Night, Lisbon, Portugal, November 27, 2020.

PhD Theses

Rui Traquete, 05/06/2020, Development of traceless strategies for the selective release of BET inhibitors in cancer cells, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Gonçalo Bernardes.

Joana Neves Lab

Major Interests/Objectives

Our central interest is the exploration of the tissue repair processes that have evolved to heal damaged organs to improve regenerative success in older individuals. We use skeletal muscle regeneration as a paradigm of tissue repair to understand the molecular and cellular basis of the immune modulatory component of tissue regeneration and how its dysregulation in ageing and disease can be targeted to optimize stem cell-based therapies. Our goal is to identify pathways that are used by immune cells to modulate the inflammatory tone of the tissue environment, with the goal of identifying new molecules with immune modulatory properties and therapeutic potential in regenerative medicine applied to old patients. The Neves lab is part of the Ageing & Tissue Repair joint lab, running two independent, complementary and cooperative research programs focused on biology of stem cell aging and the age-associated changes in the immune environment.

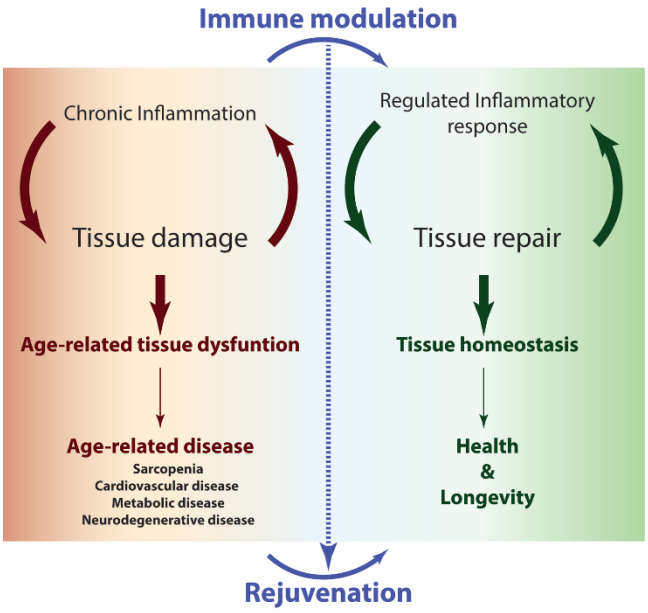
Head of Laboratory

Joana Mendes Neves, PhD

Team

Audrey Kahn	MSc Student (Started January. Left July)
Júlia Garrido Fernandes	Trainee (Started October)

Graphical Abstract



Laboratory Keywords/Research Areas

Immune Modulation, Inflammation, Regeneration, Aging, Muscle.

Major Scientific Achievements

This year we discovered how aging imposes a limitation to the repair capacity of the retina and demonstrated that MANF therapy modulates the aged immune environment to improve the success of cell replacement therapies applied to the retina (Neves et al., 2020). We are now trying to transpose these findings to the skeletal muscle, while understanding the specific defects of the aged immune system that compromise repair capacity. We characterized the differences between young and old macrophages in the context of tissue repair and identified intrinsic alterations in gene expression, and defects in MANF signaling, that may contribute to the age-related impairments of the myeloid system. We found that MANF modulates the macrophage response to tissue debris and we are now exploring how age-related defects alter this response and how MANF supplementation can be used to rescue macrophage function and improve repair capacity.

Selected Publications

Munoz-Canoves P**, Neves J, Sousa-Victor P** (2020). Understanding muscle regenerative decline with aging: new approaches to bring back youthfulness to aged stem cells. FEBS Journal 287(3):406416. Review. *(IF: 4.392, Citations: 5. Source: Google Scholar).*

Neves J**, Sousa-Victor P** (2020). Regulation of inflammation as an anti-aging intervention. FEBS Journal 287(2020):43–52. Perspective. *(IF: 4.392, Citations: 7. Source: Google Scholar).*

Sousa-Victor P*, Neves J*, Cedron-Craft W, Ventura PB, Liao CY, Riley RR, Soife I, van Bruggen N, Kolumam GA, Villeda SA, Lamba DA, Jasper H (2019). MANF regulates metabolic and immune homeostasis in ageing and protects against liver damage. Nature Metabolism 1(2):276–290. *(IF:--, Citations: 22. Source: Google Scholar).*

Neves J*, Sousa-Victor P*, Jasper H (2017). Rejuvenating Strategies for Stem Cell-Based Therapies in Aging. Cell Stem Cell 20(2):161-175. Review. *(IF: 20.860, Citations: 82. Source: Google Scholar).*

Neves J, Zhu J, Sousa-Victor P, Konjikusic M, Riley R, Chew S, Qi Y, Jasper H, Lamba DA (2016). Immune modulation by MANF promotes tissue repair and regenerative success in the retina. Science 353(6294):aaf3646. *(IF: 41.845, Citations: 123. Source: Google Scholar).*

Neves J*, Demaria M*, Campisi J, Jasper H (2015). Of Flies, Mice, and Men: Evolutionarily Conserved Tissue Damage Responses and Aging. Developmental Cell 32(1):9-18. Review. *(IF: 10.092, Citations: 70. Source: Google Scholar).*

*equal contribution
**Corresponding author

Publications in Peer Reviewed Journals

Sousa-Victor P**, Neves J**, Muñoz-Cánoves P** (2020). Muscle stem cell aging: identifying ways to induce tissue rejuvenation. Mechanisms of Ageing and Development 128:111246. *(IF: 3.390, Citations: 0. Source: Google Scholar).*

Neves J (2020). Aging eyes and the immune system. Science 367(6483):1205-1206. *(IF: 41.845, Citations: 0. Source: Google Scholar).*

Neves J**, Chirco KR, Cedron-Craft W, Chew S, Zhu J, Jasper H, Lamba DA** (2020). MANF delivery improves retinal homeostasis and cell replacement therapies in ageing mice. Experimental Gerontology 134:110893. *(IF: 3.376, Citations: 1. Source: Google Scholar).*

Munoz-Canoves P**, Neves J, Sousa-Victor P** (2020). Understanding muscle regenerative decline with aging: new approaches to bring back youthfulness to aged stem cells. The FEBS journal 287(1):43-52. Review. *(IF: 4.392, Citations: 5. Source: Google Scholar).*

Neves J**, Sousa-Victor P** (2020). Regulation of inflammation as an anti-aging intervention. The FEBS journal 287(3):406-416. Perspective. *(IF: 4.392, Citations: 7. Source: Google Scholar).*

*equal contribution
**Corresponding author

Ongoing Research Projects

2020/2021: MANF Role in Bone Marrow Hematopoiesis. Coordinator: Pedro Sousa-Victor and Joana Neves. Funding Agency: Genentech, Inc. Reference: MANF ROLE IN BONE MARROW HEMATOPOIESIS. Amount: 42 200,00€. Total Amount: 42 200,00€.

Invited Lectures and Seminars

Neves J, Sousa-Victor P. The role of MANF in aging and tissue repair. HiLIFE Viikki Seminar, University of Helsinki, Helsinki, Finland, October 26, 2020.

Neves J. Immune modulatory interventions in ageing and tissue repair. NECiB-AAUAv Meeting, AGING: Unveiling the mysteries of time (webinar), Universidade de Aveiro, Aveiro, Portugal, December 9, 2020.

Prizes, Honors and Awards

Neves J. 2019 Sartorious & Science Prize for Regenerative medicine & Cell Therapy, Science Magazine, USA, March 13, 2020.

Industry Contract Research

Sponsored research contract between Neves&Sousa-Victor Labs at iMM and Genentech (South San Francisco, CA, USA). The sponsored research is aimed at understanding the role of MANF in hematopoiesis.

Advanced Teaching

Neves J. Immune modulatory interventions in ageing and tissue repair. Seminar for Histology Class – 2nd year Medical Students, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 2, 2020.

Science and Society

JNeves was interviewed for Visão Magazine within the article “Os jovens de 90 anos que continuam a ser inspiradores”.

MSc Theses

Audrey Kahn, 23/07/2020, The role of MANF in macrophage function during regeneration, International Master: From fundamental molecular bioscience to biotherapies – Sorbonne Université. Supervisor: Joana Neves. Co-Supervisor: Pedro Sousa-Victor.

João Barata Lab

Major Interests/Objectives

We aim to understand the role of cell-autonomous alterations and microenvironmental cues in the development of cancer, focusing mainly on the dissection of signaling pathways essential for tumor maintenance. To do so, we make use of patient material, as a key source of insights into the disease, and integrate different biochemical, cellular and molecular biology techniques with appropriate *in vitro* and *in vivo* models - enabling an overall appreciation of the molecular, cellular and systemic nuances associated with cancer. The basic and pre-clinical research we perform is translation-oriented and enriched by active collaborations with clinicians. Ultimately, we aim to identify and characterize molecular targets for the development of novel, more selective therapies against cancer.

Head of Laboratory

João Pedro Taborda Barata, PhD, Associate Professor

Team

Alice Sofia dos Santos Melão	PhD Student (Left December)
Ana Patrícia Cebola Cachucho	PhD Student
Ana Rita Cascão Rodrigues	Senior Postdoctoral Researcher
Ana Rita Freitas Martins de Matos Fragoso	Staff Scientist
Beatriz Carrinho Raposo	Lab Technician (Left June)
Brian Ringhofer	MSc Student (Started January. Left December)
Bruno António Caetano Cardoso	Senior Postdoctoral Researcher
Carlos Manuel Tavares da Custódia	PhD Student
Clara Lúcia Gonçalves Dias	Postdoctoral Researcher
Cláudia Maria Coelho de Faria	Clinical Researcher
Daniel Filipe Silva Ribeiro	Postdoctoral Researcher
Diana Filipa Pereira Vaz	Lab Manager
Eunice Ribeiro João Silva Paisana	PhD Student
Inês Miguel Marques Pereira	Trainee (Started March. Left March)
João Luís Aguiar Martins Neto	Postdoctoral Researcher
Luís Pedro Dias Bernardo Maricoto Monteiro	PhD Student
Mafalda dos Santos Dias Duque	Lab Technician
Mariana Lobato de Oliveira	PhD Student
Marta Sofia Barbosa Fernandes	PhD Student
Mayara Ferreira Euzébio	Lab Technician (Left August)
Rita Alexandra Nunes Rodrigues	Trainee (Started September)
Susana Luísa dos Santos Costa Constantino Moleirinho	Senior Postdoctoral Researcher (Started April)
Tatiana Vanessa Fernandes Araújo	MSc Student (Started August)

Laboratory Keywords/Research Areas

Cancer Biology, Signal Transduction, Cellular and Molecular Biology, Rational Targeted Therapies, Leukemias (especially acute lymphoblastic leukemia), Brain Tumors.

Major Scientific Achievements

Our efforts to translate basic findings into therapeutic potential resulted in the demonstration that CIGB-300, a clinical-grade peptide-based inhibitor of CK2, blocks viability and proliferation of leukemic T cells and counteracts IL-7 stimulation and stromal support. Importantly, we submitted a provisional patent application for an exciting technology aiming at treating T-ALL in a selective manner.

Selected Publications

Martins LR, Lúcio P, Melão A, Antunes I, Cardoso BA, Stansfield R, Bertilaccio MT, Ghia P, Drygin D, Silva MG, Barata JT (2014). Activity of the clinical-stage CK2-specific inhibitor CX-4945 against chronic lymphocytic leukemia. Leukemia 28:179–182. *(IF: 8.665, Citations: 50. Source: Web of Science)*.

Mendes RD, Sarmento LM, Canté-Barrett K, Zuurbier L, Buijs-Gladdines J, Povoa V, Smits WK, Abecassis M, Yunes JA, Sonneveld E, Horstmann MA, Pieters R, Barata JT, Meijerink JPP (2014). PTEN micro-deletions in T-cell acute lymphoblastic leukemia are caused by illegitimate RAG-mediated recombination events. Blood 124:567-578. *(IF: 17.794, Citations: 49. Source: Web of Science)*.

Zenatti PP, Ribeiro, Li, Zuurbier L, Silva MC, Paganin M, Tritapoe J, Hixon JA, Silveira AB, Cardoso BA, Sarmento LM, Correia N, Toribio ML, Kobarg J, Horstmann M, Pieters R, Brandalise SR, Ferrando AA, Meijerink JP, Durum SK, Yunes JA, Barata JT (2011). Oncogenic IL7R gain-of-function mutations in childhood T-cell acute lymphoblastic leukemia. Nature Genetics 43:932-939. *(IF: 27.605, Citations: 235. Source: Web of Science)*.

Henriques CM, Rino J, Nibbs RJ, Graham GG, Barata JT (2010). IL-7 induces rapid clathrin-mediated internalization and JAK3-dependent degradation of IL-7Ralpha in T cells. Blood 115:2724-2731. *(IF: 17.794, Citations: 81. Source: Web of Science)*.

Silva A, Yunes JA, Cardoso BA, Martins LR, Jotta PY, Abecasis M, Nowill AE, Leslie NR, Cardoso AA, Barata JT (2008). PTEN Posttranslational Inactivation and Hyperactivation of the PI3K/Akt Pathway Sustain Primary T cell Leukemia Viability. Journal of Clinical Investigation 118:3762-3774. *(IF: 11.864, Citations: 305. Source: Web of Science)*.

Publications in Peer Reviewed Journals

Perera Y, Melão A, Ramón A, Vásquez D, Ribeiro D, Perea SE, Barata JT (2020). Clinical-grade peptide-based inhibition of CK2 blocks viability and proliferation of T-ALL cells and counteracts IL-7 stimulation and stromal support. Cancers 12(6):1377. *(IF: 6.126, Citations: 1. Source: Web of Science).*

de Smedt R, Morscio J, Reunes L, Roels J, Bardelli V, Lintermans B, van Loocke W, Almeida ARM, Cheung LC, Kotecha RS, Mansour MR, Uyttebroeck A, Vandenberghe P, La Starza R, Mecucci C, Lammens T, Van Roy N, De Moerloose B, Barata JT, Taghon T, Goossens S, Van Vlierberghe P (2020). Targeting cytokine and therapy induced PIM1 activation in T-cell acute lymphoblastic leukemia and lymphoma. Blood 135(19):1685-1695. *(IF: 17.794, Citations: 1. Source: Web of Science).*

Garcia EG, Veloso A, Oliveira ML, Allen JR, Loontiens S, Brunson D, Do D, Yan C, Morris R, Iyer S, Garcia SP, Iftimia N, Van Loocke W, Matthijssens F, McCarthy K, Barata JT, Speleman F, Taghon T, Gutierrez A, Van Vlierberghe P, Haas W, Blackburn JS, Langenau DM (2020). PRL3 enhances T-cell acute lymphoblastic leukemia growth through suppressing T-cell signaling pathways and apoptosis. Leukemia doi: 10.1038/s41375-020-0937-3. *(IF: 8.665, Citations: 0. Source: Web of Science).*

Valencia K, Erice O, Kostyrko K, Hausmann S, Guruceaga E, Tathireddy A, Flores NM, Sayles LC, Lee AG, Fragoso R, Sun TQ, Vallejo A, Roman M, Entrialgo-Cadierno R, Migueliz I, Razquin N, Fortes P, Lecanda F, Lu J, Ponz-Sarvise M, Chen CZ, Mazur PK, Sweet-Cordero EA, Vicent S (2020). The Mir181ab1 cluster promotes KRAS-driven oncogenesis and progression in lung and pancreas. Journal of Clinical Investigation 130(4):1879–1895. *(IF: 11.864, Citations: 1. Source: Web of Science).*

Nobre L, Zapotocky M, Khan S, Fukuoka K, Fonseca A, McKeown T, Sumerauer D, Vicha A, Grajkowska WA, Trubicka J, Li KKW, Ng HK, Massimi L, Lee JY, Kim SK, Zelcer S, Vasiljevic A, Faure-Conter C, Hauser P, Lach B, van Veelen-Vincent ML, French PJ, Van Meir EG, Weiss WA, Gupta N, Pollack IF, Hamilton RL, Nageswara Rao AA, Giannini C, Rubin JB, Moore AS, Chambless LB, Vibhakar R, Ra YS, Massimino M, McLendon RE, Wheeler H, Zollo M, Ferruci V, Kumabe T, Faria CC, Sterba J, Jung S, López-Aguilar E, Mora J, Carlotti CG, Olson JM, Leary S, Cain J, Krskova L, Zamecnik J, Hawkins CE, Tabori U, Huang A, Bartels U, Northcott PA, Taylor MD, Yip S, Hansford JR, Bouffet E, Ramaswamy V (2020). Pattern of Relapse and Treatment Response in WNT-Activated Medulloblastoma. Cell Reports Medicine 1(3):100038. *(IF:--, Citations: 3. Source: Scopus).*

Donovan LK, Delaidelli A, Joseph SK, Bielamowicz K, Fousek K, Holgado BL, Manno A, Srikanthan D, Gad AZ, Van Ommeren R, Przelicki D, Richman C, Ramaswamy V, Daniels C, Pallota JG, Douglas T, Joynt ACM, Haapasalo J, Nor C, Vladoiu MC, Kuzan-Fischer CM, Garzia L, Mack SC, Varadharajan S, Baker ML, Hendrikse L, Ly M, Kharas K, Balin P, Wu X, Qin L, Huang N, Stucklin AG, Morrissy AS, Cavalli FMG, Luu B, Suarez R, De Antonellis P, Michealraj A, Rastan A, Hegde M, Komosa M, Sirbu O, Kumar SA, Abdullaev Z, Faria CC, Yip S, Hukin J, Tabori U, Hawkins C, Aldape K, Daugaard M, Maris JM, Sorensen PH, Ahmed N, Taylor MD (2020). Locoregional delivery of CAR T cells to the cerebrospinal fluid for treatment of metastatic medulloblastoma and ependymoma. Nature Medicine 26(5):720-731. *(IF: 36.130, Citations: 7. Source: Web of Science).*

de Medeiros CB, Moxon-Emre I, Scantlebury N, Malkin D, Ramaswamy V, Decker A, Law N, Kumabe T, Leonard J, Rubin J, Jung S, Kim SK, Gupta N, Weiss W, Faria CC, Vibhakar R, Lafay-Cousin L, Chan J, Kros JM, Janzen L, Taylor MD, Bouffet E, Mabbott DJ (2020). Medulloblastoma has a global impact on health related quality of life: Findings from an international cohort. Cancer Medicine 9(2):447-459. *(IF: 3.491, Citations: 0. Source Web of Science).*

Other International Publications

Faria CC, Custódia C, Cascão R, Paisana E, Carvalho T, Pereira P, Roque R, Pimentel J, Miguéns J, Barata JT (2020). Patient-derived models of brain metastases recapitulate the histopathology and biology of human metastatic. bioRxiv. doi.org/10.1101/2020.11.26.400036.

Ongoing Research Projects

2020/2021: Antibody-based IL-7R targeted therapies. Coordinator: João Barata. Funding Agency: European Commission. Reference: ERC-862545 - IL7RsignaTHER. Amount: 150 000,00€. Total Amount: 150 000,00€.

2018/2021: Descodificar a interação entre CK2, PI3K, e o relógio molecular circadiano para melhor compreender a biologia e maximizar respostas terapêuticas dirigidas contra leucemia de células T. Coordinator: João Barata. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: CIRCA-TO-TREAT-LEUKEMIALISBOA-01-0145-FEDER-031588. Amount: 239 640,12€. Total Amount: 239 640,12€.

2018/2021: Uso da genómica para a identificação de novas terapias alvo nas metástases cerebrais. Coordinator: Cláudia Faria. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-ONC/32222/2017. Amount: 238 740,32€. Total Amount: 238 740,32€.

2017/2020: Identificação de novas terapias no tratamento do astrocitoma pilocítico em idade pediátrica. Coordinator: Cláudia Faria. Funding Agency: José de Mello Saúde. Reference: Manuel de Mello CFaria. Amount: 12 500,00€. Total Amount: 12 500,00€.

2016/2020: Brain Tumours. Coordinator: Cláudia Faria. Funding Agency: Fundação Millennium BCP. Reference: Millennium BTT. Amount: 90 000,00€. Total Amount: 90 000,00€.

2015/2020: IL7SigNeTure: IL-7/IL-7R signaling networks in health and malignancy. Coordinator: João Barata. Funding Agency: European Commission. Reference: ERC CoG 648455. Amount: 1 988 125,00€. Total Amount: 1 988 125,00€.

2011/2020: Research into brain tumours. Coordinator: Cláudia Faria. Reference: BTT. Amount: 213 993,00€. Total Amount: 213 993,00€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Communications in International Conferences

Silva A, Almeida A, Matos M, Demeyer S, Cachucho A, Hogan T, Li Y, Meijerink J, Cools J, Grosso AR, Seddon B, Barata JT. Overexpression of wild type IL-7Rα promotes T-cell acute lymphoblastic leukemia /lymphoma. EACR-AACR-ASPIC Conference on Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Oral Presentation)*

Fernandes MB, Melão A, Almeida A, Pyne S, Pyne NJ, Barata JT. Sphingosine Kinases are key effectors of IL-7-mediated leukemia expansion. EACR-AACR-ASPIC Conference on Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Communications in National Conferences

Paisana E, Cascão R, Custódia C, Qin N, Picard D, Carvalho T, Ruivo P, Pereira P, Roque R, Pimentel J, Remke M, Miguéns J, Barata JT, Faria CC. The role of ubiquitin conjugating enzymes in brain metástases. LPCC Webinar Cancer Biology: From Basic to Translational Research, September 25, 2020. *(Oral Presentation)*

Neto JL, Almeida A, Silva A, Matos M, Demeyer S, Cachucho A, Hogan T, Li U, Meijerink J, Cools J. Grosso AR, Seddon B, Barata JT. Overexpression of wild type IL-7Rα and Notch1 mutations cooperate to promote T-cell acute lymphoblastic leukemia. Bioinformatics Matters Day, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 21, 2020. *(Oral Presentation)*

Organization of Conferences

Barata JT. Chair. Inaugural Session of the Masters in Oncobiology, 2020-22 Edition, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 6, 2020.

Barata JT. Member of the Scientific Program Committee. EACR-AACR-ASPIC Conference: Tumor Microenvironment (EACR-AACR Basic and Translational Research Conference in partnership with ASPIC), Lisbon, Portugal, March 2-4, 2020.

Internationalization

Our projects regularly involve collaborations with international research groups in Europe, USA and Brazil. Current international collaborators in the leukemia projects include: Ben Seddon (UCL, England), David Langenau (MGH, Harvard University, USA), Doreen Cantrell (University of Dundee, Scotland), Nigel Pyne (University of Strathclyde, England), Scott Durum (NCI, USA), Charles Mullighan (St. Jude Children's Hospital, USA), Pieter van Vlierberghe (Ghent, Belgium), Jan Cools (VIB, Belgium), and J. Andres Yunes (Centro Infantil Boldrini, Brazil).

Current international collaborators in the brain tumor projects include: Michael D. Taylor (University of Toronto, Canada), James T. Rutka (University of Toronto, Canada) and Marc Remke (University of Dusseldorf, Germany).

Prizes, Honors and Awards

Luís Monteiro was awarded "Bolsa em Leucemia Linfocítica Aguda", Associação Portuguesa Contra a Leucemia (APCL), Sociedade Portuguesa de Hematologia (SPH) e Amgen, Portugal, September 22, 2020.

Patents/Prototypes

Rita Fragoso, João T. Barata. Provisional Patent Application - number 2013466.4. Aug 2020.

Advanced Teaching

Barata JT. Lecture. "Cytokine signaling in healthy and malignant T cells", Signalling & Techniques in Immunology Course (June 15-July 6), Utrecht University, The Netherlands, Online, June 25, 2020.

Science and Society

Rita Fragoso participated in the "Little iMMers Digital Edition" organized by Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, July 5, 2020.

PhD Theses

Alice Melão, 10/12/2020, Exploring the role of IL-7, CK2 and SphK in T-cell Acute Lymphoblastic Leukemia, Faculdade de Medicina da Universidade de Lisboa. Supervisor: João T. Barata.

João Eurico da Fonseca Lab

Major Interests/Objectives

The Rheumatology Research Unit (RRU) results from a partnership between the iMM/FMUL and the Rheumatology Department of the Santa Maria Hospital, CHULN. Basic scientists and clinicians closely work together to promote translational research and clinical excellence in the field of Rheumatology. Our research objective is the study of inflammatory joint diseases (such as Rheumatoid Arthritis (RA), Juvenile Idiopathic Arthritis (JIA), Spondyloarthritis (SpA) and Systemic Lupus Erythematosus (SLE)) in order to characterize potential tools for early diagnosis and prognosis and potential targets for novel therapies. The long-term objective of the RRU is to achieve recognition as a European League against Rheumatism Centre of Excellence in Rheumatology.

Head of Laboratory

João Eurico Cortez Cabral da Fonseca, MD/PhD

Team

Alexandre Figueiredo Brito	MSc Student
Ana Filipa Brojo Lopes de Oliveira Ramos Cordeiro	PhD Student
Ana Isabel Zenha Leite Tavares	Administrative Technician (Left July)
Ana Patrícia Costa Reis	Postdoctoral Researcher
Ana Rita da Cruz Machado	Clinical Researcher
Ângelo Miguel Silva Calado	Senior Postdoctoral Researcher
Bruno Miguel Costa Vidal	Postdoctoral Researcher
Catarina Sofia Melo Tomé	PhD Student
Cristina Dias Botelho da Ponte	PhD Student
Elsa Cristina Vieira de Sousa	Clinical Researcher
Fernando Manuel Diamantino Saraiva	Clinical Researcher
Inês de Almada Correia	MSc Student (Started September)
Joana da Silva Marques Coelho Dinis	Clinical Researcher (Left December)
Joaquim Miguel Polido Pereira	PhD Student
Manuel Quaresma Jorge Silvério António	Clinical Researcher
Maria Catarina Nobre Semedo Tenazinha	Clinical Researcher
Maria Helena Regalo da Fonseca	Senior Postdoctoral Researcher
Maria José Parreira dos Santos	Clinical Staff Scientist
Miguel Batista Lyon de Castro	MSc Student (Started September)
Mónica da Silva	MSc Student
Neide Fernanda Meireles da Silva	MSc Student
Nikita Khmelinskii	Clinical Researcher
Patrícia Godinho Bexiga Martins	Clinical Researcher
Pedro Manuel Ávila Ribeiro	PhD Student

Raquel Patrícia Campanilho Marques Ruivo	Clinical Researcher
Rita Alexandra Pedra Aguiar de Moura	Senior Postdoctoral Researcher
Rui Pedro Lourenço Teixeira	PhD Student
Sofia Carvalho Fernandes Barreira	Clinical Researcher
Sónia Filipa da Silva Figueiredo	Technician (Left June)
Susana Paula Leonardo Dias Abreu Capela	Clinical Researcher
Vasco Madeira Crispim Romão	Clinical Researcher

Laboratory Keywords/Research Areas

Diagnostic, Prognostic and response to treatment markers in rheumatic diseases, Inflammation and bone, Cohorts, Registries and databases, Recommendations and guidelines, Collaboration in clinical trials.

Major Scientific Achievements

- Characterization of the effect of TNF antagonists on psoriatic arthritis manifestations.
- Characterization of the adult phenotype of childhood arthritis.
- Early diagnosis of giant cell arteritis.
- Implementation of synovial tissue biopsy for patient stratification.
- Pre-clinical characterization of Celastrol as an effective treatment for arthritis.
- Impact of early arthritis on bone nanostructure.
- Impact of Jak inhibitors in early arthritis.

Selected Publications

Vieira-Sousa E, Alves P, Rodrigues AM, Teixeira F, Tavares-Costa J, Bernardo A, Pimenta S, Pimentel-Santos FM, Gomes JL, Aguiar R, Pinto P, Videira T, Catita C, Santos H, Borges J, Sequeira G, Ribeiro C, Teixeira L, Ávila-Ribeiro P, Martins FM, Canhão H, McInnes IB, Ribeiro RM, Fonseca JE (2020). GO-DACT: a phase 3b randomized, double-blind, placebo-controlled trial of GOlimumab plus methotrexate (MTX) versus placebo plus MTX in improving DACTylitis in MTX-naive patients with psoriatic arthritis. Annals of Rheumatic Diseases 79(4):490-498. *(IF: 16.102, Citations: 3. Source: Web of Science).*

Romão VC, Polido-Pereira J, Barros R, Luís R, Vidal B, Vieira-Sousa E, Vitorino E, Humby F, Kelly S, Pitzalis C, Saraiva F, Fonseca JE (2020). Efficacy, Safety, and Sample Quality of Ultrasound-Guided Synovial Needle Biopsy in Clinical Practice and Research: A Prospective Observational Study. Arthritis Care & Research (Hoboken) 72(10):1497-1505. *(IF: 4.056, Citations: 1. Source: Web of Science).*

Carmona-Fernandes D, Santos MJ, Canhão H, Fonseca JE (2013). Anti-ribosomal P protein IgG autoantibodies in patients with systemic lupus erythematosus: diagnostic performance and clinical profile. BMC Medicine 11:98. *(IF: 6.782, Citations: 25. Source: Web of Science).*

Moura RA, Cascão R, Canhão H, Sousa E, Mourão AF, Polido-Pereira J, Rodrigues AM, Queiroz MV, Souto-Carneiro MM, Rosário HS, Graça L, Fonseca JE (2011). Cytokine pattern in early Rheumatoid arthritis favors B cell activation and survival. Rheumatology 50(2):278-82. *(IF: 5.606, Citations: 37. Source Web of Science).*

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Caetano-Lopes J, Nery AM, Canhão H, Duarte J, Cascão R, Rodrigues A, Perpétuo I, Abdulghani S, Amaral PM, Sakaguchi S, Konttinen YT, Graça L, Vaz MF, Fonseca JE (2010). Chronic arthritis leads to disturbances in the bone collagen network. Arthritis Research & Therapy 12(1):R9. *(IF: 4.103, Citations: 25. Source: Web of Science).*

Publications in Peer Reviewed Journals

Santiago TL, Santos E, Duarte AC, Martins P, Sousa M, Guimarães F, Azevedo S, Ferreira RM, Guerra M, Cordeiro A, Cordeiro I, Pimenta S, Pinto P, Pinto AM, Salvador MJ, da Silva JAP. Happiness, quality of life and their determinants among people with systemic sclerosis: a structural equation modeling approach. Rheumatology (Oxford). Epub ahead of print. *(IF: 5.606, Citations: 0. Source: Web of Science).*

Borrega R, Araújo C, Aguiam N, Magro F, Fonseca JE, Danese S, Lopes J, Goncalves J. Systematic Review and Principal Components Analysis of the Immunogenicity of Adalimumab. BioDrugs 35(1):35-45. *(IF: 5.313, Citations: 0. Source: Web of Science).*

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Ongoing Research Projects

2020/2022: Juvenile Idiopathic Arthritis. Coordinator: João Eurico da Fonseca. Funding Agency: PRES/EMERGE/EMUNET. Amount: 20 000,00€. Total Amount: 20 000,00€.

2020/2023: LESS – Lisbon Enthesitis Sonographic Score. Coordinator: João Eurico da Fonseca. Funding Agency: Novartis. Amount: 5 000,00€. Total Amount: 5 000,00€.

2020/2023: Clinical course and predictors of severe coronavirus disease 19 among patients with rheumatic diseases in Portugal – a multicentre, observational, nationwide study. Coordinator: João Eurico da Fonseca. Funding Agency: Merck Sharp & Dohme. Amount: 20 482,00€. Total Amount: 20 482,00€.

2020/2023: Comparative effectiveness of tofacitinib and interleukin (IL)23/IL17 inhibitors in PsA patients registered in the Rheumatic Diseases Portuguese Register. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 9 000,00€. Total Amount: 9 000,00€.

2019/2026: Identification of the Molecular Mechanisms of non-response to Treatments, Relapses and Remission in Autoimmune, Inflammatory, and Allergic Conditions. Coordinator: João Eurico da Fonseca. Funding Agency: European Commission. Reference: 3TR. Amount: 290 996,25€. Total Amount: 40 273 191,50€.

2019/2023: Prosprective observational study to examine the change of vision-related quality of life in patients with spondyloarthritis during treatment with montly subcutaneous. Coordinator: João Eurico da Fonseca. Funding Agency: Merck Sharp & Dohme. Amount: 59 175,00€. Total Amount: 59 175,00€.

2019/2022: Estudo da permeabilidade intestinal e do microbioma em doentes com lúpus eritrematoso sistémico. Coordinator: João Eurico da Fonseca. Funding Agency: L'Oréal/FCT. Amount: 15 000,00€. Total Amount: 15 000,00€.

2019/2022: Estudo da permeabilidade intestinal e do microbioma em doentes com lúpus eritrematoso sistémico. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Genética. Amount: 10 000,00€. Total Amount: 10 000,00€.

2019/2022: The role of JAK-STAT signalling pathway as key to chronic arthritis onset. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 9 000,00€. Total Amount: 9 000,00€.

2018/2021: Loss of follow up dos doentes sob biológicos. Coordinator: João Eurico da Fonseca. Funding Agency: Novartis. Amount: 6 650,00€. Total Amount: 6 650,00€.

2018/2021: Immune response to Hepatitis B and Influenza vaccines in rheumatic patients under biological therapies. Coordinator: João Eurico da Fonseca. Funding Agency: Novartis. Amount: 10 000,00€. Total Amount: 10 000,00€.

2018/2021: MILES STUDY – Mesotherapy in Lateral Epicondylitis, a prospective randomized controlled Study. Coordinator: João Eurico da Fonseca. Funding Agency: Fundação Grünenthal. Amount: 10 000,00€. Total Amount: 10 000,00€.

2017/2022: The effect of Tofacitinib on B cells in Rheumatoid Arthritis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 15 000,00€. Total Amount: 15 000,00€.

2017/2021: Preclinical evaluation of celastrol for the treatment of RA: long-term efficacy and safety in the chronic DBA/1 mice model. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 10 000,00€. Total Amount: 10 000,00€.

2017/2021: Long term effect of tofacitinib on bone: friend or foe? Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 15 000,00€. Total Amount: 15 000,00€.

2017/2021: Predictors of response to ultrasound-guided sacroiliac joint corticosteroid-injection in patients with active sacroiliitis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: US IN SACROILITIS. Amount: 5 884,00€. Total Amount: 5 884,00€.

2017/2020: Autoinflammatory Diseases: analysis based on The Rheumatic Diseases Portuguese Register. Coordinator: João Eurico da Fonseca. Funding Agency: Novartis. Amount: 12 680,00€. Total Amount: 12 680,00€.

2017/2020: Linking Biomechanics, Inflammation and Bone Formation in Psoriatic Arthritis. Coordinator: João Eurico da Fonseca. Funding Agency: UCB Pharma. Reference: UCB ES. Amount: 51 350,00€. Total Amount: 51 350,00€.

2017/2020: Tapering Biologics in PSA. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: PSA. Amount: 9 500,00€. Total Amount: 9 500,00€.

2017/2020: Systemic Sclerosis Clinical Study. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: InRNA. Amount: 12 500,00€. Total Amount: 12 500,00€.

2017/2020: The role of lncRNAs in Rheumatoid Arthritis-associated bone degradation. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: SSPECT. Amount: 8 750,00€. Total Amount: 8 750,00€.

2017/2020: Ensaio clínico de mesoterapia. Coordinator: João Eurico da Fonseca. Funding Agency: BIAL. Reference: Mesoterapia. Amount: 4 831,25€. Total Amount: 4 831,25€.

2017/2020: B Cells in Juvenile Idiopathic Arthritis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: B cell in AIJ. Amount: 18 000,00€. Total Amount: 18 000,00€.

2016/2022: Paget's disease of bone - contribution to the study of its pathogenesis. Coordinator: João Eurico Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 3 000,00€. Total Amount: 3 000,00€.

2016/2020: Blood biomarkers of synovial tissue phenotype as predictors of response to TNF inhibitors and tocilizumab in rheumatoid arthritis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 6 500,00€. Total Amount: 6 500,00€.

2016/2020: Synovial pathobiology and clinical differences in elderly and younger-onset of rheumatoid arthirtis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Amount: 3 850,00€. Total Amount: 3 850,00€.

2016/2020: The role of certolizumab in non-infectious uveitis. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Oftalmologia. Reference: Uveítes. Amount: 5 000,00€. Total Amount: 5 000,00€.

2016/2020: Is ultrasound a good surrogate marker for remission in RA? (Association of ultrasound and histological synovitis in rheumatoid arthritis patients in clinical remission). Coordiantor: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: Ultrasound - SPR JPP. Amount: 10 000,00€. Total Amount: 10 000,00€.

2015/2020: Disease course and adult outcomes of childhood-onset rheumatic diseases. Coordinator: João Eurico da Fonseca. Funding Agency: Sociedade Portuguesa de Reumatologia. Reference: Bolsa de Inovação Diagnóstica. Amount: 14 500,00€. Total Amount: 14 500,00€.

2014/2020: IL-6 blockade in rheumatoid arthritis patients: impact on Tfh subsets and humoral responses. Coordinator: João Eurico da Fonseca. Funding Agency: Pfizer. Reference: BioTB. Amount: 2 500,00€. Total Amount: 2 500,00€.

2014/2020: Post-transcriptional regulation of response to Etanercept in patients with rheumatoid arthritis. Coordinator: Helena Canhão. Funding Agency: Pfizer. Reference: WI187429. Amount: 40 000,00€. Total Amount: 40 000,00€.

2013/2020: Inhibition of bone and cartilage degradation in rat induced arthritis treated with tofacitinib. Coordinator: João Eurico da Fonseca. Funding Agency: Pfizer. Amount: 60 000,00€. Total Amount: 60 000,00€.

2012/2020: Golimumab as first line DMARD therapy in MTX naive psoritic arthritis - a 24 weeks eddicacy and safety study focussing on dactylitis and enthesitis. Coordinator: Elsa de Sousa. Funding Agency: Merck Sharp & Dohme. Reference: GO-DACT. Amount: 36 087,50€. Total Amount: 36 087,50€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Santos MJ. Autoanticorpos. III Curso de Internos de Reumatologia, Lisbon, Portugal, January 21, 2020.

Romão VC. História Clínica e Exame Objetivo em Reumatologia. III Curso de Internos de 2º ano, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25, 2020.

Vieira-Sousa E. Escalas de Monitorização e Atividade da Doença. III Curso de Internos do 2º Ano, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25, 2020.

Santos MJ. Lombalgia – Especificidades da Reumatologia. 18º Convénio ASTOR – 27ªs Jornadas da Unidade da Dor do HGO Lisboa, Lisbon, Portugal, January 31, 2020.

Romão VC. Doenças Inflamatórias Articulares. 5ª Edição – Pós-graduação em Medicina Laboratorial, Instituto de Ciências da Saúde, Universidade Católica Portuguesa, Lisbon, Portugal, January 31, 2020.

Romão VC. Síndromes Autoinflamatórias. 5ª Edição – Pós-graduação em Medicina Laboratorial, Instituto de Ciências da Saúde, Universidade Católica Portuguesa, Lisbon, Portugal, January 31, 2020.

Vieira-Sousa E. Vantagens da identificação e intervenção precoce nas espondilartrites axiais não radiográficas. Fórum Art&Treat Espondilartrites 2020, Peniche, Portugal, February 7, 2020.

Leal I. Avanços terapêuticos na uveíte relacionada com a espondilartrite. Fórum Art&Treat Espondilartrites 2020, Peniche, Portugal, February 8, 2020.

Dourado E. Queixas musculo-esqueléticas no Serviço de Urgência. IV Curso Básico de Urgência (Centro de Formação do Centro Hospitalar Universitário Lisboa Norte), Lisbon, Portugal, February 12, 2020.

Fonseca JE. IV Jornadas de Dermatologia, Lisbon, Portugal, February 13-14, 2020.

Cruz-Machado AR. Treat to target, uma nova abordagem para os seus doentes com gota, Real World Data. Simpósio Menarini, Queluz, Portugal, February 19, 2020.

Costa L, Conceição I, Vieira-Sousa E, Centro de Investigação Clínica do Centro Académico de Medicina de Lisboa. Sessão Aula Magna do Centro Académico de Medicina de Lisboa, Centro Hospitalar Lisboa Norte, Hospital de Santa Maria, Lisbon, Portugal, February 27, 2020.

Fonseca JE. 12 topics in rheumatology. Biomarkers in RA: a focus on synovial Tissue. Lisbon, Portugal, March 6-7, 2020.

Fonseca JE. Da teoria à prática durante a pandemia COVID-19: A reorganização do atendimento num serviço de Reumatologia. Sociedade Portuguesa de Reumatologia, Online, April 17, 2020.

Vieira-Sousa E. How to write a manuscript without plagiarism? XIV Workshop Mestrado Integrado em Medicina, Lisbon, Portugal, May 14, 2020.

Romão VC. Disbiose, imunidade das mucosas e inflamação sistémica: o exemplo da periodontite e artrite reumatoide. Seminário de Relação Periodontologia — Medicina, Pós-graduação em Periodontologia, Faculdade de Medicina Dentária da Universidade de Lisboa, Lisbon, Portugal, June 18, 2020.

Fonseca JE. Rheumatology struck by COVID-19 – a case study representative of the impact of SARS-CoV-2 on medical care. Institutode Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, June 24, 2020.

Fonseca JE. Rheumatology struck by COVID-19 – a case study. Webinar Reumatologia Brasil, June 30, 2020.

Dourado E. Reumatologia Geriátrica. Curso Intensivo de Geriatria (Iniciativa Médica 3M's), Tagus Park, Porto Salvo, Portugal, July 9, 2020.

Barreira SC. Artrite Psoriática - aspetos clínicos e papel da ecografia". Sessão Clínica do Serviço de Dermatologia, Implementação da telemedicina no Centro Hospitalar Lisboa Norte. August 24, 2020.

Leal I. In the steroid spectrum. Summer Autoimmunity School 6th Edition, Figueira da Foz, Portugal, September 9, 2020.

Campanilho-Maques R. Diagnóstico diferencial de Dor musculo-esquelética. III Curso de Reumatologia Pediátrica para Médicos Internos, September 10, 2020.

Dourado E, Castro JP. Exame objetivo osteo-articular (sessão prática). Curso Intensivo de Dor (Iniciativa Médica 3M's), Tagus Park, Porto Salvo, Portugal, September 14, 2020.

Santos MJ. Artrites Idiopáticas Juvenis – Terapêutica Imunossupressora: orientações gerais. III Curso de Reumatologia Pediátrica da Sociedade Portuguesa de Pediatria, Online, September 17, 2020.

Reis PC. Vacinas em Reumatologia Pediátrica. III Curso de Reumatologia Pediátrica da Sociedade Portuguesa de Pediatria, Online, September 17, 2020.

Oliveira-Ramos F. Vasculites Sistémicas. Curso para Internos da Sociedade Portuguesa de Pediatria, Online Event, September 18, 2020.

Marques R, Tansley S, McHugh N, McCann L. Myositis Specific Antibodies in juvenile onset Idiopathic Inflammatory Myopathy. PReS JDM working party meeting, September 24, 2020.

Vieira-Sousa E. Rheumatoid Arthritis and Cancer. XX Jornadas da ANDAR, Lisbon, Portugal, September 24-25, 2020.

Romão VC. COVID-19 e Artrite Reumatoide: o que sabemos? XX Jornadas ANDAR, Lisbon, Portugal, September 24-25, 2020.

Dourado E, Pereira J. Reumatologia. Mostra de Especialidades Médicas (Ordem dos Médicos – Região Sul), Lisbon, Portugal, September 30, 2020.

Leal I. Abordagem terapêutica da prevenção da uveíte posterior não infeciosa. Reunião Anual do GER (Grupo de Estudos de Retina), Online Event, Portugal, October 10, 2020.

Vieira-Sousa E. Dactylitis: more that arthritis. A change in Psoriatic Arthritis treatment paradigm. XXII Congresso Português de Reumatologia, Portugal, Online Event, October 13-17, 2020.

Romão VC. Drug-induced rheumatic and musculoskeletal diseases. XXII Congresso Português de Reumatologia, Portugal, Online Event, October 13-17, 2020.

Polido-Pereira J. How to use Tofacitinib in everyday practice. SIMPÓSIO Pfizer – Practicalities of Tofacitinib Treatment, XXII Congresso Português de Reumatologia, Portugal, Online Event, October 13-17, 2020.

Dourado E. Artrite: gestão da dor e da atividade da doença. Webinar (Iniciativa Médica 3M's), Lisbon, Portugal, October 17, 2020.

Leal I. Oftalmologia de A a Z na consulta de MGF. Congresso Update em Medicina Geral e Familiar, Online Event, Portugal, October 18, 2020.

Suppiah R*, Ponte C*, Grayson PC* (*joined presentation). ACR-EULAR Diagnosis and Classification study (DCVAS): an update. Vasculitis Clinical Research Investigators Meeting, Online Event, November 1, 2020.

Leal I. Behçet's disease: ocular features. North West Ophthalmology Teaching NHS, Manchester, UK, November 11, 2020.

Vieira-Sousa E. Co-Moderator Sessão de Comunicações Orais. 1.º Congresso Virtual de Dermatologia e Venereologia, Portugal, November 21-22, 2020.

Vieira-Sousa E. Can We Prevent Irreversible Damage In Psoriatic Arthritis? 1.º Congresso Virtual de Dermatologia e Venereologia, Portugal, November 21-22, 2020.

Santos MJ. Conceitos Clínicos – O que é fundamental para justificar a referenciação a Reumatologia Pediátrica. XVII Jornadas Internacionais de Reumatologia Pediátrica, Portugal, Online Event, November 25, 2020.

Oliveira-Ramos F. Tratamentos das AIJ. XVII Jornadas Internacionais de Reumatologia Pediátrica, Portugal, Online Event, November 26, 2020.

Vieira-Sousa E. Malignidade e Doença Reumática Inflamatória Sistémica. XXVIII Jornadas Internacionais do IPR 2020, Online Event, Portugal, November 26-27, 2020.

Dourado E. Exame físico osteo-articular. Reunião de Internos de MGF de Lisboa e Vale do Tejo, Lisbon, Portugal, December 2, 2020.

Capela S. O essencial sobre a gota. 23º Fórum de Apoio ao doente reumático, Lisbon, Portugal, December 3, 2020.

Romão VC. Reumatologia. Mentoring 2.0 Job Talks, Associação de Estudantes da Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 3, 2020.

Romeu JC. Mesa Redonda - Outras doenças ósseas metabólicas: Doença Óssea de Paget. Congresso Português de Osteoporose SPODOM 2020, Online Event, December 3-5, 2020.

Monti S, Ponte C, Luqmani RA. The long-term prognostic role of a quantitative ultrasound assessment in giant cell arteritis. PMR/GCA work group meeting, Online Event, December 4, 2020.

Romão VC. Research pitch. ACR/EULAR 2020 Virtual Exchange Program December 10, 2020.

Romão VC. COVID-19 e Doenças Reumáticas: o que sabemos? 23º Fórum de Apoio ao Doente Reumático, Liga Portuguesa Contra as Doenças Reumáticas, December 14, 2020.

Dourado E, Castro JP. Exame objetivo osteo-articular (sessão prática). Curso de Dor (Tonic App), Lisbon, Portugal, December 19, 2020.

Reis PC. Raquitismo Hipofosfatémico Ligado ao X. XII Congresso Português de Osteoporose – Sociedade Portuguesa de Osteoporose e Doenças Ósseas Metabólicas, December 2020.

Reis PC. How to define remission and low disease activity in Juvenile Systemic Sclerosis' renal involvement? 13th Hamburg Symposium on Juvenile Systemic Sclerosis, December 2020.

Fonseca JE. Artrite Psoriática: a outra face da Psoríase. Referenciar para prevenir o dano irreversível.

Dourado E, Martins-Martinho J. Urgências reumatológicas e dor no Serviço de Urgência. V Curso Básico de Urgência (Centro de Formação do Centro Hospitalar Universitário Lisboa Norte), Lisbon, Portugal, 2020/2021. (Available online).

Communications in International Conferences

Moura RA, Oliveira-Ramos F, Marques C, Brito A, Teixeira RL, Romão VC, Campanilho-Marques R, Teixeira V, Saavedra MJ, Ponte C, Khmelinskii N, Fonseca JE. Children with extended oligoarticular and polyarticular juvenile idiopathic arthritis have a cytokine pattern favouring B cell activation in circulation. 40th European Workshop for Rheumatology Research (EWRR), Leuven, Belgium, February 13-15, 2020. *(Poster Presentation)*

Tomé C, Barreira S, Martins P, Valido A, Barros R, Polido-Pereira J, Graca L*, Fonseca JE*, Moura RA*. Established rheumatoid arthritis patients have increased frequencies of follicular regulatory T cells in peripheral blood. 40th European Workshop for Rheumatology Research (EWRR), Leuven, Belgium, February 13-15, 2020. *(Poster Presentation)*

Vieira-Sousa E, Alves P, Rodrigues AM3, Teixeira F, Tavares-Costa J, Bernardo A, Pimenta S, Pimentel-Santos FM, Gomes JL, Aguiar R, Videira T, Pinto P, Catita C, Santos H, Borges J, Sequeira G, Ribeiro C, Teixeira L, Ávila-Ribeiro P, Martins FM, Canhão H, McInnes IB, Ribeiro RM, Fonseca JE. A Randomized Double-Blind Placebo-Controled Trial, Of GOlimumab Plus Methotrexate (MTX) Versus MTX Monotherapy, for improving DACTylitis, In MTX-Naïve Psoriatic Arthritis Patients. 40th European Workshop for Rheumatology Research (EWRR), February 13-15, 2020. *(Poster Presentation)*

Fernandes B, Bernardes M, Barreira S, Fonseca JE, Cunha M, Santos MJ, Gonçalves N, Fernandes AL, Rodrigues J, Fontes T, Costa L. Belimumab in the treatment of 38 Portuguese SLE patients: a real-life multicentric study. 12th European Lupus Congress, Online Event, March 25-27, 2020. *(Poster Presentation)*

Farinha F, Barreira S, Couto M, Cunha M, Fonseca D, Freitas R, Inês L, Luís M, Macieira C, Rodrigues J, Santos B, Torres R, Pepper R, Rahman A, Santos MJ. Membranous and proliferative lupus nephritis – analysis of a nationwide multicentre cohort. 12th European Lupus Congress, Online Event, March 25-17, 2020. *(Poster Presentation)*

Son M, Kimura Y, Aalto K, Berntson L, Dallas J, Duffy C, Glerup M, Guzman J, Herlin T, Hovi P, Hyrich K, Klotsche J, Magnusson B, McIntyre V, Nordal E, Ozen S, Santos M, Sozeri B, Beukelman T. The Initial Treatment of Systemic Juvenile Idiopathic Arthritis: An International Collaboration among 10 Registries ACR sponsored. Pediatric Rheumatology Symposium, New Orleans, USA, Online Event, April 29-May 5, 2020. *(Oral Presentation)*

Hernandez M, Wailoo A, Chrysanthou G, Carvalho PD, van der Heijde D, Santos MJ, Machado PM. Mapping from the Ankylosing Spondylitis Disease Activity Score (ASDAS) to EQ5D in Patients with Axial Spondyloarthritis. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Lauper K, Mongin D, Bergstra SA, Choquette D, Codreanu C, De Cock D, Dreyer L, Elkayam O, Hyrich K, Iannone F, Inanc N, Kristianslund E, Kvien TK, Leeb B, Lukina G, Nordström D, Pavelka K, Pombo-Suarez M, Rotar Z, Santos MJ, Strangfeld A, Courvoisier D, Fincjh A. Comparative effectiveness of JAK-inhibitors, TNF-inhibitors, abatacept and IL-6 inhibitors in an international collaboration of registers of rheumatoid arthritis patients (the "JAK-pot" study). European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Nissen MJ, Delcoigne B, Di Giuseppe D, Jacobsson L, Fagerli K, Loft AG, Ciurea A, Nordström D, Rotar, Z Iannone F, Santos MJ, Pombo-Suarez M, Gudbjornsson B, Mann H, Akkoc N, Codreanu C, van der Horst-Bruinsma I, Michelsen B, Macfarlane G, Hetland ML, Tomšič M, Ribeiro PA, Sanchez-Piedra C, Relas H, Geirsson AJ, Nekvindova L, Cetin GY, Ionescu R , Krogh NS, Askling J, Glintborg B, Lindström U. Co-medication with a conventional synthetic DMARD in patients with axial spondylarthritis is associated with improved retention of TNF inhibitors: results from the EuroSpA collaboration. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Lauper K, Kedra J, De Wit M, Fautrel B, Frisell T, Hyrich KL, Iannone F, Machado P, Ornbjerg LM, Rotar Z, Santos MJ, Stamm TA, Stones S, Strangfeld A, Landewe R, Finckh A, Bergstra SA, Courvoisier DS. A systematic review to inform the EULAR points to consider when analysing and reporting comparative effectiveness research with observational data in rheumatology. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Son MB, Kimura Y, Aalto K, Berntson I, Dallas J, Duffy C, Glerup M, Guzman J, Herlin T, Hovi P, Hyrich K, Klotsche J, Magnusson B, Mcityre V, Nordal E, Özen S, Santos MJ, Sözeri B, Beukelman T. The initial treatment of systemic juvenile idiopathic arthritis: an international collaboration among 10 registries. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Michelsen B, Georgiadis S, Di Giuseppe D, Loft AG, Nissen M, Iannone F, Pombo-Suarez M, Mann H, Rotar Z, Eklund K, Kvien TK, Santos MJ, Gudbjornsson B, Codreanu C, Yilmaz S, Wallman JK, Brahe CH, Moeller B, Favalli EG, Sánchez-Piedra C, Nekvindova L, Tomsic M, Trokovic N, Kristianlund E, Santos H, Love T, Ionescu R, Pehlivan Y, Jones GT, Van der Horst-Bruinsma I, Midtbøll Ørnbjerg L, Østergaard M, Hetland ML. Secukinumab effectiveness in 1543 patients with Psoriatic Arthritis treated in routine clinical practice in 13 European countries in the EuroSpA research Collaboration Network. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Michelsen B, Lindström U, Codreanu C, Ciurea A, Zavada J, Loft AG, Pombo-Suarez M, Onen F, Kvien TK, Rotar Z, Santos MJ, Iannone F, Hokkanen AM, Gudbjornsson B, Askling J, Ionescu R, Nissen M, Pavelka K, Sánchez-Piedra C, Akar S, Sexton J, Tomsic M, Santos H, Sebastiani M, Osterlund J, Geirsson AJ, Jones GT, Van der Horst-Bruinsma I, Georgiadis S, Brahe CH, Midtbøll Ørnbjerg L, Hetland ML, Østergaard M. Drug retention rates and treatment outcomes in 1860 axial spondyloarthritis patients treated with secukinumab in routine clinical practice in 13 European countries in the EuroSpA research collaboration network. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Farinha F, Barreira SC, Couto M, Cunha M, Fonseca D, Freitas R, Inês L, Luís M, Macieira C, Prata AR, Rodrigues J, Santos B, Pinheiro Torres R, Pepper RJ, Rahman A, Santos MJ. Risk of CKD in membranous and proliferative lupus nephritis - analysis of a nationwide multicentre cohort. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Foeldvari B, Hinrichs K, Torok, Santos MJ, Kasapcopur O, Adrovic A, Stanevicha V, Sztajnbok FR, Terreri MT, Sakamoto AP, Alexeeva E, Anton J, Katsikas M, Smith V, Cimaz R, Kostik M, Appenzeller S, Janarthanan M, Moll M, Nemcova D, Schonenberg D, Battagliotti C, Berntson L, Bica B, Brunner J, Costa Reis P, Eleftheriou D, Harel L, Horneff G, Lazarevic D, Minden K, Nielsen S, Nuruzzaman F, Patwardhan A, Uziel Y, Helmus N. Under detection of interstitial lung disease in juvenile systemic sclerosis (jSsc) utilizing pulmonary function tests. Results from the juvenile scleroderma inception cohort. European Congress of Rheumatology - EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Azevedo S, Tavares-Costa J, Melo AT, Freitas R, Cabral M, Conde M, Aguiar F, Neto A, Mourão AF, Oliveira-Ramos F, Santos MJ, Peixoto D. Predictive factors of relapse after methotrexate discontinuation in JIA patients with inactive disease. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Foeldvari B, Klotsche J, Kasapcopur O, Adrovic A, Terreri T, Cimaz R, Katsikas M, Nemcova D, Santos MJ, Brunner J, Kostik M, Minden K, Patwardhan A, Torok K, Helmus N. No disease progression after 36 months follow up in the juvenile systemic scleroderma inception cohort. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Foeldvari B, Klotsche J, Kasapcopur O, Adrovic A, Torok K, Terreri MT, Sakamoto AP, Stanevicha V, Sztajnbok FR, Anton J, Feldman B, Alexeeva E, Katsikas M, Smith V, Marrani E, Kostik M, Vasquez-Canizares N, Appenzeller S, Janarthanan M, Moll M, Nemcova D, Patwardhan A, Santos MJ, Sawhney S, Schonenberg D, Battagliotti C, Berntson L, Bica B, Brunner J, Costa Reis P, Eleftheriou D, Harel L, Horneff G, Kaiser D, Lazarevic D, Minden K, Nielsen S, Nuruzzaman F, Uziel Y, Helmus N. Is there a different presentation of juvenile systemic diffuse and limited subset? Data from the juvenile scleroderma inception cohort. www.juvenile-scleorderma.com. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Foeldvari B, Hinrichs K, Torok, Santos MJ, Kasapcopur O, Adrovic A, Stanevicha V, Sztajnbok FR, Terreri MT, Sakamoto AP, Alexeeva E, Anton J, Katsikas M, Smith V, Cimaz R, Kostik M, Appenzeller S, Janarthanan M, Moll M, Nemcova D, Schonenberg D, Battagliotti C, Berntson L, Bica B, Brunner J, Costa Reis P, Eleftheriou D, Harel L, Horneff G, Lazarevic D, Minden K, Nielsen S, Nuruzzaman F, Patwardhan A, Uziel Y, Helmus N. Underdetection of interstitial lung disease in juvenile systemic sclerosis utilizing pulmonary function tests: results from the juvenile scleroderma inception cohort. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*. This work was also presented at the PReS meeting 2020.

Foeldvari B, Klotsche J, Kasapcopur O, Adrovic A, Torok K, Terreri MT, Sakamoto AP, Stanevicha V, Sztajnbok FR, Anton J, Feldman B, Alexeeva E, Katsikas M, Smith V, Marrani E, Kostik M, Vasquez-Canizares N, Appenzeller S, Janarthanan M, Moll M, Nemcova D, Patwardhan A, Santos MJ, Sawhney S, Schonenberg D, Battagliotti C, Berntson L, Bica B, Brunner J, Costa Reis P, Eleftheriou D, Harel L, Horneff G, Kaiser D, Lazarevic D, Minden K, Nielsen S, Nuruzzaman F, Uziel Y, Helmus N. Is the presentation and severity different of the juvenile diffuse and limited subtype systemic sclerosis? Results from the juvenile scleroderma inception cohort EULAR 2020. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with rheumatic diseases- 10 year experience from a Portuguese tertiary centre. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with vasculitis – A 10-year experience from a Portuguese tertiary centre. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Barreira SC, Cruz-Machado AR, Fernandes AL, Genrinho I, Sequeira G, Monteiro P, Fonseca JE. Prescription Patterns and disease activity in Portuguese Women of Childbearing Age with Rheumatoid Arthritis, Psoriatic Arthritis, Ankylosing Spondylitis and Juvenile Idiopathic Arthritis. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with rheumatic diseases – a 10-year experience from a portuguese tertiary centre. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Manica SR, Sepriano A, Pimentel-Santos F, Gouveia N, Barcelos A, Branco JC, Bernardes M, Ferreira RM, Vieira-Sousa E, Barreira SC, Vinagre F, Roque R, Santos H, Madeira N, Rovisco J, Daniel A, Ramiro S. Effectiveness of switching between TNF inhibitors in patients with axial spondyloarthritis: is the reason to switch relevant? European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Tomé C, Barreira SC, Martins P, Valido A, Barros R, Pereira JP, Graça L, Fonseca JE, Moura RA. Established rheumatoid arthritis patients have increased frequencies of follicular regulatory T cells in peripheral blood. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Freitas R, Madeira N, Fernandes BM, Costa F, Santiago M, Neto A, Azevedo S, Madruga Dias J, Couto M, Bernardes M, Cunha Miranda L, Polido-Pereira J, Fonseca JE, Santos MJ How effective and safe are biologic disease-modifying antirheumatic drugs in elderly and very elderly patients with rheumatoid arthritis? European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Martins P, Dourado E, Melo AT, Khmelinskii N, Cordeiro I, Campanilho-Marques R. Clinical and demographic characteristics of patients with antisynthetase autoantibodies: data from a Portuguese tertiary outpatient clinic. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation) (Available Online)*

Martins P, Dourado E, Fonseca JE, Cordeiro I, Resende C. The importance of a Systemic Sclerosis Clinic in a Tertiary Referral Center – a Portuguese experience. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation) (Available Online)*

Santiago T, Santos E, Duarte AC, Martins P et al. THU0632-HPR Determinants of happiness and quality of life in people with systemic sclerosis: A structural equation modelling approach. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Nissen M, Delcoigne B, Di Giuseppe D, Jacobsson LTH, Fagerli K, Loft AG, Ciurea A, Nordström D, Rotar Z, Iannone F, Santos MJ, Pombo-Suarez M, Gudbjornsson B, Mann H, Akkoc N, Codreanu C, Van der Horst-Bruinsma I, Michelsen B, Macfarlane G, Hetland ML, Tomsic M, Moeller B, Ávila-Ribeiro P, Sánchez-Piedra C, Relas H, Geirsson AJ, Nekvindova L, Yildirim Cetin G, Ionescu R, Steen Krogh N, Askling J, Glintborg B, Lindström U. Co-medication with a conventional synthetic DMARD in patients with axial spondyloarthritis is associated with improved retention of TNF inhibitors: results from the EuroSpA collaboration. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Oral Presentation)*

Lindström U, Di Giuseppe D, Delcoigne B, Glintborg B, Moeller B, Pombo-Suarez M, Sánchez-Piedra C, Eklund K, Relas H, Gudbjornsson B, Love T, Jones GT, Ciurea A, Codreanu C, Ionescu R, Nekvindova L, Zavada J, Atas N, Yolbaş S, Fagerli K, Michelsen B, Rotar Z, Tomsic M, Iannone F, Santos MJ, Ávila-Ribeiro P, Midtbøll Ørnbjerg L, Østergaard M, Jacobsson LTH, Askling J, Nissen M. Co-medication with csDMARD has little effect on the retention of TNF inhibitors in psoriatic arthritis, results from the EuroSpA collaboration. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Romão VC, Ávila-Ribeiro P, Gonçalves MJ, Cruz-Machado AR, Guerreiro A, Teixeira V, Valido A, Silva-Dinis J, Vieira-Sousa E, Saavedra MJ, Leite E, Tato Marinho R, Fonseca JE. Poor response to hepatitis B vaccination in rheumatic patients treated with biologic therapy – implications for clinical practice. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Carvalho P, Marreiros A, Fonseca JE, Ruyssen-Witrand A, Machado PM. Clinical disease activity, MRI spinal inflammation and enthesitis are key determinants of impairment of spinal mobility in early axial spondiloarthritis – Data from the desir cohort. European Congress of Rheumatology – EULAR 2020, Online Event, June 3-6, 2020. *(Poster Presentation)*

Son MB, Kimura Y, Aalto K, Berntson I, Dallas J, Duffy C, Glerup M, Guzman J, Herlin T, Hovi P, Hyrich K, Klotsche J, Magnusson B, Mcityre V, Nordal E, Özen S, Santos MJ, Sözeri B, Beukelman T. The initial treatment of systemic juvenile idiopathic arthritis: an international collaboration among 10 registries. American College of Rheumatology Convergence, Online Event, June 5 and November 8, 2020. *(Poster Presentation)*

Barreira SC, Cruz-Machado AR, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, Pereira da Silva JA, Fonseca JE, Ponte C. Efficacy and safety of methotrexate in giant cell arteritis: results from a bicentric Portuguese cohort study. American College of Rheumatology Convergence, Online Event, June 5 and November 8, 2020. *(Poster Presentation)*

Martins P, Dourado E, Fonseca JE, Cordeiro I, Resende C. The importance of a Systemic Sclerosis Clinic in a Tertiary Referral Center – a Portuguese experience. 6th Systemic Sclerosis World Congress, Prague, Czech Republic, July 12, 2020. *(Poster Presentation)*

Martins P, Dourado E, Marques F, Jorge S, Lopes JÁ, Guerra J, Cordeiro I, Fonseca JE, Resende C. Systemic Sclerosis and Nephrotic Syndrome: an unusual association. 6th Systemic Sclerosis World Congress, Prague, Czech Republic, July 12, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with vasculitis – a 10-year experience from a tertiary centre. RheumaPreg Webinar, October 1, 2020. *(Poster Presentation)*

Martins P, Neto A, et al. Adverse pregnancy outcomes in antiphospholipid antibody carriers: results from a specialized multidisciplinary unit. RheumaPreg Webinar, October 1, 2020. *(Poster Presentarion)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with rheumatic diseases – a 10-year experience from a portuguese tertiary centre. 11th International Conference on Reproduction, Pregnancy and Rheumatic diseases, Online Event, October 1, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira SC, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Predictors of Visual Loss and Cerebrovascular Accidents in Giant Cell Arteritis. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Cruz-Machado R, Crisafulli F, Barreira SC, Martins P, Gerardi MC, Filippini M , Fredi M, Gorla R, Lazzaroni M, Nalli C, Taglietti M, Lojacono A, Zatti S, Centeno M, Araújo C, Pinto L, Franceschini F, Tincani A, Capela S, Andreoli L. Risk Factors For Adverse Pregnancy Outcomes In Women With Spondyloarthritis: An Observational Study From Two European Multidisciplinary Pregnancy Clinics. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Barreira SC, Cruz-Machado AR, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Efficacy and Safety of Methotrexate in Giant Cell Arteritis: Results from a Bicentric Portuguese Cohort Study. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Dourado E, Barreira SC, Cruz-Machado AR, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Predictors of Early Mortality for Giant Cell Arteritis at the Time of Diagnosis. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Martins-Martinho J, Ponte A, Dourado E, Khmelinskii N, Dias SS, Barreira SC, Cruz-Machado AR, Macieira C, Teixeira V, Rodrigues AM, Telles-Correia D, Fonseca JE, Ponte C. Risk Factors for Anxiety and Depression in Patients with Giant Cell Arteritis. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Dourado E, Barreira S, Cruz-Machado AR, Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Predictors of early mortality for GCA at the time of diagnosis. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Cruz-Machado AR, Barreira S, Dourado E, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Risk factors for cranial ischaemic events in giant cell arteritis – a bicentric population-based study. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Dyke B, Maybury M, Alivernini S, Cañete J, De Lucia O, Fonseca JE, Gullick N, Just S, Kane D, Koski J, Manzo A, Meric de Bellefon L, Mullan R, Najm A, Pratt A, Garcia FJR, Rawlings C, Rayner F, Romão VC, Sahbudin I, Tabechian D, Filer A. Survey of Minimally-Invasive Ultrasound-Guided Synovial Biopsy Performed at Rheumatology Centres. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Foeldvari B, Hinrichs K, Torok, Santos MJ, Kasapcopur O, Adrovic A, Stanevicha V, Sztajnbok FR, Terreri MT, Sakamoto AP, Alexeeva E, Anton J, Katsikas M, Smith V, Cimaz R, Kostik M, Appenzeller S, Janarthanan M, Moll M, Nemcova D, Schonenberg D, Battagliotti C, Berntson L, Bica B, Brunner J, Costa Reis P, Eleftheriou D, Harel L, Horneff G, Lazarevic D, Minden K, Nielsen S, Nuruzzaman F, Patwardhan A, Uziel Y, Helmus N. Under Detection of Interstitial Lung Disease in Juvenile Systemic Sclerosis (jSSc) Utilizing Pulmonary Function Tests. Results from the Juvenile Scleroderma Inception Cohort. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Schaefer V, Chrysidis S, Carrara G, Schmidt WA, Bruyn GA, Dasgupta B, De Miguel E, Diamantopoulos AP, Duftner C, Fredberg U, Nielsen B, Hartung W, Hocevar A, Iagnocco A, Juche A, Kermani T, TLorenzen T, Macchioni P, Milchert M, Døhn U, Monti S, Mukhtyar C, Ponte C, Scire C, Terslev L, Seitz L, Dejaco C. Definitions and Reliability Assessment of Chronic Ultrasound Lesions of the Axillary Artery in Giant Cell Arteritis: A Study from the OMERACT Large Vessel Vasculitis Ultrasound Working Group. American College of Rheumatology Convergence, Online Event, November 5-9, 2020. *(Poster Presentation)*

Crisafulli F, Cruz-Machado R, Barreira SC, Martins P, Gerardi MC, Filippini M, Fredi M, Gorla R, Lazzaroni M, Nalli C, Taglietti M, Lojacono A, Zatti S, Centeno M, Araújo C, Pinto L, Franceschini F, Tincani A, Capela S, Andreoli L. Gravidanza e postpartum in pazienti con spondiloartrite: chi è a rischio di flare? Dati da due centri europei. 57º Congresso Nazionale della Società Italiana di Reumatologia, Online Event, November 25-28, 2020. *(Oral Presentation)*

Papadopoulou C, Wilkinson MGLl, Campanilho-Marques R, Judith Wienke, Sanner H, Bellutti Enders F, van Royen-Kerkhof A, McCann LJ, on behalf of the PReS JDM working group. A survey of the use of share JDM recommendations in clinical practise: report of the PRES JDM working group. Young Investigator Meeting, 2020. *(Oral Presentation)*

Papadopoulou C, Wilkinson MGLl, Campanilho-Marques R, Judith Wienke, Sanner H, Bellutti Enders F, van Royen-Kerkhof A, McCann LJ, on behalf of the PReS JDM working group. A survey of the use of share JDM recommendations in clinical practise: report of the PRES JDM working group. Paediatric Rheumatology European Society Congress 2020. *(Poster Presentation)*

Fernandes BM, Barreira S, Fonseca JE, Cunha M, Santos MJ, Gonçalves N, Fernandes AL, Rodrigues J, Fontes T, Costa L, Bernardes M. Belimumab in the treatment of Portuguese Systemic Lupus Erythematosus patients: a real-life multicenter study. 12th European Lupus Meeting. *(Poster Presentation)*

Communications in National Conferences

Ferreira M, Figueira L, Polido-Pereira J, Melo Cristino J. Um caso de artrite gonocócica, Congresso Português de Patologia Clínica, Porto, Portugal, February 13-15, 2020. *(Poster Presentation)*

Tomé C, Barreira S, Martins P, Valido A, Barros R, Polido-Pereira J, Graca L*, Fonseca JE*, Moura RA*. Established rheumatoid arthritis patients have increased frequencies of follicular regulatory T cells in peripheral blood. 12 Topics in Rheumatology, CEDOC - Chronic Diseases Research Center, NOVA Medical School, Lisbon, Portugal, March 6-7, 2020. *(Poster Presentation)*

Moura RA, Oliveira-Ramos F, Marques C, Brito A, Teixeira RL, Romão VC, Campanilho-Marques R, Teixeira V, Saavedra MJ, Ponte C, Khmelinskii N, Fonseca JE. Children with extended oligoarticular and polyarticular juvenile idiopathic arthritis have a cytokine pattern favouring B cell activation in circulation. 12 Topics in Rheumatology, CEDOC - Chronic Diseases Research Center, NOVA Medical School, Lisbon, Portugal, March 6-7, 2020. *(Poster Presentation)*

Baltazar AM, Bandeira M, Silva AG, Duarte L, Serrazina J, Meireles PA, Parreira I, Gonçalves CS, Lopes JM, Mota C, Monteiro P, Alvoeiro L (*Primeira Coautoria). Covid-19 linfopenia como preditor de gravidade em doentes com covid-19 num hospital terciário. 26º Congresso Nacional de Medicina Interna, Braga, Portugal August 27-30, 2020. *(Oral Presentation)*

Parreira I*, Gaspar P, Silva VD, Meireles PA, Bessa F, Mendes CC, Passos DT, Carreira NR, Duarte L, Martins ME, Barbacena HA, Serrazina J, Dias M, Gonçalves CS, Baltazar AM, Wahnon A, Silva AG, Bandeira M, Barbosa AL, Abrantes AM, Rodrigues AF, Ferreira T, Silva MT, Lopes JM, Monteiro P, Alvoeiro L, Mota C. Caracterização clínica dos doentes internados com covid-19 num hospital terciário português. 26º Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Poster Presentation)*

Cristea V, Domingos G, Brazão C, Duarte-Monteiro AM, Falcão LM. Pitfalls of the investigation of a haemolytic anaemia. 26ª Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Poster Presentation)*

Mendes CC, Duarte L, Dias M, Rodrigues AF, Zinterl C, Rodrigues AB, Lopes JM. Síndrome de Boerhaave complicado de mediastinite e empiema – um desafio diagnóstico com final feliz. 26º Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Poster Presentation)*

Mendes CC, Duarte L, Dias M, Rodrigues AF, Zinterl C, Rodrigues AB, Lopes JM. Sarcoma eritroblástico em doente com mielofibrose primária. 26º Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Oral Presentation)*

Rodrigues F, Zinterl C, Dias M, Duarte L, Mendes CC, Rodrugues AB, Lopes JM. Anemia ferropénica – Um achado laboratorial? 26º Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Poster Presentation)*

Rodrigues F, Zinterl C, Dias M, Duarte L, Mendes CC, Rodrugues AB, Lopes JM. Doença renal poliquística – A expressão de uma doença frequente. 26º Congresso Nacional de Medicina Interna, Braga, Portugal, August 27-30, 2020. *(Image)*

Tenazinha C, Romão VC, Polido-Pereira J, Khmelinskii N, Barros R, Saraiva F, Fonseca, JE. Performance of major salivary gland ultrasound for the diagnosis of Sjögren's Syndrome in clinical practice. XXII Congresso Português de Reumatologia, Online Event, Portugal, October 13-16, 2020. *(Oral Presentation)*

Barreira SC, Cruz-Machado AR, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, Pereira da Silva JA, Fonseca JE, Ponte C Efficacy and safety of methotrexate in giant cell arteritis: results from a bicentric Portuguese cohort study XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Farinha F, Barreira S, Couto M, Cunha M; Fonseca D, Freitas R, Inês L, Luís M; Macieira C, Rodrigues J, Santos B, Torres R, Pepper R, Rahman A, Santos MJ. Membranous and proliferative lupus nephritis – analysis of a nationwide multicentre cohort. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Freitas R, Godinho F, Cordeiro A, Santos MJ. Long term experience with rituximab in rheumatoid arthritis patients. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Nero P, Pestana Lopes J, Silva I, Teixeira RL, Fonseca JE, Santos MJ, Vieira-Sousa E. New biologic and targeted synthetic DMARDs for the treatment of PsA. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Cunha MM, Vinagre F, Santos MJ, Castro A. O uso da PET-FDG no diagnóstico de arterite de células gigantes –a experiência de um centro e breve revisão da literatura. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Romão VC, Ávila-Ribeiro P, Gonçalves MJ, Cruz-Machado AR, Guerreiro AB, Teixeira V, Valido A, Silva-Dinis J, Vieira-Sousa E, Saavedra MJ, Sacadura-Leite E, Marinho RT, Fonseca JE. Poor response to hepatitis B vaccination in rheumatic patients treated with biologic therapy – implications for clinical practice. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with rheumatic diseases- 10 year experience from a portuguese tertiary centre. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Barreira SC, Cruz-Machado AR, Fernandes AL, Genrinho I, Sequeira G, Monteiro P, JE Fonseca.Prescription Patterns and disease activity in Portuguese Women of Childbearing Age with Rheumatoid Arthritis, Psoriatic Arthritis, Ankylosing Spondylitis and Juvenile Idiopathic Arthritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Dourado E, Barreira SC, Cruz-Machado AR, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Predictors of Early Mortality for Giant Cell Arteritis at the Time of Diagnosis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Cruz-Machado AR, Barreira SC, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Risk factors for cranial ischemic events in giant cell arteritis a bicentric population based study. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Cruz-Machado R, Crisafulli F, Gerardi MC, Filippini M, Fredi M, Gorla R, Lazzaroni M, Nalli C, Taglietti M, Lojacono A, Zatti S, Franceschini F, Tincani A, Andreoli L. Risk factors for adverse pregnancy outcomes in spondyloarthritis: maternal disease phenotype and disease activity may play a role. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation*)

Cruz-Machado AR, Romeu JC. Paget's disease or something else? XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Barreira SC, Cruz-Machado AR, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Risk factors for flares in pregnant women with systemic lupus erythematosus – a 10-year study in a tertiary centre. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Barreira SC, Cruz-Machado AR, Dourado E, Martins-Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Kmelinskii N, Macieira C, da Silva JAP, Fonseca JE, Ponte C. Efficacy and Safety of Methotrexate in Giant Cell Arteritis: Results from a Bicentric Portuguese Cohort Study. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins-Martinho J, Ponte A, Dourado E, Khmelinskii N, Dias SS, Barreira SC, Cruz-Machado AR, Macieira C, Teixeira V, Rodrigues AM, Telles-Correia D, Fonseca JE, Ponte C. Risk Factors for Anxiety and Depression in Patients with Giant Cell Arteritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Melo AT, Dourado E, Martins P, Khmelinskii N, Fonseca JE, Cordeiro I, Campanilho-Marques R. First clinical analysis of myositis patients registered at Reuma.pt/Myositis protocol: data from a single-center. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Melo AT, Cordeiro I, Moldovan O, Melo-Gomes S, Campanilho-Marques R. Not just another calcinosis clinical case. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Image)*

Cruz-Machado AR, Barreira SC, Martins P, Centeno M, Araújo C, Pinto L, Capela S. Maternal and perinatal outcomes in women with rheumatic diseases – a 10-year experience from a portuguese tertiary centre. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Barreira SC, Melo AT, Ponte C, Khmelinskii N. Macaroni sign and carotid occlusion in Takayasu's arteritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Fernandes BM, Barreira S, Fonseca JE, Cunha M, Santos MJ, Gonçalves N, Fernandes AL, Rodrigues J, Fontes T, Costa L, Bernardes M. Belimumab in the treatment of Portuguese Systemic Lupus Erythematosus patients: a real-life multicenter study. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Tomé C, Barreira SC, Martins P, Valido A, Barros R, Polido-Pereira J, Graça L. Fonseca JE, Moura RA. Established rheumatoid arthritis patients have increased frequencies of follicular regulatory T cells in peripheral blood. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Tenazinha C, Romão V, Polido Pereira J, Khmelinskii N, Barros R, Saraiva F, Fonseca JE. Performance of major salivar gland ultrasound for the diagnosis of Sjögren's syndrome in clinical practice. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

António MS, Parlato F, Martins P, Khmelinskii N, Braz S, Polido Pereira J. Gastric Adenocarcinoma presenting as a rheumatoid factor and anti-cyclic citrullinated protein antibodies arthritis, a case-based review of seropositive paraneoplastic arthritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

António MS, Polido-Pereira J. Tocilizumab for corticodependent polymyalgia rheumatica, reporto f a case and review of the literature. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Nero P, Lopes JP, Teixeira RL, Silva I, Santos MJ, Fonseca JE, Vieira-Sousa E. New biologic and targeted synthetic disease modifying antirheumatic drugs for the treatment of psoriatic arthritis. How are they positioned in clinical practice? XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Manica SAR, Sepriano A, Pimentel-Santos F, Gouveia N, Barcelos A, Branco JC, Bernardes M, Ferreira RM, Vieira-Sousa E, Barreira SC, Vinagre F, Roque R, Santos H, Madeira N, Rovisco J, Daniel A, Ramiro S. Effectiveness of switching between TNF inhibitors in patients with axial spondyloarthritis: is the reason to switch relevant? XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Melo AT, Dourado E, Martins P, Khmelinskii N, Fonseca JE, Cordeiro I, Campanilho-Marques R. First clinical analysis of myositis patients registered at Reuma.pt / Myositis protocol: data from a single-center. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Marona A, Sepriano S, Ramiro D, Almeida L, Brites M, Couto I, Cunha B, Fernandes J, Garcia AT, Melo L, Miranda T, Nóvoa M, Oliveira P, Pinto V, Tavares, Fonseca JE, Araújo FC. Efficacy of biosimilar infliximab CT-P13 compared to originator infliximab in rheumatoid arthritis and axial spondyloarthritis patients: data from the Portuguese Register Reuma.pt. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Martins-Martinho J, Fonseca I, Barros R, Ponte C. Orbital apex syndrome mimicking giant cell arteritis: the importance of a correct diagnosis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins-Martinho J, Dourado E, Gonçalves MJ, Valido A, Fonseca JE, Ponte C. Giant cell arteritis as a possible paraneoplastic manifestation. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Valido A, Melo AT, Santareno A, Sousa R, Inácio JR, Oliveira-Ramos F, Ponte C, Romeu JC. Posterior reversible encephalopathy syndrome and digital gangrene in a patient with granulomatosis with polyangiitis – a rare case report. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Barreira SC, Melo AT, Khmelinskii N, Ponte C. Macaroni sign and carotid occlusion in a patient with Takayasu arteritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Dourado E, Barreira SC, Cruz-Machado AR, Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, da Silva JAP, Fonseca FE, Ponte C. Predictors of early mortality for GCA at the time of diagnosis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Dourado E, Martins P, Khmelinskii N, Cordeiro I. Polymyalgia Rheumatica-like syndromes: a case series. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Dourado E, Melo AT, Khmelinskii N, Cordeiro I, Campanilho-Marques R. Clinical and demographic characteristics of patients with antisynthetase autoantibodies: data from a Portuguese tertiary outpatient clinic. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Pinto AS, Santos FC, Melo AT, Dourado E, Campanilho-Marques R, Ferreira JF, Vaz C. Impacto das doenças reumáticas: um questionário de 8 itens. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Dourado E, Teixeira V. Bywaters Lesions. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Image)*

Dourado E, Capela S, Cordeiro I. Large volume articular effusion secondary to knee osteoarthritis. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Image)*

Silvério-António M, Polido-Pereira J. Tocilizumab for corticodependent polymyalgia rheumatica, report of a case and review of the literature. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Cruz-Machado AR, Romeu JC. Paget`s disease or something else? XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Dourado E, Fonseca JE, Cordeiro I, Resende C. The importance of a Systemic Sclerosis Clinic in a Tertiary Referral Center – a Portuguese experience. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Martins P, Dourado E, Marques F, Jorge S, Lopes JÁ, Guerra J, Cordeiro I, Fonseca JE, Resende C. Systemic Sclerosis and Nephrotic Syndrome: an unusual association. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Dourado E, Barreira SC, Cruz-Machado AR, Martinho J, Raimundo D, Brites L, Assunção H, Teixeira V, Khmelinskii N, Macieira C, da Silva JAP, Fonseca FE, Ponte C. Risk factors for cranial ischaemic events in giant cell arteritis – a bicentric population-based study. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Poster Presentation)*

Azevedo S, Tavares-Costa J, Melo AT, Freitas R, Cabral M, Conde M, Aguiar F, Neto A, Mourão AF, Oliveira-Ramos F, Santos MJ, Peixoto D. Predictive factors of relapse after methotrexate discontinuation in JIA patients with inactive disease. XXII Congresso Português de Reumatologia, Online Event, October 13-16, 2020. *(Oral Presentation)*

Miguel P, Viegas I, Leal I, Foeldvari I, Angeles-Han S, Costa-Reis P. Tradução para português e validação do questionário de avaliação dos efeitos da visão de crianças com uveíte na qualidade de vida (EYE-Q). 1.ªs Jornadas Digitais de Pediatria, October 2020. *(Oral Presentation)*

Cachão J, Vilardouro AS, Durão F, Costa-Reis P, Sandes AR, Esteves da Silva JE, Stone R. Síndrome Hemolítica-Urémica: Experiência de 24 anos de uma unidade de nefrologia pediátrica. 1.ªs Jornadas Digitais de Pediatria, October 2020. *(Oral Presentation)*

Bernardo M, Lança A, Quadros C, Vilas Boas Nm Marques JG, Costa-Reis P. Descrição de um caso clínico da Síndrome de Kikuchi-Fujimoto. 1.ªs Jornadas Digitais de Pediatria, October 2020. *(Poster Presentation)*

Miguel P, Costa-Reis P, Esteves da Silva JE, Stone R. Nefrite Intersticial Aguda ao Paracetamol. 1.ªs Jornadas Digitais de Pediatria, October 2020. *(Poster Presentation)*

Dourado E, Ferro M, Guerreiro CS, Fonseca JE. Diet as a Modulator of Intestinal Microbiota in Rheumatoid Arthritis. Jornadas Internacionais do Instituto Portugês de Reumatologia 2020, Lisbon, Portugal, November 26, 2020. *(Poster Presentation)*

Martins P, Dourado E, Melo AT, Samões B, Sousa M, Freitas R, Lourenço M, Fernandes B, Costa E, Parente H, Martins F, Romão V, Khmelinskii N, Campanilho-Marques R, Cordeiro I. Clinical and demographic characteristics of patients with antisynthetase autoantibodies: nationwide analysis. Rheumatology in Practice 10th edition, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Martins P, Dourado E, Melo AT, Samões B, Sousa M, Freitas R, Lourenço M, Fernandes B, Costa E, Guimarães F, Martins F, Romão VC, Khmelinskii N, Campanilho-Marques R, Cordeiro I. Clinical characterization of Portuguese patients with Antisynthetase syndrome. Rheumatology in Practice 10th edition, Lisbon, Portugal, December 9, 2020. *(Oral Presentation)*

Martins P, Dourado E, Melo AT, Khmelinskii N, Cordeiro I, Campanilho-Marques R. Clinical and demographic characteristics of patients with antisynthetase autoantibodies: data from a Portuguese tertiary outpatient clinic. Rheumatology in Practice 10th edition, Lisbon, Portugal, December 9, 2020. *(Oral Presentation)*

Organization of Conferences

Leal I. Co-Organizer. Colóquios de Oftalmologia (Encontro Científico Anual dos serviços de Oftalmologia do CHULN e do IOGP), Lisbon, Portugal, January 24-25, 2020.

Sousa E. Fórum Art&Treat 2020 – Espondilartrites, Peniche, Portugal, February 7, 2020.

Campanilho-Marques R. Young Investigator Meeting of the Paediatric Rheumatology European Society. Organization and coordination as member of the EMERGE group from the Paediatric Rheumatology European Society. September 22-23, 2020.

Campanilho-Marques R. Juvenile Dermatomyositis Working Party Annual Meeting. Organization and coordination as responsible for the Education and Training pillar of the Juvenile Dermatomyositis Working Party from the Paediatric Rheumatology European Society. September 25, 2020.

Sousa E. XXII Congresso Português de Reumatologia, Online Event, Portugal, October 13-17, 2020.

Polido-Pereira J, Roxo A. Chair of “Sessão – Qua há de novo?”, XXII Congresso Português de Reumatologia, Online Event, October 14, 2020.

Cordeiro I. Organization and coordination on behalf of Sociedade Portuguesa de Reumatologia. XXII Congresso Português de Reumatologia, Online Event, October 2020.

Oliveira Ramos F. Co-President and Organizer. Jornadas Internacionais de Reumatologia Pediátrica, November 26-27 and December 2-3, 2020.

Teixeira RL. Organizing Committee of the CAML PhD Student's Meeting, Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, 2020-2021.

Internationalization

Fonseca JE. European Synovitis Study Group: EULAR task force on EULAR Points to consider for minimal reporting requirements in synovial tissue clinical practice and research in rheumatology.

Costa-Reis P. Jury of the Annual International BioMedical Students Meeting Research Competition 2021.

Romão VC. Clinical Abstract Reviewer, EULAR E-Congress 2020.

Campanilho-Marques R. Young Investigator Meeting of the Paediatric Rheumatology European Society. Organization and coordination as member of the EMERGE group from the Paediatric Rheumatology European Society, September 2020.

Campanilho-Marques R. Jury of the abstracts for the Young Investigator Meeting of the Paediatric Rheumatology European Society, September 2020.

Campanilho-Marques R. Jury of the application for the PReS training bursary. Paediatric Rheumatology European Society Congress, September 2020.

Campanilho-Marques R. Revision process of the abstracts submitted to Congresso Português de Reumatologia, October 2020.

Campanilho-Marques R. Jury of the abstracts for the Congresso Português de Reumatologia, October 2020.

Leal I. - Member of the Harvard Club Portugal.

Oliveira-Ramos F. Moderadora numa sessão de comunicações orais do e-Congresso Português de Reumatologia, October 13, 2020.

Calado A, Fonseca JE. Members of the GEMSTONE (Genomics of musculoskeletal traits translational network) COST Action.

Macieira C. Chair of the Júri de Poster de Casos Clínicos do XXII e-Congresso Português de Reumatologia, October 2020.

Ponte C, Falcão S, Teixeira L, Alexandra A. Abstract selection jury for original research. XXII Congresso Português de Reumatologia, e-meeting, October 2020.

Prizes, Honors and Awards

Moura RA, Oliveira-Ramos F, Marques C, Brito A, Teixeira RL, Romão VC, Campanilho-Marques R, Teixeira V, Saavedra MJ, Ponte C, Khmelinskii N, Fonseca JE. Honorable Mention Award in Clinical Investigation Poster, CEDOC - Chronic Diseases Research Center, NOVA Medical School, Portugal. March 6-7, 2020.

Costa-Reis P. Louvor n.º 126/2020, DR, 2.ª série, N.º 63, March 30, 2020.

Ponte C. Poster presentation honorable mention in the category of clinical research at the 12 Topics in Rheumatology, March 2020.

Leal I. Certificate of appreciation in recognition of outstanding contribution to Ophthalmology Services in Manchester Royal Eye Hospital, NHS, August 2020.

Ponte C. Best image honorable mention at the XXII Congresso Português de Reumatologia, October 2020.

Barreira SC, Cruz-Machado AR, Fernandes AL, Genrinho I, Sequeira G, Monteiro P, JE Fonseca. Prescription Patterns and disease activity in Portuguese Women of Childbearing Age with Rheumatoid Arthritis, Psoriatic Arthritis, Ankylosing Spondylitis and Juvenile Idiopathic Arthritis, 1º Lugar Melhor Comunicação Oral, Sociedade Portuguesa de Reumatologia, XXII Congresso Português de Reumatologia, Portugal, October 13-16, 2020.

Cruz-Machado AR, Romeu JC. Paget's disease or something else? 1º Lugar Poster Melhor Imagem, Sociedade Portuguesa de Reumatologia, XXII Congresso Português de Reumatologia, Portugal, October 13-16, 2020.

Romão VC, Ávila-Ribeiro P, Gonçalves MJ, Cruz-Machado AR, Guerreiro AB, Teixeira V, Valido A, Silva-Dinis J, Vieira-Sousa E, Saavedra MJ, Sacadura-Leite E, Marinho RT, Fonseca JE. Poor response to hepatitis B vaccination in rheumatic patients treated with biologic therapy – implications for clinical practice. Menção Honrosa de Comunicações Orais, XXII Congresso Português de Reumatologia, Portugal, October, 13-16, 2020.

Barreira SC, Melo AT, Ponte C, Khmelinskii N. Macaroni sign and carotid occlusion in Takayasu's arteritis. Menção honrosa atribuída pela Sociedade Portuguesa de Reumatologia no âmbito da apresentação no XXII Congresso Português de Reumatologia, Portugal, October 13-16, 2020.

Cruz-Machado AR, Romeu JC. Paget`s disease or something else? XXII Congresso Português de Reumatologia, Portugal, Online Event, October 13-16, 2020. Poster Presentation - 1º Lugar do Prémio Melhor Imagem.

Vieira de Sousa E. Menção Honrosa Sociedade Portuguesa Reumatologia, XXII Congresso Português de Reumatologia, Portugal, Online Event, October 13-16, 2020.

Costa-Reis P. Síndrome Hemolítica-Urémica: Experiência de 24 anos de uma unidade de nefrologia pediátrica. Honorable Mention in the 1.ªs Jornadas Digitais de Pediatria 2020.

Industry Contract Research

Rita Machado - For the project “Clinical course and predictors of severe coronavirus disease 19 among patients with rheumatic diseases in Portugal – a multicentre, observational, nationwide study”, funding from MSD in the amount of USD 23,144.84 / EUR 20.482,00 approved on November 14.

Government/Organization Contract Research

António M, Vieira-Sousa E, Fonseca JE. Fundo de Modernização Tecnológica da Sociedade Portuguesa de Reumatologia, 2020.

Teixeira RL, Patrícia M, Miranda-Rosa C, Vieira-Sousa E. “Comparative effectiveness of tofacitinib and interleukin (IL)23/IL17 inhibitors in PsA patients registered in the Rheumatic Diseases Portuguese Register”. Prémio-Bolsa Jakie – Dr. Robert Martings. Sociedade Portuguesa de Reumatologia 2020.

Martins, P, Sousa E. “Comparative effectiveness of tofacitinib and interleukin (IL)23/IL17 inhibitors in PsA patients registered in the Rheumatic Diseases Portuguese Register”, 2º lugar Bolsa Jackie, Pfizer, October 2020.

Paget's disease of bone - contribution to the study of its pathogenesis. Supervisor: João Eurico Fonseca. Coordenador: Sílvia Fernandes. Sociedade Portuguesa de Reumatologia Research Grant.

Is ultrasound a good surrogate marker for remission in RA? (Association of ultrasound and histological synovitis in rheumatoid arthritis patients in clinical remission. Supervisor: João Eurico Fonseca. Coordenador: Joaquim Pereira. Sociedade Portuguesa de Reumatologia Research Grant.

Uveítes. Supervisor: João Eurico Fonseca. Coordenador: Inês Leal. Sociedade Portuguesa de Oftalmologia.

Systemic Sclerosis Clinical Study (SSPECT). Supervisor: João Eurico Fonseca. Coordenador: Inês Cordeiro. Sociedade Portuguesa de Reumatologia.

The role of lncRNAs in Rheumatoid Arthritis-associated bone degradation. Coordinator: João Eurico Fonseca. Sociedade Portuguesa de Reumatologia. Reference: lnRNA.

B cells in Juvenile Idiopathic Arthritis. Coordinator: João Eurico Fonseca. Sociedade Portuguesa de Reumatologia.

Predictors of response to ultrasound-guided sacroiliac joint corticosteroid-injection in patients with active sacroiliitis. Supervisor: João Eurico Fonseca. Coordenador: Nikita Khemlinskii. Sociedade Portuguesa de Reumatologia.

Tapering biologics in PsA. Supervisor: João Eurico Fonseca. Coordenador: Pedro Ribeiro. Sociedade Portuguesa de Reumatologia.

Autoinflammatory Diseases: analysis based on The Rheumatic Diseases Portuguese Register. Coordinator: João Eurico Fonseca. Agency: Novartis.

Ensaio clínico de mesoterapia. Coordinator: João Eurico Fonseca. Fundação Grunenthal.

COST action GEMSTONE – Genomics of MusculoSkeletal traits TranslatiOnal Network (OC 2018-1-23069).

Advanced Teaching

Polido-Pereira J, Romão V. Exame Objetivo Geral e Exame Axial, III Curso de Internos de 2º ano de Reumatologia, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25, 2020.

Vieira-Sousa E. Escalas de Monitorização e Atividade da Doença. III Curso de Internos de 2º Ano de Reumatologia, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25, 2020.

Fonseca JE. Organizer. III Curso de Internos de 2º ano de Reumatologia, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25, 2020.

Fonseca JE. Grandes Síndromes em Reumatologia. III Curso de Internos de 2º ano de Reumatologia, Sociedade Portuguesa de Reumatologia, Lisbon, Portugal, January 24-25,2020.

Calado A. Metabolismo Glicídico. Master in Metabolic Diseases and Feeding Behavior (2019-20), Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, January 2020.

Calado, A. Respostas metabólicas à hiperglicemia e à hipoglicémia. Master in Metabolic Diseases and Feeding Behavior (2019-20), Faculdade de Medicina da Universidade de Lisboa, January 2020.

Marques R, Tansley S, McHugh N, McCann L. Myositis Specific Antibodies in juvenile onset Idiopathic Inflammatory Myopathy – Eduacation and Training. PReS JDM working party meeting, September 24, 2020.

Tomé C. XI Curso Pós-Graduado de Atualização em Ensaios Clínicos (Versão Formação à distância), Unidade de Epidemiologia Instituto de Medicina Preventiva e Saúde Pública, Faculdade de Medicina da Universidade de Lisboa, November 16 to December 23, 2020.

Calado A. Metabolismo Glicídico. Master in Metabolic Diseases and Feeding Behavior (2020-21), Faculdade de Medicina da Universidade de Lisboa, December 2020.

Capela S. Participation in the projet Mentoring Program 2.0, as a mentor of Faculdade de Medicina da Universidade de Lisboa, Centro Académico de Medicina de Lisboa.

Fonseca JE. Member of the PhD jury of the PhD Thesis Dissertation of Mário Nuno Romão Felício in Biomedical Sciences, speciality of Medical Biochemistry. (2020) "Design and mechanistic characterization of novel antimicrobial and anticancer peptides".

Calado A. Member of the PhD jury of the PhD Thesis Dissertation of Mário Nuno Romão Felício in Biomedical Sciences, speciality of Medical Biochemistry. (2020) "Design and mechanistic characterization of novel antimicrobial and anticancer peptides".

Science and Society

Cordeiro I. Entrevista de divulgação e esclarecimento do público em geral sobre Gota Úrica, Canal S+, February 2020.

Oliveira Ramos F. Artigo sobre "O que são Artrites Idiopáticas Juvenis" publicado no Sapo LifeStyle, March 20, 2020.
https://lifestyle.sapo.pt/saude/saude-e-medicina/artigos/artrites-idiopaticas-juvenis-o-que-sao

Fonseca JE. Presidência da sessão "Novos tratamentos da artrite" nas jornadas da Associação Nacional de Doentes com Artrite Reumatóide, April 15, 2020.

Fonseca JE. Notícia no jornal Público a 23 de Maio de 2020 – "Estudos sugerem que usar hidroxicloroquina para tratar a covid-19 pode ser prejudicial" com referência ao artigo "No evidence so far on the protective effect of hydroxychloroquine to prevent COVID-19: response to the comment by Joob and Wiwanitkit" publicado no Annals of Rheumatic Diseases.

Ponte C. Arterite das Células Gigantes – TV Congresso Português de Reumatologia, May 2020.
https://www.youtube.com/watch?v=s74eQ9ExXzg&ab_channel=SociedadePortuguesadeReumatologia

Ponte C. Polimialgia Reumática - TV Congresso Português de Reumatologia, May 2020.
https://www.youtube.com/watch?v=YE1rng3Ay

Costa-Reis P. A Importância das Vacinas em Pessoas com Doenças Reumáticas. Jornal da Liga Portuguesa contra as Doenças Reumáticas, July-September 2020.

Polido-Pereira J. Novos medicamentos orais (i-JAK). XX Jornadas ANDAR (Associação Nacional de Doentes com Artrite Reumatoide), Lisbon, Portugal, September 24-25, 2020.

Dourado E. Predictors of early mortality for GCA at the time of diagnosis. News Pharma (cobertura ACR Convergence 2020), October 2020.

Capela S. Vice-president of the Portuguese League against Rheumatic Diseases (LPCDR: Liga Portuguesa contra as doenças reumáticas).

Capela S. Member of the "ERN Transversal Study Group on pregnancy and family planning in rare complex diseases", ReCONNECT.

Capela S. Member of EULAR task force for the health professional's approach to pain management in inflammatory arthritis and osteoarthritis.

Capela S. Co-Reporter of the Pain group of the Portuguese Rheumatology Society.

Machado R. Entrevista ao site Rheumatology Consultant com o título "on bDMARDS and axSpA Remission".
https://www.consultant360.com/exclusive/rheumatology/inflammatory-rheumatic-disorders/rita-machado-md-bdmards-and-axspa-remission

Fonseca JE. Diversas noticias na imprensa escrita e televisão sobre a resposta à Pandemia por parte da Reumatologia e do Serviço de Reumatologia.

PhD Theses

Vasco Romão, 10/07/2020, Synovial Pathobiology and Patient Stratification in Rheumatoid Arthritis, Doutoramento em Medicina – Reumatologia, Faculdade de Medicina da Universidade de Lisboa. Supervisors: João Eurico Fonseca, Costantino Pitzalis, Helena Canhão.

João Lacerda Lab

Major Interests/Objectives

We study the period that follows Hematopoietic Stem Cell Transplantation (HSCT), aiming to identify immunological risk factors and mechanisms involved in the most common complications, namely Graft-versus-Host Disease (GVHD), infection, and relapse. We are investigating the clinical benefits of donor-derived regulatory T cell (Treg) infusion in patients with steroid-resistant GVHD, while simultaneously monitoring tissue regeneration markers and immunological parameters. Ongoing projects further aim to improve Treg therapies by using antigen-specific Treg to treat GVHD whilst retaining leukemia-specific responses. We also study virus-specific T cell responses after HSCT, and are involved in studies dissecting the pattern of genetic propensities for the emergence invasive fungal infections. Recently, we have started new projects focusing on Chimeric antigen T Cell Receptor (CAR-T) therapies using approaches that target cancer-specific proteoglycans.

Head of Laboratory

João Mascarenhas Forjaz de Lacerda, MD/PhD, Professor of Medicine at Faculdade de Medicina da Universidade de Lisboa and Senior Hematologist at Hospital Santa Maria.

Team

Ana Cristina Frazão Lopes Alho	PhD Student
Carolina Paulino Pacini	PhD Student
Diogo Gomes da Silva	Postdoctoral Researcher (Started January)
Eduardo Lima da Silva Espada	PhD Student
Inês Amendoeira Cabral	Lab Technician (Started March)
Joana Bianchi Marques Bettencourt Gesta	Postdoctoral Researcher (Left July)
Joana Brioso Infante	PhD Student
Maria Godinho Alves Vieira Duarte Soares	Senior Postdoctoral Researcher
Mariana Torres Goulart Peixoto Maurício	MSc Student
Paulo Nelson Gomes Pereira	Lab Technician (Left July)
Rita Isabel Silva de Azevedo	Senior Postdoctoral Researcher

Laboratory Keywords/Research Areas

Immune Reconstitution After Hematopoietic Stem Cell Transplantation (HSCT), Graft versus Host Disease (GvHD), Regulatory T Cell Homeostasis in HSCT Recipients, Adoptive Immunotherapy after HSCT, CAR-T Cells, Pathogen-specific Immunity after HSCT, Genetic Susceptibility for Fungal and Viral Infections.

Major Scientific Achievements

In 2020, we published the manuscript "Mesenchymal stromal cells induce regulatory T cells via epigenetic conversion of human conventional CD4 T cells in vitro" in the journal Stem Cells. This study demonstrates for the first time that human MSC induce a functional Treg-like population from purified Tcon through epigenetic modification.

The manuscript entitled "Suppression by allogeneic-specific regulatory T cells is dependent on the degree of HLA compatibility" is currently under review and focuses on the generation and expansion of antigen-specific Treg, which may disclose novel and more specific regulatory T cell populations for clinical usage.

Our team has continued to coordinate the TREGeneration consortium, a multinational project encompassing parallel clinical trials using purified donor Tregs for the treatment of steroid-refractory cGVHD. This project involves meticulous prospective immune monitoring and T cell tracking of the infused donor regulatory T cells by Next Generation Sequencing.

In the Portuguese trial, we concluded the Phase I trial and continue to actively recruit patients for the Phase II trial.

Selected Publications

Soares MV, Azevedo RI, Ferreira IA, Bucar S, Ribeiro AC, Vieira A, Pereira PNG, Ribeiro RM, Ligeiro D, Alho AC, Soares AS, Camacho N, Martins C, Lourenço F, Moreno R, Ritz J, Lacerda JF (2019). Naive and Stem Cell Memory T Cell Subset Recovery Reveals Opposing Reconstitution Patterns in CD4 and CD8 T Cells in Chronic Graft vs Host Disease. Frontiers in Immunology 6(10):334. *(IF: 4.716, Citations: 6. Source: Web of Science).*

Minskaia E, Saraiva BC, Soares MV, Azevedo RI, Ribeiro RM, Kumar SD, Vieira AIS, Lacerda JF (2018). Molecular Markers Distinguishing T cell Subtypes with TSDR Strand-Bias Methylation. Frontiers in Immunology 9:540. *(IF: 4.716, Citations: 7. Source: Web of Science).*

Gresnigt MS, Cunha C, Jaeger M, Gonçalves SM, Malireddi RK, Ammerdorffer A, Lubbers R, Oosting M, Rasid O, Jouvion G, Fitting C, Jong DJ, Lacerda JF, Campos A Jr, Melchers WJG, Lagrou K, Maertens J, Kanneganti TD, Carvalho A, Ibrahim-Granet O, van de Veerdonk FL (2018). Genetic deficiency of NOD2 confers resistance to invasive aspergillosis. Nature Communications 9:2636. *(IF: 11.878, Citations: 14. Source: Web of Science).*

Hirakawa M, Matos T, Liu H, Koreth J, Kim HT, Paul NE, Murase K, Whangbo J, Alho AC, Nikiforow S, Cutler C, Ho VT, Armand P, Alyea EP, Antin JH, Blazar BR, Lacerda JF, Soiffer RJ, Ritz J (2016). Low-dose IL-2 selectively activates subsets of CD4+ Tregs and NK cells. JCI Insight 1(18):e89278. *(IF: 6.014, Citations: 59. Source: Web of Science).*

Alho AC, Kim HT, Chammas MJ, Reynolds CG, Matos TR, Forcade E, Whangbo J, Nikiforow S, Cutler CS, Koreth J, Ho VT, Armand P, Antin JH, Alyea EP, Lacerda JF, Soiffer RJ, Ritz J (2016). Unbalanced recovery of regulatory and effector T cells after allogeneic stem cell transplantation contributes to chronic GVHD. Blood 127(5):646-657. *(IF: 16.601, Citations: 77. Source: Web of Science).*

Cunha C, Aversa F, Lacerda JF, Busca A, Kurzai O, Grube M, Löffler M, Maertens JA, Bell AS, Almeida B, Sousa PS, Barbui A, Potenza L, Caira M, Rodrigues F, Salvatori G, Pagano l, Lupi M, Garlanda C, Mantovani A, Velardi A, Romani L, Carvalho A (2014). Genetic deficiency of PTX3 and invasive aspergillosis in stem cell transplantation. The New England Journal of Medicine 370(5): 421-432. *(IF: 70.67, Citations: 175. Source: Web of Science).*

Azevedo RI, Soares MV, Albuquerque AS, Tendeiro R, Soares RS, Martins M, Ligeiro D, Victorino RM, Lacerda JF, Sousa AE (2013). Long-Term Immune Reconstitution of Naive and Memory T Cell Pools after Haploidentical Hematopoietic Stem Cell Transplantation. Biology of Blood and Marrow Transplantation 19:703. *(IF: 4.48, Citations: 15. Source: Web of Science).*

Publications in Peer Reviewed Journals

Azevedo RI, Minskaia E, Fernandes-Platzgummer A, Vieira AIS, da Silva CL, Cabral JMS, Lacerda JF (2020). Mesenchymal stromal cells induce regulatory T cells via epigenetic conversion of human conventional CD4 T cells in vitro. Stem Cells 38(8):1007–1019. *(IF: 6.022, Citations: 2. Source: Web of Science).*

Espada E, Cheng MP, Kim HT, Woolley AE, Avigan JI, Forcade E, Soares MVD, Lacerda JF, Nikiforow S, Gooptu M, Romee R, Alyea EP, Armand P, Cutler CS, Ho VT, Koreth J, Antin JH, Soiffer RJ, Marty FM, Ritz J (2020). BK virus–specific T-cell immune reconstitution after allogeneic hematopoietic cell transplantation. Blood Advances 4(9):1881–1893. *(IF: 4.9, Citations 1. Source: Web of Science).*

Gonçalves SM, Duarte-Oliveira C, Campos CF, Aimanianda V, Horst RT, Leite L, Mercier T, Pereira P, Fernández-Garcia M, Antunes D, Rodrigues CS, Barbosa-Matos C, Gaifem J, Mesquita I, Marques A, Osório NS, Torrado E, Rodrigues F, Costa S, Joosten LAB, Lagrou K, Maertens J, Lacerda JF, Campos A Jr, Brown GD, Brakhage AA, Barbas C, Silvestre R, van de Veerdonk FL, Chamilos G, Netea MG, Latgé JP, Cunha C, Carvalho A (2020). Phagosomal removal of fungal melanin reprograms macrophage metabolism to promote antifungal immunity. Nature Communications 11:2282. *(IF: 12.12, Citations: 7. Source: Web of Science).*

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Ongoing Research Projects

2020/2021: In Vitro expansion of recipiente-specific regulatory T cells for the treatment of chronic graft versus host disease ofter hematopoietic stem cell transplantation. Coordinator: João Lacerda. Funding Agency: Gilead Sciences. Reference: Programa Gilead GÉNESE 2019. Amount: 39 125,00€. Total Amount: 39 125,00€.

2020/2021: CMV infection and CMV-specific T-cell reconstitution in unrelated donor allo-HSCT after in vivo T-cell depletion with ATG. Coordinator: João Lacerda. Funding Agency: Merck Sharp & Dohme. Reference: Projecto MSD. Amount: 95 083,00€. Total Amount: 95 083,00€.

2020/2021: Prémio SPH. Coordinator: João Lacerda. Funding Agency: Sociedade Portuguesa de Hematologia. Reference: Prémio SPH. Amount: 25 000,00€. Total Amount: 25 000,00€.

2020/2021: Development of a novel chimeric antigen receptor T-cell therapu using B-cell activating factor, for triple targeting of B-cell specific receptors for multiple myeloma and other mature B cell neoplasms. Coordinator: Diogo Silva. Funding Agency: Associação Portuguesa contra a Leucemia. Reference: Bolsa em Neoplasias B Células Maduras. Amount: 15 000,00€. Total Amount: 15 000,00€.

2020/2021: Evolução dos Linfócitos T Reguladores ao Longo do Tratamento em Doentes com Leucemia Mielóide Aguda e sua Associação com Recaída. Coordinator: Joana Infante. Funding Agency: Sociedade Portuguesa de Hematologia. Reference: Bolsa de Investigação. Amount: 9 200,00€. Total Amount: 9 200,00€.

2019/2022: Apoio Doutoral Inphinit Incoming. Coordinator: Carolina Pacini. Funding Agency: "la Caixa" Foundation. Reference: Bolsas de Doutoramento 'La Caixa' Inphinit – Incoming em Centros de Investigação de Excelência de Espanha e Portugal. Amount: 115 092,00€. Total Amount: 115 092,00€.

2019/2020: Apoio Educacional. Coordinator: João Lacerda. Funding Agency: Janssen. Reference: Apoio Educacional. Amount: 19 800,00€. Total Amount: 19 800,00€.

2015/2021: TREGeneration: Repair of tissue and organ damage in refractory chronic graft versus host disease after hematopoietic stem cell transplantation by infusion of purified allogeneic donor regulatory T lymphocytes. Coordinator: João Lacerda. Funding Agency: European Commission. Reference: SC3 643776. Amount: 1 886 979,18€. Total Amount: 5 899 250,00€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Lacerda JF. Preventive measures for patients with hemato-oncological disease: transplantation". Webinar for the Portuguese Association for Leukemia and Lymphoma, April 14, 2020.

Lacerda JF. Chair of the scientific session "How Do I... manufacture T-cells for cellular therapies". European Society for Blood and Marrow Transplantation Annual Meeting, Online Event, August 31, 2020.

Lacerda JF. Is the Erasmus program possible for CODEM-LP? The 2nd Symposium of Interchange in Medicine of the Network for Cooperation of Medical Schools of Portuguese Language (CODEM-LP), Online Event, November 4, 2020.

Lacerda JF. Moderator. Hematopoietic Stem Cell Transplantation and advanced Cellular Therapies in the era of SARS-CoV-2 infection. Educational Programe of the Portuguese Society for Hematology, November 19, 2020.

Communications in International Conferences

Gómez VE, Gil AR, Guerrero EG, Cabrera CCC, Velázquez TC, Nufer M, Calderón CBG, Díaz PH, Ortega JLR, Torres NR, Martinez-Cibrian N, Tocino IE, Lacerda JF, Perez-Simon JA. Combined treatment of chronic graft versus host disease using regulatory T cells and ruxolitinib. 25th Congress of European Hematology Association – EHA, June 11-14, 2020. *(Oral Presentation)*

Organization of Conferences

JLacerda Lab organized the TREGeneration General Assembly on the April 3, 2020 (Virtual Meeting).

Internationalization

Our Unit actively collaborated in 2020 with the following international investigators under the TREGeneration Consortium of the Horizon 2020 Program:

Jerome Ritz and John Koreth, Dana-Farber Cancer Institute (DFCI) and Harvard Medical School (HMS), USA.
Matthias Edinger, Universitaetsklinik, Regensburg, Germany.
Frederic Baron, Laboratory of Cell and Gene Therapy, CHU Sart-Tilman, Liege, Belgium.
Mario Arpinati, Department of Hematology "Seragnoli", University Hospital S. Orsola-Malpighi, Bologna.
Marie-Laure Yaspo and Hans-Jörg Warnatz, Max Planck Society, Max Planck Institute for Molecular Genetics, Berlin, Germany.
Hans Lehrach, Alacris Theranostics GmbH, Berlin, Germany.
Marta Garcia-Finana, Department of Biostatistics, Faculty of Health & Life Sciences, University of Liverpool, UK.
José Antonio Pérez-Simón at the University of Seville, Spain.

José Ferro Lab

Major Interests/Objectives

We study the prevention and treatment of the cerebrovascular diseases using clinical investigation methodologies, clinical genetics, advanced statistical methods, neuropsychology, artificial intelligence, biomarkers and advanced neuroimaging. The researchers of the Unit conduct observational and experimental studies on the clinical impact of different interventions, in multinational efforts to get new targeted and personalized treatments for these common and disabling brain disorders.

Head of Laboratory

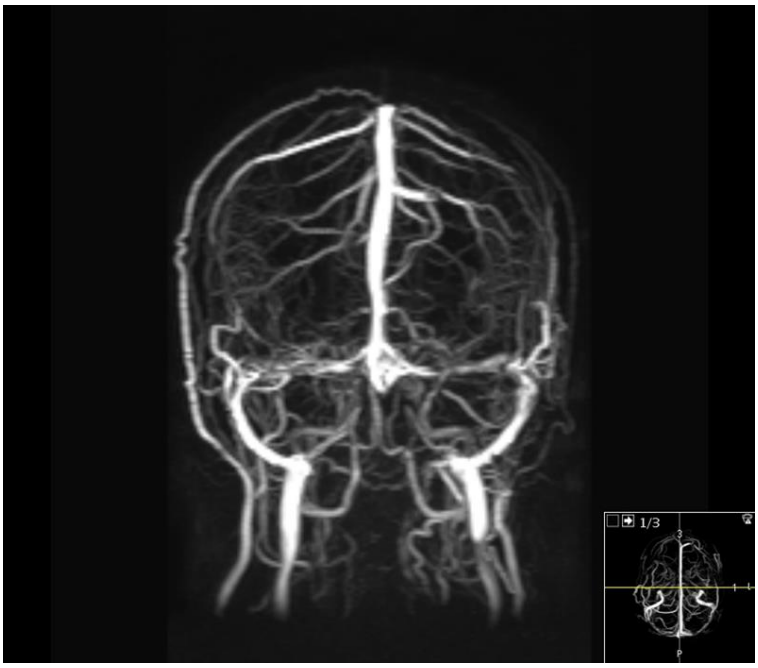
José Manuel Morão Cabral Ferro, MD, PhD, Full Professor of Neurology, Faculdade de Medicina da Universidade de Lisboa, Director, Serviço de Neurologia e Departamento de Neurociências e Saúde Mental, Centro Hospitalar Universitário Lisboa Norte, EPE

Team

Alcina Amparo Fraga Luz	Administrative Technician
Alexandre Valério de Mendonça	Clinical Staff Scientist
Ana Catarina Gaspar Fonseca	Clinical Researcher
Ana Isabel Figueira Verdelho	Clinical Staff Scientist
Bruno André e Silva Miranda	Clinical Researcher (Left December)
Carla Cristina Paulo Gabriel Bentes	Clinical Researcher
Carolina Pires Maruta	Clinical Researcher
Diana de Aguiar Dias de Sousa	Clinical Researcher
Dina Lúcia Gomes da Silva	Visiting Researcher
Elisa Cristina Leal Martins de Nunes	Lab Technician
Frederico Simões Oliveira Fernandes do Couto	Clinical Researcher
Jorge Miguel Aldinhas Ramos Ferreira	Clinical Researcher (Left December)
José Manuel Borges Fonseca	Senior Technician
Lara Isabel Pires Melo Caeiro	Clinical Researcher
Maria Gabriela Mariano Leal	Lab Technician
Maria Isabel Segurado Pavão Martins Catarino Petiz	Clinical Staff Scientist
Maria Luísa Mendonça Correia Pires	Administrative Technician
Maria Luísa Reis e Sousa de Abreu e Albuquerque	Clinical Researcher
Maria Manuela Gil Guerreiro	Clinical Staff Scientist
Mariana Durão Borges	Lab Technician
Mário Rui Jesus Santos Rodrigues	Lab Technician
Marisa Marina Fatuda Costa	Administrative Technician
Marta Almeida e Silva Granadeiro	Trainee (Started January)

Patrícia Martins Canhão	Clinical Staff Scientist
Pedro Miguel Nascimento Alves	Clinical Researcher
Sandra Maria Dias Cardoso	Lab Technician
Teresa Maria de Pinho e Melo Pereira Marques	Clinical Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

Cryptogenic Stroke, Aphasia, Spatial Orientation, Vascular Cognitive Impairment, Cerebral Venous Thrombosis.

Major Scientific Achievements

1. New dural arteriovenous fistulae do not develop within 6 months after a cerebral venous thrombosis.
2. Endovascular treatment is not superior to anticoagulation in the management of acute cerebral venous thrombosis.
3. Cardiac MRI identifies new cardiac causes of stroke in patients with cryptogenic stroke.

Selected Publications

Aguiar de Sousa D, Lucas Neto L, Arauz A, Sousa AL, Gabriel D, Correia M, Gil-Gouveia R, Penas S, Carvalho Dias M, Correia MA, Carvalho M, Canhão P, Ferro JM (2020). Early Recanalization in Patients with Cerebral Venous Thrombosis Treated with Anticoagulation. Stroke 51(4):1174-1181. *(IF: 7.19, Citations: 2. Source: Web of Science).*

Coutinho JM, Zuurbier SM, Bousser MG, Ji X, Canhão P, Roos YB, Crassard I, Nunes AP, Uyttenboogaart M, Chen J, Emmer BJ, Roosendaal SD, Houdart E, Reekers JA, van den Berg R, de Haan RJ, Majoie CB, Ferro JM, Stam J; TO-ACT investigators (2020). Effect of endovascular treatment with medical management vs standard care on severe cerebral venous thrombosis: The TO-ACT Randomized Clinical Trial. JAMA Neurology 77(8):966-973. *(IF: 13.608, Citations: 3. Source: Web of Science).*

Ferro JM, Coutinho JM, Jansen O, Bendszus M, Dentali F, Kobayashi A, van der Veen B, Miede C, Caria J, Huisman H, Diener HC; RE-SPECT CVT Study Group (2020). Dural Arteriovenous Fistulae after Cerebral Venous Thrombosis. Stroke 51(11):3344-3347. *(IF: 7.19, Citations: 0. Source: Web of Science).*

Fonseca AC, Marto JP, Pimenta D, Guimarães T, Alves PN, Inácio N, Viana-Baptista M, Pinho E Melo T, Pinto FJ, Ferro JM, Almeida AG (2020). Undetermined stroke genesis and hidden cardiomyopathies determined by cardiac magnetic resonance. Neurology 94(1):e107-e113. *(IF: 8.77, Citations: 2. Source: Web of Science).*

Publications in Peer Reviewed Journals

Aguiar de Sousa D, Lucas Neto L, Arauz A, Sousa AL, Gabriel D, Correia M, Gil-Gouveia R, Penas S, Carvalho Dias M, Correia MA, Carvalho M, Canhão P, Ferro JM (2020). Early recanalization in patients with cerebral venous thrombosis treated with anticoagulation. Stroke 51(4):1174-1181. *(IF: 7.190, Citations: 1. Source: Web of Science).*

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Altmann A, Cash DM, Bocchetta M, Heller C, Reynolds R, Moore K, Convery RS, Thomas DL, van Swieten JC, Moreno F, Sanchez-Valle R, Borroni B, Laforce R Jr, Masellis M, Tartaglia MC, Graff C, Galimberti D, Rowe JB, Finger E, Synofzik M, Vandenberghe R, de Mendonça A, Tagliavini F, Santana I, Ducharme S, Butler CR, Gerhard A, Levin J, Danek A, Frisoni G, Ghidoni R, Sorbi S, Otto M, Ryten M, Rohrer JD; Genetic FTD Initiative, GENFI (2020). Analysis of brain atrophy and local gene expression in genetic frontotemporal dementia. Brain Communications 2(2):fcaa122.

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Convery RS, Bocchetta M, Greaves CV, Moore KM, Cash DM, Van Swieten J, Moreno F, Sánchez-Valle R, Borroni B, Laforce R Jr, Masellis M, Tartaglia MC, Graff C, Galimberti D, Rowe JB, Finger E, Synofzik M, Vandenberghe R, de Mendonca A, Tagliavini F, Santana I, Ducharme S, Butler C, Gerhard A, Levin J, Danek A, Otto M, Warren JD, Rohrer JD; Genetic FTD Initiative (GENFI) (2020). Abnormal pain perception is associated with thalamo-cortico-striatal atrophy in C9orf72 expansion carriers in the GENFI cohort. Journal of Neurology Neurosurgery and Psychiatry 91(12)1325-1328. *(IF: 8.263, Citations: 0. Source: Web of Science).*

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Other International Publications

Ferro JM, Canhão P (2020). Cerebral venous thrombosis: Etiology, clinical features, and diagnosis. UpToDate, May 1.

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Martins IP (2020). ¿Por Qué Hay Una Asociación Directa Entre Migraña Y Menstruación? Migraña. 20 preguntas que sempre quisiste hacer a tu neurólogo. Belvís Nieto R, Santos Lasaosa S (Eds), 35-39.

Other National Publications

Fonseca J, Miranda F, Leal G (2020). Guia de Afasia. Laboratório de Estudos de Linguagem, Faculdade de Medicina da Universidade de Lisboa — 1ª edição.

Grincho J, Tavares A, Resende L, Fonseca J (2020). http://www.aphasiatherapyonline.com/pt/ Versão Portuguesa.

Guimarães I, Fonseca J, Correia P (Eds) (2020). Teleprática em Terapia da Fala. Linhas orientadoras para Terapeutas da Fala. Ebbol. SPTF. ISBN 978-989-33-0825-7.

Huber W, Poeck K, Weniger D, Wilmes K (portuguese version: Lauterbach M, Martins IP, Leal G, Fonseca J and Wilmes K), (2020). AAT – Bateria de Afasia de Aachen. Hogrefe.

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Ongoing Research Projects

2018/2021: Biomarcadores imagiológicos multimodais ao longo do ciclo da enxaqueca e tratamento preventivo personalizado por neurofeedback. Coordinator: Isabel Pavão Martins. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/EMD-EMD/29675/2017. Amount: 7 500,00€. Total Amount: 238 761,32€.

2016/2020: Randomised interventional prospective study of the effect of phsysical activity in vascular cognitive impairment. Coordinator: Ana Isabel Verdelho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/DTP-DES/3706/2014. Amount: 199 588,00€. Total Amount: 199 588,00€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Aguiar de Sousa D. Impact of COVID-19 pandemic on stroke care in Europe: results of European survey. 11th Antwerp Neurovascular Meeting, Antwerp, Belgium, May 2020.

Fonseca J. Intervento logopedico nell' afasia. Associazione Pedra, September 12, 2020.

Martins IP. Ser aluno da FMUL em tempo de pandemia. Jornadas de Introdução Novos Alunos da FMUL 2020. Faculdade Medicina da Universidade de Lisboa, Lisbon, Portugal, October 1, 2020.

Alves PN. Classificação da afasia. XX Congresso Nacional de Medicina Física e Reabilitação. Novas Perspetivas em MFR. Centro de Congressos Lagoas Park, Lisbon, Portugal, October 8, 2020.

Alves PN. Neuroanatomia da linguagem. XX Congresso Nacional de Medicina Física e Reabilitação. Novas Perspetivas em MFR. Centro de Congressos Lagoas Park, Lisbon, Portugal, October 8, 2020.

Fonseca J. Recuperação das afasias. 28ª Congresso Brasileiro da Sociedade Brasileira de Fonoaudiologia e 5º Congresso Iberoamericano de Fonoaudiologia, October 10, 2020.

Aguiar de Sousa D. The Less Common Strokes in Pregnancy: CVT, RCVS and the Esoterics. ESO-WSO Virtual Congress 2020, November 7-9, 2020.

Maruta C. Linhas de investigação no Laboratório de Estudos de Linguagem. Neurosciences in CAML. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 18, 2020.

Alves P. Desconexão de vias fronto-talâmicas e visuais ventrais direitas predizem falsas interpretações espaciais. Sessões clínicas do Serviço de Neurologia. Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal, November 26, 2020.

Communications in International Conferences

Alves PN, Silva DP, Fonseca AC, Martins IP, Neural basis of spatial delusions: analysis of topographic and structural disconnection patterns. European Workshop on Cognitive Neuropsychology, Bressanone, Italy, January 28, 2020. *(Oral Presentation)*

Coelho P, Rato ML, Martins IP. Chronorisk in a Chronic Cluster Headache Patient: Analysis of 2292 Attacks. 6th Congress of the European Academy of Neurology Virtual Conference, Paris, France, May 23-26, 2020. *(Oral Presentation)*

Ferreira JM, Aaron S, Sanchez van Kammen M, Conforto A, Arauz A, Carvalho M, Masjuan J, Sharma VK, Uyttenboogaart M, Werring D, Bazan R, Mohindra S, Putaala J, Weber J, Sousa D, Canhão P, Coert B, Kirubakaran P, Singh P, Coutinho J Ferro JM. Decompressive neurosurgery for patients with cerebral venous thrombosis. A prospective multicenter registry (DECOMPRESS2). 6th Congress of the European Academy of Neurology Virtual Conference, Paris, France, May 23-26, 2020. *(Oral Presentation)*

Sotero FD, Dias M, Alves PN, Martins IP. Proper names anomia after thalamic ischemic lesion. 6th Congress of the European Academy of Neurology Virtual Conference, Paris, France, May 23-26, 2020. *(Oral Presentation)*

Pompili A, Solera-Ureña R, Abad, Cardoso R, Guimarães I, Fabbri M, Martins IP, Ferreira J. Assessment of Parkinson's Disease Medication State through Automatic Speech Analysis. INTERSPEECH 2020, Shanghai, China, October 25-29, 2020. *(Oral Presentation)*

Aguiar de Sousa D, Pereira-Santos MC, Serra-Caetano A, Lucas Neto L, Sousa AL, Gabriel D, Correia M, Gil-Gouveia R, Oliveira R, Penas S, Carvalho Dias M, Correia MA, Carvalho M, Espada-Sousa A, Canhão P, Ferro J. Matrix metalloproteinase-9 and interleukin-6 in cerebral venous thrombosis – temporal profile and relation to parenchymal lesion and functional outcome. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(Oral Presentation)*

Borges M, Ferro J, Rodrigues M, Madureira S, Correia M, Vilela P, Gonçalves-Pereira M, Oliveira V, Santos AC, Santa-Clara H, Verdelho A. Physical activity and mild vascular cognitive impairment - the AFIVASC study. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Ferreira J, Aaron S, Sanchez Van Kammen M, Conforto A, Arauz A, Carvalho M, Masjuan J, Sharma V, Uyttenboogaart M, Werring D, Bazan R, Mohindra S, Putaala J, Weber J, Aguiar De Sousa D, Canhão P, Coert B, Kirubakaran P, Singh P, Coutinho J, Ferro J. Decompressive neurosurgery for patients with cerebral venous Thrombosis. A prospective multicenter registry (decompress2). ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Jaakonmäki N, Szanto T, Joutsi-Korhonen L, Martinez-Majander N, Jäkälä P, Autere J, Roine RO, Ylikotila P, Von Sarnowski B, Waje-Andreassen U, Yesilot N, Zedde ML, Junttola U, Huhtakangas J, Numminen H, Fonseca C, Redfors P, Tatlisumak T, De Leeuw FE, Tsivgoulis G, Pezzini A, Kõrv J, Ryliskiene K, Ferdinand P, Licenik R, Siegerink B, Spronk H, Ten Cate H, Putaala J. Lupus anticoagulant as an independent risk factor for early-onset cryptogenic ischemic stroke: the SECRETO study. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Vargas MA, Alves P, Amorin I, Fonseca AC. Recurrent intracranial lobar hemorrhage associated with sexual intercourse in a patient with factor XI deficiency. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Vargas MA, Canhão P, Pinho e Melo T, Ferro J, Fonseca AC. Sex differences in stroke mimics admitted to an acute stroke unit. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Ventura RM, Pinho AS, Marto JP, Sousa JA, Fonseca AC, Viana Baptista M. Electrocardiographic markers of atrial cardiopathy in cryptogenic young stroke patients. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Verdelho A, Correia M, Santa-Clara H, Borges M, Rodrigues M, Vilela P, Gonçalves-Pereira M, Santos AN, Madureira S, Ferro J. Impact of physical activity in vascular cognitive impairment - the AFIVASC study. E ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Sanchez Van Kammen M, Lindgren E, Silvis S, Hiltunen S, Heldner M, Serrano F, Zelano J, Zuurbier Y, Mansour M, Aguiar De Sousa D, Canhão P, Al-Asady S, Ekizoglu E, Redfors P, Yesilot N, Ghiasian M, Barboza MA, Arnao V, Aridon P, Punter M, Ferro J, Arauz A, Tatlisumak T, Arnold M, Putaala J, Jood K, Coutinho J. Late seizures in cerebral venous thrombosis. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(Oral Presentation)*

Shoamanesh A, Connolly SJ, Al-Shahi Salman R, Anderson C, Song L, Diener HC, Endres M, Martí Fàbregas JM, Lemmens R, Dowlatshahi D, Kwon SU, Lee BC, Ameriso SF, Milling TJ, Kasner SE, Sheth KN, Mikulik R, Xavier D, Pandian JD, Beer R, Toni D, Eckstein J, Seiffge DJ, Aamodt AH, Ferro J, Tsivgoulis G, Sharma S, Aref HM, Tarhuni W, Liou CW, Hohnloser SH, Benz A, De Sa Boasquevisque D, Katsanos AH, Sharma M, Benavente OR, Hart RG. Edoxaban for intracranial hemorrhage survivors with atrial fibrillation (ENRICH-AF): rationale and design of a global randomized trial. ESO-WSO Virtual Conference, Vienna, Austria, November 7-9, 2020. *(E-Poster Presentation)*

Rodrigues M, Batista P, Ferro J, Correia M, Borges M, Melo X, Dores H, Madureira S, Santa-Clara H, Vilela P, Verdelho A. Brain function after a single bout of aerobic exercise in vascular cognitive impairment. AFIVASC sub-study.

Communications in National Conferences

Alves P. Neural basis of spatial delusions: analysis of topographic and structural disconnection patterns. Juntos Pelo Fernando Conference, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, January 24, 2020. *(Oral Presentation)*

Calçada A, Sotero F, Fonseca AC, Aguiar de Sousa D, Pinho e Melo T, Canhão P. Parâmetros plaquetários e o prognóstico de doentes com AVC isquémico. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Poster Presentation)*

Dourado Sotero F, Canhão P. Mímicos sensitivos de AIT: duas causas incomuns. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020 *(Poster Presentation)*

Fialho MC, Pinho e Melo T, Canhão P, Ferro J, Fonseca AC. Comparação de péptidos natriuréticos para a identificação de fibrilhação auricular em AVC isquémico. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Oral Presentation)*

Leal G, Miranda F, Fonseca J, Martins IP. Um doente – Duas agrafias. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Poster Presentation)*

Miranda F, Fonseca J, Leal G. Amusia Expressiva – Um estudo de caso. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Poster Presentation)*

Santos M, Canhão P. Recorrência vascular após acidentes isquémicos transitórios com ou sem sintomas não focais acompanhantes. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Oral Presentation)*

Sotero FD, Oliveira R, Nunes Vicente B, Aguiar de Sousa D, Fonseca AC, Canhão P, Pinho e Melo T. Febre Q e doença ateromatosa – uma infeção aterogénica? 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Oral Presentation)*

Vargas M, Azevedo Kauppila L, Nascimento Alves P, Aguiar de Sousa D, Canhão P. Distonia orofacial e hemicoreia secundárias a lesão isquémica fronto-insular direita. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Poster Presentation)*

Vargas M, Canhão P, Pinho e Melo T, Ferro J, Fonseca AC. Falsos AVCs em homens e mulheres internados numa unidade de AVC. 14º Congresso SPAVC, Porto, Portugal, February 6-8, 2020. *(Oral Presentation)*

Martins IP, Gil-Gouveia R. Experiência Clínica com Ajovy em Portugal. Simpósio. Reunião Virtual da Sociedade Portuguesa de Cefaleias: Cefaleias 2020 - Inovação Terapêutica, September 24-26, 2020. *(Oral Presentation)*

Alves PA, Fonseca AC, Silva DP, Andrade MR, Melo TP, Thiebaut De Schotten M, Martins IP. Falsas Identificações Delirantes De Espaço: Estudo Da Topografia Lesional e dos Padrões de Desconexão Estrutural E Funcional. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(Oral Presentation)*

Coelho P, Schön M, Alves PA, Fonseca AC, Melo TP. Uma imagem nem sempre vale mais do que mil palavras: um mimico imagiológico de amnesia global transitória. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(E-Poster Presentation)*

Martins IP. Enxaqueca e Depressão. Meet the expert. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(Oral Presentation)*

Martins IP. Migraine: Changing Perceptions, Advancing Science, Improving Lives. Simposium. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(Oral Presentation)*

Sotero FS, Miranda F, Ventura R, Alves PN, Fonseca J, Martins IP. Melodia como Facilitador do Discurso Espontâneo. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(E-Poster Presentation)*

Sotero FS, Vicente BN, Coelho P, Valadas A, Alves PN, Antunes AP, Falcão F, Albuquerque L. Alterações da Percepção visual na encefalopatia por ozono. Congresso de Neurologia, Coimbra, Portugal, November 18-21, 2020. *(E-Poster Presentation)*

Organization of Conferences

Canhão P. Co-Organizer. 14º Congresso da SPAVC, Porto, Portugal, February 6-8, 2020.

Alves PN. Modelos de prognóstico Análise multivariada. Curso de Especialização em Introdução à Investigação Clínica: curso prático. Programa Doutoral do Centro Académico de Medicina da Faculdade de Medicina da Universidade de Lisboa 2019-2020, Lisbon, Portugal, April 18, 2020.

Martins IP. Dia Europeu de Ação contra a Enxaqueca. Atualização nas novas terapêuticas da enxaqueca: A quem se destinam? Como se inserem nas recomendações nacionais? Que resultados esperar? Comparação com os fármacos tradicionais. Como organizar os serviços. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, September 11, 2020.

Canhão P. Co-Organizer. 11ª Reunião Nacional das Unidades de AVC, Online Event, September 18, 2020.

Canhão P. Co-Organizer. 18ª Reunião Anual da SPAVC, Online Event, October 23, 2020.

Internationalization

Aguiar de Sousa D. Member at Large, Executive Committee, European Stroke Organization (ESO), since May 2020.

Aguiar de Sousa D. Member of the Public Relations Committee - Joint Conference of the European Stroke Organization Conference (ESOC) and World Stroke Organization (WSO) 2020.

Canhão P. Fellow of European Stroke Organization.

Ferro JM. Member Editorial Board "Stroke" and "European Journal of Stroke", and of the Advisory Board of "Cerebrovascular Disease" and "Journal of Neurology".

Ferro JM. Member Executive Board of the International Stroke Society.

Ferro JM. Member of the Global Advisory Board of Boehringer Ingelheim.

Ferro JM. Principal Investigator and Member of Steering Committee of Boehringer Ingelheim sponsored clinical trial RESPECT CVT.

Prizes, Honors and Awards

Aguiar de Sousa D. Best E-Poster award, Joint European Stroke Organization and World Stroke Organization Conference (ESO-WSO 2020), November 2020.

Cabral T, Martins IP. A twenty-year comparison on the burden of headache disorders" (Estudo comparativo do impacto das cefaleias nos últimos 20 anos). Bolsa SPC/Novartis Neurociências - Investigação em Enxaqueca, Sociedade Portuguesa de Cefaleias, September 24-26, 2020.

Industry Contract Research

2019-2020- *"A 12-month prospective, randomized, interventional, global, multi-center, active-controlled study comparing sustained benefit of two treatment paradigms (erenumab qm vs. oral prophylactics) in adult episodic migraine patients*" (AMGEN AMG334, Clinical Trial Protocol CAMG334A2401) PI: Isabel Pavão Martins

2020-Erenumab – Comprehensive Assessment of Efficacy in (High-Frequency) Episodic Migraine (EMBRACE). Comprehensive Assessment of Erenumab Efficacy in Subjects with High FrequencyEpisodic Migraine with at Least 1 Previously Failed Preventive Treatment: a Global, Double-blind, Placebo-controlled Phase 4 Study. Promotor AMGEN.) PI: Isabel Pavão Martins

Government/Organization Contract Research

2019 - Ongoing EEG-neurofeedback training: study of feedback modalities and brain features. Patricia Figueiredo PI.

2018 - Ongoing – "Spatial navigation and orientation after stroke". PI: Pedro Nascimento Alves. Orientation: Isabel Pavão Martins, Ana Catariana Fonseca. Laboratório de Estudos de Linguagem, Faculdade de Medicina da Universidade de Lisboa. Bolsa de Investigação em Doença Vascular Cerebral, Sociedade Portuguesa do AVC e Prémio João Lobo Antunes 2018, Santa Casa da Misericórdia de Lisboa.

2016 - ongoing - "Cognition and brain amyloid deposition in transthyretin-related familial amyloid polyneuropathy", PI: PI: Pedro Nascimento Alves. Coordination: Isabel Pavão Martins, Isabel Conceiçao. Sub-investigators: Vanda Freitas, Durval Costa. Laboratório de Estudos de Linguagem, Faculdade de Medicina da Universidade de Lisboa. 13.º Bolsa de Investigação Fundação Astrazeneca / Faculdade de Medicina da Universidade de Lisboa and Pfizer Investigator Initiated Research grant.

2014 - Ongoing – "Genetic Frontotemporal Dementia Initiative - GenFI", PI: Jonathan Rohrer, Sub-investigators: Alexandre de Mendonça, Carolina Maruta, Catarina Ferreira, Ana Verdelho, Gabriel Mitelberger-Milteny, Sónia Afonso, Ricardo Taipa. Dementia Research Centre, Institute of Neurology, University College of London, UK, Faculdade de Medicina da Universidade de Lisboa, ICNAS & Centro Hospitalar do Porto – Hospital de Santo António.

2020/2024: eMOTIONAL Cities: Mapping the cities through the senses of those who make them. Coordinator: Bruno Miranda (FMUL). Funding Agency: H2020-SC1-BHC-29 - European

Commission. Reference: SC1-BHC-29-2020-945307. Faculdade de Medicina da Universidade de Lisboa.

2019 - GLORIA - Global Registry on Long-Term Oral Antithrombotic Treatment in Patients with Atrial Fibrillation. PI: Catarina Fonseca.

Advanced Teaching

Canhão P. Course. "Curso de Preparação de Casos Clínicos para Publicação". Cursos de Apoio à Investigação, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, February 13, 2020.

Canhão P. Lecture. Basic tools of clinical research in neurosciences: defining the research question and the study protocol. Study designs. Random and systematic errors. Research in Clinical Neurosciences, Master/PhD in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online, March 31, 2020.

Canhão P. Lecture. Cohort studies. Prognostic research. Research in Clinical Neurosciences, Master/PhD in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online, March 31, 2020.

Verdelho A. As demências e a sua relação com a Disbiose na periodontite. Pós-Graduação em Periodontologia, Faculdade de Medicina Dentária da Universidade de Lisboa, Lisbon, Portugal, April 2, 2020.

Ferro JM. Lecture. Case control studies. Research in Clinical Neurosciences, Master/PhD in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online, April 14, 2020.

Martins IP. Functional organization of the mind, Methods in Cognitive assessment. Master/Doctoral Programme in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 5, 2020.

Maruta C. Assessment of memory systems. Master/Doctoral Programme in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 12, 2020.

Alves PN. Right hemisphere syndromes. Master/Doctoral Programme in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 14, 2020.

Maruta C. Executive functions and the frontal lobes. Master/Doctoral Programme in Neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 19, 2020.

Verdelho A. Modulo de Nutrição e Doença Neurológica. Mestrado em Nutrição Clínica, Escola Superior de Tecnologias da Saúde de Lisboa, Lisbon, Portugal, May 22, 2020.

Canhão P. Lecture. A revisão de publicações científicas. O processo de submissão, seleção e de discussão com os revisores. Curso Pós-graduado de Introdução à Investigação Epidemiológica e Mestrado de Epidemiologia, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online, May 22, 2020.

Ferro JM. Cerebral venous thrombosis. 6th Congress of the European Academy of Neurology Virtual Conference, Paris, France, May 23-26, 2020.

Ferro JM. Adapting stroke guidelines to sub-Saharan Africa needs. 6th Congress of the European Academy of Neurology Virtual Conference, Paris, France, May 23-26, 2020.

Canhão P. Lecture. TIA - an evolving concept. Stroke: An Integrated Approach course, Advanced Health Education, Nova Medical School, Lisbon, Portugal, July 9, 2020.

Canhão P. Course. "Curso Online de Preparação de Casos Clínicos para Publicação". Cursos de Apoio à Investigação, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, September 23, 2020.

Alves PN, Martins IP. Cognitive Functions. Masters in Neuroengineering, Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, September 23, 2020.
Martins IP. Implementação de um programa de formação dos docentes - no âmbito da preparação do ano letivo 2020/2021. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 1, 2020.

Martins IP. Curso Patologia Neurológica e Gravidez. "Cefaleias na Gravidez- diagnóstico diferencial, meios complementares de diagnóstico e terapêutica", November 13, 2020.

Aguiar de Sousa D. Co-Chair. Teaching Course "Pregnancy and Stroke", Joint Conference of the European Stroke Organization and World Stroke Organization, Vienna, November 2020.

Martins IP. Cluster e cefaleias trigemino autonómicas. Curso De Cefaleias – Diagnóstico, Terapêutica e Coordenação De Cuidados Associação Portuguesa de Medicina Geral e Familiar, Online, December 5, 12, 19, 2020.

Ferro JM. Comissão científica. Introdução à Investigação Clínica: curso prático 2020-21. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Science and Society

Martins IP. Enxaqueca na mulher, um tormento da saúde feminina. Mood Magazine. July 2020.

Alves P. Como é que o cérebro do cão reage ao rosto humano. Rádio Observador. October 09, 2020.

MSc Theses

Adriana da Fonseca Vazão, 16/07/2020, Evaluation of blood pressure control as a secondary prevention measure in poststroke, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Ana Catarina Fonseca.

Joana Amado Rodrigues, 16/07/2020, Alterações da Perceção Temporal em Doente Pós - AVC, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Ana Catarina Fonseca.

Pedro Alexandre da Silva Faria Tavares, 17/07/2020, Associação entre fadiga e a tomada de decisão baseada nas vias de esforço - Recompensa na Esclerose Múltipla, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Bruno Miranda.

Tatiana Raquel Freitas Cabral, 17/07/2020, Estudo comparativo do impacto das cefaleias num intervalo de 20 anos. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Isabel Pavão Martins.

Sara Isabel Franco Penas, 17/07/2020, Temporal trends in the clinical pattern of Cerebral Venous Thrombosis. Faculdade de Medicina da Universidade de Lisboa. Supervisor: José Ferro.

Patrícia Bidarra Figueiredo Cravo do Nascimento, 17/07/2020, Alterações psiquiátricas em doentes com epilepsia refrataria submetidos a DBS. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Carla Bentes.

Tiago da Silveira Sampaio Fernandes, 17/07/2020, Frequência de crises epiléticas em doentes submetidos a craniectomia descompressiva após AVC. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Carla Bentes.

PhD Theses

Diana Aguiar Sousa, 8/07/2020, Trombose venosa cerebral: Da Fisiopatologia à Terapêutica, Lisboa, Faculdade de Medicina da Universidade de Lisboa. Supervisor: José Ferro. Co-Supervisor: Patrícia Canhão.

Leonor Saúde Lab

Major Interests/Objectives

We want to understand the molecular and cellular mechanisms controlling fundamental regenerative processes activated in the context of a spinal cord injury.

Head of Laboratory

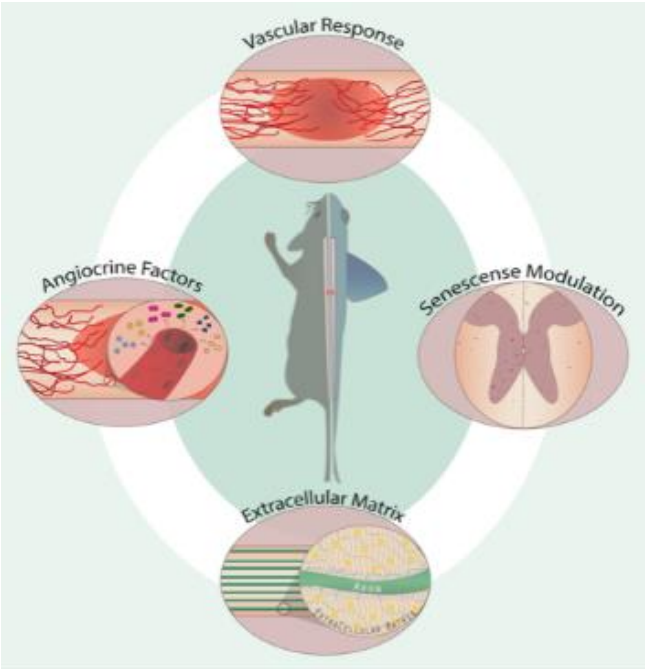
Maria Leonor Tavares Saúde, PhD, Invited Associate Professor

Team

Ana Catarina Esteves Ribeiro	Senior Postdoctoral Researcher
Ana Filipa Carvalho Marques Dias	Postdoctoral Researcher

Ana Filipa Pombinho Isidro	PhD Student (Started November)
Ana Paula Lopes Martins	MSc Student
Ana Raquel Dias Quitéria	Lab Manager
Carmen de Sena Tomás	Senior Postdoctoral Researcher
Dalila Maria Neves Silva	PhD Student
Diana Sofia Chapela Duarte Pires	PhD Student (Left April)
Diogo de Abreu Paramos de Carvalho	PhD Student (Left September)
Isaura Vanessa Antunes Martins	Postdoctoral Researcher
Maria Leonor Rebola Lameira	MSc Student (Started September)
Mariana Antas Rebocho da Costa	PhD Student (Started November)

Graphical Abstract



Laboratory Keywords/Research Areas

Regeneration, Spinal Cord, Microenvironment, Zebrafish, Mouse.

Senescent cells and their SASP as modulators of the injured spinal cord microenvironment.

Immune-vascular involvement in spinal cord injury outcomes.

Extracellular matrix and its contribution to spinal cord repair.

Major Scientific Achievements

We were awarded Prémio Santa Casa Neurociências – Melo e Castro to characterize the senescent program in the context of a spinal cord injury, not only in the spinal cord itself but also in other peripheral organs that are affected by this complex pathology.

Two of our PhD students, Diana Chapela and Diogo Paramos-de-Carvalho, defended successfully their thesis.

Selected Publications

Chapela D, Sousa S, Martins I, Cristóvão AM, Pinto P, Corte-Real S, Saúde L (2019). A zebrafish drug screening platform boosts the discovery of novel therapeutics for spinal cord injury in mammals. Scientific Reports 9(1):10475. (*IF: 3.998, Citations: 5. Source: Google Scholar).*

Ribeiro A, Monteiro JF, Certal AC, Cristovão AM, Saúde L (2017). Foxj1a is expressed in ependymal precursors, controls central canal position and is activated in new ependymal cells during regeneration in zebrafish. Open Biology 7(11):170139. (*IF: 4.93, Citations: 10. Source: Google Scholar*).

Mendes RV, Martins GG, Martins AM, Saúde L (2014). N-cadherin locks left-right asymmetry by ending the leftward movement of Hensen's node cells. Developmental Cell 30(3):353-60. (*IF: 10,092, Citations: 16. Source: Google Scholar*).

Fior R, Maxwell AA, Ma TP, Vezzaro A, Moens CB, Amacher SL, Lewis J, Saúde L (2012). Differentiation and movement of presomitic mesoderm progenitor cells are both controlled by Mesogenin1. Development 139(24):4656-65. (*IF: 5.611, Citations: 47. Source: Google Scholar*).

Azevedo AS, Grotek B, Jacinto A, Weidinger G, Saúde L (2011). The regenerative capacity of the zebrafish caudal fin is not affected by repeated amputations. PloS ONE 6(7):e22820. (*IF: 2.740, Citations: 85. Source: Google Scholar*).

Publications in Peer Reviewed Journals

Marques FG, Carvalho L, Sousa J, Diegues I, Pina F, Poli E, Rino J, Saúde L, Constantino Rosa Santos S (2020). Low doses of ionizing radiation enhance angiogenesis and consequently accelerate post-embryonic development but not regeneration in zebrafish. Scientific Reports 10(1):3137. *(IF: 3.998, Citations: 1. Source: Google Scholar).*

Ongoing Research Projects

2019/2022: Targeting induced-senescent cells: a novel approach to promote spinal cord regeneration in mammals. Coordinator: Maria Leonor Saúde. Funding Agency: Fundación Bancaria "la Caixa". Reference: Initiative i4b (HR18-00187). Amount: 444 048,00€. Total Amount: 444 048,00€.

2018/2021: A função das células senescentes induzidas na regeneração da medula espinal. Coordinator: Maria Leonor Saúde. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-NEU/30428/2017. Amount: 239 340,72€. Total Amount: 239 340,72€.

2018/2021: Modulação da reparação vascular durante a regeneração da medula espinal. Coordinator: Ana Catarina Ribeiro. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-BID/28572/2017. Amount: 239 365,16€. Total Amount: 239 365,16€.

Invited Lectures and Seminars

Saúde L. A novel approach to promote spinal cord regeneration in mammal. Sessão FCT - Fundação "la Caixa", Teatro Thalia, Lisbon, Portugal, June 17, 2020.

Saúde L. Spinal cord repair & regeneration. iMM Computational Biology and Bioinformatics Day, Online Event, October 21, 2020.

Martins I. Senescent cells as new players in Spinal Cord Injury. A tale of two opposite models: Zebrafish vs Mouse. International Online Spinal Cord Injury Research Seminars (i-OSCIRS, November 2, 2020.

Communications in International Conferences

Ribeiro A, de Sena Tomás C, Costa M, Saúde L. Vascular repair after spinal cord injury in zebrafish. 11th European Zebrafish Meeting, Online Event, October 26-27, 2020. *(Poster Presentation)*.

Communications in National Conferences

Martins I. Senescent cells as new players in Spinal Cord Injury. A tale of two opposite models: Zebrafish vs Mouse. Development in Action (DiA) Meeting, Instituto de Investigação e Inovação em Saúde (i3S) - Universidade do Porto, Porto, Portugal, December 11, 2020. *(Oral Presentation)*.

Prizes, Honors and Awards

Saúde L. Prémio Santa Casa Neurociências – Melo e Castro, Santa Casa da Misericórdia de Lisboa, Portugal, December 22, 2020.

Patents/Prototypes

Inventors: Chapela, D, Côrte-Real, S, Saúde, L, Martins, I, Sousa, S. Applicant: TechnoPhage, SA. "Eletriptan Hydrobromide for treatment of spinal cord injury and improvement of locomotor function". PPP No 116069 (22/01/2020).

Advanced Teaching

Ribeiro A. Spinal cord regeneration in zebrafish. Developmental Biology and Evolution Master, Faculdade de Ciências da Universidade de Lisboa, December 3, 2020.

Saúde L. Lecture. The zebrafish in research. IGC PhD Program, Instituto Gulbenkian de Ciência, Online Event, October 26, 2020.

Neves-Silva D. Why do we use zebrafish as an animal model? Biologia do Desenvolvimento Animal Course, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, April 7, 2020.

Ribeiro A. Creating diversity and functional integration: The Central Nervous System. Developmental Biology and Evolution Master, Faculdade de Ciências da Universidade de Lisboa, March 18, 2020.

Science and Society

Saúde L, interview, Portuguese newsmagazine VISÃO, December 24, 2020.
Saúde L, short interview, YouTube SCML, December 21, 2020.
Saúde L, moderator, A scientist in the making Q&A, European Researchers Night, YouTube Instituto de Medicina Molecular João Lobo Antunes, November 27, 2020.
Saúde L, interview, Portuguese newsmagazine VISÃO, February 20, 2020.
Saúde L, interview, Spanish newspaper La Vanguardia, January 27, 2020.

9 NeuroQuizes produced in collaboration with VAC and sponsored by Fundación "la Caixa" posted in @lsaudelab and @immolecular Instagram pages every week from October-December, 2020.

PhD Theses

Diogo Paramos-de Carvalho, 17/07/2020, On the role of senescent cells in spinal cord injury, Universidade de Lisboa - Instituto Superior Técnico. Supervisor: Leonor Saúde. Co-Supervisor: António Jacinto.

Diana Chapela, 19/06/2020, Innovative therapies for spinal cord injury: a zebrafish approach, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Leonor Saúde. Co-Supervisor: Sofia Corte-Real.

Luís Costa Lab

Major Interests/Objectives

Metastases are the hallmark of cancer lethality. They represent a unique and complex phenomenon, associated not only with genomic alterations in cancer cells, but also with a heterotypic signaling between cancer cells and host tissues. Our main goal is to better understand the molecular mechanisms driving tumor progression at the metastatic site (using bone metastases as a paradigm); and to unravel molecular signatures of organotropism through identification of "leader gene signatures" common to the primary tumor and corresponding metastasis (using colorectal cancer (CRC) as a model). We also focus in the identification of the mechanisms involved in resistance to therapy in the metastatic setting, as well as in finding new

therapeutic strategies to overcome such resistance. It is also our objective to interpret the dynamics of metastatic cancer progression by comprehensive analysis of clonal evolution and host immune and humoral response.

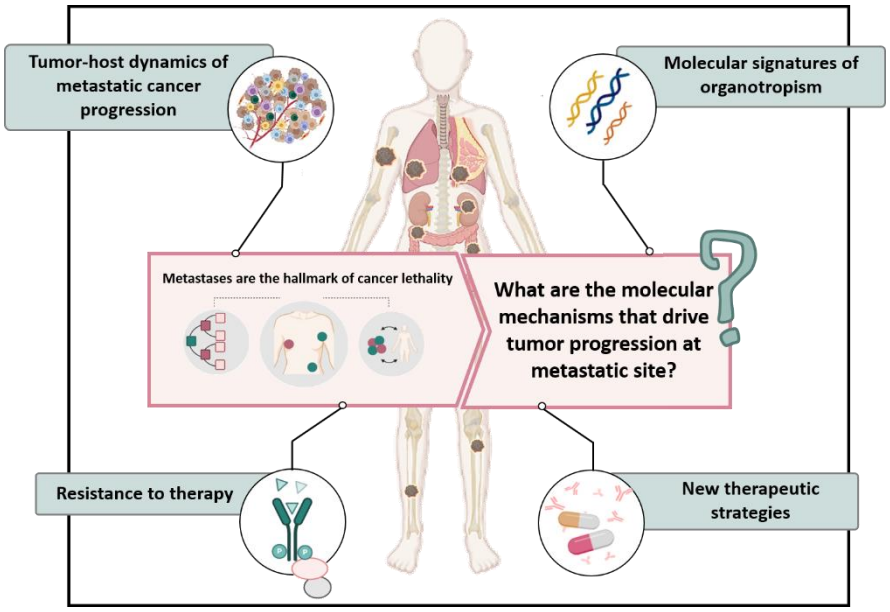
Head of Laboratory

Luís António Marques da Costa, MD, PhD, Director of the Oncology Division of Hospital Santa Maria-Centro Hospitalar Universitário Lisboa Norte, Director of the Clinical Research Center, Centro Académico de Medicina de Lisboa, Invited Associate Professor, Faculdade de Medicina da Universidade de Lisboa

Team

Ana Cláudia Martins Cavaco	Postdoctoral Researcher
Ana Leonor Pereira Bruçó	Lab Technician (Left December)
Ana Margarida Fernandes Rodrigues	MSc Student (Started September)
André Miguel Branco Mansinho	Clinical Researcher
Arlindo Júlio Rebelo da Silva Ferreira	Clinical Researcher & PhD Student (Left October)
Francisco de Aguilar António Baptista	MSc Student
Inês Fernandes Gomes	PhD Student
Isabel Cristina Ferreira Fernandes Borges da Costa	Clinical Researcher
João Brito Colaço Carvalho Belo	MSc Student (Left December)
Laura Teixeira Castro	MSc Student (Started January)
Maria Miguel Evans Seguro	MSc Student (Started August)
Marta Sofia Alves Martins	Staff Scientist
Miguel Filipe Portugal do Canto e Costa	MSc Student (Started September)
Patrícia Borges Alves	Trainee
Patrícia Isabel Martins Corredeira	Lab Technician
Raquel Sofia Cruz Duarte	PhD Student
Sandra Cristina Cara de Anjo Casimiro	Staff Scientist
Sara Miguel Jesus da Silva	MSc Student (Started September)
Soraia Lobo de Lourdes Martins	Clinical Researcher
Teresa Raquel Duarte Pacheco	Senior Postdoctoral Researcher
Tito Miguel Palmela Leitão	Clinical Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

Metastasis, Organotropism, Heterotypic Signaling, Oncodynamics, Liquid Biopsy/ Metastization, Resistance to Therapy, Tumor-Host Interface.

Major Scientific Achievements

During 2020, we completed patient's enrollment for the breast (n=113), prostate (n=36) and colorectal (n=34) cancer cohorts in the Oncodynamics Biobanking project (ODB), a clinically annotated prospective collection of liquid biopsies, aiming to characterize both the host immune response and tumor clonal evolution of metastatic cancer progressing under therapy. Results from the characterization of the immune alterations in breast cancer patients progressing under CDK4/6i plus ET were presented at SABCS2020. From our international collaboration with Illumina Inc, focusing in the identification of new prognostic and predictive biomarkers in CRC, we obtained deep-coverage WES and RNAseq data from 168 samples; and first analysis showed that HERVs establish a distinct molecular subtype in stage II/III colorectal cancer with poor outcome (In press, npj Genomic Medicine). We also published an international patent on RANK pathway inhibitors in combination with CDK4/6 inhibitors (WO2020/222668A1).

Selected Publications

Coleman RE, Croucher PI, Padhani AR, Clézardin P, Chow E, Fallon M, Guise T, Colangeli S, Capanna R, Costa L (2020). Bone metastases. Nature Reviews Disease Primers 6(1):83. Review. *(IF: 40.689, Citations: 0. Source: Web of Science).*

Gomes I, de Almeida BP, Dâmaso S, Mansinho A, Correia I, Henriques S, Cruz-Duarte R, Vilhais G, Félix P, Alves P, Corredeira P, Barbosa-Morais N, Costa L, Casimiro S (2020). Expression of receptor activator of NFkB (RANK) drives stemness and resistance to therapy in ER+HER2- breast cancer. Oncotarget 11 (19):1714-1728. *(IF:* 5.162*, Citations: 2. Source: Web of Science).*

Costa L, Ferreira AR (2017). Adjuvant zoledronic acid to treat breast cancer: not for all. Lancet Oncology 18(11):1437-1439. *(IF: 33.752, Citations: 2. Source: Web of Science).*

Body JJ, Casimiro S, Costa L (2015). Targeting bone metastases in prostate cancer: improving clinical outcome. Nature Reviews Urology 12: 340-56. *(IF: 11.000, Citations: 35. Source: Web of Science).*

Henry D, Costa L, Goldwasser F, Hirsh V, Hungria V, Prausova J, Scagliotti GV, Sleeboom H, Spencer A, Vadhan-Raj S, von Moos R, Willenbacher W, Woll PJ, Wang J, Jiang Q, Jun S, Dansey R, Yeh H (2011). A Randomized, Double-blind Study of Denosumab Versus Zoledronic Acid in the Treatment of Bone Metastases in Patients With Advanced Cancer (Excluding Breast and Prostate Cancer) or Multiple Myeloma. Journal of Clinical Oncology 9(9):1125-1132. *(IF: 32.956, Citations: 607. Source: Web of Science).*

Publications in Peer Reviewed Journals

Marques da Costa P, Marinho RT, Cortez-Pinto H, Costa L, Velosa J (2020). Twenty-Five Years of Increasing Mortality from Pancreatic Cancer in Portugal. Pancreas 49(1):e2-e3. Letters to the Editor. *(IF:* 2.920*, Citations: 0. Source: Web of Science).*

Patel VM, Flanagan CE, Martins M, Jones CL, Butler RM, Woollard WJ, Bakr FS, Yoxall A, Begum N, Katan M, Whittaker SJ, Mitchell TJ (2020). Frequent and Persistent PLCG1 Mutations in Sézary Cells Directly Enhance PLCγ1 Activity and Stimulate NFκB, AP-1, and NFAT Signaling. Journal of Investigative Dermatology 140(2):380-389. *(IF: 7.143, Citations: 0. Source: Web of Science).*

Sousa SA, Leitão JH, Silva RAL, Belo D, Santos IC, Guerreiro JF, Martins M, Fontinha D, Prudêncio M, Almeida M, Lorcy D, Marques F (2020). On the path to gold: Monoanionic Au bisdithiolate complexes with antimicrobial and antitumor activities. Journal of Inorganic Biochemistry 202:110904. *(IF: 3.212, Citations: 4. Source: Web of Science).*

Coelho S, Rego IB, Dionísio MR, Cavaco-Silva J, Semedo PM, Pavão F, Leite RB, Costa L (2020). 360 Health Analysis (H360) - A Proposal for an Integrated Vision of Breast Cancer in Portugal. European Journal of Breast Health 16(2):91-98. Review. *(IF:--, Citations: 0. Source: Web of Science).*

Caiado J, Brás R, Paulino M, Costa L, Castells M (2020). Rapid Desensitization to Antineoplastic Drugs in an Outpatient Immunoallergology Clinic: Outcomes and Risk Factors. Annals of Allergy Asthma & Immunology 125(3):325-333.e1. *(IF:* 4.969*, Citations: 2. Source: Web of Science).*

Gomes I, de Almeida BP, Dâmaso S, Mansinho A, Correia I, Henriques S, Cruz-Duarte R, Vilhais G, Félix P, Alves P, Corredeira P, Barbosa-Morais N, Costa L, Casimiro S (2020). Expression of receptor activator of NFkB (RANK) drives stemness and resistance to therapy in ER+HER2- breast cancer. Oncotarget 11 (19):1714-1728. *(IF:* 5.162*, Citations: 2. Source: Web of Science).*

Tăbăcaru A, Dediu AVB, Dinică RM, Cârâc G, Basliu V, Campello MPC, Silva F, Pinto CIG, Guerreiro JF, Martins M, Mendes F, Marques F (2020). Biological properties of a new mixed lanthanide(III) complex incorporating a dypiridinium ylide. Inorganica Chimica Acta 506:119517. *(IF:* 2.304*, Citations: 0. Source: Web of Science).*

Martins Cavaco AC, Dâmaso S, Casimiro S, Costa L (2020). Collagen biology making inroads into prognosis and treatment of cancer progression and metastasis. Cancer and Metastasis Reviews 39(3):603-623. Review. *(IF:* 6.4*, Citations: 2. Source: Web of Science).*

Chowdhury S, Bjartell A, Lumen N, Maroto P, Paiss T, Gomez-Veiga F, Birtle A, Kramer G, Kalinka E, Spaëth D, Feyerabend S, Matveev V, Lefresne F, Lukac M, Wapenaar R, Costa L (2020). Real-World Outcomes in First-Line Treatment of Metastatic Castration-Resistant Prostate Cancer: The Prostate Cancer Registry. Targeted Oncology 15(3):301-315. *(IF: 4.036, Citations: 2. Source: Web of Science).*

Kumar R, George B, Campbell MR, Verma N, Paul AM, Melo-Alvim C, Ribeiro L, Pillai MR, da Costa LM, Moasser MM (2020). HER Family in Cancer Progression: From Discovery to 2020 and Beyond. Advances in Cancer Research 147:109-160. Review. *(IF: 5.235, Citations: 1. Source: Web of Science).*

Kakoo Brioso E, Ferreira Cristina S, Costa L, Ouakinin S (2020). Correlation between emotional regulation and peripheral lymphocyte counts in colorectal cancer patients. PeerJ 8:e9475. *(IF: 2.379, Citations: 0. Source: Web of Science).*

Lobo-Martins S, Ferreira AR, Mansinho A, Casimiro S, Leitzel K, Ali S, Lipton A, Costa L (2020). Impact of Extraskeletal Metastases on Skeletal-Related Events in Metastatic Castration-Resistant Prostate Cancer with Bone Metastases. Cancers 12(8):E2034. *(IF: 6.126, Citations: 0. Source: Web of Science).*

Melo-Alvim C, Miguel-Semedo P, Paiva RS, Lobo-Martins S, Luna-Pais H, Costa AL, Santos AR, Florindo A, Vasconcelos AL, Abrunhosa-Branquinho AN, Palmela P, Fernandes L, Presa DL, Costa L, Ribeiro L (2020). Pretreatment hemoglobin level as a prognostic factor in patients with locally advanced head and neck squamous cell carcinoma. Reports of Practical Oncology and Radiotherapy 25(5):768-774. *(IF: NA, Citations: 0. Source: Web of Science).*

Silva Paiva R, Gomes I, Casimiro S, Fernandes I, Costa L (2020). c-Met expression in renal cell carcinoma with bone metastases. Journal of Bone Oncology 25:100315. *(IF: 3.5, Citations: 0. Source: Web of Science).*

Rezaei M, Martins Cavaco AC, Stehling M, Nottebaum AF, Brockhaus K, Caliandro MF, Schellhas S, Schmalbein F, Vestweber D, Eble JA (2020). Extracellular Vesicle Transfer from Endothelial Cells Drives VE-Cadherin Expression in Breast Cancer Cells, Thereby Causing Heterotypic Cell Contacts. Cancers 12(8):2138. *(IF:* 6.126*, Citations: 1. Source: Web of Science).*

Martins Lima A, Saint Auguste DS, Cuenot F, Martins Cavaco AC, Lachkar T, Khawand CME, Fraga-Silva RA, Stergiopulos N (2020). Standardization and Validation of Fluorescence-Based Quantitative Assay to Study Human Platelet Adhesion to Extracellular-Matrix in a 384-Well Plate. International Journal of Molecular Sciences 21(18). *(IF:* 4.556, *Citations: 1. Source: Web of Science).*

Gil Marques F, Poli E, Malaquias J, Carvalho T, Portêlo A, Ramires A, Aldeia F, Ribeiro RM, Vitorino E, Diegues I, Costa L, Coutinho J, Pina F, Mareel M, Constantino Rosa Santos S (2020). Low doses of ionizing radiation activate endothelial cells and induce angiogenesis in peritumoral tissues. Radiotherapy and Oncology 151:322-327. *(IF: 4.856, Citations: 0. Source: Web of Science).*

Peixoto C, Lopes MB, Martins M, Costa L, Vinga S (2020). TCox: Correlation-Based Regularization Applied to Colorectal Cancer Survival Data. Biomedicines 8(11):488. *(IF: 4.717, Citations: 0. Source: Web of Science).*

Coleman RE, Croucher PI, Padhani AR, Clézardin P, Chow E, Fallon M, Guise T, Colangeli S, Capanna R, Costa L (2020). Bone metastases. Nature Reviews Disease Primers 6(1):83. Review. *(IF: 40.689, Citations: 0. Source: Web of Science).*

R Ferreira A, Ferreira S, Lambertini M, Maurer C, Martel S, Costa L, Ponde N, de Azambuja E (2020). Association between pertuzumab-associated diarrhoea and rash and survival outcomes in patients with HER2-positive metastatic breast cancer: Exploratory analysis from the CLEOPATRA trial. European Journal of Cancer 144:351-359. *(IF: 7.275, Citations: 0. Source: Web of Science).*

Other International Publications

Pissarra AJ, Abreu C, Mansinho A, Costa AL, Dâmaso S, Lobo-Martins S, Martins M, Costa L (2020). Landscape of Current Targeted Therapies for Advanced Colorectal Cancer. In Colorectal Cancer, Ed. Dr. Alberto Vannelli, Intechopen.

Other National Publications

Spencer A, Tomás T, Mansinho A (2020). Radium-223. Manual Cancro Urológico, SPO.

Semedo P, Mansinho A (2020). Importância dos Perfis Moleculares no na prática clínica futura - Cancro da Bexiga. Manual Cancro Urológico, SPO.

Ongoing Research Projects

2020/2023: MCPP- Illumina. Coordinator: Luís Costa. Funding Agency: Illumina. Reference: MCPP- Illumina. Amount: 36 000,00€. Total Amount: 36 000,00€.

2018/2021: Fisiopatologia e implicações clínicas da mutação RANK c.1386C>T (R450W) em doentes com cancro da mama. Coordinator: Sandra Casimiro. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-ONC/28636/2017. Amount: 234 615,31€. Total Amount: 234 615,31€.

2018/2021: Inervação patológica em metástases ósseas: OSTEOCLASTOS, o que estão a fazer? Coordinator: Sandra Casimiro. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: POCI-01-0145-FEDER-030158. Amount: 6 250,00€. Total Amount: 239 504,80€.

2017/2020: ONCODYNAMICS. Coordinator: Luís Costa. Funding Agency: Several. Reference: ONCODYNAMICS. Amount: 286 461,20€. Total Amount: 286 461,20€.

2009/2020: Cancer Genomics Consortium. Coordinator: Luís Costa. Funding Agency: Several. Reference: GCGC. Amount: 437 174,00€. Total Amount: 437 174,00€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 421,20€.

Invited Lectures and Seminars

Costa L. Tranlational Oncobiology - Science & Clinical Research & Outcomes. XIBeinMed – Beira Interior Medical Meeting, Covilhã, Portugal, January 18, 2020.

Mansinho A. Hot Topics no Tratamento Sistémico do Melanoma – Terapêutica alvo vs Imunoterapia como abordagem inicial no contexto metastático. Melanoma Expert Meeting, Lisbon, Portugal, January 31, 2020.

Casimiro S. RANKing estrogen receptor-positive breast cancer, IBIMED, Universidade de Aveiro, Aveiro, Portugal, February 2, 2020.

Costa L. Adjuvant antiresorptive therapy for early breast cancer. Where are we? Innovation Breast Cancer, Madrid, Spain, February 14, 2020.

Mansinho A. Renal Cell Cancer mRCC – Immunotherapy in first-line. XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Mansinho A. Take home messages: Renal Cell Carcinoma. XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Mansinho A. Clinical consensus on metastatic renal cell carcinoma – First line treatment: Immuno, TKI or combination? XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Fernandes I. Neoadjuvant therapy in invasive bladder cancer. XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Fernandes I. RCC – Sequential treatment for the patient in the individualized treatment. XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Fernandes I. Bladder cancer – Take home messages. XXV Workshop GPGU, Carvoeiro, Portugal, March 7, 2020.

Mansinho A. Xchange – O que muda na terapêutica oncológica com a medicina de precisão. Webinar SPAP, Portugal, June 22, 2020.

Mansinho A. Trombose associada ao Cancro. Webinar, Portugal, July 2, 2020.

Mansinho A. Highlights ASCO GI – Cancro Colorectal. Webinar, Portugal, July 9, 2020.

Mansinho A. Highlights ASCO - Cancro Génito-Urinário. Webinar, Portugal, July 23, 2020

Mansinho A. Trombose associada a Cancro – Tromboembolismo venoso: tempos de mudança, desafios e decisões. 26º Congresso Nacional e VII Congresso Ibérico de Medicina Interna, Braga, Portugal, August 29, 2020.

Costa L. Cancer Biology: From Basic to Translational Research. Webinar CANCER BIOLOGY: FROM BASIC TO TRANSLATIONAL RESEARCH, September 25, 2020.

Mansinho A. Revolution Sessions – Cancro colorectal BRAF mutado. Webinar, Portugal, October 8, 2020.

Costa L. Is it possible to preserve the quality of life of HR+HER-2/neu negative mBC patients getting effective treatment? Best of MASCC International conference, Moscow, Russia, October 9, 2020.

Leitão TP. Nefrectomia parcial sempre que tecnicamente exequível? Sim. XVI Simpósio APU, Lisbon, Portugal, October 10, 2020.

Mansinho A. Imunoterapia no Tubo Digestivo. 16º Congresso Nacional de Cancro Digestivo, October 16, 2020.

Mansinho A. Individualized Immunotherapy for Patients with Solid and Hematologic Malignancies - What´s New on Management of Immunotherapy adverse events. Webinar, October 22, 2020.

Mansinho A. Experiência da Imunoterapia no Tratamento da 2ª Linha do Carcinoma de Células Renais. A imunoterapia no tratamento do CCR, November 5, 2020.

Mansinho A. Cabometyx RWE em segunda linha - Avanços no tratamento do carcinoma de células renais. November 12, 2020.

Mansinho A. Medicina de Precisão – Simpósio, Congresso Nacional APFH, November 12, 2020.

Mansinho A. Tratamento do cancro colorectal com doença oligometastática. 17º Congresso Nacional de Oncologia, November 20, 2020.

Mansinho A. Meet the Expert - Registo Epidemiológico Nacional de Tumores de fusão NTRK. 17º Congresso Nacional de Oncologia, November 20, 2020.

Fernandes I. Atividade de Portugal na EU - Projeto iPAAC (Innovative partnership for action against cancer). Congresso Nacional de Oncologia Médica, Portugal, November 21, 2020.

Mansinho A. Tratamento do Melanoma Metastático: O papel da Imunoterapia. O Contributo da Imunoterapia no Tratamento do Melanoma, November 26, 2020.

Costa L. Sucessos e Questões no Cancro. Programa de Formação de Séniores. Universidade de Lisboa, Lisbon, Portugal, December 9, 2020.

Cruz-Duarte R. PlCγ1 and SHP2: new biding partners mediating Cetuximab resistance in RAS WT metastatic colorectal cancer. Pizza Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, December 15, 2020.

Communications in International Conferences

Piairo P, Corredeira P, Lopes C, Alves P, Costa L, Diéguez L. Phenotypic profiling of circulating tumour cells during metastatic disease progression. Liquid Biopsy Symposium, Santiago Compostela, Spain, January 26, 2020. *(Poster Presentation)*

Lopes C, Piairo P, Corredeira P, Muinelo-Romay L, Costa L, Diéguez L. Validation of a microfluidic device for the isolation and enumeration of circulating tumor cells and cancer progression

monitoring in metastatic breast cancer. Liquid Biopsy Symposium, Santiago Compostela, Spain, January 26, 2020. *(Poster Presentation)*

Vilhais G, Gomes I, de Almeida BP, Barbosa-Morais L, Costa L, Casimiro S. Tackling the mystery of the "small xenografts": RANK-pathway activation in RANK overexpressing breast cancer xenografts in an immune deficient mouse host. In4Med, Coimbra, Portugal, February 21-24, 2020. *(Poster Presentation)*

Martins Cavaco AC, Alho I, Simpson H, Enguita F, Park MC, Costa L. Biological effect of Clinically Relevant Collagen-I Fragments in the Tumour Microenvironment. EARC-AARC Basic and Translational Research - Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Gomes I, de Almeida BP, Dâmaso S, Mansinho A, Cruz-Duarte R, Vilhais G, Alves P, Barbosa-Morais N, Costa L, Casimiro S. RANK ligand (RANKL)-rich microenvironment drives resistance to hormone therapy in ER+HER2- breast cancer. EACR-AACR-ASPIC Conference: Tumor Microenvironment. Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Marques S, Pereira P, Pimentel J, Casimiro S, Costa L. Cancer-associated fibroblast in breast cancer brain metastases. EACR-AACR-ASPIC Conference: Tumor Microenvironment. Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Luna Pais H, Mansinho A, Branco F, Alvim C, Lobo-Martins S, Fernandes G, Fernandes L, Matos A, Paiva R, Dâmaso S, Brás R, Pinho I, Donato A, Semedo P, Albuquerque J, Ribeiro L. Locally advanced/metastatic gastric cancer: Real-world data on first-line treatment with oxaliplatin and cisplatin-based doublets. ESMO World Congress on Gastrointestinal Cancer – Virtual 2020, June 30–July 3, 2020. *(Abstract Publication)*

Lobo-Martins S, Martins M, Semedo P, Alvim C, Luna Pais H, Paiva R, Pinto C, Ribeiro L, Fernandes I, Macedo D, Mansinho A, Vendrell I, Teixeira de Sousa R, Costa L. The impact of adjuvant chemotherapy regimens in stage II colon cancer (CC) patients. ESMO World Congress on Gastrointestinal Cancer – Virtual 2020, June 30–July 3, 2020. *(Poster Presentation)*

Gomes I, Costa L, Casimiro S. Receptor Activator of NFkB (RANK) pathway is associated with resistance to endocrine therapy in Luminal A breast cancer. Webinar CANCER BIOLOGY: FROM BASIC TO TRANSLATIONAL RESEARCH, September 25, 2020. *(Poster Presentation)*

Lobo-Martins S, Martins-Branco D, Semedo PM, Alvim CM, Monteiro AM, Vendrell I, Gouveia E, Passos MJ, Costa L, Mansinho A, Teixeira de Sousa R. Prognostic factors for overall survival in patients with advanced melanoma treated with Anti-PD-1 therapy–the melimmune score. 35th The Society for Immunotherapy of Cancer (SITC) Annual Meeting, Virtual Congress, November 9-14, 2020. *(Poster Presentation)*

Bravo AC, Lobo-Martins SL, Vendrell I, Mansinho AB, Melo-Alvim C, Hasmucrai D, Vilariça AS, Alves P, Teixeira E, Teixeira de Sousa R, Bárbara C, Costa L. Impact of body mass index (BMI) in non-small cell lung cancer patients treated with anti PD-1 immunotherapy (IO): A retrospective cohort study. ESMO Virtual Congress 2020, September 19-21, 2020. *(Poster Presentation)*

Brás R, Damaso S, Paiva R, Macedo D, Costa L, Fernandes I. Pazopanib in metastatic bone sarcomas – a unicentric retrospective analysis at a tertiary university hospital. Connective Tissue Oncology Society (CTOS) 2020, Virtual Congress, November 18-21, 2020. *(Poster Presentation)*

Damaso S, Brás R, Alvim C, Garrido PM, Costa L, Borges-Costa J, Fernandes I. Kaposi sarcoma after solid organ transplantation, a single centre experiente. Connective Tissue Oncology Society (CTOS) 2020, Virtual Congress, November 18-21, 2020. *(Poster Presentation)*

Brás R, Fernandes G, Macedo D, López D, Santos AR, Luis Costa, Fernandes I. Head and neck alveolar rhabdomyosarcoma – a rare entity. Connective Tissue Oncology Society (CTOS) 2020, Virtual Congress, November 18-21, 2020. *(Poster Presentation)*

Silveira C, Sousa AC, Corredeira P, Martins M, Sousa AR, Da Cruz Paula A, Selenica P, Brown DN, Golkaram M, Kaplan S, Zhang S, Liu L, Weigelt B Reis Filho JS, Costa L, Carmo Fonseca M. Liquid Biopsy Detects Therapy Response in Advanced Breast Cancer. EACR Liquid Biopsies, Virtual Congress, November 18-19, 2020. *(Poster Presentation)*

Lobo-Martins S, Corredeira P, Alves PB, Antunes M, Rodrigues A, Quintela A, Filipe P, Ribeiro L, Teixeira de Sousa R, Pinto C, Abreu C, Gordino G, Ribot J, Serre K, Martins M, Cavaco A, Casimiro S, Silva-Santos B, Costa L. Immune cell populations in peripheral blood of metastatic breast cancer patients under CDK4/6 inhibitors. CTRC-AACR San Antonio Breast Cancer Symposium, Virtual Congress, December 8-12, 2020. *(Poster Presentation)*

Communications in National Conferences

Miranda M, Leitão TP, Fernandes M, Polido J, Almeida J, Reis JP. Laparoscopic calyceal reinsertion during a partial nephrectomy: a trick to maximize nephron-sparing. XVI Simpósio APU, Lisbon, Portugal, October 10, 2020. *(Oral Presentation)*

Polido J, Miranda M, Leitão TP, Alfarelos J, Oliveira T, Garcia R, Lopes T, Nobre A, Pedro LM, Reis JP. Prognostic predictors in patients with renal tumors and vena cava thrombus. XVI Simpósio APU, Lisbon, Portugal, October 10, 2020. *(Poster Presentation)*

Miranda M, Polido J, Fernandes M, Ponte CB, Castro A, Leitão TP, Reis JP. Impacto da pandemia Covid-19 na cirurgia eletiva urológica de um hospital universitário. XVI Simpósio APU, Lisbon, Portugal, October 10, 2020. *(Poster Presentation)*

Castro A, Oliveira T, Ponte CB, Miranda M, Polido J, Fernandes M, Leitão TP, Reis JP. Histologia tripla em carcinoma de células renais multifocal ipsilateral. XVI Simpósio APU, Lisbon, Portugal, October 10, 2020. *(Poster Presentation)*

Castro L, Gomes I, Costa L, Casimiro S. Effect of RANK+ breast cancer cell's secretome in monocytic differentiation. 9ª edição do Dia da Investigação, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Baptista F, Gomes I, Costa L, Casimiro S. Efficacy of OPG-Fc plus Palbociclib to treat RANK overexpressing CDKi-resistant breast cancer: a proof-of-concept xenograft trial. 9ª edição do Dia da Investigação, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Organization of Conferences

Costa L. Scientific Program Committee. EACR-AACR-ASPIC Conference: Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020.

Casimiro S. Scientific Committee. Cancer Biology: From Basic to Translational Research (webinar), Liga Portuguesa Contra o Cancro, September 25, 2020.

Mansinho A. Co-Organizer. 17º Congresso Nacional de Oncologia (webinar), November 20-21, 2020.

Internationalization

Fernandes I, in representation of the Director of the National Program for Oncologic Diseases from DGS in the WHO European Conference on Screening, Copenhagen, Denmark, February 11-12, 2020.

Prizes, Honors and Awards

Castro L. Best Oral Presentation. GAPIC – Dia da Investigação 2020, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020.

Industry Contract Research

Mansinho A. Principal Investigator. IIT - RAMBO-223: Radium-223 Dichloride Effect in the Metabolism of Bone Turnover Markers. Sponsor: Bayer

Patents/Prototypes

Casimiro S and Costa L. RANK pathway inhibitors in combination with CDK4/6 inhibitors. WO 2020/222668 A1. November 5, 2020.

Advanced Teaching

Fernandes I. Lecture. Off-label Therapeutics. II Curso Pós-Graduado de Atualização em Direito da Medicina, Leges Artis, Prática Clínica, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, January, 2020.

Casimiro S. Lecture. Informed Consent in Biomedical Research - Non vulnerable Adults. II Curso Pós-Graduado de Atualização em Direito da Medicina, Leges Artis, Prática Clínica, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, January 14, 2020.

Mansinho A. Lecture. Abordagem terapêutica do CCRm juntamente com a revisão dos estudos 2L: AXIS, METEOR, CM-025, AcceleratIOn – UEM, Madrid, Spain, February 6, 2020.

Mansinho A. Lecture. Casos Clínicos de Digestivo, Curso de Oncologia NIJE/SPO, Curia, Portugal, February 21, 2020.

Costa L. First Opponent. Rui Pedro Pinheiro Gonçalves Marques, Associação entre a terepêutica com cetuximab e vevacizumab e outcomes em doentes com cancro colorrectal metastizado: um estudo de efectividade comparativa em oncologia, PhD in Pharmacoepidemiology, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, July 7, 2020.

Casimiro S. First Opponent. Filipa Marques da Costa, Caso Clínico – Tumor de Células Gigantes da Coluna Cervical, Masters in Medicine, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, July 10, 2020.

Fernandes I. First Opponent. Marta Henriques Monteiro Vaz Lopes, O impacto da participação em investigação clínica nos outcomes de doentes com cancro da mama avançado HER2+: estudo da população de doentes do Serviço de Oncologia Médica do HSM. Masters in Medicine, Faculdade de Medicina da Universidade de Lisboa, July 17, 2020.

Fernandes I. Lecture. Governança Clínica. Masters in Health Services Management, INDEG – ISCTE, Universidade Nova de Lisboa, Lisbon, Portugal, September – December, 2020.

Casimiro S. Second Opponent. Mário Filipe Teixeira de Fontes e Sousa, Exploring epigenetic profiling as predictive/prognostic markers of endocrine resistence in estrogen positive breast cancer, PhD in Medicine and Molecular Oncology, Faculdade de Medicina da Universidade do Porto, O'Porto, Portugal, September 24, 2020.

Mansinho A. Lecture. Cancro Génito-Urinário, BCOP – Board of Pharmaceutical Specialities, Portugal, October 28, 2020.

Mansinho A. Lecture. Ensaios Clínicos de Fase I, Curso de Investigação Clínica NIJE/SPO, Portugal, October 30, 2020.

Mansinho A. Lecture. Investigação de Iniciativa do Investigador, Curso Monitorização Ensaios Clínicos, Portugal, October 30, 2020.

Fernandes I. Lecture. Ethical dilemas. Programa de Alta Direção de Instituições de Saúde (PADIS), AESE Business School, Lisbon & O'Porto, Portugal, November 4 and December 3, 2020.

Science and Society

Costa L. Interview. Journal Público. Impacto da pandemia COVID-19 nos doentes oncológicos. March 28, 2020.

Costa L. Interview. Observador. Impacto da pandemia COVID-19 nos doentes oncológicos. May 2, 2020.

Costa L. Interview. Revista Sábado. Impacto da pandemia COVID-19 nos doentes oncológicos. April 9, 2020.

Costa L. Debate. Expresso. Tenho Cancro. E Depois? July 4, 2020.

Costa L. Interview. SIC Notícias. Tenho Cancro. E Depois? November14, 2020.

MSc Theses

Hanna Simpson, 13/01/2020, Optimization and Exploration of the Biological Role of Clinically Relevant Type-1 Collagen Fragments in Metastatic Breast Cancer, Maastricht University. Supervisor: Ana Cavaco. Co-Supervisor: Roy Erkens.

Bianca Miranda Basso, 28/05/2020, *In vitro* and *in vivo* activities of an MMP-9 inhibitory protein isolated from *Lupinus albus* seeds against colon adenocarcinoma, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Ricardo Ferreira. Co-Supervisor: Luís Costa.

Filipa Marques da Costa, 10/07/2020, Caso Clínico – Tumor de Células Gigantes da Coluna Cervical, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Luís Costa.

João Bello, 18/12/2020, Sensitivity profile of triple-negative breast cancer cell lines to combination therapies including RANKL blockade, Faculdade de Ciências da Universidade de Lisboa. Supervisor: Sandra Casimiro. Co-Supervisor: Helena Caria.

PhD Theses

Estela Maria de Gouveia Kakoo Brioso, 03/07/2020, Factores Psicológicos no Cancro do Cólon/Recto - Suas Relações com a Evolução da Doença, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Sílvia Ouakinin. Co-Supervisor: Luís Costa.

Arlindo Júlio Rebelo da Silva Ferreira, 29/10/2020, Adjuvant endocrine therapy for the treatment of early breast cancer: real world effectiveness, tolerability and adherence, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Luis Costa. Co-Supervisor: Inês Vaz-Luis.

Luís Graça Lab

Major Interests/Objectives

Our Unit studies mechanisms underlying induction and maintenance of immune tolerance. In other words, we research methods to alter the balance of the immune response: reducing its action when the immune system is causing a disease, such as allergy, autoimmunity, and transplant rejection; or enhancing the immune response to vaccines or infection.

We are especially interested in defining the functional properties of lymphocytes that can promote immune tolerance by suppressing pathogenic immune responses. We have been studying how different types of lymphocytes with regulatory function can be induced and modulated in the periphery.

We believe that in the foreseeable future antibody therapy, as well as other strategies to modulate the immune system, will have an important repercussion on the quality of life of people suffering from immune-mediated diseases.

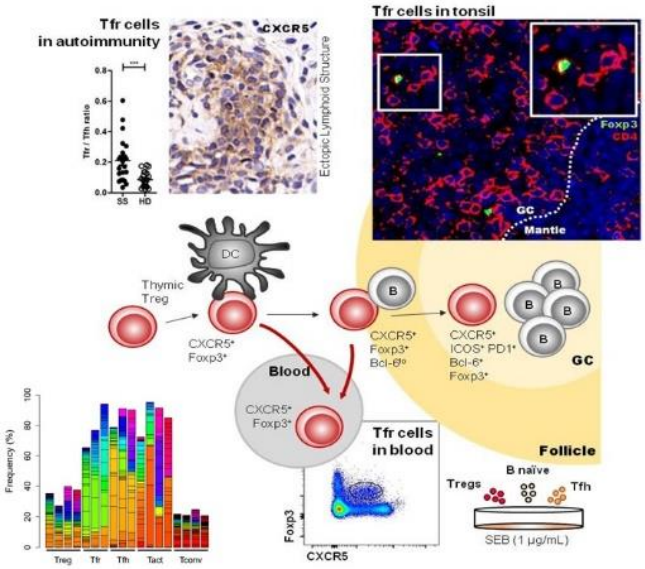
Head of Laboratory

Luis Graca, MD/PhD, Full Professor

Team

Alexandra Patrícia dos Santos Souto	MSc Student (Started November)
Ana Catarina Jorge Mendes	Lab Manager
Ana Isabel Neves de Matos	Trainee
Carina Sofia Gonçalves Peres	Postdoctoral Researcher
Dikélélé Elessa Ngollo	MSc Student (Started March. Left October)
Diogo Alves Antunes	MSc Student (Started January)
Filipa Ramos de Moura Ribeiro	PhD Student
João Torrado Malato	PhD Student (Started January)
José António Matos Silva	BSc Student (Started March. Left November)
Rodrigo Balsinha Pedroso	PhD Student
Ruy Miguel Sousa Soeiro de Figueiredo Ribeiro	Senior Postdoctoral Researcher
Sara Daniela Botelho Rosa	MSc Student (Left June)
Saumya Dileep Kumar	PhD Student
Válter Bruno Ribeiro Fonseca	Postdoctoral Researcher
Vanessa Alexandra Gonçalves de Oliveira Martins	Clinical Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

Immune Tolerance, Regulatory T-cell Subsets, T Follicular Helper (Tfh) Cells, T Follicular Regulatory (Tfr) Cells, Germinal Centre, Allergy, Autoimmunity, Transplantation, Vaccines.

Major Scientific Achievements

We found that Tfh and Tfr cells in the same germinal center differ in their TCR usage: Tfh cells are specific to the immunizing antigen, and Tfr cells retain a TCR specificity similar to Tregs. These results suggest Tfh cells select high-affinity BCRs during affinity maturation, while Tfrs prevent autoimmunity.

We established, using human samples, that human circulating Tfr cells are generated in lymphoid tissues following exposure to antigens, and are not fully mature.

We have shown that adoptive transfer of Foxp3+ iNKT cells, due to CXCR6-mediated preferential hepatic homing, leads to liver-specific immune suppression allowing long-term survival of allogeneic islet transplants delivered through intra-portal route in mice.

Finally, we have started a number of clinical studies regarding the impact of Tfh subsets in antibody-mediated human diseases, and how Tfh and Tfr subsets can be used as biomarkers.

Selected Publications

Deng J, Wei Y, Fonseca VR, Graca L*, Yu D* (2019). T follicular helper cells and T follicular regulatory cells in rheumatic diseases. Nature Reviews Rheumatology 15:475-490. *(IF: 18.545, Citations: 5. Sources: Web of Science and Scopus).*

Fonseca VR, Ribeiro F, Graca L (2019). Dissecting the Complexity of T Follicular Regulatory Cells. Immunological Reviews 288:112-127. *(IF: 13.939, Citations: 4. Sources: Web of Science and Scopus)*.

Fonseca VR, Romão VC, Agua-Doce A, Santos M, López-Presa D, Ferreiras AC, Fonseca JE, Graca L (2018). The Ratio of Blood T Follicular Regulatory Cells to T Follicular Helper Cells Marks Ectopic Lymphoid Structure Formation While Activated Follicular Helper T Cells Indicate Disease Activity in Primary Sjögren's Syndrome. Arthritis Rheumatology 70:774-784. *(IF: 9.002, Citations: 23. Sources: Web of Science and Scopus)*.

Fonseca VR, Agua-Doce A, Maceiras AR, Pierson W, Ribeiro F, Romão VC, Pires AR, Silva SL, Fonseca JE, Sousa AE, Linterman MA, Graca L (2017). Human Blood CXCR5+Foxp3+ T cells Are Indicators of Ongoing Humoral Activity Not Fully Licensed with Suppressive Function. Science Immunology 2: eaan1487. *(IF: 10.551, Citations: 35. Source: Web of Science and Scopus).*

Maceiras R, Almeida SCP, Mariotti-Ferrandiz E, Chaara W, Jebbawi F, Six A, Hori S, Klatzmann D, Faro J, Graca L (2017). T follicular helper and T follicular regulatory cells from the same germinal centers have different TCR-specificity. Nature Communications 8:15067. *(IF: 12.353, Citations: 34. Sources: Web of Science and Scopus).*

Oliveira VG, Água-Doce A, Curotto de Lafaille MA, Lafaille JJ, Graça L (2013). Adjuvant facilitates tolerance induction to factor VIII in hemophilic mice through a Foxp3-independent mechanism that relies on IL-10. Blood 121(19):3936-3945. *(IF: 16.601, Citations: 13. Sources: Web of Science and Scopus)*.

Wollenberg I, Água-Doce A, Hernández A, Almeida C, Oliveira VG, Faro J, Graça L (2011). Regulation of the germinal center reaction by Foxp3+ follicular regulatory T cells. Journal of Immunology 187(9):4553-4560. *(IF: 4.718, Citations: 284. Sources: Web of Science and Scopus).*

Publications in Peer Review Journals

Waldmann H, Graca L (2020). Infectious tolerance. What are we missing? Cellular Immunology 354: 104152. *(IF: 4.078, Citations: 1. Source Web of Science).*

Ribeiro RM, Graca L (2020). Untangling the immune basis of disease susceptibility. eLife 9:e56886. *(IF: 7.080, Citations: 0. Source: Web of Science).*

Graca L (2020). The contribution of B cells to transplantation tolerance. Journal of Clinical Investigation 130:3406-3408. *(IF: 11.869, Citations: 0. Source: Web of Science).*

Calado R, Duarte J, Borrego P, Marcelino JM, Bártolo I, Martin F, Figueiredo I, Almeida S, Graça L, Vítor J, Aires da Silva F, Dias I, Carrapiço B, Taveira N (2020). A Prime-Boost Immunization Strategy with Vaccinia Virus Expressing Novel gp120 Envelope Glycoprotein from a CRF02_AG Isolate Elicits Cross-Clade Tier 2 HIV-1 Neutralizing Antibodies. Vaccines 8(2):171. *(IF: 4.760, Citations: 1. Source: Web of Science).*

Rodriguez-Barbosa JI, Schneider P, Graca L, Bühler L, Perez-Simon JA, Del Rio ML (2020). The Role of TNFR2 and DR3 in the In Vivo Expansion of Tregs in T cell Depleting Transplantation Regimens. International Journal of Molecular Sciences 21(9):3347. *(IF: 4.556, Citations: 0. Source: Web of Science).*

Ongoing Research Projects

2020/2023: Thymic Abnormalities in Rare Immunological Diseases. Coordinator: Luís Graça. Funding Agency: Fundação para a Ciência e a Tecnologia / European Joint Programme on Rare Diseases (EU). Reference: EJPRD/0003/2020. Amount: 150 000,00€. Total Amount: 150 000,00€.

2020/2021: Nanomateriais para desenho de novas vacinas. Coordinator: Luís Graça. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: UTA-EXPL/NPN/0082/2019. Amount: 40 000,00€. Total Amount: 40 000,00€.

2020/2021: Immune senescence in COVID-19. Coordinator: Luís Graça. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT Research4Covid-19. Amount: 40 000,00€. Total Amount: 40 000,00€.

2020/2020: Repository of single cell transcriptomes of COVID-19 immune cell subsets. Coordinator: Luís Graça. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT Research4Covid-19. Amount: 30 000,00€. Total Amount: 30 000,00€.

Invited Lectures and Seminars

Graca L. Regulation of Germinal Centre Responses. European Midwinter Workshop 2020, Angerer Alm, Austria, January 22-24, 2020.

Kumar S, Graça L. Computational Approaches to study Lymphocyte regulation. 5th Session IST-MedNetworking Virtual Lecture Series, Lisbon, Portugal, May 7, 2020.

Graca L. T cell phenotypes and stratification of autoimmune patients. RTCure Tolerance Workshop, Online Event, Stockholm, Sweden, May 18-20, 2020.

Graca L. Research in times of COVID-19. Universidad de Los Andes, Santiago de Chile, Chile, Online Event, June 4, 2020.

Graca L. Understanding Tfh cells one cell at a time. TARID kick-off meeting, Online Event, Helsinki, Finland, June 15, 2020.

Graca L. Understanding Tfh cells one cell at a time. European Federation of Immunology Society - T cell interest group talks, Online Event, November 3, 2020.

Graca L. Understanding Tfh cells one cell at a time. Internal Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, November 4, 2020.

Communications in International Conferences

Malato J, Graça L, Lacerda E, Nacul L, Sepúlveda N. Stratification of patients with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome using multivariate analysis. Jornadas de Estatística Médica, Lisbon Portugal, February 12-13, 2020. *(Oral Presentation)*

Conniot J, Scomparin A, Carreira B, Peres C, Matos AI, Acúrcio R, Moura L, Yeini E, Pozzi S, Graça L, Préat V, Satchi-Fainaro R, Florindo HF. Functionalized nanobiomaterials as novel combination immunotherapies in cancer. EACR-AACR-ASPIC Basic and Translational Research Conference: Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Matos AI, Pena S, Mateus M, Carreira B, Peres C, Moura L, Viana AS, Conde JP, Graça L, Satchi-Fainaro R, Florindo HF. Targeted nanovaccine as a powerfull platform to improve immune modulation therapy in colorectal cancer. EACR-AACR-ASPIC Basic and Translational Research Conference: Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Peres C, Matos AI, Moura L, Conniot J, Carreira B, Viana AS, Préat V, Graça L, Satchi-Fainaro R, Florindo HF. Multifunctional nanovaccine synergizes with immune checkpoint therapy against triple-negative breast cancer. EACR-AACR-ASPIC Basic and Translational Research Conference: Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Carreira B, Matos AI, Peres C, Acúrcio R, Moura L, Pisarevsky E, Krivitsky A, Conniot J, Scomparin A, Yeini E, Pozzi S, Ribeiro F, Basto A, Préat V, Graça L, Satchi-Fainaro R, Florindo HF. Nanovaccines as multifuntional modulators of cancer immune microenvironment. CRS Virtual Annual Meeting, June 29-July 2, 2020. *(Oral Presentation)*

Matos AI, Carreira B, Peres C, Acúrcio R, Moura L, Pisarevsky E, Krivitsky A, Pozzi S, Graça L, Préat V, Satchi-Fainaro R, Florindo HF. Nanotechnological approaches for immune modulation against solid cancers. NanoPT 2020, September 23-24, 2020. *(Oral Presentation)*

Communications in National Conferences

Kumar S. Computational Approaches to study Lymphocyte regulation. Computational Biology and Bioinformatics Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online Seminar, May 20, 2020. *(Oral Presentation)*

Malato J, Graça L, Lacerda E, Nacul L, Sepúlveda N. Stratification of ME/CFS patients using multivariate methods. iMM Computational Biology and Bioinformatics Day, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 21, 2020. *(3 Minute Pitch Talk)*

Ribeiro F, Kumar S, Basto A, Tosello J, Piaggio E, Fonseca V, Graca L. Defining the differentiation of T follicular regulatory cells. iMM Computational Biology and Bioinformatics Day, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 21, 2020. *(Oral Presentation)*

Kumar S, Fonseca VR, Ribeiro F, Basto AP, Água-Doce A, Monteiro M, Miragaia RJ, Gomes T, Piaggio E, Segura E, Gama-Carvalho M, Teichmann SA, Graça L. Developmental bifurcation of human T follicular regulatory cells. iMM Computational Biology and Bioinformatics Day, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 21, 2020. *(3 Minute Pitch Talk)*

Ribeiro F. Maturation of T follicular regulatory cells in human tissue. Immunology Club Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online Seminar, November 11, 2020. *(Oral Presentation)*

Organization of Conferences

Graça L. As Fronteiras das Ciências Médicas (conference series being on advances on medical sciences, being held alternately in the two medical schools in Lisbon, organized by Sociedade das Ciências Médicas de Lisboa). One monthly seminar at NOVA Medical School and Faculdade de Medicina da Universidade de Lisboa, 2020. (Interrupted in March due to COVID-19)

Graça L. European Congress of Immunology, Belgrade 2021. (Member of Scientific Council)

Prizes, Honours and Awards

Kumar S was selected to participate talks, lectures and debates in the Lindau Nobel Laureate Meeting's Online Science Days 2020, June28-July 1, 2020.

Industry Contract Research

2019/2020: Immune modulatory activity of exossomes. Coordinator: Luís Graça. Funding Agency: Exogenus.

Advanced Teaching

Kumar S. Computational Approaches to study Lymphocyte regulation. MSc in molecular biology and bioinformatics. Invited guest speaker at Faculdade de Ciências da Universidade de Lisboa virtual lecture, Lisbon, Portugal, November 11, 2020.

Graca L and Ribeiro F supervised Diogo Antunes and José Silva, medical students from Universidade de Lisboa, during their GAPIC internship, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 2019 – November 2020.

Science and Society

Patient Groups:

Malato J attended the International Association for Chronic Fatigue Syndrome/Myalgic Encephalomyelitis (IACFS/ME), 1st Virtual Scientific Conference, a program of scientific talks with symposiums on COVID-19 and ME/CFS, August 21, 2020.

COVID-19 Response:

Graca L coordinated the biobank collection of COVID-19 biological samples.

Graca L was appointed to the experts' commission of vaccines against COVID-19, by the National Health Authority (Direção-Geral da Saúde).

Graca L was appointed to the experts' commission of COVID-19 testing, by the National Health Authority (Direção-Geral da Saúde).

Pedroso R was a volunteer in the Diagnostic and Research Sample task forces developed at the Instituto de Medicina Molecular João Lobo Antunes in response to the COVID-19 pandemic, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March-June, 2020.

Ribeiro F was a volunteer in the Diagnostic and Research Sample task forces developed at the Instituto de Medicina Molecular JLA in response to the COVID-19 pandemic, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March-June, 2020.

Graca L, Investigação em tempo de COVID-19, Webinar, SEMAPA.

Graca L, Investigadores respondem a dúvidas sobre COVID-19. Webinar, Instituto de Medicina Molecular João Lobo Antunes.

Graca L had several appearences in Portuguese media (radio, television, and printed media) providing informations related to COVID-19, vaccination, and immunity to viruses.

Science and Culture:

Graça L was part of the organizing committee of FACTT Festival as scientific consultant. FACTT organized visual art exhibitions and seminars, exploring the interface of science and art, in several international locations: Lisbon (MAAT and Culturgest), New York (School of Visual Arts, Parsons School of Design, and NYU), and Mexico City (Centro de Cultura Digital and UNAM). FACTT is coordinated by the ARTE Institute, New York.

Graca L led an artist/scientist walk at Ars Eletronica Festival 2020, Linz, Austria, September 10, 2020 (virtual tour).

In 2020 the artist Marta de Menezes was appointed Associate Artist in the LGraca Lab. It was the first appointment of a visual artist to be included in a research laboratory. This appointment highlights the commitment of the institution towards bridging science and culture. Artworks developed in LGraca lab were exhibited during 2020 in the USA (Allegheny Art Galleries), Russia (Saint Petersburg), Norway (Vitanparken, Norway), and Brazil. The work of Graca and De Menezes regarding Art and Biomedical research was reviewed in the media, including the New York Times.

Invited Speaker:

Graca L. Art in the Laboratory. Instituto Superior Técnico, Online, Lisbon, Portugal, May 25, 2020.

Graça L. Keynote speaker. Adaptive Responses. Viral Life Symposium, Vitenparken As, Norway, Online, November 17, 2020.

Publications:

De Menezes M, Graca L (2020). I'am – Immortality'anti-marta. In "Art as Yoou Don't Know IT". Ed. E. Berger, K. Mäki-Reinikka, K. O'Reilly, H. Sederholm. Aalto University Press, Berlin. P: 52.

MSc Thesis Completed

Dikélélé Elessa, 30/06/2020, Defining tissue T follicular regulatory cells, Université de Paris. Supervisors: Luis Graca, Filipa Ribeiro and Saumya Kumar.

Sara Rosa, 08/04/2020, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Valter Fonseca.

PhD Thesis

Carina Peres, 28/05/2020, Intracellularly-targeted nanoplatform to target dendritic cells and for immunomodulation, Faculdade de Farmácia da Universidade de Lisboa. Supervisor: Helena Florindo, Luís Graça and Véronique Préat.

Internship Supervisions

Graca L and Ribeiro F supervised Diogo Antunes and José Silva, medical students from Universidade de Lisboa, during their GAPIC internship, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October 2019 – November 2020.

Graca L and Pedroso R supervised the internship of Alexandra Souto, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, October–December, 2020.

Luísa Figueiredo Lab

Major Interests/Objectives

Parasitism relies on the ability of an organism to exploit its host. African trypanosomes are unicellular parasites responsible for a fatal disease in humans (sleeping sickness), and for a chronic disease in cattle (nagana). We study the cellular and molecular mechanisms employed by Trypanosomes to maintain the host chronically ill. We also study the host response to the infection.

TISSUE TROPISM - The adipose tissue is a major reservoir of parasites, which metabolically adapt to this environment. How do parasites move between tissues? What is the contribution to parasite transmission? What is the relevance of tissue tropism to cachexia? How heterogenous is the parasite population in vivo?

ANTIGENIC VARIATION allows Trypanosomes to escape the host immune response. A long-standing interest of our group is to understand the underlying molecular mechanisms. We are currently studying the importance of non-coding RNAs and epigenetic modifications in the regulation of Variant Surface Glycoproteins.

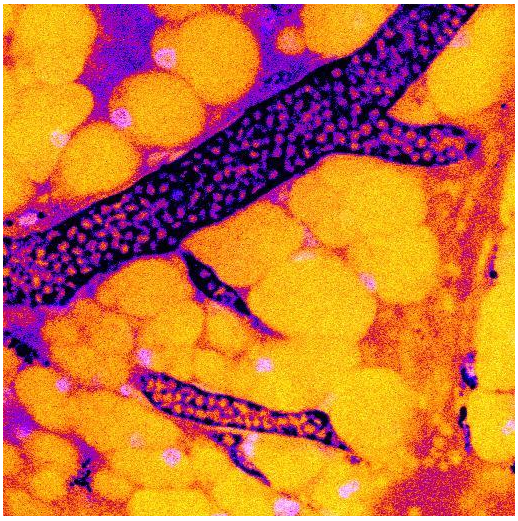
Head of Laboratory

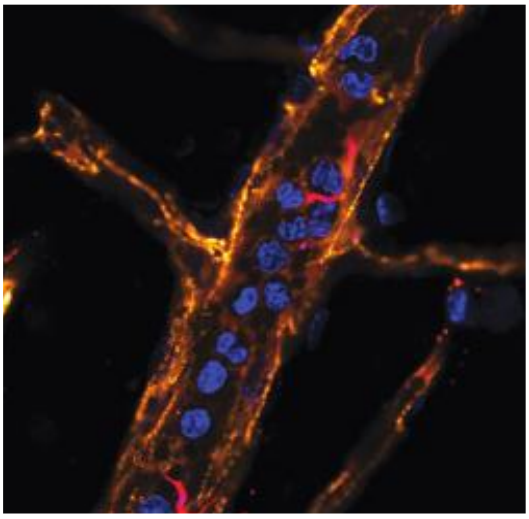
Luisa Miranda Figueiredo, PhD

Team

Adriana Beatriz Oliveira Temporão	PhD Student
Ana Margarida Roque Sanches Vaz Serra	PhD Student (Left February)
Ana Raquel Santos Pereira	MSc Student (Started September)
Adriana Beatriz Oliveira Temporão	PhD Student
Fabien Marc Guegan	Senior Postdoctoral Researcher
Henrique Pedro Pereira da Silva Amaral Machado	PhD Student
Idálio de Jesus Contreiras Viegas	PhD Student
João Francisco Parraga Ribeiro Colaço	Lab Technician (Left June)
Juan Pereira de Macedo	Senior Postdoctoral Researcher (Left September)
Lara López Escobar	PhD Student (Started July)
Leonor Duarte Pinho	Lab Manager
Lúcia Branco Serra	Lab Technician (Started July)
Mariana Isabel De Niz Hidalgo	Postdoctoral Researcher
Sandra Isabel Gonçalves Trindade	Senior Postdoctoral Researcher
Sara Silva Pereira	Postdoctoral Researcher

Graphical Abstract





Laboratory Keywords/Research Areas

Parasite, Adipose Tissue, Metabolism, Antigenic Variation, Gene Expression, Sleeping Sickness, Nagana.

Major Scientific Achievements

- Award of *La Caixa* research grant (500k€);
- Award for FCT PhD fellowship for Lucia Serra;
- Participation in the COVID-19 diagnostic and serology task forces;
- Appointment of Luísa Figueiredo to chair of Kinetoplastid Molecular Cell Biology meeting, Woods Hole, USA;
- Award for best poster to Mariana de Niz at MPM 2020;
- Prize for best video of "The Coolest parasitology lab in 2020" (https://youtu.be/W9bDh5Ww9u0);
- Invitation to write a review for Annual Review in Microbiology.

Selected Publications

Aresta-Branco F, Sanches-Vaz M, Bento F, Rodrigues JA, Figueiredo LM (2019). African trypanosomes expressing multiple VSGs are rapidly eliminated by the host immune system. Proceedings of the National Academy of Sciences 116:20725-20735. *(IF: 9.412. Citations: 2. Source: Web of Science).*

Sanches-Vaz M, Temporão A, Luis R, Nunes-Cabaço H, Mendes AM, Goellner S, Carvalho T, Figueiredo LM, Prudêncio M (2019). *Trypanosoma brucei* infection protects mice against malaria. PLoS Pathogens 15(11):e1008145 *(IF: 6.218. Citations: 0. Source: Web of Science)*

Rijo-Ferreira F, Carvalho T, Afonso C, Sanches-Vaz M, Costa RM, Figueiredo LM, Takahashi JS (2018). Sleeping sickness is a circadian disorder. Nature Communications 9(620). *(IF: 12.121. Citations: 35. Source: Web of Science).*

Rijo-Ferreira F, Pinto-Neves D, Barbosa-Morais NL, Takahashi JS, Figueiredo LM (2017). *Trypanosoma brucei* metabolism is under circadian control. Nature Microbiology 2(6):17032. *(IF: 15.540. Citations: 32. Source: Web of Science*).

Trindade S *et al* (2016). *Trypanosoma brucei* Parasites Occupy and Functionally Adapt to the Adipose Tissue in Mice. Cell Host & Microbe 19(6):837-848. *(IF: 15.923. Citations: 108. Source: Web of Science).*

Publications in Peer Reviewed Journals

Viegas IJ, Pereira de Macedo J, De Niz M, Rodrigues JA, Aresta-Branco F, Jaffrey SR, Figueiredo LM (2020). N6-methyladenosine in poly(A) tails stabilize VSG transcripts. bioRxiv (under revision at Nature). *(IF: NA. Citations: 0. Source: Web of Science).*

Guegan F, Bento F, Neves D, Sequeira M, Notredame C, Figueiredo LM (2020). A long non-coding RNA controls parasite differentiation in African trypanosomes. bioRxiv. *IF: NA. Citations: 0. Source: Web of Science).*

Machado H, Figueiredo LM (2020). Polyreactive Antibodies Bridge Immunity Particles to Pathogen. Trends in Parasitology 36(10):804-806. (*IF: 5.560. Citations: 0. Source: Web of Science).*

Ongoing Research Projects

2019/2023: Cell2Cell: What makes a successful pathogen? Understanding the impact of cell-to-cell heterogeneity in chromatin structure on infection and adaptation. Coordinator Luísa Figueiredo. Funding Agency: European Commission. Reference: MSCA-ITN 860675. Amount: € 228 720,24. Total Amount: € 228 720,24.

2019/2021: TRYPTISSUE: Characterising *Trypanosoma* tissue tropism: new perspectives for variant surface glycoproteins. Coordinator: Luísa Figueiredo. Funding Agency: European Commission. Reference: MSCA-IF 839960. Amount: € 159 815,04. Total Amount: € 159 815,04.

2019/2021: HFSP fellowship - Human Frontier Science Program. Coordinator: Mariana De Niz. Funding Agency: Human Frontier Science Program. Amount: € 69 120,00. Total Amount: € 69 120,00.

2018/2022: FatTryp: Exploring the hidden life of African *trypanosomes*: parasite fat tropism and implications for disease. Coordinator: Luísa Figueiredo. Funding Agency: European Commission. Reference: ERC- FATTRYP - 771714. Amount: € 2 000 000,00. Total Amount: € 2 000 000,00.

2018/2021: FatReservoir: Importância dos Reservatórios de Parasitas Extravasculares em Gado e Modelos Laboratoriais de Ratinhos. Coordinator: Sandra Trindade. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: LISBOA-01-0145-FEDER-029161. Amount: € 231 666,35. Total Amount: € 239 970,42.

Invited Lectures and Seminars

Figueiredo LM. Tissue tropisms in the mammalian host. TsetseNET meeting. West African Centre for Cell Biology and Infectious Pathogens (WACCBIP), Department of Biochemistry, Cell and Molecular Biology, University of Ghana, Ghana, January 10, 2020.

Communications in International Conferences

De Niz M, Bras Pedro M, Franco C, Figueiredo LM. *In vivo* imaging reveals that establishment of tissue reservoirs by *Trypanosoma brucei* is multi-factorial. 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Award for Best Poster Presentation)*

Guegan F, Bento F, Pinto-Neves D, Sequeira M, Notredame C, Figueiredo LM. Grumpy lncRNA regulates life cycle progression of *Trypanosoma brucei*. 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Poster Presentation)*

Machado H, Hofer P, Zechner R, Figueiredo LM. Loss of fat mass during a *Trypanosoma brucei* infection prolongs host survival. 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Poster Presentation)*

Temporão A, Sanches-Vaz M, K. Smith T, Prudencio M, Figueiredo LM. *Trypanosoma brucei* proteins: new allies in the fight against malaria? 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Poster Presentation)*

Trindade S, Sequeira M, De Niz M, Dejung M, Bento F, Pinto-Neves D, Butter F, Bringaud F, Gjini E, Figueiredo LM. Adipose Tissue Resident *Trypanosoma brucei*: a Population of Slow Growers. 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Poster Presentation)*

Viegas I, Rodrigues JA, Pereira JP, Aresta-Branco F, Jaffrey S, Figueiredo LM. m6A methylation of the polyA-tail regulates VSG transcript stability in trypanosomes. 31st Molecular Parasitology Meeting, Marine Biological Laboratory, Woods Hole, MA, USA, Online, September 21-24, 2020. *(Oral Presentation)*

Guegan F, Bento F, Pinto-Neves D, Sequeira M, Notredame C, Figueiredo LM. A long non-coding RNA controls parasite differentiation in African trypanosomes. EMBO YIP sectorial meeting in RNA and Structural biology, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, September 2-4, 2020. *(Poster Presentation)*

Viegas I, Rodrigues JA, Pereira JP, Aresta-Branco F, Jaffrey S, Figueiredo LM. Poly(A) tail methylation stabilizes VSG transcripts. EMBO YIP sectorial meeting in RNA and Structural biology, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, September 2-4, 2020. *(Oral Presentation)*

Viegas I, Rodrigues JA, Pereira JP, De Niz M, Aresta-Branco F, Temporao A, Serra L, Jaffrey S, Figueiredo LM. Strategies to identify the mechanism of poly(A) methylation. EMBO meeting the complex life of RNA, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, October 7-9, 2020. *(Oral Presentation)*

Internationalization

Our research group acts internationally at several levels. First, by being invited to become the next Chair of the Kinetoplastid Molecular and Cellular Biology Meeting (Woods Hole, USA). Second, by participating and presenting our work at international meetings including the Molecular Parasitology Meeting (Woods Hole, USA).

Third, by establishing and maintaining collaborations (Samie Jaffrey, Cornell University, USA; Frederic Bringaud, Université de Bordeaux, France; Falk Butter, University of Mainz, Germany; Catarina Gadelha, Nottingham University, UK).

Fourth, by being a member of editorial board of iScience and by acting as a reviewer for Nature Microbiology, Nature Communications, Nucleic Acids Research, Journal of Cell Science and PLoS Pathogens. Fifth, by being a member of the Innovative Training Network Cell2Cell Network (Marie Curie actions) and of the international collaborative award Cobalt by the Welcome Trust Fund. Finally, by acting as jury member of PhD defense juri of Miss Akila Yagoubat (Université de Montpellier, France).

Prizes, Honors and Awards

- Award of La Caixa research grant (500k€);
- Award for FCT PhD fellowship for Lucia Serra;
- Prize for best video of "The Coolest parasitology lab in 2020" (https://youtu.be/W9bDh5Ww9u0);
- Award for best poster to Mariana de Niz at MPM 2020;
- Award of "CEEC Individual call" salary contract.

Advanced Teaching

Figueiredo LM. Invited lecture. Is the adipose tissue an immune privileged site for trypanosomes? Mestrado em Investigação Biomédica, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, October 29, 2020.

Figueiredo LM. Invited lecture (virtual). Tissue Tropism in the mammalian host. ITN Cell2Cell program, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online, November 23, 2020.

Science and Society

Participation in the COVID-19 diagnostic and serology task forces by Adriana Temporão, Fabien Guegan, Henrique Machado, Juan de Macedo and Mariana de Niz.

MSc Theses

João Colaço, 24/06/2020, Longitudinal analysis of adipocytes and liver gene expression during *T. brucei* infection?, Mestrado em Bioinformática e Biologia Computacional, Faculdade de Ciências da Universidade de Lisboa. Supervisor: Luísa M. Figueiredo. Co-Supervisor: Sara Silva Pereira.

Luísa Lopes Lab

Major Interests/Objectives

The living human brain is considerably inaccessible to neuroscientific experimentation. Animal models, while yielding important insights, have also revealed important limitations regarding extrapolation to human physiology and lifespan. There are important early synaptic alterations taking place in the aged and diseased brain that correlate well with cognitive decline, at least in animal models. However, it is currently not possible to assess synaptic function from patients, even using the best imaging techniques available. We are currently focused into exploring the age-related alterations in glutamatergic synapses and its outcome in behavior performance and synaptic function, using animal models.

Our ultimate goal is to translate the knowledge we obtained from animal models using novel technologies in order to detect specific synaptic features in neurons derived from patients and testing these molecular imprints in healthy and diseased human brain tissue.

Head of Laboratory

Luísa Maria Vaqueiro Lopes, PhD

Team

Ana Inês Marques Morgado	PhD Student
Cátia Cristina Peixinho Reis	PhD Student
Joana Fernandes Esteves Soares Coelho	Senior Postdoctoral Researcher
Joana Gomes Ribeiro	PhD Student
Joana Isabel Rajão Saraiva	PhD Student
Mariana de Brito Morais	MSc Student (Left December)
Raquel Lagoa Madruga da Costa	MSc Student
Rui Artur Paiva Loureiro Gomes	Senior Postdoctoral Researcher

Laboratory Keywords/Research Areas

Neurosciences, Cognition, Aging, Hippocampus.

Major Scientific Achievements

With progressive age some individuals can maintain a stable cognitive function while others suffer from a rapid cognitive decline. As people age, some maintain the cognitive function, while others suffer from rapid cognitive decline. It is thought that the cholinergic circuit gradually degenerates with aging, resulting in impaired cholinergic function and memory impairment. However, the lack of high-resolution approaches to measure Ach release in vivo has impeded its follow-up research.

We have brought together our expertise to that of Ulkuhan Guler (Worcester Polytechnic Institute, US) and Yusuke Tsuno (Kanazawa University, Japan) to develop novel methods in order to study the dynamics of cholinergic dysfunction.

This project was awarded the Catalyst Award 2020 in the international Healthy Longevity Challenge. The identification of the cholinergic input which is dysfunctional in age-impairment will add knowledge to the field and hopefully provide novel clues to interfere or delay memory decline upon aging.

https://healthylongevitychallenge.org/winners/cholinergic-input-in-fast-versus-slow-cognitive-decline-upon-aging/

Selected Publications

Pousinha PA, Mouska X, et al (2019). The Amyloid Precursor Protein C-Terminal Domain Alters CA1 Neuron Firing, Modifying Hippocampus Oscillations and Impairing Spatial Memory Encoding. Cell Reports 29(2):317. *(IF: 8.1. Citations: 1. Source Web of Science)*.

Ribeiro M, Brigas HC, Temido-Ferreira M, Pousinha PA, Regen T, Santa C, Coelho JE, Marques-Morgado I, Valente CA, Omenetti S, Stockinger B, Waisman A, Manadas B, Lopes LV, Silva-Santos B, Ribot JC (2019). Meningeal γδ T cell-derived IL-17 controls synaptic plasticity and short-term memory. Science Immunology 4(40). *(IF: 10.551. Citations: 25. Source Web of Science)*.

Temido-Ferreira M, Ferreira DG, Batalha VL, Marques-Morgado I, Coelho JE, Pereira P, Gomes R, Pinto A, Carvalho S, Canas PM, Cuvelier L, Buée-Scherrer V, Faivre E, Baqi Y, Müller CE, Pimentel J, Schiffmann SN, Buée L, Bader M, Outeiro TF, Blum D, Cunha RA, Marie H, Pousinha PA, Lopes LV (2018). Age-related shift in LTD is dependent on neuronal adenosine A(2A) receptors interplay with mGluR5 and NMDA receptors. Molecular Psychiatry 25(8):1876-1900. *(IF: 15.4, Citations: 35. Source: Web of Science).*

Ferreira DG, Temido-Ferreira M, Miranda HV, Batalha VL, Coelho JE, Szegö EM, Marques-Morgado I, Vaz SH, Rhee JS, Schmitz M, Zerr I, Lopes LV*, Outeiro TF* (2017). α-Synuclein interacts with PrPC to induce cognitive impairment through mGluR5 and NMDAR2B. Nature Neuroscience 20(11):1569-1579. *Co-senior author. *(IF: 17.8, Citations: 90. Source: Web of Science).*

Batalha VL, Pego JM, Fontinha BM, Costenla AR, Valadas JS, Baqi Y, Radjainia H, Müller CE, Sebastião AM, Lopes LV (2013). Adenosine A2A receptor blockade reverts hippocampal stress-induced deficits and restores corticosterone circadian oscillation. Molecular Psychiatry 18(3):320-31. *(IF: 15.4, Citations 80. Source: Web of Science).*

Publications in Peer Review Journals

Brito DVC, Gulmez Karaca K, Kupke J, Mudlaff F, Zeuch B, Gomes R, Lopes LV, Oliveira AMM (2020). Modeling human age-associated increase in Gadd45γ expression leads to spatial recognition memory impairments in young adult mice. Neurobiology of Aging 94:281-286. *(IF: 4.4, Citations: 0. Source Web of Science)*.

Armada-Moreira A, Coelho JE, Lopes LV, Sebastião AM, Städler B, Vaz SH (2020). Multicompartment Microreactors Prevent Excitotoxic Dysfunctions In Rat Primary Cortical Neurons. Advanced Biosystems 4(10):2000139. *(IF:--, Citations: 0. Source: Web of Science)*

Korman M, Tkachev V, Reis C, Komada Y, Kitamura S, Gubin D, Kumar V, Roenneberg T (2020). COVID-19-mandated social restrictions unveil the impact of social time pressure on sleep and body clock. Scientific Reports 10(1):22225. *(IF: 3.9, Citations: 4. Source: Web of Science).*

Reis C, Staats R, Pellegrino P, Alvarenga T, Bárbara C, Paiva T (2020). The prevalence of excessive sleepiness is higher in shift workers than in patients with sleep apnea. Journal of Sleep Research 29(4): e13073. *(IF: 3.6, Citations: 0. Source: Web of Science).*

Miranda-Lourenço C, Duarte ST, Palminha C, Gaspar C, Rodrigues TM, Magalhães-Cardoso T, Colino-Oliveira M, Gomes R, Ferreira S, Xapelli S, Armstrong J, García-Cazorla A, Correia-de-Sá P, Sebastião AM, Diógenes MJ (2020). Impairment of adenosinergic system in Rett syndrome: Novel therapeutic target to boost BDNF signalling. Neurobiology of Disease 145:105043. *(IF: 5.3, Citations: 0. Source: Web of Science)*.

Reis C, Madeira SG, Lopes LV, Paiva T, Roennerberg T (2020). Validation of the Portuguese Variant of the Munich Chronotype Questionnaire (MCTQPT). Frontiers in Physiology 11:795. *(IF: 4.3, Citations: 0. Source: Web of Science)*.

Navia AM, Ben DD, Lambertucci C, Spinaci A, Volpini R, Marques-Morgado I, Coelho JE, Lopes LV, Marucci G, Buccioni M (2020). Adenosine Receptors as Neuroinflammation Modulators: Role of A1 Agonists and A2A Antagonists. Cells 9(7):1739. *(IF: 4.3, Citations: 0. Source: Web of Science)*.

Ongoing Research Projects

2019/2021: NeuroSeS: Neuroscience Seminar Series. Coordinator: Luísa Lopes. Funding Agency: Roche Farmacêutica. Reference: NeuroSeS: Neuroscience Seminar Series. Amount: 3 200,00€. Total Amount: 3 200,00€.

2019/2021: The physiological role of circadian rhythms in memory. Coordinator: Luísa Lopes. Funding Agency: Fundação BIAL. Reference: Bial Llopes. Amount: € 45 000,00. Total Amount: € 45 000,00.

2019/2021: Mechanistic insight on Alzheimer's using novel aging-based models. Coordinator: Luísa Lopes. Funding Agency: Santa Casa da Misericórdia de Lisboa. Reference: Prémio Santa Casa Mantero Belard (MB-07-2018) – Luísa Lopes. Amount: € 175 000,00. Total Amount: € 175 000,00.

2016/2020: Targeting the glycation defenses as a protective strategy for Parkinson's disease. Coordinator: Luísa Lopes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/NEU-OSD/5644/2014. Amount: 51 000,00€. Total Amount: 199 961,00€.

2016/2019: Microglia dysregulation as trigger for vhronic brain inflammation. Coordinator: Joana Coelho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIMMEC/4778/2014. Amount: 195 035,00€. Total Amount: 195 035,00€.

Other Projects

2018/2021: Hippocampal-cortical coordination and the mechanisms of cognition: the formation and retrieval of contextual memory during decision-making. Coordinator: Miguel Remondes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-NEU/29325/2017. Amount: € 239 421,20. Total Amount: € 239 421,20.

2018/2021: Meningeal gd 17 T cells: impact on cognitive functions in health and disease. Coordinator: Julie Ribot. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: iMMunoCOGNITION - LISBOA-01-0145-FEDER-028241. Amount: € 239 679,45. Total Amount: € 239 679,45.

Communications in International Conferences

Reis C, Piltz L, Björg Thorleifsdottir, Paiva T, Roenneberg T. Are really the Portuguese the latest in Europe? Society for Research on Biological Rhytms (SRBR), Online Event, June 1-3, 2020.

Marques-Morgado I, Dias M, Coelho JE, Ribeiro JG, Remondes M, Dawson N, Lopes LV. Detrimental-compensatory interactions in memory-related regions upon chronic circadian manipulation. 12th FENS Forum of Neuroscience, Online Event, July 11-17, 2020.

Reis C, Rebocho S, Paiva T (2020). Circadian and homeostatic processes in delayed sleep-wake phase disorder patients. 25th Congress of the ESRS, Online Event, September 22-24, 2020.

Reis C. Sleep in Portugal in the context of Europe. The International online conference: "Chronodiagnostics and Chronotherapy: Fundamentals of Digital Health", November 2020.

Communications in National Conferences

Marques-Morgado I, Coelho JE, Dias M, Remondes M, Dawson N, Lopes LV. Impact of circadian shifting on functional brain connectivity. "Juntos pelo Fernando Lopes da Silva" Conference, Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 24, 2020.

Organization of Conferences

Lopes LV. Director of the Course: 'Cognition and Ageing', FENS Cajal School of Neurosciences, Bordeaux Neurocampus.

Lopes LV. Co-Organizer with Cláudia Faria. NeuroSeS (Neuroscience Seminar Series), Centro Académico de Medicina de Lisboa, Lisbon, Portugal, 2020.

Internationalization

Saraiva J. PhD Exchange Period in University of Lille, France, January-March 2020.

Prizes, Honours and Awards

Lopes LV - Catalyst Award (National Academy of Medicine) Healthy Longevity Challenge.

Lopes LV, Brigas H, Coelho JE, Ribeiro M, Marques-Morgado I – Pfizer Award (Investigação Básica) with Julie Ribot.

Advanced Teaching

Lopes LV. Neurosciences PhD/MSc. Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, 2020.

Lopes LV. Biomedical Research Master Course, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Science and Society

Lopes LV. COLife and iMM COVID-related webinars (host).

Lopes LV. 'Cromo da semana', interview Revista Exame Informática.

Lopes LV - Colaboração no livro "Leadership – The Power Of Giving Back", de Pedro Afonso, editora Tema Central

PhD Theses Completed

Cátia Reis, 27/05/2020, Sleep patterns in Portugal: European and International comparisons, EnviHealth PhD Program, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Teresa Paiva. Co-Supervisor: Luísa V. Lopes and Till Roenneberg.

Helena Brigas, 26/06/2020, Searching for innate and adaptive immune cell fingerprints in Alzheimer's disease progression, LisbonBiomed PhD Program, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Julie Ribot. Co-Supervisor: Luísa V. Lopes.

Mamede de Carvalho Lab

Major Interests/Objectives

This Unit aims to further develop the main areas where it has been highly competitive internationally. In particular: markers for early diagnosis, including wet biomarkers; epidemiology and treatment effectiveness/costs in hATTR amyloidosis; neurophysiology, phenotype-genotype and data mining in amyotrophic lateral sclerosis (ALS); and computational models in behaviour and basal ganglia dysfunction. We intend to increment the progressive involvement in international projects associated with very productive centres located in Europe and USA, promoting scientific development and higher output in topics of this Unit expertise.

Head of Laboratory

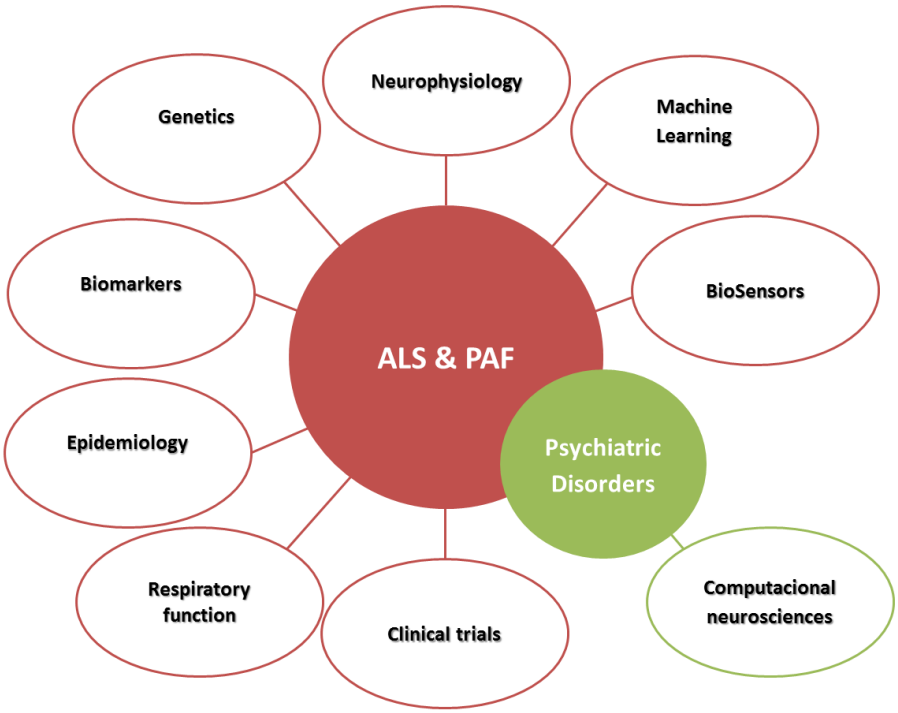
Mamede Alves de Carvalho, Full Professor of Physiology and Director of Physiology Institute, Unit Leader iMM, and Vice-Dean of the Faculdade de Medicina da Universidade de Lisboa, Neurologist and Neurophysiologist, head of the Neuromuscular Unit of Centro Hospitalar Universitário Lisboa-Norte

Team

Ana Catarina de Oliveira da Silva Pronto Laborinho	Postdoctoral Researcher
Ana Catarina dos Santos Farinha	PhD Student
Anabela Leuschner Fernandes Cardoso Pinto Noronha Sanches	Clinical Researcher
Andreia Leitão Tavares Ribeiro dos Santos	PhD Student
Ângelo Rodrigo Neto Dias	PhD Student
Anna Caroline Marques dos Anjos Braga	Clinical Researcher
Bruno André e Silva Miranda	Clinical Researcher
Bruno Daniel da Costa Gomes	Postdoctoral Researcher
Cristiano Torres Tavares dos Santos	Clinical Researcher
Fernando Manuel Pinto Ferreira Domingos	Clinical Researcher
Francisco José Correia Graça Almeida	Trainee
Gabriel Miltényi-Miltenberger	Staff Scientist
Isabel Maria dos Santos Conceição	Clinical Researcher
Isabel Martins de Castro	Technician
João Daniel Galvão Antunes	Trainee (Left December)
José Filipe Oliveira Castro	Senior Technician
Lena Helene Ernst	Postdoctoral Researcher
Leonel Almeida Luis	Clinical Researcher
Maria da Conceição Jonet de Azevedo Coutinho	Clinical Researcher (Left December)
Mariana Fernandes Alves Pereira	PhD Student
Marta Luísa Gromicho Morgado da Silva	Senior Postdoctoral Researcher

Michael Swash	Clinical Researcher
Sofia Rita Cardoso Fernandes	Postdoctoral Researcher
Susana Cristina da Costa Pinto	Visiting Researcher
Tiago Vaz Maia	Staff Scientist
Vasco Manuel Aranha da Conceição	Postdoctoral Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

Amyotrophic Lateral Sclerosis, Neurophysiology of Respiratory Function, Spinal Cord Excitability. hATTR Amyloidosis, Neurocomputational Modelling of Brain Disorders, Tourette Syndrome, Biological Signal Processing.

Major Scientific Achievements

Our Unit is involved in neuromuscular disorders, in particular amyotrophic lateral sclerosis (ALS) and hATTR amyloidosis, and in the nascent field of computational psychiatry. We have increased our output in the main areas of research, with important contributions published regarding the dopaminergic dysfunction in Tourette Syndrome, learning, modulation of the spinal cord and peripheral nerve on direct current stimulation, markers of diagnosis and progression in ALS, respiratory neurophysiology, novel treatments and its impact in hATTR amyloidosis.

Also, we published results on the genetic mutations, predictors and wet-biomarkers in ALS, clinical/neurophysiological features and epidemiology of hATTR amyloidosis. Our participation in several competitive projects in ALS will promote additional future publications.

Selected Publications

Maia TV, Frank MJ. An integrative perspective on the role of dopamine in schizophrenia (2017). Biological Psychiatry *81(1):52-66. (IF: 12.095. Citations: 146. Source: Google Scholar).*

Conceição I, Miranda B, Castro J, de Carvalho M (2018). Hereditary amyloidosis related to transthyretin V30M (hATTR V30M): disease progression in treated and untreated patients. European Journal of Neurology 25:1320-e115. *(IF: 4.387. Citations: 5. Source: Google Scholar)*.

Miltenberger-Miltenyi G, Conceição VA, Gromicho M, Pronto-Laborinho AC, Pinto S, de Carvalho M (2019). C9orf72 expansion is associated with accelerated decline of respiratory function and decreased survival in amyotrophic lateral sclerosis. Journal of Neurology Neurosurgery and Psychiatry 90(1):118-120. *(IF: 8.234. Citations: 7. Source: Google Scholar)*.

Johnsen B, Pugdahl K, ..., Swash M, de Carvalho M (2019). Diagnostic criteria for amyotrophic lateral sclerosis: a multicenter study of inter-rater variation and sensitivity. Clinical Neurophysiology 130(2):307-314*. (IF: 3.214. Citations: 12. Google Scholar).*

Gromicho M, Figueiral M, Uysal H, Grosskreutz J, Kuzma-Kozakiewicz M, Pinto P, Petri S, Madeira S, Swash M, de Carvalho M (2020). Spreading in ALS: the relative impact of upper and lower motor neuron involvement. Annals of Clinical and Translational Neurology 7:1181-1192. *(IF: 3.66. Citations: 2. Google Scholar)*

Publications in Peer Year Reviews

Zapata-Zapata CH, Dáger EF, Aguirre-Acevedo DC, de Carvalho M, Solano J (2020). Prevalence, incidence and clinical-epidemiological characterization of amyotrophic lateral sclerosis in Antioquia – Colombia. Neuroepidemiology 54(3):251-257. *(IF: 2.689, Citations: 0. Source. Web of Science)*. Q2.

Silva C, Rodrigues FB, Duarte, GS, Costa J, de Carvalho M (2020). Prognostic value of phrenic nerve conduction study in Amyotrophic Lateral Sclerosis: a systematic review and meta-analysis. Clinical Neurophysiology 131(1):106-113. *(IF: 3.675, Citations: 2. Source: Scopus)*. Q1

Dengler R, de Carvalho M, Shahrizaila N, Nodera H, Vucic S, Grimm A, Padua L, Schreiber S, Kneiser MK, Brown AD, Hobson-Webb LD, Boon AJ, Smith BE, Litchy WJ, Li Y, Lenihan M, Thompson VB, Stalberg E, Sanders DB, Kincaid JC (2020). AANEM - IFCN Glossary of Terms in Neuromuscular Electrodiagnostic Medicine and Ultrasound. Clinical Neurophysiology 131(7):1662-1663. *(IF: 3.675, Citations: 0. Source: Web of Science)*. Q1

Dengler R, de Carvalho M, Shahrizaila N, Nodera H, Vucic S, Grimm A, Padua L, Schreiber S, Kneiser MK, Brown AD, Hobson-Webb LD, Boon AJ, Smith BE, Litchy WJ, Li Y, Lenihan M, Thompson VB, Stalberg E, Sanders DB, Kincaid JC (2020). AANEM - IFCN Glossary of Terms in Neuromuscular Electrodiagnostic Medicine and Ultrasound. Muscle & Nerve 62(1):10-12. *(IF: 2.393, Citations: 3. Source: Web of Science*). Q2

Turner MR, Barohn R, Corcia P, Fink JK, Harms M, Kiernan MC, Ravits J, Silani V, Simmons Z, Statland J, van den Berg L, Delegates of the 2nd International PLS Conference*, Mitsumoto H (2020). Primary lateral sclerosis: diagnostic criteria. Journal of Neurology Neurosurgery and Psychiatry 91(4):373-377. *(IF: 8.272, Citations: 13. Source: Web of Science)*. Q1

Inês M, Coelho T, Conceição I, Landeiro F, de Carvalho M, Costa J (2020). Societal costs and burden of hereditary transthyretin amyloidosis polyneuropathy. Amyloid-Journal of Protein Folding Disorders 27(2):89-96. *(IF: 2.553, Citations: 1. Source: Web of Science).* Q2

de Carvalho M (2020). Electrodiagnosis of Amyotrophic Lateral Sclerosis: a review of existing guidelines. Journal of Clinical Neurophysiology 37(4):294–298. *(IF: 1.673, Citations: 0. Source: Web of Science)*. Q2

Byrne RP, van Rheenen W, Project MinE ALS GWAS Consortium, van den Berg LH, Veldink JH, McLaughlin RL (2020). Dutch population structure across space, time and GWAS design. Nature Communications 11(1):4556. *(IF: 12.121, Citations: 1. Source: Web of Science).*

Pereira M, Swash M, de Carvalho M (2020). Immobility and F-waves: impact on lower motor neuron excitability. Muscle & Nerve 61(4):480-484. *(IF: 2.393, Citations: 1. Source: Web of Science)*. Q2

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Duque T, Gromicho M, Pronto-Laborinho AC, de Carvalho (2020). Transforming growth factor-β plasma levels and its role in Amyotrophic Lateral Sclerosis. Medical Hypotheses 139:109632. *(IF: 1.375, Citations: 3. Source: Web of Science)*. Q3

Inês M, Coelho T, Conceição I, Ferreira L, de Carvalho M, Costa J (2020). Health-Related Quality of Life in Hereditary Transthyretin Amyloidosis Polyneuropathy: a prospective, observational study. Orphanet Journal of Rare Diseases 15(1):67. *(IF: 3.687, Citations: 0. Source: Web of Science)*. Q1

de Carvalho M, Swash M (2020). Motor Unit Estimation by MRI: integrating old and new ideas. Clinical Neurophysiology 131(6):1379-1380. Editorial. *(IF: 3.675, Citations: 1. Source: Web of Science)*. Q1

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Silva DP, Soeiro e Sá M, Silveira F, Pinto S, Gromicho M, Berta Sousa A, Leão M, de Carvalho, M (2020). VRK1 variants in two Portuguese unrelated patients with childhood-onset motor neuron disease. Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration 21(3-4):291-295. *(IF: 2.883, Citations: 1. Source: Web of Science).* Q1

Torrieri C, Miranda B, Gromicho M, Pinto S, de Carvalho M (2020). Reliability of phrenic nerve conduction study: In healthy controls and in patients with primary lateral sclerosis. Clinical Neurophysiology 131(5):994-999. *(IF: 3.675, Citations: 1. Source: Web of Science)*. Q1

Shefner JM, Al-Chalabi A, Baker MR, Cui LY, de Carvalho M, Eisen A, Grosskreutz J, Hardiman O, Henderson R, Matamala JM, Mitsumoto H, Paulus W, Simon N, Swash M, Talbot K, Turner MR, Ugawa Y, van den Berg LH, Verdugo R, Vucic S, Kaji R, Burke D, Kiernan MC (2020). A Proposal for New Diagnostic Criteria for ALS. Clinical Neurophysiology 131(8):1975-1978. *(IF:3.675, Citations: 20. Source: Scopus)*. Q1

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Braga AC, Gromicho M, Pinto S, de Carvalho M, Henning F (2020). A comparative study of South African and Portuguese amyotrophic lateral sclerosis cohorts. Journal of the Neurological Sciences 414:116857. *(IF: 2.651, Citations: 4. Source: Web of Science)*. Q2

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Casanova I, Caetano A, Díaz A, Conceição I, Brum M, de Carvalho M (2020). Motor excitability measurements in early stage familial amyloid polyneuropathy: the influence of tafamidis treatment. Neurophysiologie Clinique 50(3)-145-153. *(IF: 2.553, Citations: 0. Source: Web of Science)*. Q2

Swash M, de Carvalho M (2020). Measuring spinal presynaptic inhibition in human subjects. Clinical Neurophysiology 131(8):1966-1967. Editorial. *(IF:3.675, Citations: 0. Source: Web of Science)*. Q1

Conceição I, Falcão de Campos C, Oliveira Santos M, de Carvalho M (2020). Orientações clínicas para a abordagem de doentes neuromusculares durante a pandemia COVID-19. Sinapse 20(2):50-54. *(IF:--, Citations: 0. Source: Scopus)*

de Carvalho M (2020). Needling the future in ALS. Clinical Neurophysiology 131(8):1973-1974. *(IF: 3.675, Citations: 0. Source: Scopus)*. Q1

Henning F, Braga AC, Gromicho M, Pinto S, de Carvalho M (2020). Differences between South African and Portuguese ALS cohorts from an environmental perspective. Journal of the Neurological Sciences 414:116933. Authors' Reply. *(IF: 2.651, Citations: 0. Source: Web of Science)*. Q2

Gromicho M, Figueiral M, Uysal H, Grosskreutz J, Kuzma-Kozakiewicz M, Pinto P, Petri S, Madeira S, Swash M, de Carvalho M (2020). Spreading in ALS: the relative impact of upper and lower motor neuron involvement. Annals of Clinical and Translational Neurology 7(7):1181-1192. *(IF: 4.656, Citations: 2. Source: Web of Science)*. Q1

Schijven D, Stevelink R, McCormack M, van Rheenen W, Luykx JL, Koeleman BPC, Veldink JH, on behalf of the Project MinE ALS GWAS Consortium, and the International League Against Epilepsy Consortium on Complex Epilepsies (2020). Analysis of shared common genetic risk between amyotrophic lateral sclerosis and epilepsy. Neurobiology of Ageing S0197-4580(20)30130-5. *(IF: 4.398, Citations: 0. Source: Web of Science)*. Q1

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Oliveira Santos M, Gromicho M, Pinto S, de Carvalho M (2020). Clinical characteristics in young-adult ALS – results from a Portuguese cohort study. Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration 21(7-8):620-623. *(IF: 2.883, Citations: 0. Source: Web of Science)*. Q1

Barć K, Szacka K, Nieporęcki K, de Carvalho M, Gromicho M, Grosskreutz J, Petri S, Rödiger A, Steinbach R, Uysal H, Kuźma-Kozakiewicz M (2020). Emotional Lability at Disease Onset Is an Independent Prognostic Factor of Faster Disease Progression in Amyotrophic Lateral Sclerosis. Aging and Disease 11(5):1021-1028. *(IF: 4.130, Citations: 0. Source: Web of Science)*. Q1

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Cooper-Knock J, Zhang S, Kenna KP, Moll T, Franklin J, Allen S, Nezhad HG, Iacoangelini A, Yacovzada NY, Eitan C, Hornstein E, Ehilak E, Celadova P, Bose D, Farhan S, Fishilevich S, Lancet D, Morrison KE, Shaw CE, Al-Chalabi A, Project MinE ALS Sequencing Consortium, Veldink JH, Kirby J, Snyder MP, Shaw PJ (2020). Rare variant burden analysis within enhancers identifies CAV1 as an ALS risk gene. Cell Reports 33(9):108456. *(IF: 14.403, Citations: 0. Source: Web of Science*). Q1

Uysal H, Bilge U, İlhanlı N, Gromicho M, Grosskreutz J, Kuzma-Kozakiewicz M, Pinto S, Petri S, Szacka K, Nieporecki K, de Carvalho M (2020). ALS and fertility: does ALS affect number of children patients have? Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration 8:1-7. *(IF: 2.883, Citations:--. Source: Web of Science)*. Q1.

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Castro J, Swash M, de Carvalho M (2020). The Cutaneous Silent Period in Motor Neuron Disease. Clinical Neurophysiology. In Press. *(IF: 3.675, Citations: 1. Source: Scopus)*. Q1

Pereira M, Gromicho M, Henriques A, Pronto-Laborinho AC. Grosskreutz J, Kuźma-Kozakiewicz M, Petri S, Uysal H, Swash M, de Carvalho M (2020). Cardiovascular comorbidities in Amyotrophic Lateral Sclerosis. Journal of Neurology Science *(IF: 2.651, Citations: 0. Source: Web of Science)*. Q2

Moisse M, Zwamborn R, van Vugh J, van Rheenen W, Kenna B, van Eijk K, Kenna K, Corcia P, Couratier P, Hardiman O, McLaughin R, Gotkine M, Drory V, Ticozzi N, Silani V, de Carvalho M, Pardina M, Povedano M, Andersen PM, Weber M, Badsak NA, Chen X, Eberle MA, Al-Chalabi A, Shaw C, Shaw PJ, Morrison KE, Landers JE, Glass JD, van Es M, van den Berg L, Veldink J, Van Damme P, on behalf of Project MinE Sequencing Consortium (2020). The effect of SMN gene dosage on ALS risk and disease severity. Annals of Neurology. *(IF: 9.037, Citations: 0. Source: Web of Sciencce)*. Q1

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González-Duarte A, Berk JL, Quan D, Mauermann ML, Schmidt HH, Polydefkis M, Waddington-Cruz M, Ueda M, Conceição IM, Kristen AV, Coelho T, Cauquil CA, Tard C, Merkel M, Aldinc E, Chen J, Sweetser MT, Wang JJ, Adams D (2020). Analysis of autonomic outcomes in APOLLO, a phase III trial of the RNAi therapeutic patisiran in patients with hereditary transthyretin-mediated amyloidosis. Journal of Neurology 267(3):703-712. *(IF: 3.78; Citations: 6. Source: Google Scholar).* Q2

Coelho T, Yarlas A, Waddington-Cruz M, White MK, Sikora Kessler A, Lovley A, Pollock M, Guthrie S, Ackermann EJ, Hughes SG, Karam C, Khella S, Gertz M, Merlini G, Obici L, Schmidt HH, Polydefkis M, Dyck PJB, Brannagan Iii TH, Conceição I, Benson MD, Berk JL (2020). Inotersen preserves or improves quality of life in hereditary transthyretin amyloidosis. Journal of Neurology 267(4):1070-1079. *(IF: 3.78, Citations: 6. Source: Google Scholar).* Q2

Maia LF, Maceski A, Conceição I, Obici L, Magalhães R, Cortese A, Leppert D, Merlini G, Kuhle J, Saraiva MJ (2020). Plasma neurofilament light chain: an early biomarker for hereditary ATTR amyloid polyneuropathy. Amyloid-Journal of Protein Folding Disorders 27(2):97-102. *(IF: 4.0, Citations: 8. Source: Google Scholar).* Q1

González-Duarte A, Conceição I, Amass L, Botteman MF, Carter JA, Stewart M (2020). Impact of Non-Cardiac Clinicopathologic Characteristics on Survival in Transthyretin Amyloid Polyneuropathy. Neurology Therapy 9(1):135-149. *(IF: 3.65, Citations: 0. Source: Google Scholar).* Q2

Inês M, Coelho T, Conceição I, Ferreira L, de Carvalho M, Costa J (2020). Health-related quality of life in hereditary transthyretin amyloidosis polyneuropathy: a prospective, observational study. Orphanet Journal of Rare Diseases 15(1):67. *(IF: 3.5, Citations: 0. Source: Google Scholar).* Q1

Casanova I, Caetano A, Díaz A, Conceição I, Brum M, de Carvalho M (2020). Motor excitability measurements in early stage familial amyloid polyneuropathy: The influence of Tafamidis treatment. Neurophysiologie Clinique 50(3):145-153. *(IF: 3.2, Citations: 0. Source: Google Scholar).* Q1

Azevedo Coutinho MC, Cortez-Dias N, Cantinho G, Gonçalves S, Menezes MN, Guimarães T, Lima da Silva G, Francisco AR, Agostinho J, Santos L, Conceição I, Pinto FJ (2020). The sensitivity of DPD scintigraphy to detect transthyretin cardiac amyloidosis in V30M mutation depends on the phenotypic expression of the disease. Amyloid-Journal of Protein Folding Disorders 27(3):174-183. *(IF: 4.0, Citations: 0. Source: Google Scholar).* Q1

Brannagan TH, Wang AK, Coelho T, Waddington Cruz M, Polydefkis MJ, Dyck PJ, Plante-Bordeneuve V, Berk JL, Barroso F, Merlini G, Conceição I, Hughes SG, Kwoh J, Jung SW, Guthrie S, Pollock M, Benson MD, Gertz M, NEURO-TTR open-label extension investigators (2020). Early data on long-term efficacy and safety of inotersen in patients with hereditary transthyretin amyloidosis: a 2-year update from the open-label extension of the NEURO-TTR trial. European Journal of Neurology 27(8):1374-1381. *(IF: 4.5, Citations: 5. Source: Google Scholar).* Q1

Coelho T, Adams D, Conceição I, Waddington-Cruz M, Schmidt HH, Buades J, Campistol J, Berk JL, Polydefkis M, Wang JJ, Chen J, Sweetser MT, Gollob J, Suhr OB (2020). A phase II, open-label, extension study of long-term patisiran treatment in patients with hereditary transthyretin-mediated (hATTR) amyloidosis. Orphanet Journal of Rare Diseases 15(1):179. *(IF: 3.5, Citations: 4. Source: Google Scholar).* Q1

Adams D, Polydefkis M, González-Duarte A, Wixner J, Kristen AV, Schmidt HH, Berk JL, Losada López IA, Dispenzieri A, Quan D, Conceição IM, Slama MS, Gillmore JD, Kyriakides T, Ajroud-Driss S, Waddington-Cruz M, Mezei MM, Planté-Bordeneuve V, Attarian S, Mauricio E, Brannagan TH 3rd, Ueda M, Aldinc E, Wang JJ, White MT, Vest J, Berber E, Sweetser MT, Coelho T; patisiran Global OLE study group (2020).Long-term safety and efficacy of patisiran for hereditary transthyretin-mediated amyloidosis with polyneuropathy: 12-month results of an open-label extension study. Lancet Neurology 20(1):49-59. *(IF: 30.0, Citations: 1; Source: Google Scholar).* Q1

Inês M, Coelho T, Conceição I, Landeiro F, de Carvalho M, Costa J (2020). Societal costs and burden of hereditary transthyretin amyloidosis polyneuropathy. Amyloid-Journal of Protein Folding Disorders 27(2):89-96. *(IF: 4.0, Citations: 4. Source: Google Scholar).* Q1

Santos MO, P Coelho, Roque R, Conceição I (2020). Very late-onset limb-girdle muscular dystrophy type 2D: A milder form with a normal muscle biopsy. Journal of Clinical Neuroscience 72:471-473. *(IF: 1.59, Citations: 2. Source: Google Scholar).* Q2

Coelho P, Oliveira Santos M (2020). First Portuguese patient presenting with hereditary sensory and autonomic neuropathy type 1E associated with a novel mutation in DNMT1 gene. Neurological Sciences 41(5):1289-1290*. (IF: 2.415, Citation: 0. Source: Google Scholar).* Q2

Oliveira Santos M, Bentes C, Teodoro T, Moreira S, Marques M, Tomé D, Peralta AR (2020). Complex sleep-disordered breathing after vagus nerve stimulation: broadening the spectrum of adverse events of special interest. Epileptic Disorders 22(6):790-796. *(IF: 1.276, Citation: 0. Source: Google Scholar)*. Q2

Miranda B, Malalasekera WMN, Behrens TE, Dayan P, Kennerley SW (2020). Combined model-free and model-sensitive reinforcement learning in non-human primates. PLOS Computational Biology 16(6):e1007944. *(IF: 4.428, Citations: 4. Source: Google Scholar).* Q1

Other National Publications

Conceição I, Campos CF, Santos MO, de Carvalho M (2020). Guidelines for management of patients with neuromuscular disorders during Covid-19 pandemic | Orientações clínicas para a abordagem de doentes neuromusculares durante a pandemia COVID-19. Sinapse 20(2):50–54. (IF: 0.04, Citations: 0. Source: Scopus). Q4

Ongoing Research Projects

2018/2021: Avaliação detalhada de microRNA circulantes como biomarcadores de diagnóstico e prognóstico em Esclerose Lateral Amiotrófica. Coordinator: Mamede de Carvalho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MEC-NEU/31195/2017. Amount: 155 615,31€. Total Amount: 239 294,65€.

2018/2021: Investigação Sindrome Tourette. Coordinator: Tiago Maia. Funding Agency: Ampastta. Reference: Investigação Síndrome Tourette. Amount: 9 183,50€. Total Amount: 9 183,50€.

2017/2021: Computational Psychiatry Consulting on Pediatric Mental Illnesses. Coordinator: Tiago Maia. Funding Agency: National Institutes of Health (NIH). Reference: Computational Psychiatry Consulting on Pediatric Mental Illnesses. Amount: 30 903,27€. Total Amount: 30 903,27€.

2016/2020: Unravelling Prognostic markers in NEUROdegenerative diseases trough CLINical and OMICS data integration. Coordinator: Mamede de Carvalho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/EEI-SII/1937/2014. Amount: 48 791,00€. Total Amount: 197 346,00€.

Invited Lectures and Seminars

Miranda B. Goal-directed behaviour in health and disease. Neuroscience Seminar Series, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 14, 2020.

Conceição VA. The computational roles of dopamine and serotonin in Tourette syndrome and obsessive-compulsive disorder. Escola de Psicologia, CIPsi, Universidade do Minho, Braga, Portugal, February 10, 2020.

Conceição I. Rethink disease monitoring in transthyretin (ATTR) amyloidosis. Accelerate Webinar Series: hATTR Amyloidosis MATTERS, organized and funded by Alnylam® Pharmaceuticals, June 16, 2020.

Maia TV. From reinforcement learning models to neuropsychiatric disorders. Luncheon Seminar of the Department of Electrical and Computer Engineering of Instituto Superior Técnico, Lisbon, Portugal, Online Event, June 17, 2020.

Conceição I. Manifestações neurológicas da amiloidose hATTR. Formação Amiloidose hATTR do Núcleo de Estudos de Doenças Raras da Sociedade Portuguesa de Medicina Interna, September 24, 2020.

Conceição I. A Neurofisiologia no estudo das pequenas fibras. 8º Congresso Português de Doenças Neuromusculares, Online Event, October 23-24, 2020.

Conceição VA. Serotonin facilitates hidden-state learning. Institute for Systems and Robotics, Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal, October 29, 2020.

de Carvalho M. Aspetos neurofisiológicos no diagnóstico e seguimento das doenças do neurónio motor. I Webinar Online de Neurofisiologia Clínica, October 2020.

Conceição I. hATTR Amyloidosis. Tracing and treating a multisystem disease. Swiss Neurologists Webinar Series, November 11, 2020.

Conceição I. Small fiber cannalopathies. 14th Colombian Congress of Neurology 2020, Online Event, November 12-16, 2020.

Conceição I. Neurophysiological evaluation of small fibers. 14th Colombian Congress of Neurology 2020, Online Event, November 12-16, 2020.

Conceição I. Intraoperative Monitoring. 14th Colombian Congress of Neurology 2020, Online Event, November 12-16, 2020.

Conceição I. The experience of CHLN-Hospital Santa Maria in SMA. Go further SMA, Online Event, November 26, 2020.

Conceição I. Panel discussion- unanswered questions and research priorities in ATTR amyloidosis. ARiA 2020 Emeeting Series, December 3, 2020.

de Carvalho M. Overview of Current and Emerging Therapies for Amyotrophic Lateral Sclerosis. The 4th Moroccan Congress of Neurophysiology and the 2nd African Congress of Clinical Neurophysiology, Online Event, December 2020.

Maia TV. An integrative perspective on the role of dopamine in schizophrenia. Congress of the Schizophrenia International Research Society (plenary session on "Computational Approaches to Understand Psychosis"), 2020. *(The congress was originally scheduled for Florence, Italy, but was changed to recorded seminars because of the Covid pandemic)*

Communications in International Conferences

Alves IA, Maruta C, Miranda B. Semantic knowledge and cognitive planning. Advances in Alzheimer's and Parkinson's Therapies an AAT-AD/PD Focus Meeting, Virtual Meeting, April 1-5, 2020. *(Poster Presentation)*

Coelho P, Campos C, Conceicao I. Clinical heterogeneity of hereditary ATTR amyloidosis related to V30M mutation (hATTRm): experience of a Portuguese reference amyloidosis centre. European Academy of Neurology Annual Meeting, Virtual meeting, June 19-22, 2020. *(Oral Presentation)*

Coelho T, Conceição I, Plante-Bordeneuve V, Wixner J, Kiszko J, Chapman D, Stewart M, Moh-Lim Ong, Amass L. Long term stabilization of transthyretin amyloid polyneuropathy with tafamidis treatment: results from the Transthyretin Amyloidosis Outcomes Survey (THAOS). 2020 PNS Virtual Event, June 27-30, 2020. *(Poster Presentation)*

Martins AS, Gromicho M, Pinto S, de Carvalho M, Madeira S. Learning Prognostic Models using Disease Progression Patterns: Predicting the Need for Non-Invasive Ventilation in Amyotrophic Lateral Sclerosis. 19th International Workshop on Data Mining in Bioinformatics, Online Event, August 24, 2020. *(Poster Presentation)*

Waddington-Cruz M, Rapezzi C, Plante-Bordeneuve V, Coelho T, Sekijima Y, Conceição I, Wixner J, Maurer M, Dispenzieri A, Kristen A, González-Moreno J, González-Duarte A, Barroso F, Drachman B, García-Pavía P, González- Costello J, Schmidt H, Tournev I, Vita G, Shapiro B, Kiszko J, Flynn A, Rill D, Mundayat R, Amass L. The Changing Face of ATTR Amyloidosis: A 12 Year Perspective from the Transthyretin Amyloidosis Outcomes Survey (THAOS). XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Obici L, Conceição I, Polydefkis M, Gillmore J, Berber E, White MT, Sweetser MT, Wang JJ, Berk JL. Long-Term, Integrated Safety of Patisiran in Patients with Hereditary Transthyretin-Mediated Amyloidosis with Polyneuropathy. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Barroso F, Coelho T, Dispenzieri A, Conceição I, Waddington-Cruz M, Wixner J, Maurer MS, Rapezzi C, Plante-Bordeneuve V, Kristen AV, González Duatre A, Kiszko J, Flynn A, Rill D, Mundayat R, Stewart M, Amass L. Characteristics of patients with autonomic dysfunction in the transthyretin Amyloidosis outcomes survey. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Gertz M, Khella S, Wang AK, Coelho T, Cruz MW, Polydefkis MJ, Dyck PJ, Plante-Bordeneuve V, Berk JL, Barroso F, Brannagan TH, Merlini G, Conceição I, Jung SW, Hughes SG, Aquino P, O'Dea LL, Narayana A, Dasgupta N, Benson MD. Management of Thrombocytopenia in Patients with Hereditary Transthyretin Amyloidosis Treated with Inotersen. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Khella S, Gertz M, Wang AK, Coelho T, Waddington Cruz M, Polydefkis MJ, Plante-Bordeneuve V, Berk JL, Barroso F, Brannagan TH, Merlini G, Conceição I, Jung SW, Hughes SG, Aquino P, O'Dea LL, Narayana A, Dasgupta N, Benson MD. Clinical Efficacy and Monitoring of Platelet Count and Kidney Function in Patients with Hereditary Transthyretin Amyloidosis Treated with Inotersen. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Lovley A, Coelho T, Yarlas A, Pollock M, McCausland K, Conceição I, Karam C, Khella S, Obici L, Waddington-Cruz M, Vera Llonch M. Long-term impact of inotersen on neuropathy quality of life for transthyretin amyloidosis & polyneuropathy: neuro-TTR open-label extension at 2 years. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Yarlas A, Coelho T, McCausland K, Lovley A, Vera Llonch M, Conceição I, Karam C, Khella S, Obici L, Waddington-Cruz M, Pollock M. Inotersen Delays Impact of Polyneuropathy Symptoms and Impaired Daily Activities for 3 Years in Patients with Hereditary Transthyretin Amyloidosis. XVII International Symposium on Amyloidosis, Online Event, September 14-18, 2020. *(Poster Presentation)*

Pinto S, Swash M, de Carvalho M. Can the central respiratory drive compensate for the weakness of the respiratory muscles in amyotrophic lateral sclerosis? World Federation for Neurorehabilitation & SOFMER 2020, Lyon, France, Online Event, October 7-10, 2020. *(Poster Presentation)*

Pinto S, Swash M, de Carvalho, M. Can the Central Respiratory Drive Compensate for the Weakness of the Respiratory Muscles in Amyotrophic Lateral Sclerosis. World Federation for Neurorehabilitation & SOFMER 2020, Lyon, France, Online Event, October 7-10, 2020. *(Poster Presentation)*

Pinto S, de Carvalho M. Impact of the Positioning on the Results of the Respiratory Function Tests in Amyotrophic Lateral Sclerosis. World Federation for Neurorehabilitation & SOFMER 2020, Lyon, France, Online Event, October 7-10, 2020. *(Poster Presentation)*

Pires P, Gromicho M, Pinto S, de Carvalho M, Madeira S. Patient Stratification in Amyothrophic Lateral Sclerosis using Clinical and Patient Profiles. 8th International Work-Conference on Bioinformatics and Biomedical Engineering, Online Event, September 30-October 2, 2020. *(Poster Presentation)*

Pires S, Aidos H, Gromicho M, Pinto S, de Carvalho M, Madeira S. Unravelling Disease Presentation Patterns in ALS using Biclustering for Discriminative Meta-features Discovery. 8th International Work-Conference on Bioinformatics and Biomedical Engineering, Online Event, September 30-October 2, 2020. *(Poster Presentation)*

Fernandes SR, Pereira M, Salvador R, de Carvalho M, Miranda PC. A Combined Modelling-Experimental Approach in Non-Invasive Spinal Cord Stimulation. 7th International Conference on Non-invasive Brain Stimulation, Online Event, November 10-14, 2020. *(Oral Presentation)*

Soerensen DM, Bostock H, Ballegaard M, Fuglsang-Frederiksen A, Graffe CC, Grötting AG, Jones K, Kallio M, Krarup C, Kroigård T, Lupesco T, Maitland S, Moldovan M, Nilsen KB, Pugdahl K, Oliveira Santos M, Themistocleus A, Zlateva SS, Ööpik M, Tankisi H. Assessing inter-rater reproducibility in a novel MUNE method MScanFit MUNE in a single subject Round Robin setup. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Oliveira Santos M, Gromicho M, Pinto S, de Carvalho M (2020). Clinical characteristics in young-adult ALS – results from a Portuguese cohort study. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Pinto S, Carvalho M. Phrenic nerve study as inclusion criterion and outcome in clinical trials for amyotrophic lateral sclerosis. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Oliveira Santos M, Gromicho M, Pinto S, de Carvalho M. Clinical characteristics in young-adult ALS – results from a Portuguese cohort study. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Pinto S, Swash M, de Carvalho M. Mouth occlusion pressure at 100ms (P0.1) in ALS: what is its significance? 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Pronto- Laborinho AC, Lopes CS, Conceição VC, Gromicho M, Santos NS, Carvalho M, Carvalho FA. Gamma fibrinogen as a predictor of survival in Amyotrophic Lateral Sclerosis. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Campos CF, Gromicho M, Uysal H, Grosskreutz J, Kuzma-Kozakiewicz M, Pinto S, Petri P, de Carvalho M. Family history of neurodegenerative disorders in Amyotrophic Lateral Sclerosis patients: population-based case-control study. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Stubendorff B, Gromicho M, Szacka K, Hertel N, de Carvalho M, Kuźma-Kozakiewicz M, Petri S, Uysal H, Grosskreutz J. Comparison of individual disease courses in partner centers of the ONWebDUALS project applying the D50 model. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Pereira M, Gromicho M, Henriques A, Pronto-Laborinho AC, Grosskreutz J, Kuźma-Kozakiewicz M, Petri S, Uysal H, Swash M, de Carvalho M. Cardiovascular comorbidities in Amyotrophic Lateral Sclerosis. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Braga AC, Gromicho M, Pinto S, de Carvalho M, Henning F. A comparative study of South African and Portuguese amyotrophic lateral sclerosis cohorts. 31st International Symposium on ALS/MND, Online Event, December 09-11, 2020. *(Poster Presentation)*

Communications in National Conferences

Rodrigues SG, Oliveira Santos M. Dermatomiosite focal. Congresso de Neurologia 2020 "Da molécula à prática clínica", Online Event, November 19-21, 2020. *(Poster Presentation)*

Vicente BN, Oliveira Santos M. Atrofia muscular espinhal tipo 2 e gravidez: um parto eutócico de sucesso, mas inesperado. Congresso de Neurologia 2020 "Da molécula à prática clínica", Online Event, November 19-21, 2020. *(Poster Presentation)*

Rodrigues SG, Oliveira Santos M. Dermatomiosite focal. Congresso de Neurologia 2020 "Da molécula à prática clínica", Online Event, November 19-21, 2020. *(Poster Presentation)*

Oliveira Santos M. When to consider AHP: suspicion in patients with neurological manifestations. 8.º Congresso Português de Doenças Neuromusculares, Online Event, October 23-24, 2020. *(Oral Presentation)*

Ionel C, Coelho P, Oliveira Santos M, Pereira P. Neuropatia sensitivo-autonómica hereditária tipo 1E: descrição de duas novas mutações no gene DNMT1 em famílias portuguesas e revisão. 8.º Congresso Português de Doenças Neuromusculares, Online Event, October 23-24, 2020. *(Oral Presentation)*

Pereira M, Gromicho M, Henriques A, Pronto-Laborinho AC, Grosskreutz J, Kuźma-Kozakiewicz M, Petri S, Uysal H, Swash M, de Carvalho M. Cardiovascular Comorbidities in Amyotrophic Lateral Sclerosis. Congresso de Neurologia 2020, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Poster Presentation)*

Oliveira Santos M, Gromicho M, Pinto S, de Carvalho, M. Características Clínicas de Jovens Adultos com Esclerose Lateral Amiotrófica. Congresso de Neurologia 2020, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Oral Presentation)*

Pronto-Laborinho AC, Lopes CS, Conceição VC, Gromicho M, Santos NS, de Carvalho M, Carvalho F. γ' fibrinogen as a Predictor of Survival in Amyotrophic Lateral Sclerosis. Congresso de Neurologia 2020, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Oral Presentation)*

Silva CS, Oliveira Santos M, de Carvalho M. Heterogeneidade fenotípica da expansão do gene C9orf72 numa família Portuguesa. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Poster Presentation)*

Santos M, Reimão S, Teotónio P, de Carvalho M. Outro Mimic da Esclerose Lateral Amiotrófica: o caso de uma fístula arteriovenosa medular dural. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Poster Presentation)*

Oliveira Santos M, Vicente BN, Domingues S, Oliveira F, Moreira S, de Carvalho M, Conceição I. Spinal Muscular Atrophy type 3 Patients under Treatment with Nusinersen: a small experience from a Universitary Portuguese Hospital. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020. *(Oral Presentation)*

Pronto-Laborinho AC, Lopes C, Gromicho M, Santos NS, Carvalho M, Carvalho F. Using AFM to study Erythrocytes morphology and elasticity on Amyotrophic Lateral Sclerosis. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020 *(Poster Presentation)*

Vicente BN, Santos MO, Oliveira FG, Moreira S, Conceição I. Terapêutica de substituição enzimática com alglucosidade alfa na doença de Pompe de início tardio: a experiência de um centro de referência de doenças de sobrecarga lisossomal. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020 *(Poster Presentation)*

Oliveira Santos M, de Campos CF, Castro I, Castro J, Conceição I. Assessment of a Proposed Approach For Monitoring Neuropathy Progression in Hereditary Variant Transthyretin Amyloidosis. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020 *(Poster Presentation)*

Oliveira Santos M, Vicentes BN, Domingues S, Oliveira F, Moreira S, Carvalho M, Conceição I. Spinal muscular atrophy type 3 patients under treatment with Nusinersen: a small experience from a University Portuguese Hospital. Congresso de Neurologia 2020, Sociedade Portuguesa de Neurologia, Coimbra, Portugal/Online Event, November 18-21, 2020 *(Poster Presentation)*

Duque T, Pronto-Laborinho AC, Gromicho M, de Carvalho M. The influence of TDP- 43 in TGF- β serum levels in Amyotrophic Lateral Sclerosis (ALS). GAPIC – DIA da INVESTIGAÇÃO, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, Online Event, December 9, 2020. *(Poster Presentation)*

Organization of Conferences

de Carvalho M. Member of the Scientific Commitee. 8º Congresso Nacional da Sociedade Portuguesa de Estudos de Doenças Neuromusculares, Porto, Portugal, October 23, 2020.

Conceição I. Member of the Steering Commitee. ARiA 2020 Emeeting Series, September 21 to December 3, 2020.

Internationalization

de Carvalho M. Evaluator for the position of *Chair of Clinical Neurophysiology.* Institute of Neuroscience of Newcastle University, UK.

de Carvalho M. Evaluator for the position of *Professor or Associate Professor of Medicine (Neurology).* University of Sydney, Australia.

Mamede de Carvalho - Collaborations with the groups of:

- MinE, International groundbreaking genetic ALS research to understand the genetic basis of ALS;
- ESTEEM- European Standardised Telematic tool to Evaluate EMG;
- LASIGE (Computer Science and Engineering research unit, Data and Systems Intelligence Research Unit);
- ITQB (Júlia Costa Lab – Glycobiology).

Tiago Vaz Maia - Collaborations with the groups of:

- Daniel Pine, National Institute of Mental Health, USA (NIH Distinguished Investigator and Chief of the Section on Development and Affective Neuroscience);
- Klaas Stephan, ETH and University of Zurich, Switzerland (Professor and Director of the Translational Neuromodeling Unit);
- Carles Soriano-Mas, IDIBELL Bellvitge Biomedical Research Institute, Barcelona, Spain (Laboratory Head);
- Amy Margolis, Columbia University (Assistant Professor in the Department of Psychiatry).

Prizes, Honors and Awards

- Coelho M, Conceição I, Inês M, de Carvalho M, Costa J. Clinical Medicine BIAL Prize 2020 for the work "A Paramiloidose em Portugal e no mundo: de doença fatal a doença crónica com qualidade de vida preservada". ().
- De Carvalho M. President of the Evaluation Commission. 2nd to 9th International Medicine Award Instituto Paulo Gontijo, 2009-2020.
- De Carvalho M. Member of the Evaluation Commission "Prémio Científico Universidade de Lisboa" Human Motricity, 2016-2020.
- De Carvalho M. Member of the Evaluation Commission "Prémio Científico Universidade de Lisboa" Biomedical Sciences, 2016-2020.

- De Carvalho M. Member of the Evaluation Commission “Prémio Científico Universidade de Lisboa” Health, 2016-2020.
- De Carvalho M. Member of the Evaluation Commission for Projectos “EDP Solidária” (Fundação EDP), 2016-2020.

Industry Contract Research

- de Carvalho, M – Cytokinetics Inc for developing Respiratory Function Research in ALS.
- Clinical Trials
    - ISIS 420915-CS3;
    - ALN-TTR02-006;
    - ALN-TTRSC02-002:
    - Neuro-TTRansform.

Government/Organization Contract Research

- Maia TV (Principal Investigator), Reinforcement-learning disturbances due to exposure to prenatal tobacco smoke, Subcontract with Columbia Center for Environmental Child Health - Child & Adolescent Psychiatry, Columbia University, USA, 2019-2020.
- Maia TV (Co-Investigator), State learning in the orbitofrontal cortex: a combined neuroimaging and computational psychiatry study in obsessive-compulsive disorder (PI: C. Soriano-Mas), Ministerio de Ciencia, Innovación y Universidades, Spain, 2020-2022.
- Maia TV (Consultant), Computational psychiatry consulting services on pediatric mental illnesses, National Institute of Mental Health (75N95B19P00153), USA, 2019-2020.
- Maia TV (Consultant), Computational psychiatry consulting, IDIBELL Bellvitge Biomedical Research Institute (PI19/01171), Spain, 2020.

Advanced Teaching

Unit members are usual lectures in national and international post-graduate teaching.

de Carvalho M is co-coordinator of the master-PhD Degree of Neurosciences (Faculty of Medicine) and in the Integrative Neuroscience PhD Program (University of Lisbon).

Miranda B. Surdez Súbita – Fisiopatologia. Webinar da Associação Portuguesa de Otoneurologia, Portugal, October 29, 2020.

Science and Society

https://www.touretteportugal.pt/quem-somos/assembleia-geral/
https://www.touretteportugal.pt/quem-somos/direccao/
https://www.apela.pt/page/29/conselho-cientifico

MSc Theses

Diogo Lima, 16/07/2020, Envolvimento do sistema nervoso central em "Hereditary Neuropathy with liability to Pressure Palsies", Faculdade de Medicina da Universidade de Lisboa. Supervisor: Mamede de Carvalho.

Inês Alexandra Alves, Submitted (awaiting defence), Planeamento cognitivo episódico e semântico: evidência de populações clínicas, Mestrado em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Bruno Miranda.

Renata Cruz, Submitted (awaiting defence), Role of the telencephalon in the maintenance of social dynamics of zebrafish in a free moving environment. Mestrado em Neurociências, Faculdade de Medicina da Universidade de Lisboa. Co-Supervisor: Bruno Miranda.

PhD Theses

Ana Catarina Pronto Laborinho, 03 /02/2020, Biomarcadores respiratórios na abordagem clínica da Esclerose Lateral Amiotrófica, Fisiologia, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Mamede de Carvalho. Co-Supervisor: Filomena Carvalho.

Vasco Manuel Aranha da Conceição, 01/2020, The Computational Roles of Dopamine and Serotonin in Tourette Syndrome and Obsessive-Compulsive Disorder, Neurociências, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Tiago Maia.

Jury Contests

* Mamede de Carvalho. Vogal na Prova de Doutoramento em Medicina (Fisiologia) do Mestre Sérgio Miguel Matosos Laranjo, com o título "*Reflex Syncope: an integrative physiological approach*". Faculdade de Medicina da Universidade de Lisboa, Janeiro de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado Integrado de Medicina da licenciada Inês Tomás M Martins Margarido, com o título *A Medicina do futuro nos dias de hoje:*

aplicações da inteligência artificial. Faculdade de Medicina da Universidade de Lisboa, Março de 2020.

* Mamede de Carvalho. Membro do Júri no concurso destinado ao recrutamento de dois Professores Associados da área disciplinar de Ciências Funcionais e Alvos Terapêuticos, da Faculdade de Ciências Médicas, NOVA Medical School da Universidade Nova de Lisboa, Abril de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências do licenciado Daniel Mateus Correia, com o título *From sensory cues to complex behaviour: towards an understanding of the neuronal computations underlying sensorimotor transformation in Caenorhabditis Elegans*. Faculdade de Medicina da Universidade de Lisboa, Maio de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências da licenciada Beatriz dos Santos P Soromenho, com o título *Role of S100B in EAE pathogenesis*. Faculdade de Medicina da Universidade de Lisboa, Junho de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências da licenciada Inês Filipa E Martins, com o título *Can musical trainning boost emotional processing skills?* Faculdade de Medicina da Universidade de Lisboa, Julho de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências da licenciada Ana Rita Colaço, com o título *Dissecting neuronal miRNA-124 modulation effects on secretome-mediated microglia deregulation in mSOD1-associated amyotrophic lateral sclerosis*. Faculdade de Medicina da Universidade de Lisboa, Julho de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências da licenciada Beatriz Faustino Guedes, com o título *EEG as a prognostic tool after cardiac arrest*. Faculdade de Medicina da Universidade de Lisboa, Julho de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Neurociências da licenciada Mariana Cristina Lança de Oliveira, com o título *The role of sexual hormones in glioblatoma*. Faculdade de Medicina da Universidade de Lisboa, Julho de 2020.

* Mamede de Carvalho. Membro do Júri do concurso para recrutamento de seis Professores Associados para a Área Disciplinar de Física, subáreas de Física, Engenharia Física e Engenharia Biomédica, no Departamento de Física da FCT NOVA, Junho de 2020.

* Mamede de Carvalho. Membro do Júri do concurso para recrutamento de dois Professores Catedráticos para a Área Disciplinar de Física, subáreas de Física, Engenharia Física e Engenharia Biomédica, no Departamento de Física da FCT NOVA, Junho de 2020.

* Mamede de Carvalho. Presidente do Júri na Prova do Mestrado de Medicina Hiperbárica e Subaquática do licenciado António Marques Lopes, com o título *Patologias Disbáricas-alterações da função auditiva dos enfermeiros expostos a ambiente hiperbárico*. Faculdade de Medicina da Universidade de Lisboa, Setembro de 2020.

* Mamede de Carvalho. Vogal na Prova de Doutoramento em Medicina (Fisiologia) do Mestre Angela Amaro Leal, com o título "*Peripheral Multiorgan Dysfunction Induced by Sepsis: the role of NfKb pathway and its impact on brain and heart function"*. Faculdade de Medicina da Universidade de Lisboa, Setembro de 2020.

*Mamede de Carvalho. Arguente na discussão do curriculum vitae nas Provas de Agregação da Doutora Maria Augusta Vieira Coelho, Faculdade de Medicina da Universidade do Porto, Novembro de 2020.

* Mamede de Carvalho. Arguente na Prova de Mestrado de Engenharia Eléctrica e Computacional, do licenciado Tiago Miguel da Silva Leão, com o título "*Profiling ALS Disease Progression trough Data Mining Techniques"*, Faculdade de Ciências, Dezembro de 2020.

* Mamede de Carvalho. Membro do Júri do procedimento concursal comum para Assistente Técnico da Faculdade de Medicina da Universidade de Lisboa (Instituto de Farmacologia e Neurociências), 2020.

* Mamede de Carvalho. Avaliador para a posição de *Chair of Clinical Neurophysiology* do Institute of Neuroscience of Newcastle University, UK, 2020.

* Mamede de Carvalho. Avaliador para a posição de *Professor or Associate Professor of Medicine (Neurology)* da University of Sydney, Australia, 2020.

Marc Veldhoen Lab

Major Interests/Objectives

We are interested in how T cells are activated and differentiate, and how tissue resident T-cells are generated, maintained and activated at the epithelial barrier, especially in the small intestine. We aim to understand the cellular and molecular cues, which result in epithelial T-cell generation and activation. Furthermore, we assess how the biology of these cells effect tissue homeostasis, immune protection and pathology.

Head of Laboratory

Marc Veldhoen, PhD

Team

Birte Blankenhaus	Senior Postdoctoral Researcher (Left December)
Cristina da Conceição Varandas Ferreira	Senior Postdoctoral Researcher
Joana Alexandra Lima Gonçalves	MSc Student
Júlia Fanczal	Lab Technician (Started June)
Leandro Joel Barros Fernandes	PhD Student
Marta Sofia Serra Baptista	Lab Technician (Left June)
Patrícia Isabel Figueiredo Campos	PhD Student
Roos Haczewski	Lab Technician (Left June)
Silvia Ariotti	Postdoctoral Researcher
Sofia Carreira Pereira Ribeiro	Lab Technician (Started June)
Spela Konjar	Senior Postdoctoral Researcher (Left November)
Tomás Ochôa May Pereira da Cruz	MSc Student (Left March)

Laboratory Keywords/Research Areas

Epithelial Immunology, T cell Activation, T cell Differentiation, Tissue Resident T cells Immunology, Infection, Vaccination.

Major Scientific Achievements

Preliminary data obtained over the past 3 years regarding the biology of tissue resident memory T cells, awarded funding via the Fundo iMM-Laço award the “la Caixa” Foundation Health Research program resulted in an article in *Nature Immunology*. Participation in an EU H2020 ITN was rewarded; ENLIGHT-TENplus. FCT grants were submitted, two under the RESEARCH4COVID programme were obtained and one under the R&D programme (3 year grant).

A COVID-19 serology lab was successfully setup and established, underpinning diagnostics for the HSM, supporting scientific projects, the National Survey Portugal and the convalescent serum initiative from the IPST. For the latter, a SARS-CoV-2 neutralisation assay was developed. The work contributes to several manuscripts, with one published in 2020 (European Journal of Immunology).

One MSc student successfully completed.

Selected Publications

Ferreira C, Barros L, Baptista M, Blankenhaus B, Barros A, Figueiredo-Campos P, Konjar S, Laine A, Kamenjarin N, Stojanovic A, Cerwenka A, Probst HC, Marie JC, Veldhoen M (2020). Type 1 Treg cells promote the generation of CD8(+) tissue-resident memory T cells. Nature Immunology 21:766-776. *(IF: 23.5, Citations: 7. Source: Google Scholar).*

Konjar S, Frising UC, Ferreira C, Hinterleitner R, Mayassi T, Zhang Q, Blankenhaus B, Haberman N, Loo Y, Guedes J, Baptista M, Innocentin S, Stange J, Strathdee D, Jabri B, Veldhoen M (2018). Mitochondria maintain controlled activation state of epithelial-resident T lymphocytes. Science Immunology 3:eaan2543. *(IF: 8.16, Citations: 20. Source: Google Scholar).*

Li Y, Innocentin S, Withers DR, Roberts NA, Gallagher AR, Grigorieva EF, Wilhelm C, Veldhoen M (2011). Exogenous stimuli maintain intraepithelial lymphocytes via aryl hydrocarbon receptor activation. Cell 147:629-640. *(IF: 30.165, Citations: 622. Source: Google Scholar).*

Veldhoen M, Hirota K, Westendorf AM, Buer J, Dumoutier L, Renauld JC, Stockinger B (2008). The aryl hydrocarbon receptor links TH17-cell-mediated autoimmunity to environmental toxins. Nature 453:106-109. *(IF: 31.434, Citations: 1568. Source: Google Scholar).*

Veldhoen M, Hocking RJ, Atkins CJ, Locksley RM, Stockinger B (2006). TGFbeta in the context of an inflammatory cytokine milieu supports de novo differentiation of IL-17-producing T cells. Immunity 24:179-189. *(IF: 16.548, Citations: 4283. Source: Google Scholar).*

Publications in Peer Reviewed Journals

Ferreira C, Barros L, Baptista M, Blankenhaus B, Barros A, Figueiredo-Campos P, Konjar S, Laine A, Kamenjarin N, Stojanovic A, Cerwenka A, Probst HC, Marie JC, Veldhoen M (2020). Type 1 Treg cells promote the generation of CD8(+) tissue-resident memory T cells. Nature Immunology 21:766-776. *(IF: 23.5, Citations: 7. Source: Google Scholar).*

Stark AK, Davenport ECM, Patton DT, Scudamore CL, Vanhaesebroeck B, Veldhoen M, Garden OA, Okkenhaug K (2020). Loss of Phosphatidylinositol 3-Kinase Activity in Regulatory T Cells Leads to Neuronal Inflammation. Journal of Immunology 205:78-89. *(IF: 4.718, Citations: 1. Source: Google Scholar).*

Kazakevych J, Denizot J, Liebert A, Portovedo M, Mosavie M, Jain P, Stellato C, Fraser C, Correa RO, Celestine M, Mattiuz R, Okkenhaug H, Miller JR, Vinolo MAR, Veldhoen M, Varga-Weisz P (2020). Smarcad1 mediates microbiota-induced inflammation in mouse and coordinates gene expression in the intestinal epithelium. Genome Biology 21:64. *(IF: 10.806, Citations: 2. Source: Google Scholar).*

Figueiredo-Campos P, Blankenhaus B, Mota C, Gomes A, Serrano M, Ariotti S, Costa C, Nunes-Cabaco H, Mendes AM, Gaspar P, Pereira-Santos MC, Rodrigues F, Condeco J, Escoval MA, Santos M, Ramirez M, Melo-Cristino J, Simas JP, Vasconcelos E, Afonso A, Veldhoen M (2020). Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to 6 months post disease onset. European Journal of Immunology 50:2025-2040. *(IF: 5.179, Citations: 19. Source: Google Scholar).*

de Araujo EF, Preite NW, Veldhoen M, Loures FV, Calich VLG (2020). Pulmonary paracoccidioidomycosis in AhR deficient hosts is severe and associated with defective Treg and Th22 responses. Scientific Reports 10:11312. *(IF: 3.998, Citations: 0. Source: Google Scholar).*

Ongoing Research Projects

2020/2020: Generating SARS-CoV2 seroconversion assay. Coordinator: Marc Veldhoen. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT- COVID19. Amount: 29 696,22€. Total Amount: 29 696,22€.

2020/2020: High-throughput SARS-CoV2. Coordinator: Marc Veldhoen. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT- COVID19. Amount: 39 800,00€. Total Amount: 39 800,00€.

2019/2022: Enhancing Tissue Resident Immunity. Coordinator: Marc Veldhoen. Funding Agency: Fundación Bancaria "La Caixa". Reference: HR18-00104, “ETERNITY”-“ENHANCING TISSUE RESIDENT. Amount: 497 158,00€. Total Amount: 497 158,00€.

2019/2020: Fundo iMM-Laço. Coordinator: Marc Veldhoen. Funding Agency: Fundo iMM-Laço. Reference: FUNDO LAÇO - MARC VELDHOEN. Amount: 29 700,00€. Total Amount: 29 700,00€.

2018/2021: Regulação da rede de resposta imunológica epitelial. Coordinator: Marc Veldhoen. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: 028003/2017. Amount: 164 988,93€. Total Amount: 164 988,93€.

Invited Lectures and Seminars

Veldhoen M. Generating resident memory T lymphocytes. NBCM, Caparica, Portugal, February 10, 2020.

Veldhoen M. COVID-19 diagnostics. Sociedade Portuguesa de Pneumologia – SPP, Online Event, April 30, 2020.

Veldhoen M. Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to five months post disease onset. WHO SOLIDARITY II Meetings, Online Event, September 20, 2020.

Veldhoen M. Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to six months post disease onset. Ibero-American Science and Technology Program for CYTED Development, Online Event, September 25, 2020.

Veldhoen M. Generating resident memory T lymphocytes. TCC_EUROPE Online Immunology Lecture Series, Online Event, November 6, 2020.

Communications in International Conferences

Veldhoen M. T lymphocytes; Differentiation, maintenance, development. EMBO Sectorial Meeting, Malaga, Spain, February 20-21, 2020. *(Oral Presentation)*

Communications in National Conferences

Veldhoen M. Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers. XVI Colóquio_II Jornadas Agentes e Vetores Doenças, Porto, Portugal, November 6-7, 2020.

Internationalization

We are part of several international collaborations, including France, UK, Germany, US, Brazil and Argentina. Lab members are internationally recruited (Netherlands, Germany, Slovenia, and Italy).

We participated in international meetings can be found under "conferences".

We have invited speakers as part of the ERA Chair project programme. We are part of an H2020 ITN, annual meeting and summer school and have been awarded a new ITN project. We are part of a European T-cell focus group, funded by EMBO, which organizes an annual meeting to exchange ideas and with additional funding from EFIS obtained in 2018. Under this group we started a ZOOM seminar series for all lab members to exchange ideas and maintain and/or setup new networks.

Lastly, M Veldhoen lab hosts international students under the ERASMUS programme.

Patents/Prototypes

Methods of Treatment Using Resident Memory T Cells, GB 2007321.9, 05/2020.

Advanced Teaching

Veldhoen M. Imunidade Celular II, Tronco Comum IIa, Mestrado Integrado em Medicina, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 12, 2020.

Veldhoen M. Imunidade das Mucosas, Tronco Comum IIa Mestrado Integrado em Medicina, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 19, 2020.

Veldhoen M. T helper cell types and cytokines. Licenciatura Ciências da Nutrição, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 26, 2020.

Veldhoen M. T helper cell types and cytokines. iMM MSc course, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 28, 2020.

Veldhoen M. Mucosal immunology (T cells and ILCs). Licenciatura Ciências da Nutrição, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 2, 2020.

Veldhoen M. Microbiota and immunity, Licenciatura Ciências da Nutrição, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 9, 2020.

Veldhoen M. Metabolism and Immunity, Licenciatura Ciências da Nutrição, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 16, 2020.

Veldhoen M. The complexity of Thelper subsets. Master Immunology Course, Pasteur Institute and Paris Universities, Paris, France, December 11, 2020.

Science and Society

The COVID-19 pandemic put science, especially infectious disease at the forefront of societies mind.

Our lab members contributed to the institute's diagnostic efforts, stood at the basis of the setup and testing for antibodies, provided diagrams and helped with short videos to explain the different testing, participated in TV items, social media campaigns and contributed to seminars explaining the testing efforts. Many phone calls and video/WhatsApp conversations were had with journalist in Portugal (Expresso, Observador, Público) and abroad (TVE, The Scientist magazine; National Geographic), to provide background and detailed knowledge on immunological questions. Of note was the larger piece in Expresso "Alma Grande": "COVID-19: as vacinas são a solução", emphasising the importance of vaccines to help end the pandemic targeted at a larger lay audience.

MSc Theses

Joana Alexandra Lima Gonçalves, 30/12/2020, The Impact of Protein Tyrosine Phosphatases on the Activation of Intraepithelial Lymphocytes, Faculdade de Medicina da Universidade de Coimbra. Supervisor: Birte Blankenhaus. Co-Supervisor: Cláudia Pereira.

Maria Carmo-Fonseca Lab

Major Interests/Objectives

Gene regulation is central to all biology. RNA molecules, with their ability to both encode information and exert catalytic activities, play a key role in the regulation of gene expression. Our group aims to discover molecular pathways and mechanisms implicating RNA in human health and disease. More specifically, we study the role of RNA in the regulation of gene expression in cancer, cardiac and neurological diseases, and we are exploring new therapeutic strategies targeting disease-causing RNA molecules.

Head of Laboratory

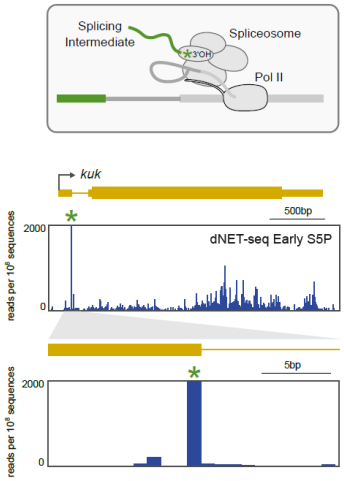
Maria do Carmo Salazar Velez Roque da Fonseca, MD/PhD, Full Professor

Team

Adriana Andrade Vieira	MSc Student
Ana Catarina Cardoso Lopes	MSc Student (Started September)
Ana Cláudia Bernardino Raposo	PhD Student
Beatriz Anjo Santos Lima	MSc Student (Started September)
Beatriz Dias Gomes da Silva	Lab Technician (Started June)
Beatriz Pinto Galvão	MSc Student
Carina Sofia Barradas Maranga	PhD Student
Catarina Alves do Vale	Trainee
Catarina Fernandes Pereira Noronha Ribeiro	BSc Student (Started September)
Célia da Conceição Vicente Carvalho	Staff Scientist
Christian Gomes da Silva Ramos	Senior Postdoctoral Researcher
Cláudia Raquel Estopa Gil	Lab Technician (Left August)
Cristiano Emanuel Ribeiro Esteves	BSc Student (Left December)
Dinora Levy	Administrative Technician
Evguenia Pavlovna Bekman	Senior Postdoctoral Researcher
João Tiago Alves Prior Proença	Senior Postdoctoral Researcher
Maria Joana Pinto Desterro	Staff Scientist
Maria João de Andrade Terras Arez	Lab Technician
Maria Teresa Tenório Figueiredo Carvalho Gonçalves	Staff Scientist
Marta de Jesus Ribeiro	Postdoctoral Researcher
Marta Isabel Brandão Furtado	Lab Technician
Michelle Xavier Gonçalves Pereira	Lab Technician (Started December)
Noélia Maria Fernandes Custódio	Staff Scientist
Patrícia Alexandra Veloso Napoleão	Senior Postdoctoral Researcher
Paulo Jorge Varanda Bernardo	Clinical Researcher
Pedro António Pereira Prudêncio	Postdoctoral Researcher
Pedro Galhardo Bak-Gordon	MSc Student
Pedro Santos Barbosa	PhD Student

Rodrigo Filipe Fernandes Narciso	BSc Student (Started January. Left June)
Rosina Savisaar	Postdoctoral Researcher
Rui Gonçalo Viegas Russo da Conceição Martinho	Visiting Researcher
Rui Sérgio de Sousa Luís	PhD Student
Samantha Mancino	Postdoctoral Researcher
Sandra Cristina Bento Penisga Martins	Senior Postdoctoral Researcher
Sandrina Nóbrega Pereira	Senior Postdoctoral Researcher
Sara Patrícia Henriques Castro	Lab Technician (Left June)
Simão José Teixeira da Rocha	Staff Scientist
Tajda Klobucar	MSc Student (Left July)
Teresa Maria Pereira da Silva	Postdoctoral Researcher
Thais Souza Cunha	MSc Student (Started September)
Tomás Miguel Custódio dos Santos	MSc Student (Left April)

Graphical Abstract



Genome-wide analysis of co-transcriptional splicing

Laboratory Keywords/Research Areas

Laboratory Keywords: RNA Biology, Gene Regulation, Splicing, RNA in Disease.

Research Areas: Cell and Molecular Biology, Human Genetics, Cancer.

Major Scientific Achievements

Our lab is known for studies on RNA splicing using a combination of cutting-edge cell imaging and genome-wide approaches. Our previous work indicated that reciprocal interconnectivity between the different steps required for gene activation plays a critical role ensuring efficiency and fidelity of gene expression. In collaboration with the Proudfoot Lab in Oxford, we have pioneered genome-wide analysis of nascent RNA complexes using NET-seq (Nojima, Gomes, *et al.*, 2015; Prudêncio, Rebelo *et al*. 2019).

Using this methodology, we have unraveled unanticipated dynamic links between Pol II and the spliceosome (Nojima, Rebelo, *et al.*, 2018). More recently, our group became interested in understanding how defects in RNA metabolism contribute to disease phenotypes and could be targeted for treatment. Prompted by increasing evidence that alterations in pre-mRNA splicing are responsible for monogenic disorders and contribute to cancer, the lab is developing stem-cell derived cellular models to study the role of RNA molecules in disease (Ribeiro *et al* 2020; Silva *et al* 2020).

Selected Publications

Nojima T, Rebelo K, Gomes T, Grosso AR, Proudfoot NJ, Carmo-Fonseca M (2018). RNA Polymerase II phosphorylated on CTD Serine 5 interacts with the spliceosome during co-transcriptional splicing. Molecular Cell 72(2):369-379. (*IF: 14.55, Citations: 52. Source: Google Scholar*).

Nojima T, Gomes T, Grosso AR, Kimura H, Dye MJ, Dhir S, Carmo-Fonseca M, Proudfoot N (2015). Mammalian NET-seq reveals genome-wide nascent transcription coupled to RNA processing. Cell 161(3):526-540. (*IF: 36.22, Citations: 335. Source: Google Scholar*).

Martin RM, Rino J, Carvalho C, Kirchhausen T, Carmo-Fonseca M (2013). Live-cell visualization of pre-mRNA splicing with single-molecule sensitivity. Cell Reports 4(6):1144-1155. (*IF: 7.81, Citations: 127. Source: Google Scholar*).

de Almeida SF, Grosso AR, Koch F, Fenouil R, Carvalho S, Andrade J, Levezinho H, Gut M, Eick D, Gut I, Andrau JC, Ferrier P, Carmo-Fonseca M (2011). Splicing enhances recruitment of methyltransferase HYPB/Setd2 and methylation of histone H3 Lys36. Nature Structural & Molecular Biology 18(9):977-983. (IF: 12.59, Citations: 220. *Source: Google Scholar*).

Grosso AR, Gomes AQ, Barbosa-Morais NL, Caldeira S, Thorne NP, Grech G, von Lindern M, Carmo-Fonseca M (2008). Tissue-specific splicing factor gene expression signatures. Nucleic Acids Research 36(15):4823-4832. (IF: 11.15, Citations: 162. *Source: Google Scholar*).

Publications in Peer Reviewed Journals

Lopes LR, Barbosa P, Torrado M, Quinn E, Merino A, Ochoa JP, Jager J, Futema M, Carmo-Fonseca M, Monserrat L, Syrris P, Elliott PM (2020). Cryptic Splice-altering Variants in MYBPC3 Are a Prevalent Cause of Hypertrophic Cardiomyopathy. Circulation-Genomic and Precision Medicine 13(3):165-167. *(IF: 4.063, Citations: 1. Source: Web of Science).*

Ribeiro M, Furtado M, Martins S, Carvalho T, Carmo-Fonseca M (2020). RNA Splicing Defects in Hypertrophic Cardiomyopathy: Implications for Diagnosis and Therapy. International Journal of Molecular Sciences 21(4):1329. *(IF: 4.56, Citations: 1. Source: Web of Science)*.

Carvalho C, Carmo-Fonseca M (2020). Design and Application of a Short (16-mer) Locked Nucleic Acid Splice-Switching Oligonucleotide for Dystrophin Production in Duchenne Muscular Dystrophy Myotubes. In: Ørom U. (eds) RNA-Chromatin Interactions. Methods in Molecular Biology 2161:37-50. Humana, New York, NY.

Silveira C*, Sousa AC*, Janeiro A*, Malveiro S, Teixeira E, Brysch E, Pantarotto M, Felizardo M, Madureira R, Nogueira F, Guimarães C, Matos C, Canário D, Bruges-Armas J, Carmo-Fonseca M (2020). Detection and quantification of EGFR T790M mutation in liquid biopsies by droplet digital PCR. Translational Lung Cancer Research doi: 10.21037/tlcr-20-1010.

Rathore OS, Silva RD, Ascensão-Ferreira M, Matos R, Carvalho C, Marques B, Tiago MN, Prudêncio P, Andrade RP, Roignant JY, Barbosa-Morais NL, Martinho RG (2020). NineTeen Complex-subunit Salsa is required for efficient splicing of a subset of introns and dorsal-ventral patterning. RNA 26(12):1935-1956. *(IF: 4.32, Citations: 0. Source: Web of Science).*

Maranga C, Fernandes TG, Bekman, E, da Rocha ST (2020). Angelman Syndrome: a journey through the brain. The FEBS Journal 287(11):2154-2175. *(IF: 4.382, Citations: 2. Source: Web of Science).*

Silva TP, Bekman EP, Fernandes TG, Vaz SH, Rodrigues CAV, Diogo MM, Cabral JMS, Carmo-Fonseca M (2020). Maturation of Human Pluripotent Stem Cell-Derived Cerebellar Neurons in the Absence of Co-culture. Frontiers in Bioengineering and Biotechnology 8:70. *(IF: 4.210, Citations: 4. Source: Web of Science).*

Silva TP, Fernandes TG, Nogueira DES, Rodrigues CAV, Bekman EP, Hashimura Y, Jung S, Lee B, Carmo-Fonseca M, Cabral JMS (2020). Scalable Generation of Mature Cerebellar Organoids from Human Pluripotent Stem Cells and Characterization by Immunostaining. Journal of Visualized Experiments 160:e61143. *(IF: 1.325, Citations: 0. Source: Web of Science).*

Klobučar T, Kreibich E, Krueger F, Arez M, Pólvora-Brandão D, von Meyenn F, da Rocha S.T.*, Eckersley-Maslin M* (2020). IMPLICON: an ultra-deep sequencing method to uncover DNA methylation at imprinted regions. Nucleic Acids Research 48(16):e92. *(IF: 11.140, Citations: 2. Source: Web of Science).*

Other International Publications

Arez M, Eckersley-Maslin M, Klobučar T, von Gilsa Lopes J, Krueger F, Raposo AC, Gendrel AV, Bernardes de Jesus B, da Rocha ST (2020). Sex of donor cell and reprogramming conditions predict the extent and nature of imprinting defects in mouse iPSCs. bioRxiv https://doi.org/10.1101/2020.11.20.370973.

Prudêncio P, Rebelo K, Savisaar R, Martinho RG, Carmo-Fonseca M (2020). Transcription and splicing dynamics during early Drosophila development. bioRxiv https://doi.org/10.1101/2020.11.05.367888.

Sousa-Luis R, Dujardin G, Zukher I, Kimura H, Carmo-Fonseca M, Proudfoot NJ, Nojima T (2020). POINT Technology illuminates the processing of polymerase-associated intact nascent transcripts. bioRxiv https://doi.org/10.1101/2020.11.09.374108.

Other National Publications

Catarina A, Santos P, Coutinho A, Cruz I, Carmo-Fonseca M, Rocha L (2020). Whole-genome DNA sequencing: The key to detecting a sarcomeric mutation in a 'false genotype-negative' family with hypertrophic cardiomyopathy. Revista Portuguesa de Cardiologia. doi:10.1016/j.repc.2019.03.011.

Ongoing Research Projects

2020/2023: spliceHCM - RNA mis-splicing in hypertrophic cardiomyopathy: opportunities for diagnosis and therapy. Coordinator: Maria Carmo-Fonseca. Funding Agency: "la Caixa" Foundation. Reference: HR20-00322 - spliceHCM. Amount: 573 796,50€. Total Amount: 986 694,00€.

2020/2022: From co-transcriptional splicing kinetics to the evolutionary impact of exon and intron definition. Coordinator: Rosina Savisaar. Funding Agency: European Commission. Reference: EvolSpliceKinetics - GAP-842695. Amount: 147 815,00€. Total Amount: 147 815,00€.

2020/2021: Exploring new therapeutic strategies for Angelman syndrome: A disease modelling approach based on 3D cerebellar organoids derived from patient iPSCs. Coordinators: Simão Teixeira da Rocha and Evguenia Bekman. Funding Agency: Fundação Amélia de Mello. Reference: Bolsa de Angelman da Fundação Amélia de Mello. Amount: 25 000,00€. Total Amount: 25 000,00€.

2020/2021: Assessing response to splicing inhibitor sulfonamides in cultured primary human AML cells. Coordinator: Maria Carmo-Fonseca. Funding Agency: Gilead Sciences. Reference: Programa Gilead GÉNESE 2019. Amount: 26 500,00€. Total Amount: 26 500,00€.

2020/2021: AbbVie Inc - Material Transfer Agreement. Coordinator: Maria Carmo-Fonseca. Funding Agency: AbbVie Inc. Reference: AbbVie Inc - Material Transfer Agreement. Amount: 108 000,00€. Total Amount: 108 000,00€.

2019/2022: RNA in disease – RiboMed. Coordinator: Maria Carmo-Fonseca. Funding Agency: European Commission. Reference: RiboMed - GA 857119. Amount: 424 750,00€. Total Amount: 799 795,00€.

2019/2020: Homenagem Prof. Fernando Lopes da Silva. Coordinator: Maria Carmo-Fonseca. Funding Agency: Fundação BIAL. Reference: Homenagem Prof. Fernando Lopes da Silva. Amount: 5 000,00€. Total Amount: 5 000,00€.

2018/2021: O papel dos RNAs não-codificantes longos (lncRNAs) na adaptação molecular e metabólica do cancro da mama. Coordinator: Bruno Jesus. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: RNAMETCANCER - LISBOA-01-0145-FEDER-028534. Amount: 238 213,92€. Total Amount: 238 213,92€.

2018/2021: CEREBREX: Desenvolvimento de organóides cerebelares para investigação de ataxias. Coordinator: Maria Carmo-Fonseca. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: CEREBREX - LISBOA-01-0145-FEDER-029298. Amount: 83 750,00€. Total Amount: 239 773,28€.

2018/2021: BRCA_RNA: Organóides com edição génica para estudar o impacto funcional de mutações BRCA1 e BRCA2. Coordinator: Maria Carmo-Fonseca. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: BRCA_RNA LISBOA-01-0145-FEDER-029469. Amount: 237 261,63€. Total Amount: 237 261,63€.

2018/2021: As barreiras epigenéticas do envelhecimento na reprogramação celular. Coordinator: Simão Rocha. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-MOL/29320/2017. Amount: 239 555,22€. Total Amount: 239 555,21€.

2017/2024: The Discoveries CTR: Implementation of the discoveries centre for regenerative and precision medicine, a new centre of excellence in Portugal. Coordinator: Maria Carmo-Fonseca. Funding Agency: European Commission. Reference: Teaming 739572. Amount: 1 001 137,50€. Total Amount: 14 996 606,25€.

2017/2021: LysoMod: Genetic and small molecule modifiers of Lysomomal Function. Coordinator: Maria Carmo-Fonseca. Funding Agency: European Commission. Reference: MSCA RISE 734825. Amount: 279 000,00€. Total Amount: 1 102 500,00€.

2016/2020: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: Maria Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

2016/2020: Celgene - pesquisa de mutações nos genes IDH. Coordinator: Maria Carmo-Fonseca. Funding Agency: Celgene. Reference: Celgene - pesquisa de mutações nos genes IDH. Amount: 189 000,00€. Total Amount: 189 000,00€.

2015/2020: Exploring the role of lncRNAs and chromatin modifying complexes for the establishment of defined chromatin states. Coordinator: Simão Rocha. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: IF/00242/2014/CP1236/CT0009. Amount: 50 000,00€. Total Amount: 50 000,00€.

Other Projects

2020/2023: Investigating the causes of mutation-negative hypertrophic cardiomyopathy: Role of Cryptic RNA mis-splicing in myosin binding protein C (MYBPC3). Coordinator: Perry Elliott. Funding Agency: British Heart Foundation. Reference: BHF PG/20/10170. Amount: £66 000,00. Total Amount: £225 111,37.

Invited Lectures and Seminars

Savisaar R. Footprints of splicing in sequence evolution. Population Genetics Group 53. Leicester, United Kingdom, January 5-8, 2020.

Carmo-Fonseca M. The timing of pre-mRNA splicing. Keynote lecture. 11th <Interact> Symposium organized by PhD students, Munich, Germany, February 27-28, 2020.

Savisaar R. Sequence evolution and the dynamics of splicing. Seminar series of the Boehringer-Ingelheim Fonds alumni, Online Event, April 1, 2020.

Carmo-Fonseca M. Amortalidade: uma nova perceção do envelhecimento. Conferência Ciclo Longevidade - Culturgest, Online Event, May 20, 2020.

Silva TP. Organoids as Models for Cerebellar Development. Brain Organoids Virtual Seminar, StemCellTM Technologies, June 8, 2020.

Klobučar T. IMPLICON: an ultra-deep sequencing method to uncover DNA methylation at imprinted regions. "The Kemomind science conference", Online Event, September 22-24, 2020.

Carmo-Fonseca M. If I could turn back the clock – the search for an anti-ageing agent for Pakinson disease. BIAL International Parkinson's disease summit, Online Event, June 5, 2020.
Carmo-Fonseca M. As bases moleculares da terapia génica. Congresso da Sociedade Portuguesa de Estudos de Doenças Neuromusculares, Online Event, October 23, 2020.

Carmo-Fonseca M. As bases moleculares da terapia génica. Congresso APFH, Online Event, November 16, 2020.

Carmo-Fonseca M. Human genome sequencing and cancer: 20 years of history. 17º Congresso Nacional de Oncologia, Online Event, November 20-21, 2020.

Carmo-Fonseca M. Os novos desafios da medicina de precisão. 8º Congresso Internacional dos Hospitais, Online Event, November 26-27, 2020.

Savisaar R. The dynamics of splicing. Big Data Meets Precision Medicine. A workshop of the German-Egyptian Dialogue on tackling Precision Medicine using AI (GED-PerMedAI), Online Event, December 4-6, 2020.

Bak-Gordon P. RNA Therapeutics for Pediatric Diseases. Pediatrics Department of Hospital de Santa Maria – Centro Hospitalar Universitário Lisboa Norte, Lisbon, Portugal, December 11, 2020.

da Rocha ST. From reprogramming to disease modeling: the assets and drawbacks of induced pluripotent stem cells. DBE seminars, Department of Bioengineering, Instituto Superior Técnico, Lisbon, Portugal, December 14, 2020.

Communications in International Conferences

Gil C, Raposo A, da Rocha ST. Cut the silence - a way to understand X-chromosome inactivation. <Interact> 2020 PhD Conference, Munich, Germany, February 27-28, 2020. *(Poster Presentation)*

Klobučar T, Arez M, Kreibich E, Krueger F, Pólvora-Brandão D, von Meyenn F, Eckersley-Maslin M, da Rocha ST. IMPLICON: a high resolution method to uncover DNA methylation at imprinted regions. <Interact> 2020 PhD Conference, Munich, Germany, February 27-28, 2020. *(Oral Presentation)*

Bak-Gordon P, Carvalho C, Custódio N, Carmo-Fonseca M. Characterizing the impact of pathogenic BRCA mutations on tissue-specific gene expression and pre-mRNA splicing. ESMO Breast Cancer Virtual Meeting, May 23-24, 2020. *(Poster Presentation)*

Sousa-Luís R, Nojima T, Carmo-Fonseca M, Proudfoot NJ. *POINT*ing out the impact of splicing on RNA transcription in mammalian cells. RNA2020 – 25th Annual Meeting of the RNA Society, Online Event, May 26-31, 2020. *(Poster Presentation)*

da Rocha ST, Klobučar T, Arez M, Kreibich E, Krueger F, Pólvora-Brandão D, von Meyenn F, Eckersley-Maslin. IMPLICON: an ultra-deep sequencing method to uncover DNA methylation at imprinted regions. "Genomic Imprinting – From Biology to Disease", Online Event, September 28-October 1, 2020. *(Oral Presentation)*

Prudêncio P, Savisaar R, Rebelo K, Martinho RG, Carmo-Fonseca M. Impact of gene architecture on pervasive transcription in Drosophila embryos. EMBO | EMBL Symposium: The Complex Life of RNA, Online Event, October 7-9, 2020. *(Poster Presentation)*

Savisaar R, Prudêncio P, Rebelo K, Martinho RG, Carmo-Fonseca M. Immediate splicing in Drosophila embryos is associated with a specific pattern of Pol II pausing. EMBO | EMBL Symposium: The Complex Life of RNA, Online Event, October 7-9, 2020. *(Poster Presentation)*

Galvão B, Alves-Vale C, Silvestre AR, Nunes P, Carmo-Fonseca M, Custódio N. Patient-derived ovarian cancer organoids for modeling drug response. EMBO Symposium on Organoids: Modelling Organ Development and Disease in 3D Culture, Online Event, October 21-24, 2020. *(Poster Presentation)*

Silva TP, da Rocha ST, Milagre I, Pereira C, Cabral JMS, Carmo-Fonseca, M. iPSC-derived mammary organoids as a model to study the onset of malignant transformation triggered by BRCA mutations. EMBO Symposium on Organoids: Modelling Organ Development and Disease in 3D Culture, Online Event, October 21-24, 2020. *(Poster Presentation)*

Maranga C, Silva TP, Vaz SH, Fernandes TG, da Rocha, ST, Bekman, E, Cabral JMS. hiPSC-derived cerebellar organoids to model Angelman Syndrome. EMBO Symposium on Organoids: Modelling Organ Development and Disease in 3D Culture, Online Event, October 21-24, 2020. *(Poster Presentation)*

Maranga C, Vieira AA, Silva TP, Fernandes TG, Cabral JMS, da Rocha ST, Bekman E. Brain-in-a-dish approach for studying Angelman Syndrome. "Neuroepigenetics: From Cells to Behaviour and Disease" Virtual EMBO Workshop, October 28-30, 2020. *(Poster Presentation)*

Silveira C, Sousa AC, Corredeira P, Martins M, Sousa AR, Da Cruz Paula A, Selenica P, Brown DN, Golkaram M, Kaplan S, Zhang S, Liu L, Weigelt B, Reis-Filho JS, Costa L, Carmo-Fonseca M. Liquid biopsy detects therapy response in advanced breast cancer. EACR Virtual Conference on Liquid Biopsies, November 18-19, 2020. *(Poster Presentation)*

Silva TP, da Rocha ST, Milagre I, Pereira C, Cabral JMS, Carmo-Fonseca M. iPSC-derived mammary organoids as a model to study the onset of malignant transformation triggered by BRCA mutations. Organoids With]Out[Borders, Online Symposium, November 23, 2020. *(Oral Presentation)*

Pessoa J, Carvalho C, Carmo-Fonseca M. Compartmentalized RNA transcription in human cells. Cell Bio Virtual 2020: An online ASCB|EMBO meeting, December 2-16, 2020. *(Poster Presentation)*

Communications in National Conferences

Carvalho, C, Custódio, N, Dias, P, Porto, B, Sousa, AB, Carmo-Fonseca, M. A biallelic intronic variant in the BRCA2 gene affects splicing and DNA damage repair. International Meeting of the Portuguese Society of Genetics, Faro, Portugal, January 23-24, 2020. *(Poster Presentation)*

Prudêncio P, Savisaar R, Rebelo K, Martinho RG, Carmo-Fonseca M. Links between RNA Pol II pausing and immediate splicing. International Meeting of the Portuguese Society of Genetics. Faro, Portugal, January 23-24, 2020. *(Poster Presentation)*

Savisaar R, Prudêncio P, Rebelo K, Martinho RG, Carmo-Fonseca M. Links between RNA Pol II pausing and immediate splicing. International Meeting of the Portuguese Society of Genetics, Faro, Portugal, January 23-24, 2020. *(Poster Presentation)*

Martins S, Carvalho T, Ribeiro M, Furtado M, Barbosa P, Tavares J, Lopes L, Syrris P P, Akhtar M, Elliot P, Carmo-Fonseca M. A cell model in hypertrophic cardiomyopathy: opportunities for diagnosis and therapy. European infrastructure for translational medicine (EATRIS) Annual meeting, INFARMED, Lisbon, Portugal, February 11-12, 2020. *(Poster Presentation)*

Vieira A, Maranga C, Gomes AR, Bekman E, da Rocha ST. Modeling of Angelman Syndrome using the Neural Commitment of Patient-Specific iPSCs. iMed Conference, Lisbon, Portugal, September 30-October 4, 2020. *(Poster Presentation)*

Ramos CG, Lourenço DL, Barbosa P, Joseph T, Neves M, Ferreira JA, Xapelli SA, Futerman AH, Carmo-Fonseca M. Stalled lysosomes prime cell proliferation. 16th International Symposium of the Portuguese Society for Metabolic Disorders, Online Event, November 11-13, 2020. *(Oral Presentation)*

Furtado M, Martins S, Carvalho T, Ribeiro M, Proença J, Barreto V, Carmo-Fonseca M. Gene edited iPSC-derived cardiomyocytes reveal RNA splicing defects in Hypertrophic Cardiomyopathy. 24th Annual Meeting of Sociedade Portuguesa de Genética Humana, Online Event, November 20, 2020. *(Oral Presentation)*

Bak-Gordon P, Carvalho C, Custódio N, Carmo-Fonseca M. Looking beyond DNA II: Screening for mRNA biomarkers of response to PARP inhibition. Dia da Investigação - 9º Edição, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Grilo M, Antunes R, Custódio N. Why does BRCA loss of function predisposes to tumors mainly in estrogen-related tissues? Dia da Investigação - 9º Edição, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Catarina Ribeiro, Carvalho C, Carmo-Fonseca M. Qual o mecanismo pelo qual o lncRNA PCAT-1 afeta a expressão de BRCA2? Dia da Investigação - 9º Edição, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Beatriz Anjo Lima, Carvalho C, Carmo-Fonseca M. Modulação de splicing em doentes portadores de mutação no gene BRCA2: potencial terapêutico. Dia da Investigação - 9º Edição, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020. *(Poster Presentation)*

Organization of Conferences

Pessoa J. Organizer and moderator. Cellular Imaging of Nucleic Acids roundtable discussion session, Cell Bio Virtual 2020: An online ASCB|EMBO Meeting, December 2-16, 2020.

Internationalization

Carmo-Fonseca M. Coordinates an EU H2020 Research and Innovation Staff Exchange (RISE) programme entitled "LysoMod: Genetic and small molecule modifiers of lysosomal function".

Carmo-Fonseca M. Participates in COST action CardioRNA: Catalysing transcriptomics research in cardiovascular disease.

Carmo-Fonseca M. Coordinates an EU H2020 Research and Innovation Twinning program entitled "RiboMed: RNA in disease".

Da Rocha ST. Collaborates with Prof. Edith Heard at the Curie Institute on RNA-seq and ChIP-seq experiments on inducible Xist non-coding RNA mutants and their effects on X-linked gene inactivation.

Simão T. da Rocha and Evguenia Bekman establish collaborations regarding the research on cerebellar organoids derived from Angelman syndrome iPSCs with the group of Kathleen Millen (Center for Integrative Brain Research, Seattle Children's research Institute, USA), for the single cell RNAseq and Maud Borensztein (IGMM – Institut de Génétiqu Moléculaire de Montpellier, France) for pyrosequencing analyses.

Maria Arez did a 4-months internship in Simon Hippenmeyer group at Institute of Science and Technology Austria (IST Austria). The internship focused on establishing an in vitro model of cortical neurons from mouse embryonic stem cells harboring a conditional knockout of Cdkn1c imprinted gene.

Custódio N. Training staff exchange. Establishment of Fallopian tube organoid cultures. Professor Ahmed Ahmed laboratory. MRC Weatherall Institute of Molecular Medicine, University of Oxford, January 15-17, 2020.

Prizes, Honors and Awards

M. Carmo-Fonseca was elected President of the RNA Society 2021/22.

M. Carmo-Fonseca was considered one of the "Most influential women in Portugal" by the magazine Executiva. https://executiva.pt/mulheres-mais-influentes-de-portugal-2019/

M. Carmo-Fonseca, was awarded Prémio Forma Justa 2020, atribuído pelas Mulheres Socialistas. December 11, 2020.

Simão T. da Rocha became a Review Editor in Developmental Epigenetics for the Journal Frontiers in Cell and Developmental Biology.

Klobučar T. received The Prešeren Award of University of Ljubljana for Best Master Thesis of Biotechnical Faculty, University of Ljubljana, Slovenia in academic year 2019/20.

Beatriz Anjo Lima was awarded the AEFML 3rd Prize for Best Presented Poster. Dia da Investigação - 9º Edição, GAPIC, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, December 9, 2020.

Advanced Teaching

da Rocha ST. Epigenetic regulation of gene expression: the classical examples of X-chromosome inactivation and genomic imprinting. LisbonBioMed PhD Program, Faculdade de Medicina da Universidade de Lisboa, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March 2, 2020.

Bekman EP. Gene editing & gene and cell therapy Course in Cell and Gene therapy. Master in Bioengineering, Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, April 15, 2020.

Bekman EP. Modelling neural development in vitro: An essential toolkit for ambitious mini-brain engineers. Course in Biology and Technology of Stem Cells, Master in Evolutive and Developmental Biology, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, May 7, 2020.

Maranga C. Cerebellar organoids derived from hiPSCs to model Angelman syndrome. Course in Biology and Technology of Stem Cells, Master in Evolutive and Developmental Biology, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, May 7, 2020.

da Rocha ST. Epigenetic stability and long non-coding RNAs in stem cell biology. Course in Frontiers in Biology Research, Master in Molecular Biology and Genetics, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, Online, May 27, 2020.

Savisaar R. Analysis of nascent RNA sequencing data. Introduction to Bioinformatics: an online course by Egypt Scholars, Virtual Lectures, August 27-28, 2020.

Savisaar R. Calling peaks. Master's in Bioinformatics seminar series, Faculdade de Ciências da Universidade de Lisboa, Online, October 29, 2020.

Bekman EP. CRISPR/Cas9-based Genome Editing for Disease Modeling with human iPS cells. Course in Cell and Gene Therapy, Master in Biomedical engineering, Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, November 16, 2020.

Custódio N. Seminar. Transcription and RNA processing in human genetic diseases. Mestrado em Tecnologias Moleculares em Saúde, Escola Superior de Tecnologia da Saúde de Lisboa, Lisbon, Portugal, November 18, 2020.

da Rocha ST. Reversing the aging epigenotype during iPSC Reprogramming. UC: Aging and Dementia. PhD program IBIMED/Aveiro and Nova Medical School/Lisbon, Aveiro, Portugal, Online, November 24, 2020.

Martins, S. Supervision of the final work of the integrated Master Course in Medicine of Beatriz Lopes Draiblate, entitled "Correction of sick-cell anemia using CRISPR-Cas9 system in hematopoietic stem cells", Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Martins S, Carvalho T. Supervision of final work of the Bachelor´s degree in Molecular and Cellular Biology of Rodrigo Filipe Fernandes Narciso, entitled "Characterization of a gene-edited cell model to study mis-splicing in MYBPC3", Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, Lisbon, Portugal.

Martins S. Supervision of final work of the European Bachelor´s degree in Genetics of Carla Piqueras, entitled "Insights into cardiomyocytes model´s validation", Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal/University Diderot, Paris, France.

Custódio N. Supervision of GAPIC ("Educação pela Ciência") research project. Medical student Pedro Bak-Gordon. Looking beyond DNA II: Screening for mRNA biomarkers of response to PARP inhibition.

Custódio N. Supervision of GAPIC ("Educação pela Ciência") research project. Medical students Maria Grilo and Raquel Antunes. Why does BRCA loss of function predispose to tumor mainly in estrogen-related tissues?

Carvalho C. Supervision of GAPIC ("Educação pela Ciência") research project. Medical student: Catarina Ribeiro. Qual o mecanismo pelo qual o lncRNA PCAT-1 afeta a expressão de BRCA2?

Carvalho C. Supervision of GAPIC ("Educação pela Ciência") research project. Medical student: Beatriz Anjo Lima. Modulação de splicing em doentes portadores de mutação no gene BRCA2: potencial terapêutico.

Science and Society

Maranga C, Vieira A, Bekman E, and da Rocha ST participated in the Angelman Syndrome Day, Lisbon, Portugal, February 15, 2020.

Carvalho C participated as a volunteer in iMM COVID-19 Diagnostic Task Force, April-July 2020.

Maranga, C, Vieira, A, Bekman, E, and da Rocha, ST participated in a virtual meeting with Associação Síndrome de Angelman Portugal on Síndrome de Angelman: Ensaios clínicos e "Mini cérebros", May 27, 2020.

Carmo-Fonseca M. Qual será o próximo coronavírus? Masterclasses COGITO, Oeiras, Portugal, September 17, 2020.

MSc Theses

Tajda Klobucar, 17/07/2020, Characterization of genomic imprinting defects during mouse iPSC generation, Biotechnology (Master program), Biotechnical Faculty, University of Ljubljana, Slovenia (9.67 in 10). Supervisor: Simão Teixeira da Rocha.

Cristiano Esteves, 18/12/2020, Instability of X-chromosome inactivation in female human iPSCs. Mestrado Integrado em Medicina, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Simão Teixeira da Rocha.

PhD Theses

Pedro António Pereira Prudêncio, 23 /07/2020, Pre-mRNA splicing and regulation of gene expression after egg fertilization, PhD in Biomedical Sciences, Faculdade de Medicina e Ciências Biomédicas da Universidade do Algarve, Faro (Muito Bom, com Distinção e Louvor). Supervisor: Rui Gonçalo Martinho. Co-Supervisor: Maria Carmo-Fonseca.

Marta de Jesus Ribeiro, 22/05/2020, Developing cellular models for Hypertrophic Cardiomyopathy, PhD in Bioenginnering, Instituto de Medicina Molecular João Lobo Antunes and Biosciences and Biotechnology Institute, Universidade de Lisboa. Supervisor: Maria-Carmo Fonseca. Co-Supervisors: Sandra Martins and Margarida Diogo.

Maria Mota Lab

Major Interests/Objectives

Disease burden is disproportionally distributed around the globe. A direct contributor to such asymmetry is malaria – more than 200 million new infections and 400 thousand deaths still occur every year. Disease combat is impaired by a poor understanding of the factors that dictate the onset of severe disease and outcome of infection.

Our overall goal has been towards the elucidation of the most fundamental and conceptually innovative questions of Host-*Plasmodium* interactions. Our ongoing work indicates that the web of host-*Plasmodium* interactions is densely woven, with liver stage and the blood stage interacting towards pathology and disease severity. Moreover, we have identified a third-party determining disease – host microbiota!

We continue to pursue our long-lasting question – What is so special about the liver? Our data indicates that the liver special metabolism might be the key to modulate the ability of Plasmodium species that infect mammals to achieve extraordinary rates of replication.

Head of Laboratory

Maria Manuel Dias da Mota, PhD, Executive Director of Instituto de Medicina Molecular João Lobo Antunes

Team

Ana Filipa Caetano Parreira	Lab Technician
Ana Margarida Aires Alves Vigário	Visiting Researcher
Ângelo António Ferreira Chaves do Rosário Chora	Senior Postdoctoral Researcher
Aparajita Lahree	PhD Student
Camila Fernandes Mariano	Trainee (Left September)
Catarina Alexandra Dinis de Andrade Pedro	Trainee (Left September)
Cristina Fernández Arias	Senior Postdoctoral Researcher
Debanjan Mukherjee	PhD Student
Inês Fernandes Bento	Senior Postdoctoral Researcher
Joana Lisboa da Silva Gonçalves	PhD Student (Left October)
João Tiago Carvalho Jordão de Mello Vieira	PhD Student (Left August)
Maria Inês Moreira Oliveira Leite Marreiros	PhD Student
Marta Sofia Martinez Barata	MSc Student (Started September)
Nuno Miguel Valente Leal	MSc Student (Started September)
Sara de Jesus Santos Baptista	PhD Student
Sofia Pinto Guia Marques	Lab Manager

Sonali Setua	Postdoctoral Researcher (Left July)
Sónia Maria Leite Pereira	PhD Student
Soraia Cristina Marques Caetano	Postdoctoral Researcher
Vanessa Alexandra Zuzarte Luís	Senior Postdoctoral Researcher
Viriato M´Bana	Postdoctoral Researcher (Left November)
Yash Girish Pandya	Postdoctoral Researcher
Yvonne Azasi	Postdoctoral Researcher (Started September)

Laboratory Keywords/Research Areas

Keywords:

Malaria, *Plasmodium*, Replication, Microbiota, Pathology.

Research Areas:

Liver Metabolism and Parasite Replication, Host-*Plasmodium*-Microbiota Interactions, Parasite Nutrient Sensing and Adaptation.

Major Scientific Achievements

In 2020 we highlighted in two publications the importance of understanding the liver stage (LS) of *Plasmodium* infection towards better strategies of Malaria management.

In the first one (Mello-Vieira *et al*) we show that the translocon component Exported Protein 2 (EXP2) is critical for invasion of hepatocytes. Our findings establish a novel and critical function for EXP2 that leads to an active participation of the host cell in *Plasmodium* sporozoite invasion, challenging the current view of the establishment of LS infection.

In the second (Setua *et al*), we went a step further from our previous observation describing the interaction between *Plasmodium*'s UIS3 and host's LC3 proteins (Real *et al*, 2018) and showed that a small molecule that disrupts that interaction, triggers parasite elimination by host cell autophagy. Data establishes a proof of concept for the prophylactic targeting of parasite's evasion mechanisms during the LS to impair the first obligatory step of malaria infection.

Selected Publications

Mello-Vieira J, Enguita FJ, de Koning-Ward TF, Zuzarte-Luís V, Mota MM (2020). *Plasmodium* translocon component EXP2 facilitates hepatocyte invasion. Nature Communications 11(1):5654. *(IF: 12.121, Citations: 0. Source: Web of Science).*

Real E, Rodrigues L, Cabal GG, Enguita FJ, Mancio-Silva L, Mello-Vieira J, Beatty W, Vera IM, Zuzarte-Luís V, Figueira TN, Mair GR, Mota MM (2018). *Plasmodium* UIS3 sequesters host LC3 to avoid elimination by autophagy in hepatocytes. Nature Microbiology 3(1):17-25. *(IF: 14.174, Citations: 26. Source: Web of Science)*.

Zuzarte-Luís V, Mello-Vieira J, Marreiros IM, Liehl P, Chora ÂF, Carret CK, Carvalho T, Mota MM (2017). Dietary alterations modulate susceptibility to *Plasmodium* infection. Nature Microbiology 2:600-1607. *(IF: 14.174, Citations: 25. Source: Web of Science).*

Mancio-Silva L, Slavic K, Grilo Ruivo MT, Grosso AR, Modrzynska KK, Vera IM, Sales-Dias J, Gomes AR, MacPherson CR, Crozet P, Adamo M, Baena-Gonzalez E, Tewari R, Llinás M, Billker O, Mota MM (2017). Nutrient sensing modulates malaria parasite virulence. Nature 13:213-216. *(IF: 40.137, Citations: 53. Source: Web of Science).*

Liehl P, Zuzarte-Luís V, Chan J, Zillinger T, Baptista F, Carapau D, Konert M, Hanson KK, Carret C, Lassnig C, Müller M, Kalinke U, Saeed M, Chora AF, Golenbock DT, Strobl B, Prudêncio M, Coelho LP, Kappe SH, Superti-Furga G, Pichlmair A, Vigário AM, Rice CM, Fitzgerald KA, Barchet W, Mota MM (2014). Host-cell sensors for *Plasmodium* activate innate immunity against liver-stage infection. Nature Medicine 20:47-53. *(IF: 29.886, Citations: 142. Source: Web of Science).*

Publications in Peer Reviewed Journals

Huang H, Zuzarte-Luis V, Fragoso G, Calvé A, Hoang TA, Oliero M, Chabot-Roy G, Mullins-Dansereau V, Lesage S, Santos MM (2020). Acute invariant NKT cell activation triggers an immune response that drives prominent changes in iron homeostasis. Science Reports 10(1):21026. *(IF: 3.998, Citations: 0. Source: Web of Science).*

Setua S, Enguita FJ, Chora ÂF, Ranga-Prasad H, Lahree A, Marques S, Sundaramurthy V, Mota MM (2020). Disrupting *Plasmodium* UIS3-host LC3 interaction with a small molecule causes parasite elimination from host cells. Communications Biology 3(1):688. *(IF: 4.165, Citations: 0. Source: Web of Science).*

Mello-Vieira J, Enguita FJ, de Koning-Ward TF, Zuzarte-Luís V, Mota MM (2020). *Plasmodium* translocon component EXP2 facilitates hepatocyte invasion. Nature Communications 11(1):5654. *(IF: 12.121, Citations: 0. Source: Web of Science).*

Tripathi J, Segeritz CP, Griffiths G, Bushell W, Vallier L, Skarnes WC, Mota MM, Billker O (2020). A Novel Chemically Differentiated Mouse Embryonic Stem Cell-Based Model to Study Liver Stages of *Plasmodium* berghei. Stem Cell Reports 14(6):1123-1134. *(IF: 6.032, Citations: 1. Source: Web of Science).*

Rijo-Ferreira F, Acosta-Rodriguez VA, Abel JH, Kornblum I, Bento I, Kilaru G, Klerman EB, Mota MM, Takahashi JS (2020). The malaria parasite has an intrinsic clock. Science 368(6492):746-753. *(IF: 41.846, Citations: 10. Source: Web of Science).*

Balasubramanian L, Zuzarte-Luís V, Syed T, Mullick D, Deb S, Ranga-Prasad H, Meissner J, Almeida A, Furstenhaupt T, Siddiqi K, Prudêncio M, Rodrigues CMP, Mota MM, Sundaramurthy V (2020). Association of *Plasmodium berghei* with the Apical Domain of Hepatocytes is Necessary for the Parasite's Liver Stage Development. Frontiers in Cellular and Infection Microbiology 9:451. *(IF: 4.123, Citations: 0. Source: Web of Science).*

Mukherjee D, Chora ÂF, Mota MM (2020). Microbiota, a Third Player in the Host-Plasmodium Affair. Trends in Parasitology 36(1):11-18. *(IF: 6.918, Citations: 4. Source: Web of Science).*

Ongoing Research Projects

2020/2020: Test, Test, Test: Diagnostic of COVID-19. Coordinator: Vanessa Zuzarte-Luís. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT Research4COVID-19. Amount: 30 000,00€. Total Amount: 30 000,00€.

2018/2021: Hepatic metabolism driving *Plasmodium* replication. Coordinator: Maria Mota. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: LISBOA-01-0145-FEDER-030751. Amount: 239 886,62€. Total Amount: 239 886,62€.

2018/2021: Vias Metabólicas do Ferro em *Plasmodium*: deteção, aquisição e desintoxicação. Coordinator: Vanessa Zuzarte-Luís. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-MOL/30112/2017. Amount: 239 761,60€. Total Amount: 239 761,60€.

2018/2021: Modulação da malária pela interação entre as duas fases da infeção por *Plasmodium*. Coordinator: Ângelo Chora. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-IMU/28664/2017. Amount: 239 058,69€. Total Amount: 239 058,69€.

2018/2021: Plasmodium Exploitation of Liver-specific Methionine Metabolism. Coordinator: Maria Mota. Funding Agency: "la Caixa" Foundation. Reference: PoEMM: La Caixa. Amount: 499 950,00€. Total Amount: 499 950,00€.

2018/2021: Sanofi - Institut Pasteur Awards 2018. Coordinator: Maria Mota. Funding Agency: Institut Pasteur. Reference: Sanofi - Institut Pasteur Awards 2018. Amount: 150 000,00€. Total Amount: 150 000,00€.

2018/2021: Prémio Lóreal. Coordinator: Inês Bento. Funding Agency: L'oréal Paris. Reference: PRÉMIO LOREAL - INÊS BENTO. Amount: 13 500,00€. Total Amount: 13 500,00€.

Invited Lectures and Seminars

Mota MM.. Severe Malaria: What's liver got to do with it? Molecular Approaches to Malaria Meeting, Lorne, Australia, February 23-27, 2020. *(Invited Speaker)*

Communications in International Conferences

Mukherjee D. Microbiota: A new player in Host-Plasmodium affair. Molecular Approaches to Malaria Meeting, Lorne, Australia, February 23-27, 2020. *(Invited Speaker)*

Zuzarte-Luís V. Plasmodium exploitation of liver-specific methionine metabolism. BioMalPar XVI: Biology and Pathology of the Malaria Parasite, Heidelberg, Germany, Online Event, May 18-19, 2020.

Bento I. Temporal control of transmission efficiency. BioMalPar XVI: Biology and Pathology of the Malaria Parasite, Heidelberg, Germany, Online Event, May 18-19, 2020.

Internationalization

The Mota Lab has developed over the years and strengthen in 2020 a network of international collaborations with multiple laboratories around the world. This strategy allows us to develop more interdisciplinary projects by bringing together our own interest and expertise on *Plasmodium* with that of others in different areas. Examples are liver metabolism (J. Mato, CIC, Biogune, Spain), metabolism of microbial pathogens (M. Barrett, Glasgow University, UK), *P. falciparum* epigenetics (A. Scherf, Institut Pasteur, France), *Plasmodium* transporters (S. Krishna and H. Staines, St. George's, University of London, UK), *Plasmodium* genetic technologies (O. Billker, Sanger Institute, UK), endosome biology and 3D tissue imaging (M. Zerial, Max Planck

Institute, Germany),human micro livers (S. Bhatia, MIT, USA) and single molecule approaches and patterns of intra-cellular localization (S. Itzkovitz, Weizmann Institute of Science, Israel).

Prizes, Honors and Awards

Mota MM. Prémio Dona Antónia de consagração de carreira, atribuído pela Sogrape (Casa Porto Ferreira), July 2020.

Advanced Teaching

Ferreira-Chora A. Principles of Infection and Immunity/*Plasmodium* - Liver stage modulates malaria pathology. Biomedical Research (Mestrado integrado), Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 26, 2020.

Science and Society

Bento I. *Clube de Ciência* in Hospital de Santa Maria pediatrics, Instituto de Medicina Molecular João Lobo Antunes, January 2020.

Mota MM. *Fármaco Malária - COVID-19* in Jornal de Notícias, March 23, 2020.

Mota MM. *País que se segue* in RTP, April 13/14, 2020.

Mota MM. *Regresso à normalidade* - Interview in TVI 24, April 24, 2020.

Baptista S. Next Einstein Forum Community of Scientists for "COVID-19- Area 4 Diagnostics and Clinical Work in Africa", since April 2020.

Mota MM. COVID-19, Fronteiras XXI - COVID-19 in RTP, May 13/14, 2020.

Mota MM. COVID-19, Expresso da Meia Noite in SIC Notícias, May 29/30, 2020.

Zuzarte-Luís V. Ciência Portuguesa na luta contra a COVID-19, Universidade Federal do Rio de Janeiro, Brasil, Online Event, June 29, 2020.

Bento I. 'Little iMMers', Instituto de Medicina Molecular João Lobo Antunes, Online Event, July 5, 2020.

Baptista S. *Nu Papia Ciência podcast:* COVID-19, Public radio from Cabo Verde and private radio stations from Angola, July/August 2020.

Marques S. A Scientist in the making, Noite Europeia dos Investigadores, Instituto de Medicina Molecular João Lobo Antunes, Online Event, November 27, 2020.

Zuzarte-Luís V. Sessão de esclarecimento: Testes à COVID-19, Rotaract Clube de Castelo Branco, Online Event, December 4, 2020.

Mota MM. COVID-19, *Especial 3* in RTP3, December 29, 2020.

PhD Theses

Viriato M'Bana, 17/01/2020, Uncovering the UIS4 protein interacting network and its role during the malaria liver stage infection, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Maria Manuel Mota. Co-Supervisor: Ksenija Slavic.

João Mello-Vieira, 03/12/2020, A novel role for EXP2 in invasion of *Plasmodium* sporozoites, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Maria Manuel Mota. Co-Supervisor: Vanessa Zuzarte-Luís.

Mário Ramirez Lab

Major Interests/Objectives

We aim to understand the dynamics of populations of bacterial pathogens and how they respond to selective forces. We focus on the effect of antimicrobial use, human vaccination and host diversity on bacterial populations. By exploring the relationships between commensal and disease-causing populations of the same bacterial pathogen, we hope to identify particularly virulent clones as well as successful colonizers for further characterization. A strong bioinformatics effort in microbial genomics, microbial typing data sharing, data analysis and visualization tools is ongoing. The development of novel laboratory methodologies for the diagnosis of infectious diseases is also an active area of research.

Head of Laboratory

Mário Nuno Ramos d'Almeida Ramirez PhD

Team

Ana Carolina Santos Rodrigues de Castro	MSc Student (Left July)
Ana Catarina da Silva e Costa	Senior Postdoctoral Researcher
Ana Isabel de Aquino Friães	Senior Postdoctoral Researcher
Ana Rita de Oliveira Rosado Freire da Silva	MSc Student (Left March)
Ana Sofia de Sousa Soares	MSc Student (Started September)
Andreia Isabel Pais Santos	MSc Student
Beatriz Gonçalves Esteves	MSc Student (Left January)
Beatriz Vicente dos Santos	MSc Student
Bruno Brandão de Capistrano	MSc Student
Bruno Filipe Ribeiro Gonçalves	PhD Student
Catarina Inês Marques de Sousa Mendes	PhD Student
Elisabete Raquel Ferreira Martins	Senior Postdoctoral Researcher
Fábio Alexandre Súbtil Limpo	MSc Student (Started September)
Inês Maria Marques Teodoro	MSc Student (Left July)
Joana Catarina Ferreira da Silva	MSc Student (Left March)
Joana Filipa Gomes da Silva	Lab Technician
José Augusto Gamito Melo Cristino	Clinical Staff Scientist
Lúcia de Lurdes Ferreira	Administrative Technician (Started January)
Marcos Daniel Caetano Borges de Pinho	Senior Postdoctoral Researcher
Maria Guilhermina de Oliveira Firmino	MSc Student (Started February)
Melissa Neiva de Sousa	MSc Student (Started September)
Milani Sibell Rodrigues	MSc Student (Started January)
Pedro Miguel Festas Marinho	Trainee (Left March)
Pedro Rafael Vila Cerqueira	Lab Technician
Rafael Fresca Mamede	Lab Technician
Rita Alexandra Marinheiro Melão	MSc Student (Started November)
Rui David Ferro Pedrosa	MSc Student (Left July)

Sara Mateus Mahomed	MSc Student
Thomas Hanscheid	Clinical Staff Scientist
Tomás Filipe Reis Gonçalves	MSc Student (Started September)
Yara de Sousa Lobo Almeida	MSc Student (Started September)
Yenine Telma Santos Martins	MSc Student (Started September)

Laboratory Keywords/Research Areas

Population Biology and Genomics, Bioinformatics, Detection of Antimalarial Drug Resistance, Molecular Epidemiology, Diagnostic Tools, Antibiotic Resistance.

Major Scientific Achievements

Documented possible emergence of penicillin nonsusceptibity in *Streptococcus agalactiae* during infection.

Developed software for detection and genomic typing of dengue viruses directly from metagenomic patient samples

Found that vaccine serotypes are still major causes of pediatric invasive pneumococcal disease in Portugal.

Reinforced the importance of molecular diagnostic methods for an accurate picture of the serotypes causing pediatric invasive pneumococcal disease.

Development a multiplex PCR for the simultaneous detection of five bacterial causes of complicated pneumonia

Found a decrease in macrolide resistant *Streptococcus pyogenes* recovered from tonsillo-pharyngitis despite stable and significant macrolide consumption.

Established a novel *P. falciparum in vitro* culture protocol.

Selected Publications

van der Linden M, Mamede R, Levina N, Helwig P, Vila-Cerqueira P, Carriço JA, Melo-Cristino J, Ramirez M, Martins ER (2020). Heterogeneity of penicillin-non-susceptible group B streptococci isolated from a single patient in Germany. Journal of Antimicrobial Chemotherapy 75(2):296–299. *(IF: 5.439, Citations: 2. Source: Web of Science).*

Jesus TF, Ribeiro-Gonçalves B, Silva DN, Bortolaia V, Ramirez M, Carriço JA (2019). Plasmid ATLAS: plasmid visual analytics and identification in high-throughput sequencing data. Nucleic Acids Research 47:D188–D194 *(IF: 11.502, Citations: 9. Source: Web of Science).*

Pinho MD, Foster G, Pomba C, Machado MP, Baily JL, Kuiken T, Melo-Cristino J, Ramirez M, Portuguese Group for the Study of Streptococcal Infections (2019). *Streptococcus canis* are a single population infecting multiple animal hosts despite the diversity of the universally present M-like protein SCM. Frontiers in Microbiology 10:631. *(IF: 4.236, Citations: 4. Source: Web of Science).*

Friães A, Melo-Cristino J, Ramirez M, Portuguese Group for the Study of Streptococcal Infections (2019). Changes in *emm* types and superantigen gene content of *Streptococcus pyogenes* causing invasive infections in Portugal. Scientific Reports 9:18051 *(IF: 3.998, Citations: 4. Source: Web of Science).*

Silva-Costa C, Brito MJ, Pinho MD, Friães A, Aguiar SI, Ramirez M, Melo-Cristino J, Portuguese Group for the Study of Streptococcal Infections, Portuguese Study Group of Invasive Pneumococcal Disease of the Pediatric Infectious Disease Society (2018). Pediatric complicated pneumonia caused by *Streptococcus pneumoniae* serotype 3 in 13-valent pneumococcal conjugate vaccinees, Portugal, 2010-2015. Emerging Infectious Diseases 24:1307–1314. *(IF: 7.185, Citations: 26. Source: Web of Science).*

Hanscheid T, Hardisty DW (2018). How "resistant" is artemisinin resistant malaria? - The risks of ambiguity using the term "resistant" malaria. Travel Medicine and Infectious Disease 24:23-24. *(IF: 4.868, Citations: 6. Source. Web of Science).*

Publications in Peer Review Journals

Utzinger KS, Held U, Hänscheid T, Gültekin N, Fehr J, Grobusch MP, Schlagenhauf P (2020). Self-diagnosis and self-treatment of Plasmodium spp. infection by travellers (1989-2019): A systematic review and meta-analysis. Travel Medicine and Infectious Disease 38:101902. *(IF:* 4.589*, Citations: 0. Source: Web of Science).*

Figueiredo-Campos P, Blankenhaus B, Mota C, Gomes A, Serrano M, Ariotti S, Costa C, Nunes-Cabaço H, Mendes AM, Gaspar P, Pereira-Santos MC, Rodrigues F, Condeço J, Escoval MA, Santos M, Ramirez M, Melo-Cristino J, Simas JP, Vasconcelos E, Afonso Â, Veldhoen M (2020). Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to six months post disease onset. European Journal of Immunology 50:2025–2040. *(IF: 4.404, Citations: 2. Source: Web of Science).*

Dubbink JH, Branco TM, Kamara KB, Bangura JS, Wehrens E, Falama AM, Goorhuis A, Jørgensen PB, Sevalie SS, Hänscheid T, Grobusch MP (2020). COVID-19 treatment in sub-Saharan Africa: If the best is not available, the available becomes the best. Travel Medicine and Infectious Disease 37:101878. *(IF:* 4.589*, Citations: 0. Source: Web of Science).*

Pinto MPB, Melo-Cristino J. Sporogonic cycle of Plasmodium falciparum in a human blood sample. American Journal of Hematology. In press. *(IF: 6.973, Citations: 0. Source: Web of Science).*

Pinto M, Rodrigues JC, Matias R, Água-Doce I, Cordeiro D, Correia C, Gomes JP, Borrego MJ, PTGonoNet (2020). Fifteen years of a nationwide culture collection of Neisseria gonorrhoeae antimicrobial resistance in Portugal. European Journal of Clinical Microbiology & Infectious Diseases 39:1761–1770. *(IF: 2.837, Citations: 0. Source: Web of Science).*

Grobusch MP, van der Fluit KS, Stijnis C, De Pijper CA, Hänscheid T, Gautret P, Schlagenhauf P, Goorhuis A (2020). Can dengue virus be sexually transmitted? Travel Medicine and Infectious Disease 101753. *(IF:* 4.*589, Citations: 0. Source: Web of Science).*

García-Fernández S, García-Castillo M, Melo-Cristino J, Pinto MF, Gonçalves E, Alves V, Vieira AR, Ramalheira E, Sancho L, Diogo J, Ferreira R, Silva D, Chaves C, Pássaro L, Paixão L, Cantón R, STEP Study Group (2020). In vitro activity of ceftolozane-tazobactam against *Enterobacterales* and *Pseudomonas aeruginosa* causing urinary, intra-abdominal and lower respiratory tract infections in intensive care units in Portugal: The STEP multicenter study. International Journal of Antimicrobial Agents 55:105887. *(IF:* 4.621*, Citations: 1. Source: Web of Science).*

González-Díaz A, Machado MP, Càmara J, Yuste J, Varon E, Domenech M, Del Grosso M, Marimón JM, Cercenado E, Larrosa N, Quesada MD, Fontanals D, El-Mniai A, Cubero M, Carriço JA, Martí S, Ramirez M, Ardanuy C (2020). Two multi-fragment recombination events resulted in the β-lactam-resistant serotype 11A-ST6521 related to Spain9V-ST156 pneumococcal clone spreading in south-western Europe, 2008 to 2016. Euro Surveillance 25(16):pii=1900457. *(IF:* 6.454*, Citations: 0. Source: Web of Science).*

Mendes CI, Lizarazo E, Machado MP, Silva DN, Tami A, Ramirez M, Couto N, Rossen JWA, Carriço JA (2020). DEN-IM: dengue virus genotyping from amplicon and shotgun metagenomic sequencing. Microbial Genomics 6(3):e000328. *(IF:* 4.632*, Citations: 0. Source: Web of Science).*

Hänscheid T, Valadas E, Grobusch MP (2020). Coronavirus 2019-nCoV: Is the genie already out of the bottle? Travel Medicine and Infectious Disease 101577. *(IF:* 4.589*, Citations: 3. Source: Web of Science).*

Hänscheid T, Vieira S, Ferreira P, Carvalho T, Belo S, Grobusch MP (2020). The fluorescent acid-fast stain, auramine-O, stains schistosome eggs and may be an aid for detection. An old technique with a useful future? Travel Medicine and Infectious Disease 35:101569. *(IF:* 4.589*, Citations: 0. Source: Web of Science).*

Xavier BB, Mysara M, Bolzan M, Ribeiro-Gonçalves B, Alako BTF, Harrison P, Lammens C, Kumar-Singh S, Goossens H, Carriço JA, Cochrane G, Malhotra-Kumar S (2020). Bacpipe: a rapid, user-friendly whole-genome sequencing pipeline for clinical diagnostic bacteriology. iScience 23:100769. *(IF: 4.447, Citations: 4. Source: Web of Science).*

van der Linden M, Mamede R, Levina N, Helwig P, Vila-Cerqueira P, Carriço JA, Melo-Cristino J, Ramirez M, Martins ER (2020). Heterogeneity of penicillin-non-susceptible group B streptococci isolated from a single patient in Germany. Journal of Antimicrobial Chemotheraphy 75:296–299. *(IF: 5.439, Citations: 2. Source: Web of Science).*

Hänscheid T, Grobusch MP (2020). Coenzyme Q10 and cerebral malaria in mice: Questionable interpretations, improbable usefulness in humans. Parasitology International 74:101969. *(IF: 1.866, Citations: 0. Source: Web of Science).*

Ongoing Research Projects

2020/2022: Recursos de Computação Avançada para Investigação e Inovação. Coordinator: Mário Ramirez. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: TTF#10307438. Amount: N/A. Total Amount: N/A.

2019/2020: Pediatric complicated pneumonia – the importance of molecular methods in the etiological diagnosis. Coordinator: Catarina Silva-Costa. Funding Agency: Sociedade Portuguesa de Doenças Infecciosas e Microbiologia Clínica (Bolsa de Estudo Dr. Mário Nunes da Costa/Alere). Amount: 5 000,00€. Total Amount: 5 000,00€.

2018/2021: Ferramentas para análise filogenética em larga escala. Coordinator: João Carriço. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/CCI-BIO/29676/2017. Amount: 33 324,50€. Total Amount: 237 827,12€.

2017/2020: ONEIDA: Plataforma Ómica para prevenção e controlo de infeções e de resistência aos antimicrobianos. Coordinator: Mário Ramirez. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: LISBOA-01-0145-FEDER-016417. Amount: 696 698,00€. Total Amount: 2 459 635,55€.

2016/2020: The changing pneumococci: adapting to vaccination and transitioning between colonization and disease. Coordinator: José Melo Cristino. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/DTP-EPI/1555/2014. Amount: 179 000,00€. Total Amount: 179 000,00€.

Invited Lectures and Seminars

Ramirez M. Empirical antimicrobial therapy will soon become obsolete: New and old diagnostic tests in infection: fast, faster, fastest? (Invited oral). Tertúlias do Grupo de Infeção e Sepsis do Hospital de São João, Lisbon, Portugal, January 29, 2020.

Melo Cristino J. Antibióticos e Resistências. 3º Curso de Pós-Graduação em Infeciologia Pediátrica, Lisbon, Portugal, February 7, 2020.

Valadas E, Hanscheid T. Coronavírus. “A caminho da Pandemia”? Webinar FMUL Talks, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, March 11, 2020.

Valadas E, Hanscheid T. Um olhar atento e académico à Pandemia COVID-19. Atualização no diagnóstico e terapêutica. Webinar FMUL Talks, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, April 7, 2020.

Ramirez M. Porque temos resistências aos antibióticos? 7º Curso de Antimicrobianos da Sociedade de Infeciologia Pediátrica da Sociedade Portuguesa de Pediatria, June 18, 2020.

Melo Cristino J. O laboratório de Microbiologia: os produtos biológicos e os exames. 7º Curso de Antimicrobianos da Sociedade de Infeciologia Pediátrica da Sociedade Portuguesa de Pediatria. June 18, 2020.

Melo Cristino J. Pneumonia nosocomial. Apresentação dos dados do Estudo STEP e *Meet the expert*. Congresso virtual MSD, July 2, 2020.

Melo Cristino J. Como melhorar o diagnóstico de Infeção. Curso de Pós-Graduação em Doenças Infeciosas, 1ª Edição, Centro Hospitalar Universitário do Porto, Porto, Portugal, September 22, 2020.

Melo Cristino J. Antibióticos e Resistências. 15º Curso de Pós-Graduação em Doenças Infeciosas, Lisbon, Portugal, October 20, 2020.

Melo Cristino J. Multirresistência aos Antibióticos. EPT (Educação Para Todos) on Tour 2020. Organização da ANEM (Associação Nacional de Estudantes de Medicina), October 25, 2020.

Melo Cristino J. Vacinação antipneumocócica do adulto em Portugal e seu potencial impacto após a introdução da vacina PCV13 no PNV em 2015. Escola da Pneumologia, Infeção: Pneumonia, Organização da Sociedade Portuguesa de Pneumologia, December 12, 2020.

Communications in International Conferences

Silva-Costa C, Gomes-Silva J, Prados L, Ramirez M, Melo-Cristino J, Portuguese Study Group of Invasive Pneumococcal Disease of the Paediatric Infectious Disease Society, Portuguese Group for the Study of Streptococcal Infections. Pediatric invasive pneumococcal disease in Portugal: dominance of serotype 3 and increase in serotype 8 four years after PCV13 inclusion in the National Immunization Plan (Abstract 6303). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Silva-Costa C, Gomes-Silva J, Prados L, Ramirez M, Melo-Cristino J, Portuguese Group for the Study of Streptococcal Infections. Persistence of serotype 19F and the importance of non-vaccine serotypes in pediatric non-invasive pneumococcal pneumonia in Portugal (2015-2018). (Abstract 6444). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Silva-Costa C, Gomes-Silva J, Teodoro I, Ramirez M. The PCV13 serotypes still account for a large fraction of invasive pneumococcal disease in adults three-years after PCV13 introduction in the pediatric vaccination schedule (Portugal: 2015-2018) (Abstract 6485). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Castro A, Melo-Cristino J, Ramirez M, Pinho MD. Antimicrobial susceptibility of Streptococcus dysgalactiae subspecies equisimilis isolates recovered from invasive infections in Portugal (Abstract 8985). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Riche CW, Mamede R, Pereira R, Carriço JA, Dias C, Ramirez M. Decline of the Brazilian endemic clone and dominance of internationally disseminated lineages among MRSA from bacteraemic patients in Porto Alegre, Brazil (Abstract 8280). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Mamede R, Melo-Cristino J, Ramirez M, Martins ER. Emergence of penicillin non-susceptible Group B streptococci within the hypervirulent CC17 clone colonising pregnant women in Portugal: a genomic analysis (Abstract 7777). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Martins ER, Pedrosa R, Melo-Cristino J, Ramirez M. Genomic analysis of group B streptococci colonizing pregnant women in Portugal reveals the emergence of novel genetic lineages resulting from capsular switching (Abstract 7168). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Gouveia C, Varandas L, Ramirez M, Melo-Cristino J, Friães A. Clinical and bacterial characteristics of paediatric invasive infections caused by Streptococcus pyogenes (Abstract 6305). 30th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), April 2020.

Mendes CI. DEN-IM: dengue virus genotyping from amplicon and shotgun metagenomic sequencing. Micro Binfie Virtual Conference 2020, May 6, 2020. *(Oral Presentation)*

Jansen van Rensburg MJ, Jolley KA, Bray JE, Carriço JA, Ramirez M, Maiden MC, Brueggemann A. Development of the pubmlst pneumococcal genome library and core-genome multilocus sequence typing scheme for assessment of genome sequence quality and epidemiological investigations (Abstract 545). ISPPD-12, Online Abstracts and E-Posters of 2020, June 2020.

Slotved HC, Corcoran M, Pneumo-Network Group. Development of a network to harmonise identification and serotyping of streptococcus pneumoniae by national reference laboratories (Abstract 407). ISPPD-12, Online Abstracts and E-Posters of 2020, June 2020.

Friães A, Marrão G, Melo-Cristino J, Ramirez M. Decreasing macrolide resistance among group A streptococci causing pharyngitis in Portugal (O136). 38th Annual Meeting of the European Society for Paediatric Infectious Diseases, October 26-29, 2020.

Silva-Costa C,Gomes-Silva J, Prados L, Ramirez M, Melo-Cristino J, Portuguese Group for the Study of Streptococcal Infections, Portuguese Study Group of Invasive Pneumococcal Disease of the Paediatric Infectious Disease Society. Continued dominance of serotype 3 and increase in serotype 8 as causes of pediatric invasive pneumococcal disease in Portugal four years after PCV13 inclusion in the national immunization plan (P0227). 38th Annual Meeting of the European Society for Paediatric Infectious Diseases, October 26-29, 2020.

Silva-Costa C, Gomes-Silva J, Ramirez M, Melo-Cristino J, Portuguese Group for the Study of Streptococcal Infections. Serotypes 19F, 11A and 23B dominate in pediatric non-invasive pneumococcal pneumonia in Portugal (2015-2018) (P0228). 38th Annual Meeting of the European Society for Paediatric Infectious Diseases, October 26-29, 2020.

Silva-Costa C, Pinho M, Friães A, Gomes-Silva J, Ramirez M, Melo-Cristino J, Portuguese Group for the Study of Streptococcal Infections, Portuguese Study Group of Invasive Pneumococcal Disease of the Paediatric Infectious Disease Society. Despite introduction of PCV13 into routine infant immunization serotype 3 continues to cause pediatric complicated pneumococcal pneumonia among vaccinees (P0230). 38th Annual Meeting of the European Society for Paediatric Infectious Diseases, October 26-29, 2020.

Gouveia C, Varandas L, Ramirez M, Melo-Cristino J, Friães A. pediatric invasive infections caused by streptococcus pyogenes in portugal (2014-2018) (P0905). 38th Annual Meeting of the European Society for Paediatric Infectious Diseases, October 26-29, 2020.

Griffiths EJ, Timme RE, Page AJ, Alikhan NF, Fornika D, Maguire F, Mendes CI, Tausch SH, Black A, Connor TR, Tyson GH, Aanensen DM, Alcock B, Campos J, Christoffels A, Gonçalves da Silva A, Hodcroft E, Hsiao WWL, Katz LS, Nicholls SM, Oluniyi PE, Olawoye IB, Raphenya AR, Vasconcelos ART, Witney AA, MacCannell DR. Harmonizing and integrating SARS-CoV-2 contextual data using the PHA4GE specification package. Grand Challenges Annual Meeting, October 2020. *(Poster Presentation)*

Mendes CI, Maguire F, Fornika D, Manuele A, Culp E, Tausch SH, Raphenya AR, Alcock B, Feldgarden M, Tyson GH, Campos J, Witney AA, Aanensen DM, Black A, Hodcroft E, Katz LS, Oluniyi PE, Olawoye IB, Timme RE, Vasconcelos ATR, MacCannell DR, Griffiths EJ, Page AJ. hAMRonization: Improving the Utility of Antimicrobial Resistance Gene Prediction Tools Using the PHA4GE AMR Gene Detection Specification. 4th ASM Conference on Rapid Applied Microbial Next-Generation Sequencing and Bioinformatic Pipelines (ASM NGS), December 7-11, 2020. *(Oral Abstract)*

Mendes CI, Griffiths E, Hsiao W, Timme R, Maguire F, Katz L, Dooley D, Cameron R, Gonçalves da Silva A, Anderson D, MacCannell. Overcoming challenges of SARS-CoV-2 genomics data sharing for public health surveillance (Live Session). International FAIR Convergence Symposium, December 2020.

Communications in National Conferences

Mendes CI, Lizarazo E, Machado MP, Silva DN, Tami A, Ramirez M, Couto N, Rossen JWA, Carriço JA. Dengue virus identification and genotyping from amplicon and shotgun sequencing with DEN-IM. Bioinformatic Open Days, Universidade do Minho, Braga, Portugal, February 19-21, 2020. *(Oral Presentation)*

Vila-Cerqueira P, Mamede R, Silva M, Carriço JA, Ramirez, M. Chewie-NS: Enabling the use of gene-by-gene typing methods through a public and centralized service. Bioinformatic Open Days, Universidade do Minho, Braga, Portugal, February 19-21, 2020. *(Oral Presentation)*

Mamede R, Melo-Cristino J, Martins E. Genomic characterization of emerging penicillin non-susceptibility among group B streptococci. Bioinformatic Open Days, Universidade do Minho, Braga, Portugal, February 19-21, 2020. *(Poster Presentation)*

Internationalization

Collaboration in shotgun metagenomics for clinical diagnostics with Dr. John Rossen, Head of the Molecular Unit and Principal Investigator Genomics for Infection Prevention, Department of Medical Microbiology, University of Groningen, University Medical Center Groningen.

Collaboration with the Microbiology Department, of Hospital Universitari Bellvitge, Barcelona, Spain.

Advanced Teaching

Carriço JA, Friães A, Hänscheid T, Melo Cristino J, Pinho M, Ramirez M, Silva-Costa C. Organizers and lecturers. Second cycle course of Clinical Microbiology and Emerging Infectious Diseases, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Friães A, Hänscheid T, Melo Cristino J, Pinho M, Ramirez M, Silva-Costa C. Participation on the second cycle course of Microbiology (responsible for the course on Medical Microbiology). Instituto Superior Técnico da Universidade de Lisboa in collaboration with Faculdade de Medicina da Universidade de Lisboa, Faculdade de Ciências da Universidade de Lisboa and Faculdade de Medicina Veterinária da Universidade de Lisboa, Lisbon, Portugal.

MSc Theses

Ruben Bernardino Pedroso, 13/10/2020, Peptidoglycan hydrolases: Sub-cellular localization of pneumococcal LytA and LytB. Mestrado em Microbiologia Clínica e Doenças Infeciosas Emergentes. Faculdade de Medicina da Universidade de Lisboa. Co-Supervisor: Mário Ramirez.

Rui David Ferro Pedrosa, 21/06/2020, Epidemiologia molecular da colonização por *Streptococcus agalactiae* em mulheres grávidas. Mestrado em Microbiologia Clínica e Doenças Infeciosas Emergentes. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Elisabete Martins.

Inês Maria Marques Teodoro, 22/06/2020, Doença invasiva pneumocócica em adultos (2015-2017): caracterização epidemiológica e molecular de *Streptococcus pneumoniae* e análise genómica de clones emergentes. Mestrado em Microbiologia Clínica e Doenças Infeciosas Emergentes. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Catarina Silva-Costa.

Ana Carolina Santos Rodrigues de Castro, 28/06/2020, Caracterização genómica de *Streptococcus dysgalactiae* subsp. *equisimilis* responsável por infeção invasiva no Homem. Mestrado em Microbiologia Clínica e Doenças Infeciosas Emergentes. Faculdade de Medicina da Universidade de Lisboa. Supervisor: Marcos Pinho.

Miguel Castanho Lab

Major Interests/Objectives

There are many biological processes that depend on the interaction between peptides/proteins and membrane lipids, such as viral fusion, molecular translocation across epithelia or innate immune defense. Some of these may be inspiring to develop innovative therapeutic tools. Our goal is to unravel the physical principles that govern lipid-peptide interactions, with implications in viral fusion (HIV, SARS-CoV-2, Zika and Dengue viruses are of particular interest), analgesia and translocation of the blood-brain barrier, as well as in the development of antimicrobial and anticancer drugs. We are interested not only in drug targets and drug discovery itself, but also in the molecular-level mechanism of action of efficient and safe drugs.

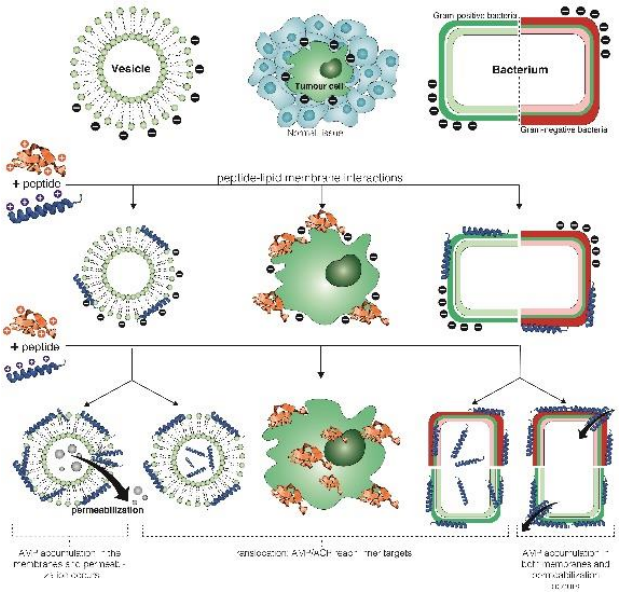
Head of Laboratory

Miguel A. R. B. Castanho, PhD, Full Professor

Team

Ana Rosa Miranda dos Santos Silva Herdade	Assistant Professor
Ana Salomé Rocha do Nascimento Veiga	Assistant Professor
Carla Íris Cadima Couto	Senior Postdoctoral Researcher
Catarina Isabel Parente Chaparro	PhD Student
Christine Cruz Oliveira	Senior Postdoctoral Researcher
Diogo Alexandre de Mendonça	PhD Student
Filipa Dias de Oliveira	PhD Student
Iara Sofia Mota Lima da Silva	Researcher
Liliana Faia Carvalho	Lab Manager
Marco Calvinho Cavaco	PhD Student
Patrícia Alexandra Branco Fraga	MSc Student (Started October)
Rita Isabel Pedro Aroeira	Project Manager
Susana Filipa Almeida Dias	PhD Student
Vera Luísa Santos Neves	Staff Scientist

Graphical Abstract



Laboratory Keywords/Research Areas

Drug Discovery, Antimicrobials/Anticancer Drugs, Antiviral Peptides, Viruses, HIV, SARS-CoV-2, Zika, Blood-brain Barrier.

Major Scientific Achievements

In 2020 we have:

- Created a process to synthesize *Pv*D1, a plant defensing, and showed that its synthetic version retained the biological activity against four different *Candida* species and showed no toxicity *in vivo*.

- Discovered and reported that the anti-HIV-1 peptide pepRF1, a human serum-resistant peptide derived from the Dengue virus capsid protein, is specific for CXCR4-tropic strains and prevents viral entry into target cells by binding to this coreceptor in human cells.

- Demonstrated that kyotorphin (endogenous neuroprotective peptide) administration counteracts amyloid β peptide-induced memory impairments in an Alzheimer's disease animal model, possibly through the rescuing of synaptic plasticity mechanisms.

- Explored and proposed the ways to harmonize peptide plasma stability studies so barriers to progress in peptide drug pharmacokinetics can be overcome.

Selected Publications

Aroeira RI, Castanho MARB (2020). Can citation metrics predict the true impact of scientific papers? The FEBS Journal 287(12):2440-2448. *(IF: 4.392, Citations: 2. Source: Web of Science).*

Belo RF, Martins MLF, Shvachiy L, Costa-Coelho T, de Almeida-Borlido C, Fonseca-Gomes J, Neves V, Vicente Miranda H, Outeiro TF, Coelho JE, Xapelli S, Valente CA, Heras MI, Bardaji E, Castanho MARB, Diógenes MJ, Sebastião AM (2020). The Neuroprotective Action of Amidated-Kyotorphin on Amyloid β Peptide-Induced Alzheimer's Disease Pathophysiology. Frontiers in Pharmacology 11:985. *(IF: 4.225, Citations: 0. Source: Web of Science).*

Cavaco M, Andreu D, Castanho MARB (2020). The Challenge of Peptide Proteolytic Stability Studies: Scarce Data, Difficult Readability, and the Need for Harmonization. Angewandte Chemie International Edition 132: 2-5. *(IF: 12.959, Citations: 0. Source: Web of Science).*

Figueira TN, Domingues MM, Illien F, Cadima-Couto I, Todorovski T, Andreu D, Sagan S, Castanho MARB, Walrant A, Veiga AS (2020). Enfuvirtide-Protoporphyrin IX Dual-Loaded Liposomes: In Vitro Evidence of Synergy against HIV-1 Entry into Cells. ACS Infectious Diseases 6(2):224-236. *(IF: 4.614, Citations: 0. Source: Web of Science).*

Skalska J, Andrade VM, Cena GL, Harvey PJ, Gaspar D, Mello ÉO, Henriques ST, Valle J, Gomes VM, Conceição K, Castanho MARB, Andreu D (2020). Synthesis, Structure, and Activity of the Antifungal Plant Defensin PvD1. Journal of Medicinal Chemistry 63(17):9391–9402. *(IF: 6.205, Citations: 0. Source: Web of Science).*

Publications in Peer Reviewed Journals

Aroeira RI, Castanho MARB (2020). Pharmaceutical innovations: the grand challenges ahead. Frontiers in Medical Technology 1:3. *(IF:--, Citations:--. Source: Web of Science).*

Aroeira RI, Castanho MARB (2020). Can citation metrics predict the true impact of scientific papers? The FEBS Journal 287(12):2440-2448. *(IF: 4.392, Citations: 2. Source: Web of Science).*

Belo RF, Martins MLF, Shvachiy L, Costa-Coelho T, de Almeida-Borlido C, Fonseca-Gomes J, Neves V, Vicente Miranda H, Outeiro TF, Coelho JE, Xapelli S, Valente CA, Heras MI, Bardaji E, Castanho MARB, Diógenes MJ, Sebastião AM (2020). The Neuroprotective Action of Amidated-Kyotorphin on Amyloid β Peptide-Induced Alzheimer's Disease Pathophysiology. Frontiers in Pharmacology 11:985. *(IF: 4.225, Citations: 0. Source: Web of Science).*

Cavaco M, Andreu D, Castanho MARB (2020). The Challenge of Peptide Proteolytic Stability Studies: Scarce Data, Difficult Readability, and the Need for Harmonization. Angewandte Chemie International Edition 132:2-5. *(IF: 12.959, Citations: 0. Source: Web of Science).*

Cavaco M, Pérez-Peinado C, Valle J, da Silva R, DG Correia J, Andreu D, Castanho MARB, Neves V (2020). To What Extent Do Fluorophores Bias the Biological Activity of Peptides? A Practical Approach Using Membrane-Active Peptides as Models. Frontiers in Bioengineering and Biotechnology 8:1059. *(IF: 3.644, Citations: 1. Source: Web of Science).*

Cavaco M, Valle J, da Silva R, Correia JDG, Castanho MARB, Andreu D, Neves V (2020). $_{D}$PepH3, an Improved Peptide Shuttle for Receptor-independent Transport across the Blood-Brain Barrier. Current Pharmaceutical Design 26:1495. *(IF: 2.208, Citations: 1. Source: Web of Science).*

Cavaco M, Gaspar D, Castanho MARB, Neves V (2020). Antibodies for the Treatment of Brain Metastases, a Dream or a Reality? Pharmaceutics 12(1):62. Review *(IF: 4.421, Citations: 5. Source: Web of Science).*

Conceição K, de Cena GL, da Silva VA, de Oliveira Neto XA, de Andrade VM, Tada DB, Richardson M, de Andrade SA, Dias SA, Castanho MARB, Lopes-Ferreira M (2020). Design of bioactive peptides derived from CART sequence isolated from the toadfish Thalassophryne nattereri. 3 Biotech 10(4):162. *(IF: 1.798, Citations: 0. Source: Web of Science).*

de Andrade VM, Bardají E, Heras M, Ramu VG, Junqueira JC, dos Santos JD, Castanho MARB, Conceiçao K (2020). Antifungal and anti-biofilm activity of designed derivatives from kyotorphin. Fungal Biology 124(5):316-326. *(IF: 2.789, Citations: 1. Source: Web of Science).*

Farber PL, Dias A, Freitas T, Pinho AC, Viggiano D, Saldanha C, Silva-Herdade AS (2020). Evaluation of hemorheological parameters as biomarkers of calcium metabolism and insulin resistance in postmenopausal women. Clinical Hemorheology and Microcirculation doi: 10.3233/CH-200956. *(IF: 1.741, Citations: 0. Source: Web of Science).*

Figueira TN, Domingues MM, Illien F, Cadima-Couto I, Todorovski T, Andreu D, Sagan S, Castanho MARB, Walrant A, Veiga AS (2020). Enfuvirtide-Protoporphyrin IX Dual-Loaded Liposomes: In Vitro Evidence of Synergy against HIV-1 Entry into Cells. ACS Infectious Diseases 6(2):224-236. *(IF: 4.614, Citations: 0. Source: Web of Science).*

Fuzeta MA, Bernardes N, Oliveira FD, Costa AC, Fernandes-Platzgummer A, Farinha JP, Rodrigues CAV, Jung S, Tseng R-J, Milligan W, Lee B, Castanho MARB, Gaspar D, Cabral JMS, Silva CL (2020).

Scalable Production of Human Mesenchymal Stromal Cell-Derived Extracellular Vesicles under Serum-/Xeno-Free Conditions in a Microcarrier-Based Bioreactor Culture System. Frontiers in Cell and Developmental Biology 8:553444. *(IF: 5.186, Citations: 1. Source: Web of Science).*

Herdade AS, Silva IM, Calado A, Saldanha C, Nguyen N, Hou I, Castanho MARB, Roy S (2020). Effects of Diabetes on Microcirculation and Leukostasis in Retinal and Non-Ocular Tissues: Implications for Diabetic Retinopathy. Biomolecules 10(11):1583. *(IF: 4.082, Citations: 0. Source: Web of Science).*

Lousa D, Pinto ART, Campos SRR, Baptista AM, Veiga AS, Castanho MARB, Soares CM (2020). Effect of pH on the influenza fusion peptide properties unveiled by constant-pH molecular dynamics simulations combined with experiment. Scientific Reports 10(1):20082. *(IF: 3.998, Citations: 0. Source: Web of Science).*

Pinto R, Antunes F, Pires J, Silva-Herdade A, Pinto ML (2020). A Comparison of Different Approaches to Quantify Nitric Oxide Release from NO-Releasing Materials in Relevant Biological Media. Molecules 25(11):2580. *(IF: 3.267, Citations: 2. Source: Web of Science).*

Skalska J, Andrade VM, Cena GL, Harvey PJ, Gaspar D, Mello ÉO, Henriques ST, Valle J, Gomes VM, Conceição K, Castanho MARB, Andreu D (2020). Synthesis, Structure, and Activity of the Antifungal Plant Defensin PvD1. Journal of Medicinal Chemistry 63(17):9391–9402. *(IF: 6.205, Citations: 0. Source: Web of Science).*

Sousa DC, Leal I, Moreira S, do Vale S, Silva-Herdade AR, Dionísio P, Castanho MARB, Abegão Pinto L, Marques-Neves C (2020). Optical coherence tomography angiography study of the retinal vascular plexuses in type 1 diabetes without retinopathy. Eye 34(2):307-311. *(IF: 2.455, Citations: 4. Source: Web of Science).*

Sousa DC, Leal I, Moreira S, do Vale S, Silva-Herdade AS, Aguiar P, Dionísio P, Abegão Pinto L, Castanho MARB, Marques-Neves C (2020). Retinal Vascular Reactivity in Type 1 Diabetes Patients without Retinopathy Using Optical Coherence Tomography Angiography. Investigative Ophthalmology & Visual Science 61(6):49. *(IF: 3.470, Citations: 0. Source: Web of Science).*

Other International Publications

Castanho MARB (2020). Peptide-Drug Conjugates across the Blood-Brain Barrier: Using Viral Protein Domains to Shuttle Small Drugs to the Central Nervous System. Biophysical Journal 118(3):238a.

Cavaco M, Gaspar D, Neves V, Castanho MARB (2020). The Effect of Different Fluorophores on Fluorescence-Based Techniques. Biophysical Journal 118(3):153a.

Mendonça DA, Figueira TN, Melo MN, Harder O, Niewiesk S, moscona A, Porotto M, Castanho MARB, Veiga AS (2020). The Efficacy of Designed Anti-Measles Virus Peptides Depends on the Stability of Self-Assembled Clusters. Biophysical Journal 118(3):60a.

Veiga AS, Pinto SN, Dias SA, Cruz AF, Mil-Homens D, Fernandes F, Valle J, Andreu D, Prieto M, Castanho MARB, Coutinho A (2020). Unravelling the Mechanism of Action of Pepr, a Viral-Derived Membrane-Active Peptide, Against Staphylococcus Aureus Biofilms. Biophysical Journal 118(3):381a.

Ongoing Research Projects

2020/2021: Projeto n. 470, RIGHT-NOW-RIGHT-HERE: Evidence-based off-label application of porphyrin-based medicines to fight SARS-CoV-2. Coordinator: Miguel Castanho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: FCT COVID 2019. Amount: 40 000,00€. Total Amount: 40 000,00€.

2019/2023: "One size fits all'' unique drug to eradicate multiple viral species simultaneously from the central nervous system of co-infected individuals - NOVIRUSES2BRAIN. Coordinator: Miguel Castanho. Funding Agency: European Commission. Reference: GA 828774 - H2020-FETOPEN-2018. Amount: 2 113 125,00€. Total Amount: 3 933 965,63€.

2019/2020: Desenvolvimento de uma plataforma trans-barreira hematoencefálica com aplicação na doença de Alzheimer. Coordinator: Miguel Castanho. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: COOPERAÇÃO CIENTIFICA E TECNOLOGICA FCT/NKFIH, 201. Amount: 2 000,00€. Total Amount: 2 000,00€.

2018/2021: Selecção de fármacos líder anti-virus zika capazes de translocar as barreiras hemato-placentária e hemato-encefálica. Combinando péptidos translocadores inovadores e eficazes com novos antivirais para alcançar o vírus Zika através de barreiras. Coordinator: Carla Couto.

Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-VIR/29495/2017. Amount: 239 302,82€. Total Amount: 239 302,82€.

Other Projects

2018/2021: ADC1.1: Desenvolvimento de uma nova classe de moléculas de conjugados de anticorpos para o tratamento do cancro. Coordinator: Frederico Aires-Silva. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: ADC1.1 - LISBOA-01-0145-FEDER-032085. Amount: 12 500,00€. Total Amount: 239 638,46€.

2018/2021: Validação polifásica de péptidos antimicrobianos como tratamento alternativo para infecções do pé diabético. Coordinator: Manuela Oliveira. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/SAU-INF/28466/2017. Amount: 5 765,20€. Total Amount: 239 655,75€.

2018/2021: Dadores de gasotransmissores NO e H25 terapêuticos baseados em materiais nanoporosos. Coordinator: Moisés Pinto. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-QUI/28721/2017. Amount: 6 000,00€. Total Amount: 227 943,25€.

2018/2025: Fighting Zika virus with antiviral peptides and conjugates translocating blood-placental and blood-brain barriers. Coordinator: David Andreu Martinez. Funding Agency: Fundación Bancaria "la Caixa". Reference: NOZIKA project. Amount: 254 650,00€. Total Amount: 777 250,00€.

2018/2021: Combinando métodos computacionais e experimentais para obter uma caracterização genérica dos péptidos de fusão de vírus. Coordinator: Diana Lousa. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/CCI-BIO/28200/2017. Amount: 54 975,00€. Total Amount: 239 648,06€.

Invited Lectures and Seminars

Castanho MARB. Developing drugs to target brain-associated diseases. Overcoming challenges and barriers. Symposium on Bioengineering. Online meeting. April 4, 2020.

Castanho MARB. Nanomedicine – tiny tools to beat the giant cancer challenge. ESOF2020 – Euroscience Open Forum (European Commission), Session chairman. September 5, 2020.

Castanho MARB. Chasing SARS-CoV-2 in the brain. 15th YES Meeting, Porto, Portugal, September 17, 2020.

Castanho MARB. Preclinical development of anti-SARS-CoV-2 drugs at iMM: whither are we bound? Internal Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, September 23, 2020.

Castanho MARB. From Zika vírus to SARS-CoV-2 – developing drugs to fight viruses in the brain. Workshop in Translational Neurology. Blood-brain barrier in the clinical setting. Online meeting. December 11, 2020.

Communications in International Conferences

Cavaco M, Valle J, Castanho MARB, Andreu D. A Methodology to predict peptide stability based on chemical properties. 17th Iberian Peptide Meeting/IQM/IQFR-CSIC, Madrid, Spain, February 5-7, 2020. (*Oral Presentation*)

Mendonça DA, Cruz-Oliveira C, Fernandes-Siqueira LO, da Costa LS, Todorovski T, Neves V, Cadima-Couto I, Veiga AS, Da Poian AT, Andreu D, Castanho MARB. Fighting central nervous system arboviral infections with peptide/porphyrin-based conjugates. 17th Iberian Peptide Meeting/IQM/IQFR-CSIC, Madrid, Spain, February 5-7, 2020. *(Oral Presentation)*

Mota-Silva I, Silva-Herdade AS, Delgado E, Had N, Hou I, Roy S, Castanho M. Neuropeptide Kyotorphin impact on diabetic retinopathy and its correlation with diabetes mellitus derived inflammation. 17th Iberian Peptide Meeting IQM/IQFR-CSOC, Madrid, Spain, February 5-7, 2020. (*Oral Presentation*)

Cadima-Couto I, Mendonça DA, Cruz-Oliveira C, Neves V, Todorovski T, Veiga AS, Da Poian A, Andreu D, Castanho MARB. Targeting central nervous system HIV reservoirs with innovative peptide-small drug conjugates. Gordon Research Conference on Chemistry and Biology of Peptides, Ventura, California, USA, February 9-14, 2020. *(Poster Presentation)*

Cadima-Couto I, Tauzin A, Freire JM, Figueira TN, Pérez-Peinado C, Cunha-Santos C, Bártolo I, Taveira N, Goncalves J, Mammano F, Andreu D, Castanho MARB, Veiga AS. Anti-HIV-1 activity and mode of action of a viral-derived and proteolysis-resistant peptide CXCR4 antagonist. Gordon Research Conference on Chemistry and Biology of Peptides, Ventura, California, USA, February 9-14, 2020. *(Oral Presentation)*

Castanho MARB. Peptide-Drug Conjugates across the Blood-Brain Barrier: Using Viral Protein Domains to Shuttle Small Drugs to the Central Nervous System. 64th Annual Meeting of the Biophysical Society, San Diego, California, USA, February 15-19, 2020. (*Poster Presentation*)

Cavaco M, Pérez-Peinado C, Valle J, Gaspar D, Andreu D, Neves V, Castanho MARB. The Effect of Different Fluorophores on Fluorescence-Based Techniques. 64th Annual Meeting of the Biophysical Society, San Diego, California, USA, February 15-19, 2020. (*Poster Presentation*)

Mendonça DA, Figueira TN, Melo MN, Harder O, Niewiesk S, moscona A, Porotto M, Castanho MARB, Veiga AS. The Efficacy of Designed Anti-Measles Virus Peptides Depends on the Stability of Self-Assembled Clusters. 64th Annual Meeting of the Biophysical Society, San Diego, California, USA, February 15-19, 2020. (*Poster Presentation*)

Veiga AS, Pinto SN, Dias SA, Cruz AF, Mil-Homens D, Fernandes F, Valle J, Andreu D, Prieto M, Castanho MARB, Coutinho A. Unravelling the Mechanism of Action of Pepr, a Viral-Derived Membrane-Active Peptide, Against Staphylococcus Aureus Biofilms. 64th Annual Meeting of the Biophysical Society, San Diego, California, USA, February 15-19, 2020. (*Poster Presentation*)

Cadima-Couto I, Tauzin A, Freire JM, Figueira TN, Pérez-Peinado C, Cunha-Santos C, Bártolo I, Taveira N, Goncalves J, Mammano F, Andreu D, Castanho MARB, Veiga AS. Anti-HIV-1 activity of pepRF1, a proteolysis-resistant CXCR4 antagonist derived from Dengue virus capsid protein. Cold Spring Harbour Laboratory Virtual Meeting on Retroviruses, Cold Spring Harbour, New York, USA, May 18-21, 2020. *(Oral Presentation)*

Internationalization

Our expertise is the development and application of biophysical techniques to dissect the molecular mechanisms of action of membrane-active peptides directly in viruses, bacteria or cells. Peptides are from 3 sources: i) Organic synthesis, for which we have collaborations with

labs in Spain, ii) Natural products, for which we have collaborations in Brazil, and iii) Pharma products during development phase.

It is worth highlighting that Miguel Castanho coordinates a H2020 – FET Open project involving 3 partners aimed at developing drugs to clear viral species from brain.

In 2020 we have co-authored papers with the following international groups:

i) Laboratório de Bioquímica de Peptídeos – Universidade Federal de São Paulo, São José dos Campos, Brazil.
ii) Laboratório de Fisiologia e Bioquímica de Microrganismos do Centro de Biociências e Biotecnologia da Universidade Estadual do Norte Fluminense Darcy Ribeiro, Rio de Janeiro, Brazil.
iii) Sorbonne Université, École Normale Supérieure, PSL University, CNRS, Laboratoire des Biomolécules, Paris, France.
iv) Department of Experimental and Health Sciences, Universitat Pompeu Fabra, Barcelona Biomedical Research Park, Barcelona, Spain.
v) Department of Medicine and Ophthalmology, Boston University School of Medicine, Boston, USA.
vi) PBS Biotech Inc., Camarillo, California, USA.
vii) AventaCell Biomedical Corp., Atlanta, Georgia, USA.
viii) Institute for Molecular Bioscience, The University of Queensland, Queensland, Australia.
ix) School of Biomedical Sciences, Institute of Health & Biomedical Innovation and Translational Research Institute, Queensland University of Technology, Brisbane, Queensland, Australia.

Prizes, Honors and Awards

Iara Mota Silva. Best Short Communication, 17th Iberian Peptide Meeting (EPI) Organizing and Scientific Committees, Spain, February 5-7, 2020.

Miguel Castanho. “Personality of the year 2020”, Jornal “O Mirante”, Portugal. December 31, 2020. (https://omirante.pt/omirante/2021-01-09-Cientista-Miguel-Castanho-e-a-escolha--de-O-MIRANTE-para-Personalidade-do-Ano-2020)

Industry Contract Research

Miguel Castanho Lab is a partner of VectorB2B, a Drug Developing Association for Research in Biotechnology that provides highly qualified services of drug discovery and development from the bench to bedside. (http://vectorb2b.com/)

Patents/Prototypes

Ana Salomé R. N. Veiga, Carla Iris C. Couto, João Freire, Miguel Augusto Rico Botas Castanho, João Gonçalves, Alexandra Tauzin, Fabrizio Mammano, Javier Valle Garcia, David Andreu, Clara Peinado. C-X-C motif chemokine receptor 4 antagonist. GB2001620.0. February, 2020.

Sofia Volker Côrte-Real, Vera Luísa Santos Neves, Pedro Manuel Correia Canhão, Tiago Fleming Outeiro, Miguel Augusto Rico Botas Castanho, Frederico Nuno Castanheira Aires da Silva, Soraia Rafaela Santiago de Oliveira. Antibody molecules and peptide delivery systems for use in Alzheimer's disease and related disorders. US10654917B2. May, 2020.

Advanced Teaching

Neves V. Seminar. Blood Brain barrier: Challenges to develop new therapeutic tools to act in the brain. PhD and MSc in neurosciences, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, September 23, 2020.

Castanho MARB. Seminar. Drug conjugation as a tool to overcome the BBB. MSc in Biopharmaceutical Sciences, topic "Barriers of the brain in drug development", Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, November 10, 2020.

Science and Society

- Diogo A. Mendonça – 42º PubhD de Lisboa, February 12, 2020.

- Miguel Castanho – Round table "Let's talk about science: Numbers, viruses and our immune system", April 8, 2020.

- Development of a video: "Can climate changes bring new viral pandemics to Europe?" - World Environmental Day, June 5, 2020.

- Creation of a video: 1st Anniversary NOVIRUSES2BRAIN – September 1, 2020.

- Miguel Castanho – Round table "Brain and Environment: The impact of the pandemic" - Brain Awareness Week 2020, October 14, 2020.

- Conception of a quiz - International Day of Climate Action, October 24, 2020.

- Filipa Oliveira - 48º PubhD de Lisboa, November 11, 2020.

- Participation in European Researchers' Night, Lisbon, November 27, 2020.

- Participation in several media communication events, from which we highlight:

  - SARS-CoV-2 included in Portuguese research financed with 4.2 million euros, Público, May 7, 2020. (https://www.publico.pt/2020/05/07/ciencia/noticia/sarscov2-incluido-investigacao-portuguesa-financiada-42-milhoes-euros-1915432)

  - Scientists at the Institute of Molecular Medicine are investigating the effects of the covid-19 virus on the central nervous system. RTP1, May 7, 2020. (https://www.rtp.pt/play/p6558/e471165/jornal-da-tarde)

  - Race to vaccine, Linha da Frente, RTP1, November 5, 2020. (https://www.rtp.pt/play/p6595/e504212/linha-da-frente)

- Miguel Castanho - "A Química do COVID-19" - Escola Internacional de Bruxelas, Schola Europaea Brussels II.

Miguel Prudêncio Lab

Major Interests/Objectives

Malaria is an infectious disease caused by *Plasmodium* parasites. The combat against this disease, which exerts a particularly heavy burden in the poorest regions of the globe, constitutes

not only a major scientific challenge but also a moral and social imperative. The Prudêncio Lab's mission is to contribute to this endeavor through harnessing the underexplored potential of the hepatic stage of *Plasmodium* infection to develop new anti-plasmodial intervention strategies. Among our major interests are the development of new experimental methods to investigate *Plasmodium* infection, discovery of novel host-parasite interactions, the investigation of co-infections between *Plasmodium* and other parasites, and the development of new drug- and vaccine-based anti-malarial strategies.

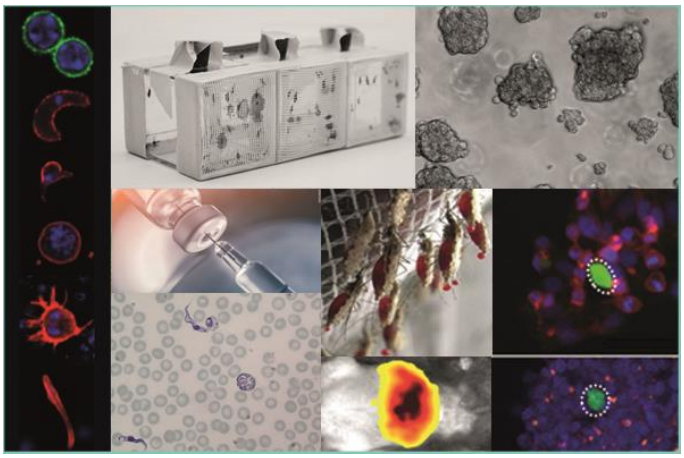
Head of Laboratory

Miguel Prudêncio, PhD, Invited Associate Professor of Faculdade de Medicina da Universidade de Lisboa

Team

Adriana Beatriz Oliveira Temporão	PhD Student
Américo José dos Santos Alves	PhD Student
Ana Filipa Gonçalves Teixeira	Lab Technician
Ana Margarida Roque Sanches Vaz Serra	PhD Student (Left February)
António Manuel Barbeiro Mendes	Senior Postdoctoral Researcher
Catarina Maria Vicente Rôla	MSc Student (Started September)
Daniela Cristina de Henriques Brás	PhD Student
Denise Rodrigues Francisco	Lab Technician
Diana Alves Moita	PhD Student
Diana Marisa Pinto Freire Fontinha	Postdoctoral Researcher
Francisca Maria de Andrade Terras Arez	PhD Student
Helena Isabel Marques Nunes Cabaço	Senior Postdoctoral Researcher
Isabel Margarida Meneses Moules	MSc Student
Jorge Henrique Ferreira Grilo	PhD Student (Left February)
Luciano Gonçalo Nogueira Seabra Pereira	MSc Student
Madalena Soares Ferreira de Jesus Carvalho	MSc Student (Started July)
Patrícia dos Santos Meireles	Postdoctoral Researcher
Pedro Gil Gameiro Eloy Sena Rego	PhD Student
Raquel Alves de Azevedo	PhD Student

Graphical Abstract



Laboratory Keywords/Research Areas

Keywords: Malaria, *Plasmodium*, Vaccines, Co-Infections, Anti-Plasmodial Drugs.

Research Areas: Vaccination, Drug screening, Host-Pathogen Interactions.

Major Scientific Achievements

Among other scientific achievements, we have published the results of the first-in-humans evaluation of *PbVac*, the first malaria vaccine candidate against malaria based on the use of rodent *P. berghei* sporozoites genetically modified to express antigens of the human-infective *P. falciparum*. We further employed a newly developed bioluminescence-based method to show for the first time that several antiretroviral drugs inhibit the mosquito stages of *Plasmodium* development. Additionally, we described for the first time the impact of aminoacid supplementation on hepatic infection by *P. berghei* parasites. In collaboration with various medicinal chemistry laboratories, we evaluated the activity of multiple compounds against different stages of *Plasmodium* infection. Finally, we also established the regular production of *P. falciparum*-infected mosquitoes to obtain sporozoites of this human-infective malaria parasite.

Selected Publications

Reuling IJ, Mendes AM, de Jong GM, Fabra-García A, Nunes-Cabaço H, van Gemert GJ, Graumans W, Coffeng LE, de Vlas SJ, Yang ASP, Lee CK, Wu Y, Birkett AJ, Ockenhouse CF, Koelewijn R, van Hellemond JJ, van Genderen PJJ, Sauerwein RW, Prudêncio M (2020). Safety and efficacy of a genetically modified rodent malaria parasite against Plasmodium falciparum malaria: an open-label randomized phase 1/2a trial. Science Translational Medicine 12:eaay2578. *(IF: 16.304. Source: Web of Science).*

Meireles P, Brás D, Fontinha D, Chora AF, Serre K, Mendes AM, Prudêncio M (2020). Elimination of Hepatic Rodent Plasmodium Parasites by Amino Acid Supplementation. iScience 23(12):101781. *(IF: 4.447. Citations: 0. Source: Web of Science).*

Sanches-Vaz M, Temporão A, Luís R, Nunes-Cabaço H, Mendes AM, Goellner S, Carvalho T, Figueiredo LM, Prudêncio M (2019). Trypanosoma brucei infection protects mice against malaria. PLoS Pathogens 15(11): e1008145. *(IF: 6.218. Citations: 0. Source: Web of Science).*

Azevedo R, Mendes AM, Prudêncio M (2019). Inhibition of Plasmodium sporogonic stages by ivermectin and other avermectins. Parasites & Vectors 12(1):594. *(IF: 2.824. Citations: 5. Source: Web of Science).*

Wolanin K, Fontinha D, Sanches-Vaz M, Nyboer B, Heiss K, Mueller AK, Prudêncio M (2019). A crucial role for the C-terminal domain of exported protein 1 during the mosquito and hepatic stages of the Plasmodium berghei life cycle. Cellular Microbiology 21(10):e13088. (*IF: 3.43. Citations: 2. Source: Web of Science).*

Arez F, Rebelo S, Fontinha D, Simão D, Martins TR, Machado M, Fischli C, Oeuvray C, Badolo L, Carrondo MJT, Rottmann M, Spangenberg T, Brito C, Greco B*, Prudêncio M*, Alves PM* (2019). Flexible 3D cell-based platforms for the discovery and profiling of novel drugs targeting Plasmodium hepatic infection. ACS Infectious Diseases 5(11):1831-1842. (*Corresponding authors). *(IF: 4.614. Citations: 4. Source: Web of Science).*

Mendes AM, Machado M, Gonçalves-Rosa N, Reuling IJ, Foquet L, Marques C, Salman AM, Yang ASP, Moser KA, Dwivedi A, Hermsen CC, Jiménez-Díaz B, Viera S, Santos JM, Albuquerque I, Bhatia SN, Bial J, Angulo-Barturen I, Silva JC, Leroux-Roels G, Janse CJ, Khan SM, Mota MM,

Sauerwein RW, Prudêncio M (2018). A Plasmodium berghei Sporozoite-Based Vaccination Platform against Human Malaria. NPJ Vaccines 3(33). *(IF: 5.699. Citations: 9. Source: Web of Science).*

Machado M, Sanches-Vaz M, Cruz JP, Mendes AM, Prudêncio M (2017). Inhibition of Plasmodium hepatic infection by antiretroviral compounds. Frontiers in Cellular Infection Microbiology 7(329). *(IF: 4.123. Citations: 10. Source: Web of Science).*

Azevedo R, Markovic M, Machado M, Franke-Fayard B, Mendes AM, Prudêncio M (2017). A bioluminescence method for in vitro screening of Plasmodium transmission-blocking compounds. Antimicrobial Agents Chemotherapy 61(6):e02699-16. *(IF: 4.904. Citations: 11. Source: Web of Science and Scopus).*

Mendes AM, Albuquerque IS, Machado M, Pissarra J, Meireles P, Prudêncio M (2017). Inhibition of Plasmodium liver infection by ivermectin. Antimicrobial Agents Chemotherapy 61(2): e02005-16. *(IF: 4.904. Citations: 22. Source: Web of Science).*

Meireles P, Sales-Dias J, Andrade CM, Mello-Vieira J, Mancio-Silva L, Simas JP, Staines HM, Prudêncio M (2017). GLUT1-mediated glucose uptake plays a crucial role during Plasmodium hepatic infection. Cellular Microbiology 19(2):e12646. *(IF: 3.43. Citations: 25. Source: Web of Science).*

Liehl P, Meireles P, Albuquerque IS, Pinkevchy M, Baptista F, Mota MM, Davenport MP, Prudêncio M (2015). Innate immunity induced by Plasmodium liver infection inhibits malaria reinfections. Infection and Immunity 83(3):1172-1180. *(IF: 3.201. Citations: 27. Source: Web of Science).*

Publications in Peer Reviewed Journals

Fonte M, Tassi N, Fontinha D, Bouzón-Arnáiz I, Ferraz R, Araújo MJ, Fernàndez-Busquets X, Prudêncio M, Gomes P, Teixeira C (2020). 4,9-diaminoacridines and 4-aminoacridines as antiplasmodial hits. ChemMedChem in press. *(IF: 3.124. Citations: 0. Source: Web of Science).*

Miyazaki Y, Marin CT, Imai T, Mendes AM, vd Laak R, Sturn A, Geurten FJ, Miyazaki S, Chevallwy-Maurel SC, Ramesar J, Kolli SK, Kroeze J, van Schuilenburg R, Salman AM, Wilder BK, Reyes-Sandoval A, Dechering K, Prudêncio M, Janse CJ, Khan SM, Franke-Fayard B (2020). Generation of a genetically modified chimeric Plasmodium falciparum parasite expressing P. vivax circumsporozoite protein for malaria vaccine development. Frontiers in Cellular and Infection Microbiology 10:591046. *(IF: 4.123. Citations: 0. Source: Web of Science).*

Meireles P, Brás D, Fontinha D, Chora AF, Serre K, Mendes AM, Prudêncio M (2020). Elimination of Hepatic Rodent Plasmodium Parasites by Amino Acid Supplementation. iScience 23(12):101781. *(IF: 4.447. Citations: 0. Source: Web of Science).*

Marinović M, Perković I, Fontinha D, Prudêncio M, Held J, Passanha de Carvalho L, Tandarić T, Vianello R, Zorc B, Rajić Z (2020). Novel Harmicines with Improved Potency against Plasmodium. Molecules 25(19):4376. *(IF: 3.267. Citations: 0. Source: Web of Science).*

Milheiro SA, Gonçalves J, Lopes RMRM, Madureura M, Lobo L, Lopes A, Nogueira F, Fontinha D, Prudêncio M, Piedade MFM, Pinto SN, Florindo PR, Moreira R (2020). Half- sandwich cyclopentadienylruthenium(II) complexes: a new antimalarial chemotype. Inorganic Chemistry in press, 59(17):12722-12732. *(IF: 4.825. Citations: 0. Source: Web of Science).*

Fontinha D, Moules I, Prudêncio M (2020). Repurposing drugs to fight hepatic malaria parasites. Molecules 25(15):3409. *(IF: 3.267. Citations: 1. Source: Web of Science).*

Fontinha D, Sousa SA, Morais TS, Prudêncio M, Leitão JH, Gal YL, Lorcy D, Silva RAL, Velho MFG, Belo D, Almeida M, Guerreuro JF, Pinheiro T, Marques F (2020). Gold(III) bis(dithiolene) complexes: from molecular conductors to prospective anticancer, antimicrobial and antiplasmodial agents. Metallomics 12(6):974-987. *(IF: 3.796. Citations: 4. Source: Web of Science).*

Reuling IJ, Mendes AM, de Jong GM, Fabra-García A, Nunes-Cabaço H, van Gemert GJ, Graumans W, Coffeng LE, de Vlas SJ, Yang ASP, Lee CK, Wu Y, Birkett AJ, Ockenhouse CF, Koelewijn R, van Hellemond JJ, van Genderen PJJ, Sauerwein RW, Prudêncio M (2020). Safety and efficacy of a

genetically modified rodent malaria parasite against Plasmodium falciparum malaria: an open-label randomized phase 1/2a trial. Science Translational Medicine 12:eaay2578. *(IF: 16.304. Source: Web of Science).*

Singh L, Fontinha D, Francisco D, Mendes AM, Prudêncio M, Singh K (2020). Molecular Design and Synthesis of Ivermectin Hybrids Targeting Hepatic and Erythrocytic Stages of Plasmodium Parasites. Journal of Medicinal Chemistry 63(4):1750-1762. *(IF: 6.205. Citations: 2. Source: Web of Science).*

Azevedo R, Mendes AM, Prudêncio M (2020). The impact of antiretroviral therapy on malaria parasite transmission. Frontiers in Microbiology 10:3048. *(IF: 4.236. Citations: 2. Source: Web of Science).*

Balasubramanian L, Zuzarte-Luís V, Syed T, Mullick D, Deb S, Prasad H, Meissner J, Almeida AS, Furstenhaupt T, Siddiqi K, Prudêncio M, Rodrigues CM, Mota MM, Sundaramurthy V (2020). Association of Plasmodium berghei with the apical domain of hepatocytes is necessary for the parasite's liver stage development. Frontiers in Cellular and Infection Microbiology 9:451. *(IF: 4.123. Citations: 0. Source: Web of Science).*

Perković I, Raić-Malić S, Fontinha D, Prudêncio M, Carvalho LP, Held J, Tandarić T, Vianello R, Zorc B, Rajić Z (2020). Harmicines − harmine and cinnamic acid hybrids as novel antiplasmodial hits. European Journal of Medicinal Chemistry 187:11927. *(IF: 5.573. Citations: 5. Source: Web of Science).*

Sousa SA, Leitão JH, Silva RAL, Belo D, Santos IC, Guerreiro JF, Martins M, Fontinha D, Prudêncio M, Almeida M, Lorcy D, Marques F (2020). On the Path to Gold: Monoanionic Au Bisdithiolate Complexes with 1 Antimicrobial and Antitumor Activities. Journal of Inorganic Biochemistry 202:110904. *(IF: 3.212. Citations: 4. Source: Web of Science and Scopus).*

Alves AJS, Alves NG, Caratão CC, Esteves M, Fontinha D, Bártolo I, Soares MIL, Lopes SMM, Prudêncio M, Taveira N, Pinho e Melo TMVD (2020). Spiro-Lactams as Novel Antimicrobial Agents. Current Topics in Medicinal Chemistry 20(2):140-152. *(IF: 3.218. Citations: 2. Source: Web of Science).*

Other International Publications

Prudêncio M (2020). In fairness to mosquitoes. Trends in Parasitology 36(11):876-877. *(IF: 6.918. Citations: 0. Source: Web of Science).*

Prudêncio M, Costa JC (2020). Research funding after COVID-19. Nature Microbiology 5(8):986. *(IF: 15.54. Citations: 2. Source: Web of Science).*

Ongoing Research Projects

2020/2023: AMAZING – toxinas de serpentes da AMAZónia: Investigação na valorização de biorrecursos. Coordinator: Miguel Prudêncio. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: CIRCNA/BRB/0281/2019. Amount: 74 615,00€. Total Amount: 234 214,63€.

2020/2020: Prémio Pfizer. Coordinator: Miguel Prudêncio. Funding Agency: Pfizer. Reference: Prémio Pfizer. Amount: 20 000,00€. Total Amount: 20 000,00€.

2018/2021: Estratégias para o desenvolvimento e melhoramento de vacinas de organismos inteiros contra a malária. Coordinator: Miguel Prudêncio. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: SporoMalVac LISBOA-01-0145-FEDER- 029550. Amount: 215 464,63€. Total Amount: 234 214,63€.

2018/2021: Uma estratégia multialvo para atuar em todas as fases do ciclo de vida do Plasmodium. Coordinator: Miguel Prudêncio. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-QUI/30021/2017. Amount: 25 000,00€. Total Amount: 239 873,31€

2018/2020: Merck-IBET. Coordinator: Miguel Prudêncio. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: Merck-IBET. Amount: 215 200,00€. Total Amount: 215 200,00€.

Invited Lectures and Seminars

Prudêncio M. Round Table on Public Presentation of Colégio Tropical da Universidade de Lisboa, Reitoria da Universidade de Lisboa, Lisbon, Portugal, March 6, 2020.

Prudêncio M. Biomedical Research in Vaccine Development. Workshop Science Talks: How Vaccines are Developed, Approved and Produced, AICIB/EATRIS/PtCRIN, Lisbon, Portugal, November, 2020.

Prudêncio M. Development and Clinical Evaluation of a New Vaccine against Malaria. Sessões Académicas - Classe de Ciências - Academia das Ciências de Lisboa, Lisbon, Portugal, December 3, 2020.

Prudêncio M. Plasmodium Liver Infection and Antimalarial Strategies - Overview of Work from 2020. iMM Internal Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, December 16, 2020.

Internationalization

The lab has an extensive network of collaborations with leading national and international researchers, including:

Catarina Brito, Paula Alves – iBET;
Joana Carneiro da Silva – University of Maryland;
Kelly Chibale – University of Cape Town;
Thomas Hanscheid - Instituto de Medicina Molecular João Lobo Antunes;
Paula Gomes – Universidade do Porto;
Chris Janse and Shahid Khan - Leiden University;
Clemens Kocken - Biomedical Primate Research Centre, Rijswijk;
Rui Moreira, Francisca Lopes and Ana Ressurreição – Faculdade de Farmácia da Universidade de Lisboa; Ann-Kristin Mueller - Universtity of Heidelberg;
Robert Sauerwein - University of Nijmegen;
Bogdan Solaja - Faculty of Chemistry, Belgrade;
Branka Zorc – University of Zagreb.

Prizes, Honors and Awards

Pfizer-SCML Clinical Investigation Award.

Patents/Prototypes

Prudêncio M, Mendes AM. Genetically modified rodent *Plasmodium* parasites as platforms for a whole-organism malaria vaccine, (WO 2013156949 A1, also published as CN104302313A, EP2838554A1, US20150071966.
Provisional application (Portugal) No. 20121000030819, filed 17/04/2012.

PCT international application PCT/IB2013/053050, submitted 17/04/2013, published 24/10/2013.

Patent applications filed in Angola, Australia, Brazil, China, India, Japan, Mozambique, South Africa, United States, and European Patent (Euro-PCT), November 2014.

Patent granted in India (07/08/2015), Mozambique (17/08/2015), South Africa (23/12/2015), Japan (2015), Australia (03/02/2017), USA (15/02/2017), China (20/11/2017), Europe (11/05/2018) and Hong-Kong (20/07/2018).
Prudêncio M, Fontinha D. Infected cell cultures, European Patent Office application EP 17 160 277.4, filed on 10/03/2017. PCT application number PCT/EP2018/055717 (08/03/2018).

Prudêncio M. Novel spiro-lactam compounds, process and uses thereof, Pub. No.: WO/2018/207165, International Application No.: PCT/IB2018/053357, International Filing Date: 14/05/2018, Publication Date: 15/11/2018.

Advanced Teaching

Prudêncio M. MSc Class. Vaccination against malaria - Development and clinical evaluation of a new vaccine. Masters in Clinical Microbiology and Emerging Infectious Diseases, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 7, 2020.

Prudêncio M, Mendes AM, Nunes-Cabaço H. MSc Class. Vaccination against malaria - Development and clinical evaluation of a new vaccine. Masters in Biochemistry/Masters in Molecular Genetics and Biomedicine/Masters in Bioorganic Chemistry, Faculdade de Ciências e Tecnologia, Universidade Nova Lisboa, Lisbon, Portugal, May 20, 2020.

Prudêncio M. MSc Class. Basic principles of writing a scientific article. Masters in Molecular Biology and Genetics, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, September 23-25, 2020.

Prudêncio M. MSc Class. Malaria - The quest for an effective vaccine. Masters in Biomedical Research, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 26, 2020.

Prudêncio M, Mendes AM, Nunes-Cabaço H. MSc Class. Malaria Vaccines. Integrated Masters in Medicine, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 24, 2020.

Prudêncio M. MSc Class. Animal models in malaria research. Masters in Evolution and Developmental Biology, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, December 4, 2020.

Science and Society

Prudêncio M. How do Vaccines Work and Can They Pave the Way to a Post-COVID-19 Era?. BNP Paribas Portugal Leadership E-Town Hall, Lisbon, Portugal, December 9, 2020.

Prudêncio M. Webinar: Sharing Information Together, "Vamos falar de vacinas" ("Let's talk about vaccines"), Lisbon, Portugal, April 29, 2020.

Miguel Remondes Lab

Major Interests/Objectives

Cognitive deficits present in Alzheimer's Disease, Anhedonia, Depression, and Schizophrenia, have been mapped to neuropathological changes in midline cortical structures, such as the

anterior cingulate cortex, necessary for appropriate decision-making, the retrosplenial cortex, critically involved in visual-spatial processing, and the hippocampal formation, critical for episodic memory and any mental function therein dependent. To understand such disorders, it is imperative that we identify the structures and mechanisms underlying the behaviors they affect. In our research group we model memory and therein behaviors in the rodent as the formation of episodic memories whose components drive goal-directed choices on a maze of variable complexity, while we dissect the neural circuits forming memories in the hippocampus and for bringing such mnemonic information to cingulate (CG) and retrosplenial (RSC) cortices. In parallel, we collaborate in human subject studies aimed at understanding decisions under higher cognitive loads such as conflicts. By dissecting neural mechanisms underlying memory and cognition, our research and its results can be leveraged to understand mental illness, and to develop mechanistically-targeted therapies.

Head of Laboratory

Armando Miguel Caseiro Pires Remondes, PhD, Principal Investigator at Instituto de Medicina Molecular João Lobo Antunes, Invited Auxiliary Professor at Faculdade de Medicina da Universidade de Lisboa

Team

Ana Inês Marques Morgado	PhD Student
Ana Sofia Carvalho Cruz	PhD Student
Bárbara Pinto Correia	PhD Student
Emanuel Ferreira Fernandes	PhD Student
Gonçalo Aires de Oliveira	Postdoctoral Researcher
Jorge Miguel Claro Cardoso	PhD Student
Marcelo Francisco Vieira Dias	PhD Student
Patrícia Morais Caldeira Rodrigues Bernardo	MSc Student
Sara Filipa Agostinho da Cruz	MSc Student
Joana Gomes Ribeiro	PhD Student

Laboratory Keyword/Research Areas

Cognitive Function and Dysfunction, Spatial-temporal Cognitive Mapping, Goal Directed Behavior and Decision-making, Electrophysiological Recording and Neural Manipulation of Defined Neural Circuits, Rodent Models of Human Behavior.

Major Scientific Achievements

Goal directed behaviours (GDB) require that a cognitive map is made available to medial mesocortical (MMC) regions, anterior cingulate cortex (CG) through retrosplenial cortex (RSC), responsible for decision-making, and dysfunctional in Autism spectrum disorder, and Schizophrenia. Besides reporting state-dependent communication between hippocampal formation (HIPPf) and CG, we have recently identified the synapses connecting the two structures, which we are currently manipulating, to assess their role in HIPPf-MMC communication during GDB. We have reported the anatomical and functional connectivity *in vitro* and *in vivo* between HIPP and MMC divisions in behaving animals.

To study time processing by HIPPf neurons we developed a behavioral task – Waiting to Trajectory Task (WTT) - in which rats are rewarding for waiting motionless for a specific self-generated time lapse. We are currently analysing the results of such neural/behavioural recording while rats process time lapses. Within this project, we have disturbed the activity in the HIPPf circuitry and found that this manipulation significantly impaired behavioural performance in the novel WTT and showing the necessity of information processed in the HIPP-EC axis for time processing, and time-lapse-dependent GDB (in revision).

Having struggled with the difficulties in accessing brain structures in the MMC, located underneath the large vessel – sagittal sinus, we have developed a surgical technique to remove the sagittal sinus, providing access to underlying structures within the brain's midline (in prep).

We have identified a sensory-mnemonic-decisional neural circuit we are currently monitoring and manipulating, in order to dissect neural mechanisms underlying cognition. Our results can be leveraged to understand the neural basis of cognitive dysfunction, and to develop mechanistically-targeted therapies.

Selected Publications

Ferreira-Fernandes E, Quintino C, Remondes M* (2019). A Gradient of Hippocampal Inputs to the Medial Mesocortex. Cell Reports 29(10):3266-3279. *(IF: 7.815, Citations: 2. Source: Web of Science).*

Remondes M*, Wilson M (2015). Slow-gamma rhythms coordinate cingulate cortical responses to hippocampal sharp-wave ripples during choice behavior. Cell Reports 13(7):1327-1335. *(IF: 7.870, Citations: 26. Source: Web of Science).*

Remondes M*, Wilson M (2013). Cingulate-hippocampus Coherence and Trajectory Coding in a Sequential Choice Task. Neuron 81(5):1277-89. *(IF: 15.982, Citations: 44. Source: Thomson Reuters).*

Wilson M*, Varela C, Remondes M* (2015). Phase organization of network computations. Current Opinion in Neurobiology 31:250-253. Review. *(IF: 6.373, Citations: 20. Source: Thomson Reuters).*

Remondes M, Schuman EM (2004). Role for a cortical input to hippocampal area CA1 in the consolidation of a long-term memory. Nature 431(709):699-703. *(IF: 32.182, Citations: 382. Source: Thomson Reuters).*

Remondes M, Schuman EM (2002). Direct Cortical Input Modulates Plasticity and Spiking in CA1 Pyramidal Neurons. Nature 416(6882):736-740. *(IF: 30.432, Citations: 217. Source: Thomson Reuters).*

Ongoing Research Projects

2018/2021: Coordenação hipocampo-cortical e mecanismos cognitivos: a formação e recuperação de memórias episódicas durante o comportamento decisional. Coordinator: Miguel Remondes. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/MED-NEU/29325/2017. Amount: € 239 421,20. Total Amount: € 239 421,20.

Invited Lectures and Seminars

Remondes M. Patient HM, Beyond Epilepsy onto the Mechanisms of Memory. NOVA Medical School PhD Program “Critical Skills in Research”, NOVA Medical School, Lisbon, Portugal, September 2020.

Remondes M. Seminar. Cortico-hippocampal neural circuits in Memory-driven Choice Behaviors. MIT-Portugal PhD Program in Bio-Engineering Neuroscience Course 2020, Center for Neuroscience and Cell Biology, Universidade de Coimbra, Coimbra, December 2020.

Remondes M. Seminar. Sensory integration in memory-dependent choice behaviors. FMUL PhD Program in Neuroscience, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, 2020.

Communications in International Conferences

Pinto Correia B, Remondes M. Functions of the HIPP projections to CG-RSC in cognitive conflict. 12th FENS Forum of Neuroscience, Virtual Forum, July 11-15, 2020.

Dias M, Ferreira R, Remondes M. Medial entorhinal cortex is necessary for the accurate estimation of elapsed time. 12th FENS Forum of Neuroscience, Virtual Forum, July 11-15, 2020.

Cruz AS, Remondes M. The involvement of cingulate cortex in memory-based choices. 12th FENS Forum of Neuroscience, Virtual Forum, July 11-15, 2020.

Internationalization

Lab members were participants at the 12th FENS Forum of Neuroscience 2020 held online.

Lab members have engaged in Summer schools abroad, and graduate students seek international scientists as thesis committee members.

The lab is part of the network "Neurologic and Psychiatric Disorders: from synapses to networks (SynaNet)", which includes labs from the United Kingdom, Finland, Italy and France.

Advanced Teaching

Remondes M. Patient HM, Beyond Epilepsy onto the Mechanisms of Memory. NOVA Medical School PhD Program “Critical Skills in Research”, NOVA Medical School, Lisbon, Portugal, September 2020.

Remondes M. Member. Doctoral Programme in Experimental Biology and Biomedicine, Center for Neuroscience and Cell Biology, Universidade de Coimbra, Coimbra, Portugal.

Remondes M. Member and Lecturer. MSc Programme Neurasmus ERASMUS Mundus Programme and MIT-Portugal PhD Programme in Bioengineering.

Remondes M. Member and Lecturer. iMM/FMUL PhD programme in Biomedicine – LisbonBioMed. Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Remondes M. Member and Lecturer. FMUL PhD Programme in Neuroscience – Lecture on Neuronal Circuits, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Remondes M. Lecture on Neuronal Circuits. NOVA Medical School PhD Program "Critical Skills in Research", NOVA Medical School, Lisbon, Portugal, 2020.

PhD Theses

Emanuel Ferreira-Fernandes, 02/07/2020, Cortico-hippocampal interactions as a neural substrate for the retrieval of contextual memories in choice behavior, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal. Supervisor: Miguel Remondes. Co-Supervisor: Luísa V. Lopes.

Nuno Morais Lab

Major Interests/Objectives

We have a long-term interest in the systems-level transcriptional regulation underlying mammalian cell specification, often perturbed in disease. We aim to understand how RNA-level

(transcription initiation, splicing, etc.) changes in (mostly) human tissues increase proneness to diseases, namely cancer, neurodegenerative disorders and other ageing-related pathologies. We thereby aim to identify molecular targets for functional exploration *in vitro* and *in vivo*. We also combine molecular and clinical information for the unveiling of novel candidate prognostic factors and therapeutic targets. Along the way, we develop some tools for assisting non-computational scientists in their analyses of transcriptomic data.

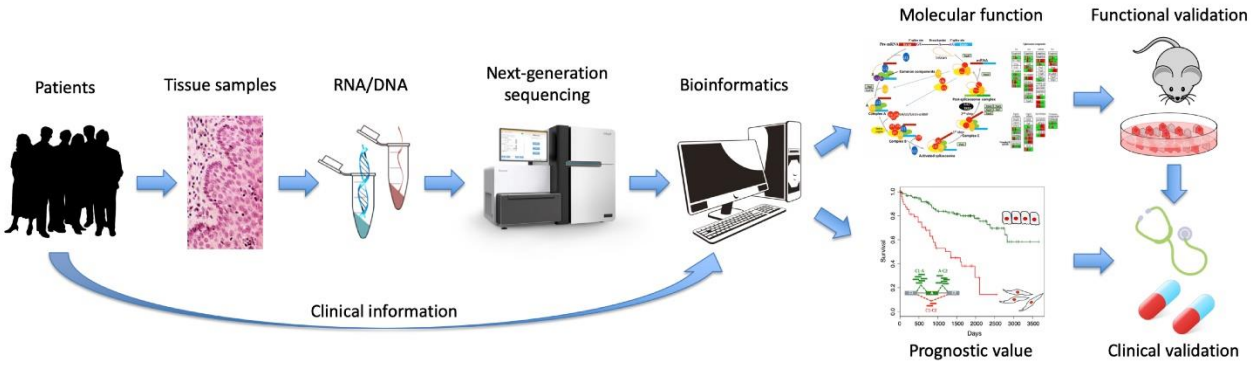
Head of Laboratory

Nuno Luís Barbosa Morais, PhD, Guest Associate Professor, Faculdade de Medicina da Universidade de Lisboa

Team

Ana Marta Fernandes Bica	Lab Technician
Ana Sofia Galrinho Borges	Trainee (Left January)
Arthur Louis François Schneider	Lab Technician (Left June)
Joel Amaque da Silva Indi	PhD Student
José Cândido de Oliveira Alves Ferrão	MSc Student (Started September)
Mariana Ascensão Ferreira	PhD Student
Marie Catherine Bordone	PhD Student (Left September)
Miguel Casanova Vieira Parente	MSc Student (Started September)
Nuno Daniel Saraiva Agostinho	PhD Student
Rita Alexandra Figueira Belo	PhD Student (Started March)

Graphical Abstract



Laboratory Keywords/Research Areas

Alternative Splicing, Transcriptional Regulation, Senescence, Immunosenescence, Transcriptomics, Oncobiology, Neurodegenerative Disorders, Computational Biology.

Major Scientific Achievements

Our book chapter on using *psichomics* to analyze alternative splicing in stem cell differentiation, was published in *Methods in Molecular Biology*.

Our collaboration with the lab of Rui Martinho (iBiMED Aveiro) on the impact of depleting the NineTeen Complex subunit *Salsa* in splicing efficiency during Drosophila oogenesis yielded a publication in the *RNA* journal (with Nuno Morais as co-corresponding author).

Our work on using digital cytometry to target molecular phenotypes in Alzheimer's and Parkinson's brains was published in *Frontiers in Neuroscience*. This article summarizes the main PhD research project of Marie Bordone, who submitted her thesis (to be defended in 2021).

Collaborations with the labs of Alexandra Santos (King's College London) and Luís Costa (iMM) also yielded publications in *Allergy* and *Oncotarget*, respectively.

Selected Publications

Bordone MC, Barbosa-Morais NL (2020). Unraveling Targetable Systemic and Cell-Type-Specific Molecular Phenotypes of Alzheimer's and Parkinson's Brains with Digital Cytometry. Frontiers in Neuroscience 14:607215. *(IF: 3.566, Citations: 0. Source: scite).*

Saraiva-Agostinho N, Barbosa-Morais NL (2020). Interactive Alternative Splicing Analysis of Human Stem Cells Using *psichomics*. In: Kidder B. (eds) Stem Cell Transcriptional Networks. Methods in Molecular Biology 2117:179-205. Humana, New York, NY. Chapter. *(IF: 10.710, Citations: 0. Source: scite).*

de Almeida BP, Vieira AF, Paredes J, Bettencourt-Dias M, Barbosa-Morais NL (2019). Pan-cancer association of a centrosome amplification gene expression signature with genomic alterations and clinical outcome. PLoS Computational Biology 15(3):e1006832. *(IF: 4.428, Citations: 7. Source: Web of Science).*

Saraiva-Agostinho N, Barbosa-Morais NL (2019). Psichomics: graphical application for alternative splicing quantification and analysis. Nucleic Acids Research 47(2):e7. *(IF: 11.501, Citations: 9. Source: Web of Science).*

Gallego-Paez LM, Bordone MC, Leote AC, Saraiva-Agostinho N, Ascensão-Ferreira M, Barbosa-Morais NL (2017). Alternative splicing: the pledge, the turn, and the prestige: The key role of alternative splicing in human biological systems. Human Genetics 136(9):1015-1042. *(IF: 5.743, Citations: 41. Source: Web of Science).*

Publications in Peer Reviewed Journals

Bordone MC, Barbosa-Morais NL (2020). Unraveling Targetable Systemic and Cell-Type-Specific Molecular Phenotypes of Alzheimer's and Parkinson's Brains with Digital Cytometry. Frontiers in Neuroscience 14:607215. *(IF: 3.566, Citations: 0. Source: scite).*

Rathore OS, Silva RD, Ascensão-Ferreira M, Matos R, Carvalho C, Marques B, Tiago MN, Prudêncio P, Andrade RP, Roignant JY, Barbosa-Morais NL, Martinho RG (2020). NineTeen Complex-subunit Salsa is required for efficient splicing of a subset of introns and dorsal-ventral patterning. RNA 26(12):1935-1956. *(IF: 3.630, Citations: 0. Source: scite).*

Gomes I, de Almeida BP, Dâmaso S, Mansinho A, Correia I, Henriques S, Cruz-Duarte R, Vilhais G, Félix P, Alves P, Corredeira P, Barbosa-Morais NL, Costa L, Casimiro S (2020). Expression of receptor activator of NFkB (RANK) drives stemness and resistance to therapy in ER+HER2- breast cancer. Oncotarget 11(19):1714-1728. *(IF: 3.710, Citations: 1. Source: scite).*

Santos AF, Barbosa-Morais NL, Hurlburt BK, Ramaswamy S, Hemmings O, Kwok M, O'Rourke C, Bahnson HT, Cheng H, James L, Gould HJ, Sutton BJ, Maleki SJ, Lack G (2020). IgE to epitopes of Ara h 2 enhance the diagnostic accuracy of Ara h 2-specific IgE. Allergy 75(9):2309-2318. *(IF: 8.706, Citations: 3. Source: Web of Science).*

Saraiva-Agostinho N, Barbosa-Morais NL (2020). Interactive Alternative Splicing Analysis of Human Stem Cells Using *psichomics*. In: Kidder B. (eds) Stem Cell Transcriptional Networks. Methods in Molecular Biology 2117:179-205. Humana, New York, NY. Chapter. *(IF: 10.710, Citations: 0. Source: scite).*

Ongoing Research Projects

2020/2022: Protocolo Limm. Coordinator: Nuno Morais. Funding Agency: Limm Therapeutics. Reference: Protocolo Limm.

2019/2022: Inovação de GWAS em cancro da mama através da integração de genómica funcional. Coordinator: Joana Xavier. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: Intergen. Amount: 500,00€. Total Amount: 236 221,43€.

2017/2021: GENOME Portugal. Coordinator: Nuno Morais. Funding Agency: Portugal 2020. Reference: PINFRA/22134/2016. Amount: 123 711,00€. Total Amount: 826 226,00€.

2015/2021: Transcriptomic landscapes of cancer: studying the transcriptional etiology of metastization and its implications on personalized therapeutics. Coordinator: Nuno Morais. Funding Agency: European Molecular Biology Organisation. Reference: EMBO IG NMorais. Amount: 250 000,00€. Total Amount: 250 000,00€.

Other Projects

2019/2022: RNA in disease — RiboMed. Coordinator: M. Carmo-Fonseca. Fundig Agency: European Commission. Reference: RiboMed - GA 857119. Amount: 424 750,00€. Total Amount: 799 750,00€.

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Barbosa-Morais N. What transcriptomic data tell us about disease. Data Science Portugal, TalkDesk Lisbon, Portugal, January 16, 2020.

Barbosa-Morais N. What transcriptomes tell us about ageing and associated diseases. Center of Biological Engineering, Universidade do Minho, Braga, Portugal, January 20, 2020.

Barbosa-Morais N. What transcriptomes tell us about diseases. iBiMED - Institute of Biomedicine, Universidade de Aveiro, Aveiro, Portugal, November 18, 2020.

Communications in International Conferences

Bica M, Serre K, Barbosa-Morais NL. Single-cell transcriptomics in unravelling the cellular diversity and molecular signature that govern anti-tumour functions of myeloid cells *in vivo*. EACR-AACR-ASPIC Basic and Translational Research Conference Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020. *(Poster Presentation)*

Ascensão-Ferreira M, Barbosa-Morais NL. Profiling the alternative splicing landscape of senescent cells. 25th Annual RNA Society Meeting - RNA 2020 Online, May 26-31, 2020. *(Poster Presentation)*

Internationalization

Our collaboration with Alexandra Santos (King's College London) yielded a publication in *Allergy*.

We carried on our collaborations with Jesus Gil (Imperial College London, England) on the role of alternative splicing in cell senescence and George Garinis (FORTH Crete, Greece) on the impact of TC-NER perturbations on splicing.

Nuno Morais was the main examiner of a PhD thesis defense at the Pompeu Fabra University in Barcelona (Spain).

Prizes, Honors and Awards

Bica M. PhD Research Scholarship, Fundação para a Ciência e a Tecnologia (FCT), Portugal. September 2020.

Industry Contract Research

Sponsored Research Agreement with Limm Therapeutics SA.

Advanced Teaching

Barbosa-Morais N. Lecture. Computational biology and what transcriptomes tell us about disease. LisbonBioMed PhD Program, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March 3, 2020.

Barbosa-Morais N. Lecture. Computational biology in the translation of disease 'omics'. Masters in Molecular Technologies in Health, Lisbon School of Health Technology, Portugal, April 23, 2020.

Barbosa-Morais N. Lecture. Computational biology in the translation of disease 'omics'. Masters in Biopharmaceutical Sciences and Integrated Masters in Pharmaceutical Sciences, Faculdade de Farmácia da Universidade de Lisboa, Lisbon, Portugal, April 24, 2020.

Barbosa-Morais NL. 20% of semestral course. Bioinformatics. Integrated Masters in Biomedical Engineering, Instituto Superior Técnico, Lisbon, Portugal, November/December, 2020.

Science and Society

Marta Bica gave an oral presentation on “Academic path in Bioinformatics and current career perspectives” at the Escola Secundária de Mem Martins Student Awareness Session on Career Guidance in Lisbon, Portugal, January 24, 2020.

Marie Bordone, Mariana Ferreira and Nuno Agostinho took part in the voluntary iMM COVID-19 Diagnostic Task Force to respond to the pandemic situation in Portugal, March-May, 2020.

Mariana Ferreira participated in the first event of the Soapbox Science initiative in Portugal (“A ciência é para ti”), a public outreach platform for promoting women and the science they do, Online Event, September 19, 2020.

Rita Belo, Marta Bica, and Nuno Barbosa co-founded a new research community at iMM, the "Bioinformatics Matters". Rita Belo and Marta Bica organized and hosted the first edition of the "iMM Computational Biology and Bioinformatics Day", iMM CBB Day, Online Events, October 21, 2020.

MSc Theses

Sara Rodrigues Mendes, 17/02/2020, Evaluating cortical transcriptomic differences between Alzheimer’s Disease PSEN-1 mutated mouse models and human patients, and their implications in drug development, Faculdade de Farmácia da Universidade de Lisboa. Supervisor: Nuno Barbosa Morais. Co-Supervisor: Elsa Rodrigues.

Nuno Santos Lab

Major Interests/Objectives

Biochemical and biophysical processes occurring in membranes of human cells, as well as of their viral, fungal and bacterial pathogens. Study of the two steps of the infection cycle of enveloped viruses (SARS-CoV-2, HIV-1, dengue, West Nile, Zika and pediatric respiratory viruses) that involve biomembranes – the entrance of the virus or its content into the target cell (including its inhibition) and the assembly of new virions. Study of the binding of fibrinogen to

erythrocytes as a determinant for cardiovascular risk. Pre-clinical evaluation of the membrane activity and mechanism of action of antimicrobial (AMP) and anticancer (ACP) peptides. Also on the Nanomedicine area, we are interested in the development of biosensor systems using innovative protein-ligand interactions (nanoparticles and amyloid-based biosensors).

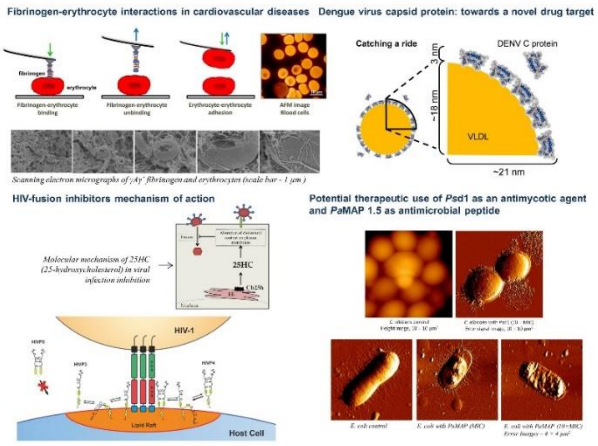
Head of Laboratory

Nuno Fernando Duarte Cordeiro Correia dos Santos, PhD and Habilitation, Associate Professor

Team

Ana de Souto Martins	PhD Student
Ana Luísa Regatão Tomás	Postdoctoral Researcher (Started October)
André Ribeiro de Oliveira	MSc Student (Started August)
Anna Reichel	Postdoctoral Researcher (Started November)
Catarina Andreia Baptista Matos	MSc Student (Started November)
Catarina Isabel de Sousa Lopes	PhD Student
Filomena Maria Dias Almeida Carvalho Arede	Staff Scientist
Guilherme Ribeiro da Silva	MSc Student (Started July)
Ítala Cristine Silva	PhD Student
Ivo Cristiano da Rocha Martins	Staff Scientist
Marcin Makowski	PhD Student
Marco André Manso Domingues	Senior Postdoctoral Researcher
Maria Constança Gomes Redinha Pais do Amaral	PhD Student
Maria Inês Pinto Coelho da Silva	MSc Student (Started July)
Maria João Martins Sarmento	Postdoctoral Researcher (Started June)
Maria Teresa Damásia Freitas Santos	Lab Technician
Nelly Marine Carreira da Silva	PhD Student
Patrícia Isabel Duarte Montês Carvalho	PhD Student
Patrícia Morgado da Silva	PhD Student
Raquel Ventura Rebordão Gouveia	Trainee (Started September)
Sónia Gonçalves Abreu	Staff Scientist

Graphical Abstract



Laboratory Keywords/Research Areas

Laboratory Keywords: Infection Cycle of Enveloped Virus (SARS-CoV-2, Dengue, Zika, West Nile, HIV), Atomic Force Microscopy (AFM), Peptide-based Therapies (antiviral, antimicrobial, and anticancer peptides), Biomarkers of Cardiovascular Diseases.

Research Areas: Clinical Biophysics and Biochemistry, Nanomedicine, Membrane Biophysics.

Major Scientific Achievements

In 2020, the results obtained for antimicrobial peptides (AMPs) deserve to be highlighted. The ever-growing spread of antimicrobial resistance among pathogens is a critical menace to public health. The Golden Age of antibiotic discovery peaked in the 1950s. Therefore, new strategies to combat antibiotic resistant microorganisms are required. Among the most promising current strategies is the use of membrane-active AMPs, which can display activity against a plethora of pathogens, including bacteria, fungi and parasites, being also able to display anti-cancer properties. The membrane activity and selectivity of two peptides with antibacterial and antifungal properties (EcDBS1R4 and Ctl2, respectively) have been extensively studied combining microbiology, biophysics and nanosciences methodologies, aiding to understand the mechanism of action of these peptides. Ctl2 is effective against the recalcitrant fungal pathogen *Candida albicans*, both planktonic and in biofilms. EcDBS1R4, on the other hand, is a synthetic peptide that kills *Escherichia coli* through membrane disruption. However, membrane permeabilization was ruled out, and alternative mechanistic hypotheses have been proposed to explain the apparently contra-intuitive killing mechanism of this peptide.

Selected Publications

Guedes AF, Carvalho FA, Malho I, Lousada N, Sargento L, Santos NC (2016). Atomic force microscopy as a tool to evaluate the risk of cardiovascular diseases in patients. Nature Nanotechnology 11(8):687-692. *(IF: 31.538, Citations: 35. Source: Clarivate Analytics)*.

Vigant F, Santos NC, Lee B (2015). Broad-spectrum antivirals against viral fusion. Nature Reviews Microbiology 13(7):426-437. *(IF: 34.209, Citations: 88. Source: Clarivate Analytics)*.

Faustino AF, Carvalho FA, Martins IC, Castanho MARB, Mohana-Borges R, Almeida FC, Da Poian AT, Santos NC (2014). Dengue virus capsid protein interacts specifically with very low-density lipoproteins. Nanomedicine (NBM) 10(1):247-255. *(IF: 5.182, Citations: 38. Source: Clarivate Analytics)*.

Hauser CA, Maurer-Stroh S, Martins IC (2014). Amyloid-based nanosensors and nanodevices. Chemical Society Reviews 43(15):5326-5345. *(IF: 40.433, Citations: 101. Source: Clarivate Analytics)*.

Carvalho FA, Connell S, Miltenberger-Miltenyi G, Pereira SV, Tavares A, Ariëns RAS, Santos NC (2010). Atomic force microscopy-based molecular recognition of a fibrinogen receptor on human erythrocytes. ACS Nano 4(8):4609-4620. *(IF: 14.588, Citations: 93. Source: Clarivate Analytics)*.

Publications in Peer Reviewed Journals

Martins IC, Santos NC (2020). Intrinsically disordered protein domains in flavivirus infection. Archives of Biochemistry and Biophysics 683:108298. Review. (*IF: 3.391, Citations: 2. Source: Clarivate Analytics*).

Maturana P, Gonçalves S, Martinez M, Espeche JC, Santos NC, Semorile L, Maffia PC, Hollmann A* (2020). Interactions of "*de novo*" designed peptides with bacterial membranes: implications in the antimicrobial activity. Biochimica et Biophysica Acta - Biomembranes 1862(11):183443. Article. (*IF: 3.790, Citations: 0*. *Source*: *Clarivate Analytics*).

Aguiar FLL, Santos NC, Cavalcante CSP, Andreu D*, Baptista GR*, Gonçalves S* (2020). Antibiofilm activity on *Candida albicans* and mechanism of action on biomembrane models of the antimicrobial peptide Ctn[15–34]. International Journal of Molecular Science 21(21):8339. Article. (*IF: 4.556, Citations: 0*. *Source*: *Clarivate Analytics*).

Makowski M, Felício MR, Fensterseifer ICM, Franco OL, Santos NC, Gonçalves S (2020). EcDBS1R4, an antimicrobial peptide effective against *Escherichia coli* with *in vitro* fusogenic ability. International Journal of Molecular Science 21(23):9104. Article. (*IF: 4.556, Citations: 0, Source: Clarivate Analytics*).

Figueira TN, Domingues MM, Illien F, Cadima-Couto I, Todorovski T, Andreu D, Sagan S, Castanho MARB, Walrant A, Veiga AS (2020). Enfuvirtide-Protoporphyrin IX Dual-Loaded Liposomes: In Vitro Evidence of Synergy against HIV-1 Entry into Cells. ACS Infectious Diseases 6(2):224-236. Article. *(IF: 4.614, Citations: 0. Source: Clarivate Analytics)*.

Sousa NA, Oliveira GAL, Oliveira AP, Lopes ALF, Sousa LKM, Araújo AR, Ramos-Jesus J, Plácido A, Amaral CP, Campelo YDM, Barbosa EA, Portugal CC, Socodato R, Lobo A, Relvas J, Bemquerer M, Eaton P, Leite JRSA, Medeiro JVR (2020). Novel Ocellatin Peptides Mitigate LPS-induced ROS Formation and Nf-kB activation in Microglia and Hippocampal Neurons. Scientific Reports 10(1): 2696. Article. (*IF: 3.998, Citations: 5. Source: Clarivate Analytics*).

Vasconcelos AG, Valim MO, Amorim AGN, Amaral CP, Almeida MP, Borges TKS, Socodato R, Portugal CC, Brand GD, Mattos JSC, Relvas J, Plácido A, Eaton P, Ramos DAR, Kückelhaus SAS, Leite José RSA (2020). Cytotoxic activity of poly-ε-caprolactone lipid-core nanocapsules loaded with lycopene-rich extract from red guava (Psidium guajava L.) on breast cancer cells. Food Research International 136:109548. Article. (*IF: 4.972, Citations: 0. Source: Clarivate Analytics*).

Silva NM, Santos NC, Martins IC (2020). Dengue and Zika Viruses: Epidemiological History, Potential Therapies, and Promising Vaccines. Tropical Medicine and Infectious Disease 5(4):150. Review. *(IF:--)*.

Ferreira S, Raimundo AF, Menezes R, Martins IC (2021). Islet amyloid polypeptide & amyloid beta peptide roles in Alzheimer's disease: two triggers, one disease. Neural Regeneration Research 16(6):1127-1130. Review. (*IF: 3.171, Citations: 0. Source: Clarivate Analytics)*.

Raimundo AF, Ferreira S, Martins IC, Menezes R (2020). Islet Amyloid Polypeptide: A Partner in Crime with Aβ in the Pathology of Alzheimer's Disease. Frontiers in Molecular Neurosciences 13:35. Review. (*IF: 4.057, Citations: 8. Source: Clarivate Analytics*).

Felício MR, Silveira GGOS, Oshiro KGN, Meneguetti BT, Franco OL, Santos NC, Gonçalves S (2020). Polyalanine peptide variations may have different mechanisms of action against multidrug-resistant bacterial pathogens. Journal of Antimicrobial Chemotherapy, in press. Article. (*IF: 5.439, Citations: 0. Source: Clarivate Analytics*).

Alves MMS, Araújo JMM, Martins IC, Pereiro AB, Archer M (2020). Insights into the interaction of Bovine Serum Albumin with Surface-Active Ionic Liquids in aqueous solution. Journal of Molecular Liquids, in press. Article. (*IF: 5.065, Citations: 0. Source: Clarivate Analytics).*

Book Chapters

Santos NC, Gonçalves S (2020). Preface to "Membrane–Peptide Interactions" in Membrane–Peptide Interactions. From Basics to Current Applications. NC Santos, S Gonçalves (eds.), MDPI, Basel, pp. ix-xii.

Books

Santos NC, Gonçalves S (2020). Membrane–Peptide Interactions. From Basics to Current Applications. MDPI, Basel (ISBN: 978-3-03943-022-2).

Ongoing Research Projects

2020/2021: UVtizer – Multifunctional sanitizer. Coordinator: Nuno Santos. Funding Agency: Portugal 2020. Reference: 15/SI/2020 (P2020) – UVTIZER. Amount: 82 195,00€. Total Amount: 250 000,00€.

2019/2023: SAFE-N-MEDTECH – Safety Testing in the life cycle of nanotechnology-enabled medical technologies for health. Coordinator: Pedro Silva. Funding Agency: European Commission. Reference: GA 814607 – SAFE-N-MEDTECH. Amount: 714 815,00€. Total Amount: 14 588 286,50€.

2018/2021: When the host cell is not so cosy anymore? A drop off in energy or an increase in toxicity? Coordinator: Filomena Carvalho. Funding Agency: Portugal 2020. Reference: PTDC/BIA-CEL/28456/2017. Amount: 47 064,00€. Total Amount: 232 799,88€.

2018/2021: iDNArT - Intelligent DNA nanostructures aimed at brain therapeutics. Coordinator: Nuno Santos. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/NAN-MAT/30898/2017. Amount: 7 812,00€. Total Amount: 239 894,05€.

2016/2020: Between Atom and Cell: Integrating Molecular Biophysics Approaches for Biology and Healthcare. Coordinator: Nuno Santos (National Responsible). Funding Agency: COST Project. Acronym: MOBIEU. Reference: OC-2015-1-19651. Total Amount: 520 000,00€.

Other Projects

2020/2022: INNO4COV-19 – Boosting Innovation for COVID-19 Diagnostic, Prevention and Surveillance. Coordinator: Pedro Silva. Funding Agency: European Commission. Reference: European Commission. Amount: 440 000,00€. Total Amount: 6 247 638,75€.

2017/2020: VIH_TRANFERSOME: Inibidor de fusão veiculado em Transfersomas para libertação transdérmica. Coordinator: Quirina Costa (FFUL). Funding Agency: Gilead Génese Project. Reference: PGG/006/2016. Amount: 2 200,00€. Total Amount: 23 000,00€.

Invited Lectures and Seminars

Santos NC. Cardiovascular risk assessment by AFM-based force spectroscopy. AFMBioMed Summer School, Marseille, France, July 20-22, 2020.

Santos NC. Oportunidades de cooperação Brasil-Portugal: um trajeto por 6 estados. XXIV Encontro de Iniciação Científica da UCDB, Campo Grande, Brazil, November 23-27, 2020.

Communications in International Conferences

Simões S, Ascenso A, Carvalheiro M, Carvalho F, Santos NC, Bento-Silva A, Duarte N, Bronze M, Santos Costa Q. Enfuvirtide-loaded deformable lipid vesicles for transdermal delivery. Spanish-Portuguese Conference on Controlled Drug Delivery, Santiago de Compostela, Spain, January 22-24, 2020. (*Poster Presentation*)

Carvalho M, Lopes C, Morais I, Medeiros M, Santos NC, Carvalho FA, Arez AP. Protective effect of red blood cell pyruvate kinase deficiency against malaria – is there a role for the host cell membrane? III International Conference NOVAhealth Chronic Disease and Infection: Infection, Cancer and Global Health, Portugal, Online Event, October 9, 2020. (*Poster Presentation*)

Pronto-Laborinho AC, Lopes CS, Conceição VC, Gromicho M, Santos NC, Carvalho M, Carvalho FA. Gamma' fibrinogen as a predictor of survival in Amyotrophic Lateral Sclerosis. 31st International Symposium on ALS/MND, December 9-11, 2020. (*E-Poster Presentation*)

Martins ASG, Santos SD, Domingues MM, Santos NC, Pêgo AP, Moreno PMD. Neuronal targeted nucleic-acid nanostructures aiming at neurotherapies. 11th World Biomaterials Congress, Glasgow, United Kingdom, December 11-15, 2020. (*Poster Presentation*)

Communications in National Conferences

Santos NC. Fibrinogen-erythrocyte interactions as a biomarker for the early detection of (cardio)vascular thrombotic events. Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 27, 2020. *(Oral Presentation)*.

Pronto-Laborinho AC, Lopes CS, Gromicho M, Santos NC, Carvalho F, De Carvalho M. Using AFM to study erythrocytes morphology and elasticity on amyotrophic lateral sclerosis. Congresso de Neurologia 2020 – "Da molécula à prática clínica", Portugal, Online Event, November 19-21, 2020. (*E-Poster Presentation*)

Pronto-Laborinho AC, Lopes CS, Conceição VC, Gromicho M, Santos NC, Carvalho M, Carvalho F. γ' fibrinogen as a Predictor of Survival in Amyotrophic Lateral Sclerosis. Congresso de Neurologia 2020 – "Da molécula à prática clínica", Portugal, Online Event, November 19-21, 2020. (*Oral Presentation*)

Organization of Conferences

Santos NC. Co-Organizer. VII Beyond Med, Lisbon, Portugal, November 10-13, 2020.

Internationalization

Collaborative publications and/or funded projects in 2020 with groups from Dom Bosco Catholic University (Campo Grande, Brazil), Catholic University of Brasília (Brazil), University of Brasília (Brazil), Federal University of Ceará (Brazil), Pompeu Fabra University (Barcelona, Spain), National University of Santiago del Estero (Argentina), CONICET (Buenos Aires, Argentina), and National University of Quilmes (Argentina). Contracted research in 2020 with companies from UK and Germany.

Industry Contract Research

On the context of the SARS-CoV-2/COVID-19 pandemic, in 2020 several contracts were established with companies, both from Portugal and from abroad, to quantify *in vitro*, in the iMM BSL-3 facility, the anti-SARS-CoV-2 activity of surface coatings, UV irradiation, pre-treated face masks and pre-treated carpets.

Government/Organization Contract Research

Contracted research in 2020 with companies from Portugal, UK and Germany.

Patents/Prototypes

Franco OL, Mandruzzato BTM, Cardoso MHS, Siqueira NMC, Santos NC, Migliolo L, Preza SLE, Carvalho CME, Rezende SB, Mortari MR, Amaral HO, Souza PHM, Lima HKR. "Peptídeos com atuação sobre o receptor hipotalâmico Y5 com atividade supressora do apetite." BR 10 2020 015866 0 Instituto Nacional da Propriedade Industrial (INPI, Brasil), Pedido Nacional de Invenção, Modelo de Utilidade, Certificado de Adição de Invenção e entrada na fase Nacional do PCT. 2020.

IC Martins, GM Guerra, PM Carvalho. Patent deposited at Portuguese Instituto Nacional de Propriedade Intelectual, Provisional Nr.: 20201000007119 - UK Intellectual Property Office, Reference number GB 2002343.8. 02/2020.

Advanced Teaching

Santos NC. PhD Program in Health Sciences, PhD Program in Experimental Biology and Biomedicine. Fibrinogen-erythrocyte interaction as a cardiovascular risk. Universidade de Coimbra, Coimbra, Portugal, April 2020.

Santos NC. Master's degree in Structural Biology. Atomic force microscopy. Instituto Superior Técnico da Universidade de Lisboa, Lisbon, Portugal, May 2020.

Santos, NC. Master's degree in Biomedical and Biophysical Engineering, Molecular interactions probed by AFM-based force spectroscopy, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, May 2020.

Santos NC. BPS Career Panel: Live Q&A for Graduate Students. Biophysical Society Virtual Graduate Student Breakfast, United States of America, Online, November 2020.

Science and Society

Santos NC. Presentation at Colégio Sagrado Coração de Maria, Lisbon, Portugal, March 3, 2020.

Domingues MM. Noite Europeia dos Investigadores, A scientist in the making. Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, Online Event, November 27, 2020.

Carvalho P. Mentor at the Social Ideation Bootcamp promoted by the Social Equity Initiative and the ''la Caixa'' Foundation, 2020.

Carvalho P. Team and skill mentor, member of the jury at the #EUvsVirus Hackathon + Matchathon + EIC COVID Platform, organized by the European Commission, 2020.

Carvalho P. Support and Mentorship of the Applied Social Entrepreneurship students (Nova SBE, Master's in Management 19/20).

MSc Theses

Diogo José Carvalho Vaz Pinto, Is nanothrombolysis the future? A comprehensive view of Acute Ischemic Stroke: Haemostasis, Thrombolytics and a new approach through nanomedicine, Mestrado Integrado em Medicina (MIM), Faculdade de Medicina da Universidade de Lisboa. Supervisor: Marco M. Domingues.

Regina Meneses Gonçalves, O uso de peptídeos antimicrobianos sintéticos no controle de bactérias relacionadas à mastite bovina, Universidade Católica Dom Bosco, Campo Grande, Mato Grande do Sul, Brazil. Supervisor: Nuno C. Santos.

Jéssica Inês Vidal Pinheiro, Avaliação hemorreológica e nutricional em atletas femininas de alta competição, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Nuno C. Santos.

PhD Theses

Beatriz Meneguetti, 17/04/2020, Desenho racional de peptídeos análogos ao neuropeptídeo Y para o tratamento da obesidade, Universidade Católica Dom Bosco, Campo Grande, Mato Grande do Sul, Brazil. Supervisor: Octávio L. Franco. Co-Supervisor: Nuno C. Santos.

Mário Felício, 09/10/2020, Design and mechanistic characterization of novel antimicrobial and anticancer peptides, Faculdade de Medicina da Universidade de Lisboa. Supervisor: Sónia Gonçalves. Co-Supervisor: Nuno C. Santos.

Paulo Filipe Lab

Major Interests/Objectives

1. To understand the host immune responses against Non-Melanoma Skin Cancers (NMSCs), namely Basal Cell carcinomas and Squamous Cell carcinomas. Also, how host innate immune cells (macrophages) modulate, and respond to, the tumor microenvironment to promote tumor growth and angiogenesis.

2. To understand how another innate immune cell – the neutrophil – is involved in the pathogenesis of psoriasis namely through participation in the IL-17 and IL-23-dependent pathways. Also, in psoriasis we are currently testing whether complement Factor H, a cell-protective factor during activation of immune responses, may serve as a biomarker of therapeutic response and disease recurrence.

3. To implement methodologies of cell cycle analysis that could be applied to human skin diseases associated with cellular hyperproliferation, namely psoriasis and skin cancers. These methods may provide useful readouts of the efficacy of targeted therapies.

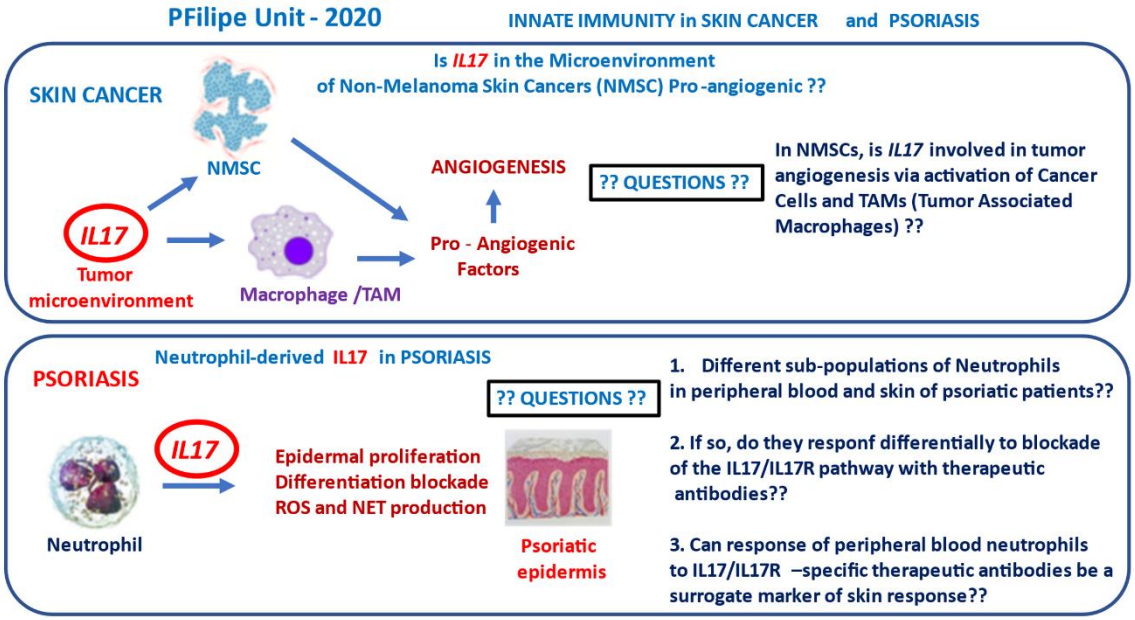
Head of Laboratory

Paulo Manuel Leal Filipe, MD, PhD, Associate Professor of Dermatology

Team

Ana Daniela Casimiro Cunha	PhD Student
Daniela Maria Teixeira Leal da Silva	Lab Technician
João António Augusto Ferreira	Staff Scientist
João Borges da Costa	Clinical Researcher
João Nuno Maia Rodrigues da Silva	Clinical Researcher
Luís Miguel dos Santos Reis Soares de Almeida	Clinical Researcher
Marco António Assunção das Neves	Lab Technician
Maria Clara Gomes da Fonseca Pedro Bicho	Clinical Researcher
Miguel Duarte Botas Alpalhão	Trainee
Rita de Cassia Anaya Gutierrez	MSc Student

Graphical Abstract



Laboratory Keywords/Research Areas

Psoriasis, NMSC (Non-Melanoma Skin Cancer), Inflammation, Cell Cycle, Phototoxicity.

Major Scientific Achievements

1. We have characterized the inflammatory infiltrate of two types of high incidence skin cancers namely Basal Cell Carcinomas (BCCs) and Squamous Cell Carcinomas (SCCs). In these cancers, we have found clear evidence for a predominant Th1-mediated immune response. Moreover, inflammatory infiltrates of BCCs and SCCs are enriched in regulatory T cells (Tregs) and in IL-17-producing cells, and feature lower levels of γδ T cells relative to normal control skin. These data are consistent with BCCs and SCCs eliciting a similar host immune response.

2. We have developed an innovative methodology that allows, through single imaging (one shot), the assessment of both the cell cycle stage at which non-synchronous cells were exposed to a specific stimulus (e.g., genotoxic drug) and the cell cycle stage upon cell collection. This is part of a series of technological developments aiming at improving analysis of the cell cycle in hyperproliferative skin conditions, namely psoriasis and skin cancers.

Selected Publications

Queirós C, Filipe P, Soares-Almeida L (2020). Cutaneous Metastases from Solid Neoplasm in the 21st Century: A Retrospective Study from a Portuguese Tertiary Care Centre. Journal of the European Academy of Dermatology and Venereology 34(6):1218-1224. *(IF: 5.248, Citations: 3. Source: Thomson Reuters).*

Morlière P, Silva AMS, Seixas RSGR, Boscá F, Mazière J-C, Ferreira J, Santus R, Filipe P (2018). Photosensitisation by voriconazole-N-oxide results from a sequence of solvent and pH-dependent photochemical and thermal reactions. Journal of Photochemistry and Photobiology B-Biology 187:1-9. (*IF: 3.165, Citations: 3. Source: Thomson Reuters*).

Pereira PD, Serra-Caetano A, Cabrita M, Bekman E, Braga J, Rino J, Santus R, Filipe PL, Sousa AE, Ferreira JA (2017). Quantification of cell cycle kinetics by EdU (5-ethynyl-2?-deoxyuridine)-coupled-fluorescence-intensity analysis. Oncotarget 8:40514-40532. (*IF: 5.168, Citations: 19. Source: Thomson Reuters*).

Teixeira A, Morlière P, Ferreira J, Conte MA, Galmiche A, Mazière JC, Santus R, Filipe P (2016). Interplay Between Membrane Lipid Peroxidation and Photoproduct Formation in the Ultraviolet A-Induced Phototoxicity of Vemurafenib in Skin Keratinocytes. Toxicological Sciences 154:289-295. *(IF: 4.081, Citations: 4. Source: Thomson Reuters).*

Morlière P, Hug GL, Patterson LK, Mazière JC, Ausseil J, Dupas JL, Ducroix JP, Santus R, Filipe P (2014). Chemistry of free radicals produced by oxidation of endogenous aminoketones. A study of 5 aminolevulinic acid and aminoacetone by fast kinetics spectroscopy. Biochimica et Biophysica Acta 1840(10):3190-7. (*IF: 5.12, Citations: 1. Source: Thomson Reuters*).

Pinheiro T, Silva R, Fleming R, Gonçalves A, Barreiros MA, Silva JN, Morlière P, Santus R, Filipe P (2014). Distribution and quantitation of skin iron in primary haemochromatosis: correlation with total body iron stores in patients undergoing phlebotomy. Acta Dermo-Venereológica 94(1):14-9. (*IF: 3.531, Citations: 7. Source: Thomson Reuters*).

Publications in Peer Reviewed Journals

Pimenta R, Soares De Almeida L, Arzberger E, Ferreira J, Leal Filipe P, Bastos PM, Oliveira AL. (2020). Reflectance confocal microscopy for the diagnosis of skin infections and infestations. Dermatology Online Journal 26(3):13030-41. (*IF: 0.52; Citations: 2. Thomson Reuters*).

Alpalhão M, Filipe P (2020). SARS-CoV-2 pandemic and Vitamin D deficiency-A double trouble. Photodermatololgy Photoimmunology & Photomedicine 36(5):412-413. *(IF: 2.387, Citations: 2. Source: Thomson Reuters).*

Alpalhão M, Ferreira JA, Filipe P (2020). Persistent SARS-CoV-2 infection and the risk for cancer. Medical Hypotheses 143:109882-83. *(IF: 1.322, Citations: 7. Source: Thomson Reuters).*

Alpalhão M, Antunes J, Ferreira JA, Soares-Almeida L, Filipe P (2020). Herpes simplex infection mimicking classical pyoderma gangrenosum. Australasian Journal of Dermatology 61(2):183-184. *(IF: 1.789, Citations: 1. Source: Thomson Reuters).*

Alpalhão M, Filipe P (2020). The Impacts of Isolation Measures against SARS-CoV-2 Infection on Sexual Health. AIDS and Behaviour 24(8):2258-2259. *(IF: 3.312, Citations: 18. Source: Thomson Reuters).*

Nascimento C, Urbano AC, Gameiro A, Ferreira J, Correia J, Ferreira F (2020). Serum PD-1/PD-L1 Levels, Tumor Expression and PD-L1 Somatic Mutations in HER2-Positive and Triple Negative Normal-Like Feline Mammary Carcinoma Subtypes. Cancers 12(6):1386-401. *(IF: 6.126, Citations: 2. Source: Thomson Reuters).*

Alpalhão M, Antunes J, Soares-Almeida L, Correia TE, Filipe P (2020). Fixed drug eruption due to norfloxacin with cross-reactivity to ciprofloxacin: A case report. Contact Dermatitis 83(2):135-137. *(IF: 2.460, Citations: 0. Source: Thomson Reuters).*

Mendes R, Roda Â, Soares de Almeida L (2020). SQuiz your knowledge: Asymptomatic plaques on the face. European Journal of Dermatology 30(2):214-215. *(IF: 2.782, Citations: 0. Source: Thomson Reuters).*

Torres T, Tavares Bello R, Paiva Lopes MJ, Menezes Brandão F, Ferreira A, Ferreira P, Varela P, Sousa Basto A, Pereira M, Selores M, Marques Pinto G, Pinto Soares A, Filipe P (2020). Portuguese recommendations for the treatment of psoriasis with biologic therapy. European Journal of Dermatology 30(6):645-654. *(IF: 2.782, Citations: 0. Source: Thomson Reuters).*

Queirós CS, Uva L, Soares de Almeida L, Filipe P (2020). Granulomatous Skin Diseases in a Tertiary Care Portuguese Hospital: A 10-Year Retrospective Study. American Jounal of Dermatopathology 42(3):157-164. *(IF: 1.027, Citations: 1. Source: Thomson Reuters).*

Queirós C, Filipe P, Soares de Almeida L (2020). Cutaneous metastases from solid neoplasms in the 21st century: a retrospective study from a Portuguese tertiary care center. Journal of the European Academy of Dermatology and Venereology 34(6):1218-1224. *(IF: 5.248, Citations: 3. Source: Thomson Reuters).*

Queirós CS, Alexandre MI, Garrido PM, Correia TE, Filipe P (2020). Allergic contact dermatitis to IBOA in FreeStyle Libre: Experience from a tertiary care Portuguese hospital. Contact Dermatitis. 83(2):154-157. *(IF: 2.460, Citations: 0. Source: Thomson Reuters).*

Other International Publications

Pimenta R, Soares De Almeida L, Filipe P, Oliveira A (2020). A 12-year-old boy with past history of acral blisters. Pediatric Dermatology 37(5): e73-e74. *(IF: 1.164, Citations: 0. Source: Thomson Reuters).*

Alpalhão M, Filipe P (2020). Skin reaction patterns as a warning sign for SARS-CoV-2. European Journal of Pediatric Dermatology 30(2):90. *(IF: 0.13, Citations: 0. Source: Thomson Reuters).*

Pimenta R, Oliveira A, Ferreira Gomes M, Kutzner H, Soares de Almeida L (2020). Novel insights in Erdheim-Chester disease using in vivo reflectance confocal microscopy. JAAD Case Reports 6(12):1194-1195. *(IF: 1.07, Citations: 0. Source: Thomson Reuters).*

Alpalhão M, Filipe P (2020). The show must go on. The impacts of SARS-CoV-2 pandemic on cutaneous allergology and patch testing. European Annals of Allergy and Clinical Immunology 52(6):280-281. *(IF: 1.13, Citations: 0. Source: Thomson Reuters).*

Alpalhão M, Filipe P (2020). Immunomodulators and immunosuppressants in the era of SARS-CoV-2 - could laboratory tests be the missing link? Journal of Dermatological Treatment 31(5):439-440. *(IF: 1.669, Citations: 5. Source: Thomson Reuters).*

Garrido P, Queirós C, Borges-Costa J, Soares-Almeida L, Filipe P (2020). Acquired perforating dermatosis: clinicopathologic study of a 10-year period at a tertiary teaching hospital. International Journal of Dermatology 59(4):445-450. *(IF: 1.794, Citations: 0. Source: Thomson Reuters).*

Other National Publications

Pimenta R, Fernandes S, Noguera-Morel L, Filipe P, Oliveira A (2020). Dermoscopy in Pediatric Dermatology – Part II: Infectious and Inflammatory Skin Lesions. Journal of the Portuguese Society of Dermatology and Venereology 78(3):197-208.

Bouceiro-Mendes R, Mendonça-Sanches M, Alpalhão M, Filipe P, Maia Silva JN (2020). The Bilobed Flap as an Option for Large Neck Defects. Journal of the Portuguese Society of Dermatology and Venereology 78(2):167-169.

Ongoing Research Projects

2020/2023: Apoio Janssen. Coordinator: Paulo Filipe. Funding Agency: Janssen - Cilag Farmacêutica, Lda. Reference: Acordo Janssen. Amount: 67 928,40€. Total Amount: 67 928,40€.

2019/2022: Study of changes in human skin microbiome induced by phototheraply treament in AD. Coordinator: Paulo Filipe. Funding Agency: Sanofi. Reference: Microbiome in Atopic Dermatitis. Amount: 18 171,65€. Total Amount: 18 171,65€.

2019/2021: The IL-23/IL-17 axis and angiogenesis in non-melanona skin cancer. Coordinator: Daniela Cunha. Funding Agency: Almirall, S.A. Reference: Almirall. Amount: 88 000,00€. Total Amount: 88 000,00€.

2018/2021: Apoio Novartis. Coordinator: Paulo Filipe. Funding Agency: Novartis Consumer Health SA. Reference: Apoio Novartis. Amount: 5 000,00€. Total Amount: 5 000,00€.

2017/2021: Vascular patterns in non-melanoma skin cancer assessed by reflectance confocal microscopy and 3D imaging. Coordinator: Paulo Filipe. Funding Agency: Sociedade Portuguesa de Dermatologia e Vernerologia and Several Laboratories. Reference: Angiogenesis PFilipe. Amount: 19 850,00€. Total Amount: 19 850,00€.

2016/2021: Th9-IL9R axis: a role in tissue memory in plaque-type psoriasis? Coordinator: Paulo Filipe. Funding Agency: Novartis. Reference: Novartis PFilipe. Amount: 30 400,00€. Total Amount: 30 400,00€.

Other Projects

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

Filipe P. Cutaneous manifestations of Diabetes mellitus as markers of metabolic control. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29, 2020.
Alpalhão M. Higher efficacy and faster response per body region to psoriasis treatment with secukinumab compared to ustekinumab – A pooled post-hoc analysis of CLEAR and CLARITY studies. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29, 2020.

Communications in International Conferences

Bouceiro- Mendes R, Alpalhão M, Soares-de-Almeida L, Filipe P. Generalized Granuloma Annulare treated with Narrowband UVB. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Bouceiro-Mendes R, Garrido P, Soares-de-Alemeida L, Filipe P, Correia T. Lichenoid drug reaction to angiotensin-converting-enzyme inhibitors confirmed by patch test. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Bouceiro-Mendes R, Pina A, Sanches M, Filipe P. Livedoid vasculopathy associated with plasminogen activator inhibitor-1 promoter polymorphisms. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Bouceiro-Mendes R, Sanches M, Soares-de-Almeida L. Solitary Sclerotic Fibroma. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Bouceiro-Mendes R, Araújo M, Lito L, Soares-de-Almeida L, Filipe P. Erythema nodosum leprosum with necrotic ulcers. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Correia C, Fernandes S, Soares-de-Almeida L, Filipe P. The importance of histopathology in the diagnosis of skin metastases - a case of chondrosarcoma of the distal phalanx. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Alpalhão M, Antunes J, Filipe P. Pyomyositis successfully treated with antibiotics only - a case report. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Pimenta R, Oliveira AL, Soares De Almeida L, Filipe P. Circumscribed palmoplantar hypokeratosis: A case report. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Pimenta R, Soares De Almeida L, Ferreira J, Filipe P. Disseminated *tinea incognito* mimicking *iga pemphigus*. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Pimenta R, Ortins Pina A, Kieselová K, Aguado M, Espinosa P, Vasconcelos JP, Soares De Almeida L. Scabies: A histopathological review of 23 cases. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Pimenta R, Marques R, Cordeiro I, Filipe P, Fonseca J. Inflammatory myopathies with cutaneous involvement: A multidisciplinary approach. 29th Virtual Congress of the European Academy of Dermatology and Venereology, October 29-31, 2020. (*Poster Presentation*)

Communications in National Conferences

Pimenta R, Roda Â, Correia T. Dermatite de contato profissional grave em médico dentista. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Roda Â, Oliveira A. O papel da dermatoscopia na diferenciação entre carcinoma basocelular e outros tumores cutâneos não pigmentados. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Alpalhão M, Antunes J, Soares-Almeida L, Filipe P. Penfigóide gestacional: a propósito de um caso clínico. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Correia C, Sanches M, Fernandes S, Soares-de-Almeida L, Ferreira J, Filipe P. Fusarium solani var keratoplasticum: uma causa rara de eumicetoma. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Correia C, Mendes R, Fernandes S, Kutzner H, Soares-de-Almeida L, Filipe P. Aspergillus ustus: uma causa rara de aspergilose invasiva com afeção cutânea. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Antunes-Duarte S, Correia C, Fraga A, Soares-de-Almeida L, Filipe P. Schwannoma do pavilhão auricular. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Bouceiro-Mendes R, Correia C, Silva-Martins A, Soares-de-Almeida L. Primary Cutaneous Follicle Center Lymphoma treated with intravenous Rituximab. 1º Congresso Virtual de Dermatologia e Venereologia, Sociedade Portuguesa de Dermatologia e Venereologia (SPDV), November 21-22, 2020.

Organization of Conferences

Filipe P. IV Jornadas de Dermatologia do Centro Hospitalar Universitário Lisboa Norte (CHULN), Hospital Santa Maria, Lisbon, Portugal, February 13-14, 2020.

Internationalization

The group maintains an active collaboration in the area of photobiology with Professors René Santus, Patrice Morlière and J-C Mazière, INSERM, Amiens, France, which has resulted in several collaborative research articles in reputed Journals in the area. Also, there is an ongoing collaboration with Professor Heinz Kutzner, Institute of Dermatopathology, Friedrichshafen, Germany in the area of skin cancer.

Industry Contract Research

Project Title: The IL-23/IL-17 axis and angiogenesis in non-melanoma skin cancer. Funding: Almirall, Barcelona. Budget: 67,000 Euro (PI: Daniela Cunha).

Project title: Biomarkers in Plaque-type psoriasis. Funding: Janssen. Budget: 112,000 Euro (PI: Miguel Alpalhão).

Advanced Teaching

Correia C. Lecture. Acne. IV Jornadas de Dermatologia e Venereologia do Centro Hospitalar Universitário Lisboa-Norte (CHULN), Lisbon, Portugal, February 13, 2020.

Alpalhão M. Lecture. Sífilis. IV Jornadas de Dermatologia e Venereologia do Centro Hospitalar Universitário Lisboa-Norte (CHULN), Lisbon, Portugal, February 13, 2020.

Alpalhão M. Lecture. HPV e molusco contagioso. IV Jornadas de Dermatologia e Venereologia do Centro Hospitalar Universitário Lisboa-Norte (CHULN), Lisbon, Portugal, February 13, 2020.

Pedro Simas Lab

Major Interests/Objectives

We utilize murid herpesvirus 4, which causes persistent infection in B-lymphocytes in laboratory mice, as a model to study human gammaherpesvirus pathogenesis, namely Kaposi's sarcoma associated herpesvirus (KSHV). KSHV is the etiologic agent of KS and primary effusion lymphoma. KSHV infection of tumor cells is primarily latent and KSHV drives cells to proliferate. KSHV persists in latently infected tumor cells as an extrachromosomal, multi-copy episome (plasmid). KSHV latency-associated nuclear antigen (kLANA) mediates KSHV episome persistence, thus tumor cell viability. Our laboratory is focused on LANA molecular functions with the goal to inhibit its function and therefore eradicating virus infection and cure associated cancers.

Head of Laboratory

João Pedro Monteiro e Louro Machado de Simas, PhD

Team

Ana Cláudia Rodrigues Fonseca	Postdoctoral Researcher (Started October)
Andreia Filipa Bonecas Mósca	Postdoctoral Researcher
Beatriz Gonçalves Arede	BSc Student
Catarina Neves Costa	PhD Student
Filipa Prata Silva	MSc Student (Started September)
Maria Beatriz Dias Salgado Lotra	Trainee (Started September)
Marta Pires de Miranda	Senior Postdoctoral Researcher
Ricardo João Lopes de Oliveira	MSc Student (Started September)

Pedro Sousa-Víctor Lab

Major Interests/Objectives

We are interested in regenerative medicine as a solution to the general decline in physiological integrity and vulnerability to disease that accompanies the aging process. Our goal is to understand the mechanisms of stem cell ageing and develop stem cell-based interventions to rejuvenate aged organs. Currently, we are using muscle aging as a model system to explore and modulate the repair response of old organisms. Our approach involves the integration of the knowledge of mechanisms that drive stem cell loss of function with a better understanding of the immune-derived signals during regeneration, with the ultimate goal of devising combinatorial approaches for improving the success stem-cell based therapies applied to sarcopenia. The Sousa-Victor lab is part of the Aging & Tissue Repair joint lab, running two independent, complementary and cooperative research programs focused on the biology of stem cell aging and the age-associated changes in the immune environment.

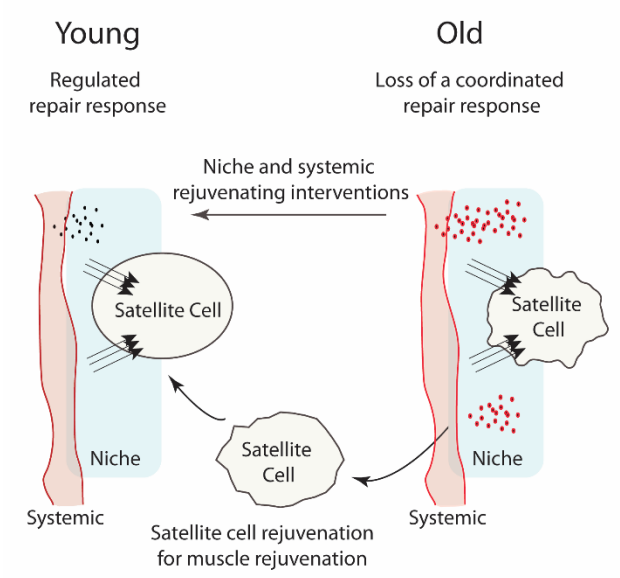
Head of Laboratory

Pedro Sousa-Victor, PhD

Team

Inês Curado Batista Antunes	Lab Manager
Neuza Sofia Simões de Sousa	MSc Student (Started September)

Graphical Abstract



Laboratory Keywords/Research Areas

Stem Cell, Regeneration, Muscle, Ageing, Sarcopenia.

Major Scientific Achievements

In 2020 we developed a project aimed at understanding the role of MANF signaling in the regulation of muscle repair response after damage. We used three different genetic models of MANF deficiency to analyze inflammatory phenotypes and regenerative efficiency in the absence of MANF. We found that loss of MANF in macrophages leads to an inflammatory crisis, delaying the transition to the anti-inflammatory phase of muscle repair and compromising the formation of new muscle fibers. In parallel, we analyzed MANF expression during muscle regeneration in young and old animals and found that MANF is transiently induced following muscle injury and that this response is blunted in aged animals. We are now exploring what are the consequences of this dysregulation for muscle stem cell activity and maintenance and will test whether MANF can improve muscle repair in old organisms when combined with stem cell transplants.

Selected Publications

Munoz-Canoves P**, Neves J, Sousa-Victor P** (2020). Understanding muscle regenerative decline with aging: new approaches to bring back youthfulness to aged stem cells. FEBS Journal 287(3):406416. Review. *(IF: 4.392, Citations: 5. Source: Google Scholar).*

Neves J**, Sousa-Victor P** (2020). Regulation of inflammation as an anti-aging intervention. FEBS Journal 287(2020):43–52. Perspective. *(IF: 4.392, Citations: 7. Source: Google Scholar).*

Sousa-Victor P*, Neves J*, Cedron-Craft W, Ventura PB, Liao CY, Riley RR, Soife I, van Bruggen N, Kolumam GA, Villeda SA, Lamba DA, Jasper H (2019). MANF regulates metabolic and immune homeostasis in ageing and protects against liver damage. Nature Metabolism 1(2):276–290. *(IF:--, Citations: 22. Source: Google Scholar).*

Sousa-Victor P, Ayyaz A, Hayashi R, Qi Y, Madden DT, Lunyak VV, Jasper H (2017). Piwi Is Required to Limit Exhaustion of Aging Somatic Stem Cells. Cell Reports 20(11):2527-2537. *(IF: 8.109, Citations: 39. Source: Google Scholar).*

Neves J*, Sousa-Victor P*, Jasper H (2017). Rejuvenating Strategies for Stem Cell-Based Therapies in Aging. Cell Stem Cell 20(2):161-175. Review. *(IF: 20.860, Citations: 82. Source: Google Scholar).*

Sousa-Victor P, Gutarra S, Garcia-Prat L, Rodriguez-Ubreva J, Ortet L, Ruiz-Bonilla V, Jardi M, Ballestar E, Gonzalez S, Serrano AL, Perdiguero E, Munoz-Canoves P (2014). Geriatric muscle stem cells switch reversible quiescence into senescence. Nature 506(7488):316-321. *(IF: 42.778, Citations: 587. Source: Google Scholar).*

*equal contribution
**Corresponding author

Publications in Peer Reviewed Journals

Sousa-Victor P**, Neves J**, Muñoz-Cánoves P** (2020). Muscle stem cell aging: identifying ways to induce tissue rejuvenation. Mechanisms of Ageing and Development 128:111246. *(IF: 3.390, Citations: 0. Source: Google Scholar).*

Segalés J, Perdiguero E, Serrano AL, Sousa-Victor P, Ortet L, Jardí M, Budanov AV, Garcia-Prat L, Sandri M, Thomson DM, Karin M, Lee JH, Muñoz-Cánoves P (2020). Sestrin prevents atrophy of disused and aging muscles by integrating anabolic and catabolic signals. Nature Communications 11(1):1-13. *(IF: 12.121, Citations: 20. Source: Google Scholar).*

Munoz-Canoves P**, Neves J, Sousa-Victor P** (2020). Understanding muscle regenerative decline with aging: new approaches to bring back youthfulness to aged stem cells. The FEBS Journal 287(1):43-52. Review. *(IF: 4.392, Citations: 5. Source: Google Scholar).*

Neves J**, Sousa-Victor P** (2020). Regulation of inflammation as an anti-aging intervention. The FEBS Journal 287(3):406-416. Perspective. *(IF: 4.392, Citations: 7. Source: Google Scholar).*

*equal contribution
**Corresponding author

Ongoing Research Projects

2020/2022: EMBO Young Investigator Network. Coordinator: Pedro Sousa-Víctor. Funding Agency: European Molecular Biology Organization. Reference: EMBO Young Investigator Network. Amount: 150 000,00€. Total Amount: 150 000,00€.

2020/2021: MANF Role in Bone Marrow Hematopoiesis. Coordinator: Pedro Sousa-Víctor and Joana Neves. Funding Agency: Genentech, Inc. Reference: MANF ROLE IN BONE MARROW HEMATOPOIESIS. Amount: 42 200,00€. Total Amount: 42 200,00€.

2019/2022: New mechanisms driving stem cell aging. Coordinator: Pedro Sousa-Víctor. Funding Agency: "la Caixa" Foundation. Reference: LA CAIXA - JUNIOR LEADER FELLOWSHIPS PROGRAMME. Amount: 297 900,00€. Total Amount: 297 900,00€.

Invited Lectures and Seminars

Sousa-Victor P, Neves J. The role of MANF in aging and tissue repair. HiLIFE Viikki Seminar, University of Helsinki, Helsinki, Finland, October 26, 2020.

Industry Contract Research

Sponsored research contract between Sousa-Victor&Neves Labs at iMM and Genentech (South San Francisco, CA, USA). The sponsored research is aimed at understanding the role of MANF in hematopoiesis.

Advanced Teaching

Sousa-Victor P. Rejuvenating Strategies for Stem Cell-Based Therapies in Aging. Lecture within the course Biologia e Tecnologia de Células Estaminais, Master in Biologia Evolutiva e do Desenvolvimento, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, May 14, 2020.

Science and Society

Interviews to P Sousa-Victor were published in Jornal expresso (article “Jovens para sempre”) and Jornal Observador (article “E se pudermos ter a forca muscular que perdemos com a idade?”). P Sousa victor was interviewed on Antena 1 over the award of the EMBO Installation grant.

MSc Theses

Audrey Kahn, 23/07/2020, The role of MANF in macrophage function during regeneration, International Master: From fundamental molecular bioscience to biotherapies – Sorbonne Université. Supervisor: Joana Neves. Co-Supervisor: Pedro Sousa-Victor.

Sérgio de Almeida Lab

Major Interests/Objectives

Our research focuses on the mechanisms that regulate chromatin dynamics during transcription and DNA damage repair and how they coordinate to safeguard the genome integrity. Our general aims are twofold: first, we aim at investigating the epigenetic regulation of transcription; in addition, we study the molecular mechanisms that sense, signal and repair DNA damage. A major goal of our research is to understand how changes in transcription and DNA repair are linked to cancer development.

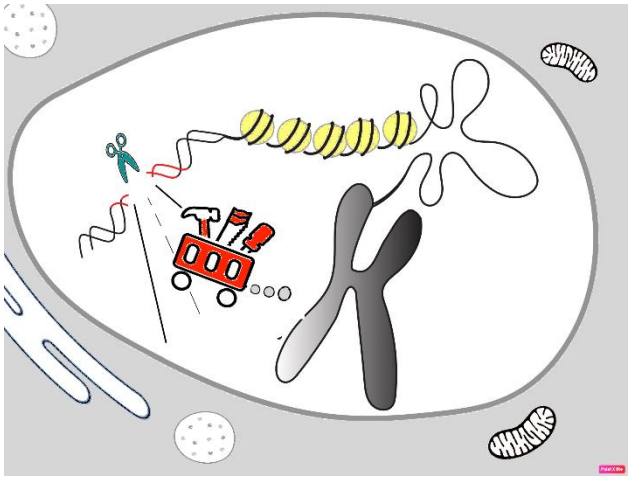
Head of Laboratory

Sérgio Fernandes de Almeida, PhD

Team

Ana Isabel Afonso Duarte	Trainee (Left September)
Ana Rita Fialho Grosso	Visiting Researcher (Left September)
Anne-Valerie Gendrel	Senior Postdoctoral Researcher
Cristiana Marisa de Sousa Morgado	Lab Technician
Eduardo Luís Correia Gameiro	MSc Student (Started February)
Inês Correia da Silva Pires Faleiro	PhD Student
João Maria Rodrigues Perlico da Cruz Sabino	PhD Student
Madalena Isabel Reto de Almeida	PhD Student
Maria João Rodrigues da Silva	Senior Postdoctoral Researcher
Mário Gil Poiares Rodrigues de Oliveira	MSc Student (Started August. Left December)
Naike Salvador Moreno	Senior Postdoctoral Researcher
Robert Manfred Martin	Senior Postdoctoral Researcher

Graphical Abstract



Laboratory Keywords/Research Areas

DNA Repair, Gene Expression, Cancer, Ageing, Epigenetics.

Major Scientific Achievements

During the last year we employed a set of cutting-edge reporter genes recently developed in our lab (Vítor *et al*., 2019 and Vítor *et al*., 2020) to further understand the dynamic interactions between gene expression and DNA damage. We began to explore the physiological consequences of such interactions in the context of cancer and ageing, a research line that we will follow up during the next years.

Selected Publications

Vítor AC, Sridhara SC, Sabino JC, Afonso AI, Grosso AR, Martin RM, de Almeida SF (2019). Single-molecule imaging of transcription at damaged chromatin. Science Advances 5(1):eaau1249. (*IF: 13.1, Citations: 15 Source: Web of Science/JCR*).

Sridhara SC, Carvalho S, Grosso AR, Gallego-Paez LM, Carmo-Fonseca M, de Almeida SF (2017). Transcription dynamics prevent RNA-mediated genomic instability through SRPK2-dependent DDX23 phosphorylation. Cell Reports 18(2):334-343. *(IF: 8.1, Citations: 37. Source: Web of Science/JCR).*

Grosso AR, Leite AP, Carvalho S, Matos MR, Martins FB, Vítor AC, Desterro JM, Carmo-Fonseca M, de Almeida AF (2015). Pervasive transcription read-through promotes aberrant expression of oncogenes and RNA chimeras in renal carcinoma. eLife 4:09214. *(IF: 7.1, Citations: 50. Source: Web of Science/JCR).*

Carvalho S, Vitor A, Sridhara SC, Martins FB, Raposo AC, Desterro JM, Ferreira J, de Almeida SF (2014). SETD2 is required for DNA double-strand break repair and activation of the p53-mediated checkpoint. eLife 3:02482. *(IF: 7.1, Citations: 117. Source: Web of Science/JCR).*

Carvalho S, Raposo AC, Martins FB, Grosso AR, Sridhara SC, Rino J, Carmo-Fonseca M, de Almeida SF (2013). Histone methyltransferase SETD2 coordinates FACT recruitment with nucleosome dynamics during transcription. Nucleic Acids Research 41(5):2881-2893. *(IF: 11.5, Citations: 86. Source: Web of Science/JCR).*

Publications in Peer Reviewed Journals

Vítor AC, Huertas P, Legube G, de Almeida SF (2020). Studying DNA Double-Strand Break repair: an ever-growing toolbox. Frontiers in Molecular Biosciences 7:24. *(IF: 4.12, Citations: 7. Source: Web of Science/JCR)*.

Zivanovic Bujak A, Weng CF, Silva MJ, Yeung M, Lo L, Ftouni S, Litchfield C, Ko YI, Kuykhoven K, Van Geelen C, Chandrashekar S, Dawson MA, Loi S, Wong SQ, Dawson SJ (2020). Circulating tumour DNA in metastatic breast cancer to guide clinical trial enrolment and precision oncology: A cohort study. PLOS Medicine 17(10):e1003363. *(IF: 10.5, Citations: 0. Source: Web of Science/JCR).*

Ongoing Research Projects

2019/2020: Targeted DNA Damage as a novel tumor suppressor tool. Coordinator: Sérgio de Almeida. Funding Agency: Fundo iMM-Laço. Reference: Fundo iMM-Laço. Amount: 30 000,00€. Total Amount: 30 000,00€.

2018/2021: O papel determinante que lesões no DNA desempenham na transcrição e o seu impacto na diferenciação celular e em cancro. Coordinator: Sérgio de Almeida. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: BREAKandENTER - LISBOA-01-0145-FEDER-030438. Amount: 239 753,90€. Total Amount: 239 753,90€.

2018/2021: Papel fisiológico de inactivação seletiva de núcleos em células multinucleadas. Coordinator: Robert Martin. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: ENUCLEATE - LISBOA-01-0145-FEDER-032271. Amount: 239 227,92€. Total Amount: 239 227,92€.

2018/2019: The inhibition of such R-loop suppressor enzymes leads to the selective killing of estrogen-dependent breast cancer cells. Coordinator: Sérgio de Almeida. Funding Agency: Fundo iMM-Laço. Reference: Fundo iMM-Laço. Amount: 29 325,00€. Total Amount: 29 325,00€.

Other Projects

2019/2021: RNA in disease — RiboMed. Coordinator: M. Carmo-Fonseca. Funding Agency: European Commission. Reference: RiboMed - GA 857119. Amount: 424 750,00€. Total Amount: 799 750,00€.

2016/2021: PRECISE: Accelerating progress toward the new era of precision medicine. Coordinator: M. Carmo-Fonseca. Funding Agency: Portugal 2020. Reference: Lisboa-01-0145-FEDER-016394. Amount: 1 199 140,10€. Total Amount: 2 499 827,92€.

Invited Lectures and Seminars

de Almeida SF. Dynamic interactions between transcription and DNA damage. 1st CABIMER International Workshop - Trends in Genome Integrity & Chromosome Dynamics, Seville, Spain, February 19-21, 2020.

de Almeida SF. Exploring the crosstalk between transcription and DNA damage. Columbia University Irving Medical Center, USA, October 13, 2020.

Silva MJ. Cromatin, DNA repair and Transcription. Escola Superior de Tecnologias da Saúde, Lisbon, Portugal, November 11, 2020.

Communications in International Conferences

Faleiro I, Duarte A, Lucas B, Martin R, Gomes ER, de Almeida SF. Unveiling the DNA damage response in multinucleated cells. First Cabimer International Workshop Trends in Genome Integrity and Chromosome Dynamics, CABIMER, Seville, Spain, February 19-21, 2020. *(Poster Presentation)*

Sabino JC, Sridhara SC, Abreu PL, Domingues MM, Santos NC, Grosso AR, de Almeida SF. Epigenetic determinants of transcription-coupled genomic instability. First Cabimer International Workshop Trends in Genome Integrity and Chromosome Dynamics, CABIMER, Seville, Spain, February 19-21, 2020. *(Poster Presentation)*

Vítor AC, Sridhara SC, Sabino JC, Afonso AI, Grosso AR, Martin RM, de Alemida SF. Single-molecule imaging of transcription at damaged chromatin. First Cabimer International Workshop Trends in Genome Integrity and Chromosome Dynamics, CABIMER, Seville, Spain, February 19-21, 2020. *(Poster Presentation)*

Internationalization

In 2020 our lab members co-authored two publications in international journals that resulted from collaborations with different labs from Spain, France and Australia. We were invited to present our most recent work in prestigious international conferences and seminars.

During this year, we also continued a collaborative study with the Alon lab of the Weizmann Institute of Science (Israel) aimed at elucidating the mechanisms by which the nuclear lamina of tumor cells influences migration and survival. This collaboration runs under the umbrella of the RiboMed project, an EU-funded twining project that includes partners from the University of Oxford (UK), the Weizmann Institute of Science (Israel) and The Max Delbrück Center for Molecular Medicine (MDC, Germany).

MSc Theses

Eduardo Gameiro, 31/12/2020, Designing novel tools to detect and quantify non-canonical DNA structures, Instituto Superior Técnico da Universidade de Lisboa. Supervisor: Robert Martin.

Sérgio Dias Lab

Major Interests/Objectives

We study cancer as a systemic disease, and our main focus is to understand how cancers communicate with their "host". In detail, we study the role of blood vessels and the importance of metabolic systemic signals in cancer onset and progression.

Head of Laboratory

Sérgio Jerónimo Rodrigues Dias, PhD, Associate Professor

Team

Ana Luísa Ferro Espadanal Torres Magalhães	Senior Postdoctoral Researcher
Diogo Da Silva Coutinho	Lab Technician
Emanuel Estevez de Oliveira	MSc Student
Miguel Maria Escoval Lopes Esperança Martins	PhD Student (Started November)
Pedro Miguel da Silva Marreiros	MSc Student (Started October)
Sofia Andreia Mata da Nazaré Pinheiro Esteves	MSc Student (Started November)
Sofia Dalla Volta	MSc Student (Left June)
Teresa Laura Mendes Serafim	Senior Post-Doctoral Researcher

Laboratory Keywords/Research Areas

Angiogenesis, Tumour Metastasis, Metabolism.

Major Scientific Achievements

We established a novel line of research at iMM, focused on cancer metabolism and its importance for cancer onset and progression in 2017. In 2019, we further developed our projects dealing with breast cancer metabolism and the importance of vascular mimicry as a mechanism favoring metastatic dissemination of solid tumors (2 manuscript in preparation). As a result, in the last 2 years we presented our findings in National and International Conferences, reinforcing our role as leaders in this particular topic of cancer research. In addition to our ongoing International (David Lyden, Cornell University, USA) and National (Rita Fior, Champalimaud Foundation) collaborations, we established fruitful collaborations with several Labs at iMM, including Vanessa Morais, Edgar Gomes, Luís Costa, and Bruno Silva-Santos.

Selected Publications

Rodrigues NV, Correia DV, Mensurado S, Nóbrega-Pereira S, deBarros A, Kyle-Cezar F, Tutt A, Hayday AC, Norell H, Silva-Santos B, Dias S (2018). Low-Density Lipoprotein Uptake Inhibits the Activation and Antitumor Functions of Human Vγ9Vδ2 T Cells. Cancer Immunology Research 6(4):448-457. *(IF: 9.188, Citations: 3. Sources: Web of Science and Scopus).*

Nóbrega-Pereira S, Caiado F, Carvalho T, Matias I, Graça G, Gonçalves LG, Silva-Santos B, Norell H, Dias S (2018). VEGFR-2-mediated reprogramming of mitochondrial metabolism regulates the sensitivity of acute myeloid leukemia to chemotherapy. Cancer Research 78(3):731-741. *(IF: 9.13, Citations: 9. Source: Web of Science).*

dos Santos CR, Domingues G, Matias I, Matos J, Fonseca I, de Almeida JM, Dias S (2014). LDL-cholesterol signaling induces breast cancer proliferation and invasion. Lipids in Health and Disease 13:16. *(IF: 2.7, Citations 75. Source: Web of Science).*

Caiado F, Carvalho T, Rosa I, Remedio L, Costa A, Matos J, Heissig B, Yagita H, Hattori K, da Silva JP, Fidalgo P, Dias Pereira A, Dias S (2013). Bone marrow-derived CD11b+Jagged2+ cells promote epitelial to mesenchymal transition and metastization in colorectal cancer. Cancer Research 73(14):4233-46. *(IF: 9.13, Citations: 25. Source: Web of Science).*

Publications in Peer Review Journals

Serafim TL, Cardoso IM. Maternal obesity impairs fetal hepatic mitochondrial respiratory chain activity and decreases total mitochondrial phospholipids (2020). European Journal of Clinical Investigation 51(2):e13375. *(IF: 3.481, Citations: 1. Source: Web of Science).*

Ferreira LMR, Li AM, Serafim TL, Sobral MC, Alpoim MC, Urbano AM (2020). Intermediary metabolism: An intricate network at the crossroads of cell fate and function. Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease 1866(10):165887. (IF: 4.352, Citations: 3. Source: Web of Science).

Other Publications

Matias I, Dias S, Carvalho T (2020). Modulating the Metabolic Phenotype of Cancer Microenvironment. In: Serpa J. (eds) Tumor Microenvironment. Advances in Experimental Medicine and Biology, vol 1219. Springer, Cham. https://doi.org/10.1007/978-3-030-34025-4_21

Ongoing Research Projects

2020/2021: Regulation of Breast Cancer Intravasation. Coordinator: Ana Magalhães. Funding Agency: Fundo iMM-Laço. Reference: Fundo iMM-Laço. Amount: 50 000,00€. Total Amount: 50 000,00€.

2018/2021: Como o colesterol promove a metastização em cancro de mama. Coordinator: Sérgio Dias. Funding Agency: Fundação para a Ciência e Tecnologia. Reference: PTDC/MED-ONC/30436/2017. Amount: 190 615,32€. Total Amount: 190 615,32€.

Invited Lectures and Seminars

Dias S. Lecture Series. Lipids and Metabolic Shifts in Cancer. CEDOC (Universidada NOVA, Lisbon), January 8, 2020.

Dias S. Lecture. Systemic Properties of Cancer. iMM Scientific Retreat, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March 9, 2020.

Communications in International Conferences

Serafim TL, Marques R, Deus C, Silva F, Sardão VA, Dias S, Oliveira PJ. Glucose dependence and metabolic reprogramming of commercial breast cancer cells. EACR-AACR-ASPIC Conference on Tumor Microenvironment, Lisbon, Portugal, March 2-4, 2020.

Magalhães A. High systemic LDL accelerates the intravasation of breast cancer cells through a vascular-mimicry like mechanism. Liga Portuguesa Contra o Cancro - NRS- Webinar - Cancer Biology: From Basic to Translational Research", Lisbon, Portugal, September 25, 2020.

Advanced Teaching

Dias S. Coordinator. Development and Cancer, Module of the Master Program in Oncobiology, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Dias S. Coordinator. Oncobiology, Module of the LisbonBiomed PhD Program, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal.

Lecturer at the following PhD Programs:

- Programa de Doutoramento em Ciências Químicas, Biológicas e Engenharia (ITQB, Nova Universidade de Lisboa).

- Programa Doutoral em Biologia Experimental e Biomedicina (Universidade de Coimbra).
- Programa de Doutoramento em Medicina (FCM, Nova Universidade de Lisboa).

And of the following Master Programs:

- Mestrado em Biologia Humana e Ambiente (Faculdade de Ciências da Universidade de Lisboa).

MSc Theses

Sofia Dalla Volta, Bologna University, Italy. Supervisor: Sérgio Dias.

Louise Moonen, University Leuven-Linburg, Bélgica. Supervisor: Sérgio Dias.

Other Theses (Licenciatura)

João Paulo Rita Fontela, January-March 2020, Regulation of LDLR expression in breast cancer cells by cytokines, Projeto da Licenciatura de Biologia Celular e Molecular da FCT-UNL.

Catarina de Oliveira Chanoca Gomes, January-March 2020, Effects of a cholesterol rich tumor microenvironment on the expression of vinculin and FAK in breast cancer cell lines, Projeto da Licenciatura de Biologia Celular e Molecular da FCT-UNL.

Vanessa Morais Lab

Major Interests/Objectives

We seek to clarify the intimate crosstalk between the host cell – the neuron – and the powerhouse organelle – the mitochondria.

Mitochondria at the synapse have a pivotal role in neurotransmitter release, but almost nothing is known about synaptic mitochondria composition or specific functions. Synaptic mitochondria compared to mitochondria in other cells, need to cope with increased calcium load, more oxidative stress, and high demands of energy generation during synaptic activity.

Our research interests aim at deciphering the intrinsic properties of synaptic mitochondria and to further scrutinize their relevance for the healthy brain, and to unveil how the disruption of these acquired mechanisms contributes to neurodegeneration. Additionally, we intend to unravel how modulation of mitochondrial properties, such as dynamics and biogenesis, can dictate the fate of neural stem cell.

Head of Laboratory

Vanessa Alexandra Morais, PhD, Group Leader at Instituto de Medicina Molecular João Lobo Antunes, Associate Professor at Faculdade de Medicina da Universidade de Lisboa

Team

Ana Beatriz Marta Ferreira Madeira Ramos	MSc Student
Andreia Sofia Faria Pereira	PhD Student
Bernardo Cetra Antunes	PhD Student
Carlos Eduardo Cardanho dos Ramos	PhD Student
Elvira Pequeno Leites	PhD Student
Filipa Alexandra Barroso Gonçalves	PhD Student
Filipe Carlos Pereira dos Reis Cortes Figueiredo	PhD Student
Renata Lopes Familiar Couto	Postdoctoral Researcher (Started April)
Rita Abrunhosa Soares	PhD Student
Rúben Filipe Alves Simões	MSc Student (Left December)

Graphical Abstract

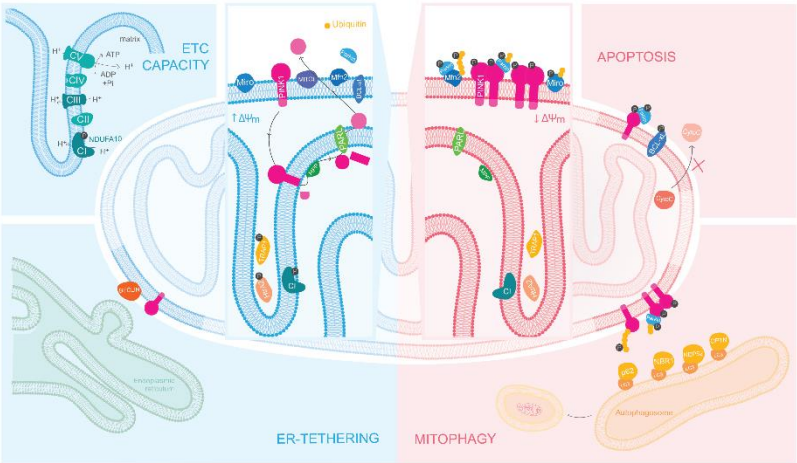


Figure 1: Quality control of mitochondria: PINK1 executes a different role depending on mitochondria's overall status. (Illustrations by Helena Pinheiro; Goncalves F, Morais VA, submitted)

Laboratory Keywords/Research Areas

Keywords: Mitochondria, Biogenesis, Neurodegeneration, Synapse, Parkinson's Disease.

Research Areas: Cell Biology, Neurobiology, Metabolism.

Major Scientific Achievements

A proper mitochondrial function is of utmost importance in neurons as their energy supply relies mostly on oxidative phosphorylation. However, little is known about mitochondrial biology and brain homeostasis.

At present, we have unraveled the protein fingerprint that will allow the discrimination between synaptic and non-synaptic mitochondria. And we are now scrutinizing the mitochondrial quality control processes and crosstalk between different neural types. Additionally, we have observed that modulating mitochondrial dynamics can be a powerful approach to regulate neural stem cell fate. And, in order to understand the impact of mitochondrial DNA heterogeneity on overall brain function, we have developed an algorithm for variant level determination.

Our research findings are driving exciting hypotheses and yielding promising molecular targets that will enable us to address key unanswered questions, stratify the importance of mitochondrial function for synapse biology, and overall brain homeostasis.

Selected Publications

Vos M, Geens A, Böhm C, Deaulmerie L, Swerts J, Rossi M, Craessaerts K, Leites E, Seibler P, Rakovic A, Lohnau T, De Strooper B, Fendt SM, Morais VA, Klein C, Verstreken P (2017). Cardiolipin promotes electron transport between ubiquinone and Complex-I to rescue PINK1 deficiency. Journal of Cell Biology 216:695-708. *(IF: 9.8, Citations: 26. Source: Web of Science).*

Aerts L, Craessaerts K, De Strooper B, Morais VA (2015). PINK1 Kinase Catalytic Activity is regulated by Phosphorylation on Serines 228 and 402. The Journal of Biological Chemistry 290:2798-811. *(IF: 4.5, Citations: 67. Source: Web of Science).*

Morais VA*, Haddad D, Craessaerts K, De Bock P, Swerts J, Vilain S, Aerts L, Overbergh L, Grünewald A, Seibler P, Klein C, Gevaert K, Verstreken P, De Strooper B* (2014). PINK1 Loss of Function Mutations Affect Mitochondrial Complex I Activity via NdufA10 Ubiquinone Uncoupling. Science 344:203-7. *(IF: 34, Citations: 236. Source: Web of Science)*. *shared corresponding authors.

Haddad D, Vilain S, Vos M, Esposito G, Matta S, Kalscheuer V, Craessaerts K, Leyssen M, Morais VA*, Verstreken P* (2013). Mutations in the Intellectual Disability Gene Ube2a Cause Neuronal Dysfunction and Impair Parkin-Dependent Mitophagy. Molecular Cell 50:831-41. *(IF: 14, Citations: 70. Source: Web of Science)*. *shared corresponding authors.

Morais VA, Verstreken P, Roethig A, Smet J, Snellinx A, Vanbrabant M, Haddad D, Frezza C, Mandemakers W, Vogt-Weisenhorn D, Van Coster R, Wurst W, Scorrano L, De Strooper B (2009). Parkinson's disease mutations in PINK1 result in decreased Complex I activity and deficient synaptic function. EMBO Molecular Medicine 1:99-111. *(IF: 9, Citations: 331. Source: Web of Science).*

Publications in Peer Reviewed Journals

Soares R, Ribeiro FF, Lourenço DM, Rodrigues RS, Moreira JB, Sebastião AM, Morais VA, Xapelli S (2020). Isolation and Expansion of Neurospheres from Postnatal (P1−3) Mouse Neurogenic Niches. Journal of Visualized Experiments 159:e60822. *(IF: 1.163, Citations: 0. Source: Web of Science).*

Other International Publications

Soares R, Lourenço DM, Verduyckt J, Sebastião AM, Xapelli S, Morais VA (2020). Mitochondrial Dynamics: impact on adult neural stem cell fate. ScienceOpen Conference Abstract: 12th FENS Forum of Neuroscience, Glasgow, United Kingdom, July 11-15, 2020. doi: 10.14293/S2199-1006.1.SOR-.PPVI8US.v1.

Ongoing Research Projects

2018/2021: Mecanismos moleculares que mantêm a Homeostase Mitocondrial no Cérebro. Coordinator: Vanessa Morais. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: PTDC/BIA-CEL/31230/2017. Amount: 239 998,20€. Total Amount: 239 998,20€.

2016/2021: SynapticMitochondria: Quality Control and Maintenance of Synaptic Mitochondria. Coordinator: Vanessa Morais. Funding Agency: European Commission. Reference: ERC StG 679178. Amount: 1 300 000,00€. Total Amount: 1 300 000,00€.

2016/2020: Homeostasis and Maintenance of Synaptic Mitochondria. Coordinator: Vanessa Morais. Funding Agency: European Molecular Biology Organization. Reference: EMBO IG VMorais. Amount: 150 000,00€. Total Amount: 150 000,00€.

2015/2020: Maintaining Mitochondria Healthy: The Molecular Checkpoints involved in Mitochondrial Quality Control in Neurons. Coordinator: Vanessa Morias. Funding Agency: Fundação para a Ciência e a Tecnologia. Reference: IF/01693/2014/CP1236/CT0003. Amount: 50 000,00€. Total Amount: 50 000,00€.

Invited Lectures and Seminars

Morais VA. HOPE2020 - Physiopathology of Parkinson's Disease, Paris, France, January 2020.

Leites EP. Parkinson’s Disease: the role of PINK1 in different neural cells. Neurosciences Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, July 27, 2020.

Morais VA. Mitochondrial Bioenergetics in Neurodegeneration. 16th International Symposium of the Portuguese Society for Metabolic Disorders, Online Event, November 13, 2020.

Communications in International Conferences

Morais VA. HOPE2020 - Physiopathology of Parkinson's Disease, Paris, France, January 2020.

Soares R, Lourenço DM, Verduyckt J, Sebastião AM, Xapelli S, Morais VA. Mitochondrial Dynamics: impact on adult neural stem cell fate. 12th FENS Virtual Forum for Neuroscience, July 11-15, 2020. *(Poster Presentation)*

Gonçalves FB, Enguita FJ, Morais VA. PINK1: a linkage between mitochondrial dysfunctions and Parkinson's Disease. Grand Challenges in Parkinson's Disease, Online Event, September 23-25, 2020. *(Poster Presentation)*

Faria-Pereira A, Spinazzi M, Craessaerts K, Savas J, De Strooper B, Morais VA. Synaptic mitochondria: In search of its functional fingerprint. 16th International Symposium of the Portuguese Society for Metabolic Disorders, Online Event, November 11-13, 2020. *(Selected Oral Presentation) (Received Honorable Mention)*

Morais VA. Mitochondrial Bioenergetics in Neurodegeneration. 16th International Symposium of the Portuguese Society for Metabolic Disorders, Online Event, November 13, 2020.

Soares R, Venillo S. Showcase of Nanolive imaging results from demonstrations with researchers and imaging facilities from the Iberian Peninsula. Spanish & Portuguese Advanced Optical Microscopy Meeting 2020, November 24-27, 2020. *(Oral Presentation) (Invited to include and present my imaging results)*

Communications in National Conferences

Simões R. MSc Student. AEFML - Dia da Investigação, Programa "Educação pela Ciência" (PEC) do Gabinete de Apoio à Investigação Científica, Tecnológica e Inovação (GAPIC), Faculdade de Medicina da Universidade de Lisboa (FMUL), Lisbon, Portugal, December 9, 2020. *(Poster Presentation and Discussion)*

Internationalization

Our projects involve collaborations with international research groups in Europe and USA. Current international collaborators include:

In Europe - Bart de Strooper (VIB, Belgium); Patrik Verstreken (VIB, Belgium); Christine Klein (University Luebeck, Germany); Friedemann Paul (Charité|MDKZ, Berlin, Germay).
In USA - Jeffrey Savas (North Western University, Chicago).

Prizes, Honors and Awards

Soares R. Travel Award from FENS-IBRO/PERC to attend the 12th FENS Virtual Forum for Neuroscience, July 11-15, 2020.

Faria-Pereira A. Received Honorable mention for oral presentation in the 16th International Symposium of the Portuguese Society for Metabolic Disorders, November 11-13, 2020.

Simões R. Prize for Best Oral Apresentation - 2nd place, AEFML- Dia da Investigação Programa "Educação pela Ciência" (PEC) do Gabinete de Apoio à Investigação Científica, Tecnológica e Inovação (GAPIC), Faculdade de Medicina da Universidade de Lisboa (FMUL), Portugal. December 9, 2020.

Advanced Teaching

Morais VA. Member of the Scientific Advisory Board of the Instituto de Medicina Molecular João Lobo Antunes Training Hub.

Morais VA. Lecture for 1st year medical students – Molecular and Cellular Biology Discipline, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 2018.

Science and Society

Faria-Pereira A was an organizational volunteer in the "Soapbox Science Lisbon 2020" event (held over Zoom).

Cortes-Figueiredo F participated in the "Noite Europeia dos Investigadores", Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, November 27, 2020.

MSc Theses

Ana Ramos, 15/12/2020, Parkinson's Disease: Identification of Novel Substrates for the Mitochondrial Kinase PINK1, Faculdade de Ciências e Tecnologia da Universidade de Coimbra. Supervisor: Vanessa Morais. Co-Supervisor: Carlos Duarte (Universidade de Coimbra).

Technical Facilities

Biobank Unit

Major Interests/Objectives

Biobanco-iMM CAML is a research infrastructure, which aims at promoting national and international collaborative research projects using human samples. It currently stores thousands of samples, including whole blood, serum, saliva, DNA, cerebrospinal fluid and tumor tissue, with detailed clinical information.

We provide support for biomedical research projects aiming at fostering national and international collaboration between researchers, namely through their participation in consortia and in international research networks.

We believe this facility creates a unique opportunity to promote synergies between partners, maximizing efficacy and minimizing costs.

Director

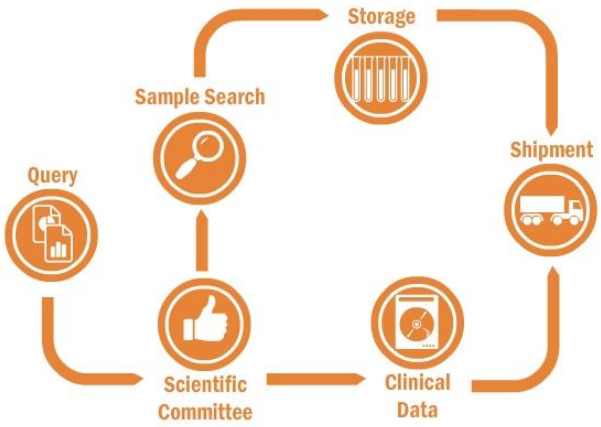
Sérgio Jerónimo Rodrigues Dias, PhD

Cláudia Maria Coelho de Faria, MD/PhD

Team

Andreia Alexandra Farinha Lopes	Lab Technician (Started July)
Ângela Maria Cerqueira Coelho Afonso	Biobank Unit Area Manager
Fabiana Cândida da Rocha Rodrigues	Technician (Left August)
Inês Duarte Dias Almeida Lourenço	MSc Student (Started November)
Ionela Alexandra Filofteia Toader	Lab Technician (Started August)
Katyayani Ajay Sharma	MSc Student (Started February. Left August)
Susana Raquel Salsinha Ferreira	Technician (Left August)

Graphical Abstract



Keywords

Biobank, Human Samples, Clinical Information, Biomedical Research.

Major Achievements

In 2020, we started three new collections (Pediatric Diseases collection, COVID-19 collection, and Systemic Sclerosis collection). Given the rarity of biobanks in pediatric diseases, we believe this new collection will be key to our biobank.

On the other hand, the COVID-19 collection was one of the most active collections during the past year. Until December 2020, we collected samples from 310 donors. Biobanco-iMM CAML also participated in several projects to study the seroprevalence of anti-SARS-CoV-2 antibodies in the Portuguese population.

We received 58 sample requests, which were used for different purposes. This represents a growth rate of 16% compared to 2019.

In 2020, Biobanco-iMM CAML consolidated itself as an international partner, evidenced by the sharing of samples worldwide.

Selected Publications

Figueiredo-Campos P, Blankenhaus B, Mota C, Gomes A, Serrano M, Ariotti S, Costa C, Nunes-Cabaço H, Mendes AM, Gaspar P, Pereira-Santos MC, Rodrigues F, Condeço J, Escoval MA, Santos M, Ramirez M, Melo-Cristino J, Simas JP, Vasconcelos E, Afonso Â, Veldhoen M (2020). Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to 6 months post disease onset. European Journal of Immunology 50(12): 2025-2040. *(IF: 4.404, Citations: 6. Source: Web of Science).*

Rosa N, Marques J, Esteves E, Fernandes M, Mendes VM, Afonso Â, Dias S, Pereira JP, Manadas B, Correia MJ, Barros M (2016). Protein Quality Assessment on Saliva Samples for Biobanking Purposes. Biopreservation and Biobanking 14(4):289-97. *(IF: 1.698, Citations: 4. Source: ResearchGate)*.

Afonso A, Polido-Pereira J, Dias S (2014). Biobank Profile: Biobanco-iMM, Lisbon Academic Medical Centre. Biopreservation and Biobanking 12: 433-434. *(IF: 1.698, Citations: 0. Source: ResearchGate)*.

Invited Lectures and Seminars

Faria CC. Clinical and Translational Research – challenges and opportunities. ACORN Summer School Workshop, Algarve, Portugal, October 22, 2020.

Faria CC. Translational Medicine in Europe and Portugal. Scicare Talks: from science to impact (Novartis), November 27, 2020. *(Online Conference)*

Communications in International Conferences

Faria CC. Medulloblastoma: molecular classification and clinical indications. Reunión de la Sociedad Española de Neurocirugía Pediátrica, Alicante, Spain, February 21-22, 2020. *(Oral Presentation)*

Communications in National Conferences

Faria CC. Tumores do Sistema Nervoso Central em idade Pediátrica. XVI Jornadas de Pediatria do Hospital de Santa Maria, Lisbon, Portugal, February 14, 2020. *(Oral Presentation)*

Paisana E, Cascão R, Custódia C, Qin N, Picard D, Carvalho T, Ruivo P, Pereira P, Roque R, Pimentel J, Remke M, Miguéns J, Barata JT, Faria CC. The role of ubiquitin conjugating enzymes in brain metastases. Cancer Biology: From Basic to Translational Research, Liga Portuguesa Contra o Cancro, September 25, 2020. *(Online Conference)*

Dias S. Biobanco-iMM. JoinHealth - Autumn welcome webinars | R&D data collection and sharing, November 10, 2020. *(Online Conference)*

Organization of Conferences

Faria CC. Co-Organizer. EATRIS International Meeting, INFARMED, Lisbon, Portugal, February 11-12, 2020.

Faria CC. Co-Organizer. GAPIC in the European Researchers' Night under the topic Ciência e Natureza – Preservação do Património Cultural e Natural, November 27, 2020. *(Online Event)*

Faria CC. Co-Organizer. GAPIC "Dia da Investigação", Faculdade de Medicina da Universidade de Lisboa, December 9, 2020. *(Online Event)*

Faria CC. Co-Organizer. Annual Meeting of the Portuguese Neurosurgical Society, December 11-12, 2020.

Faria CC. Co-Organizer. Neuroscience Seminar Series (Neuroses), Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, 2020.

Internationalization

During 2020, samples from Biobanco-iMM CAML were shared with researchers in North America, Luxembourg and Belgium.

The COVID-19 collection is included in the BBMRI directory of resources from biobanks across Europe available for research on COVID-19.

Biobanco-iMM CAML is part of the EuroPDX Consortium, an international platform that gathers multiple institutions involved in the generation of patient-derived xenografts from multiple tumor types.

Advanced Teaching

Faria CC. Lecture. Patient-derived xenografts of brain metastases – a tool for translational medicine. LisbonBioMed PhD Programme, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March 3, 2020.

Dias S. Lecture. Biobancos. Programa de Doutoramento da Universidade de Coimbra, Curso de Métodos e Técnicas de Investigação, Universidade de Coimbra, Coimbra, Portugal, September 20, 2020.

Faria CC. Lecture. Principles of Neurosciences – Neuroanatomy. Mestrado em Investigação Biomédica, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 24, 2020.

Science and Society

Faria CC promoted the creation of the iMM Science Club in the Pediatrics Department at Hospital de Santa Maria, Lisbon, Portugal.

Bioimaging Unit

Major Interests/Objectives

The Bioimaging Unit acts as a support structure to help and nurture research done with Light Microscopy inside the institute. Besides managing resources, the Bioimaging Unit provides iMM scientists and visitors with excellence in scientific know-how and expertise in using light microscopy methods for their research. We assist in planning microscopy-oriented projects, choosing materials and equipment, analyzing experimental results, processing acquired images and presenting data. Together with continuous training of new users, we organize regular courses to introduce users to the most recent microscopy techniques and foster interactions and collaborations between microscopy users at the iMM.

Director

José Miguel Rino Henriques, PhD

Team

Aida Andreia Pereira Pires Lima dos Santos	Technician
Ana Margarida Santos do Nascimento	Senior Technician
António Francisco Pinção Loução Homem Temudo	Senior Technician

Graphical Abstract

Keywords

Microscopy, Confocal, Lightsheet, Multiphoton, Image Processing.

Major Achievements

In 2020, the Bioimaging Unit services were used by 190 users from 30 different research labs, 5 of which from outside the iMM. During the year, we trained 63 new users in at least one microscopy system (a total of 151 training sessions and 1215 assistances – many of them performed remotely). The Bioimaging Unit is a Zeiss labs@location Partner, integrating a community of leading research facilities with expertise in specific applications of technologies that provide in depth knowledge and scientific support to Zeiss customers community. We are also a node of the Portuguese Platform of Bioimaging (PPBI), a consortium of imaging facilities from top research universities and institutes in Portugal dedicated to promoting the technical integration and centralized management of shared resources in bioimaging. In 2020 PPBI has been included as a Node of the Euro-Bioimaging European Research Infrastructure Consortium.

Selected Publications

Martin RM*, Rino J*, Carvalho C*, Kirchhausen T, Carmo-Fonseca M (*these authors have contributed equally to this work) (2013). Live-Cell Visualization of Pre-mRNA Splicing with Single-Molecule Sensitivity. Cell Reports 4(6):1144-1155. (*IF: 8.109, Citations: 88. Source: Web of Science*).

Carvalho S, Raposo AC, Martins FB, Grosso AR, Sridhara SC, Rino J, Carmo-Fonseca M, de Almeida SF (2013). Histone methyltransferase SETD2 coordinates FACT recruitment with nucleosome dynamics during transcription. Nucleic Acids Research 41(5):2881-2893. (*IF: 11.502, Citations: 86. Source: Web of Science*).

Martins SB*, Rino J*, Carvalho T, Carvalho C, Yoshida M, Klose JM, de Almeida SF, Carmo-Fonseca M (*these authors have contributed equally to this work) (2011). Spliceosome assembly is coupled to RNA polymerase II dynamics at the 3' end of human genes. Nature Structural Molecular Biology 18:1115. (*IF: 11.98, Citations: 58. Source: Web of Science*).

Domingues I, Rino J, Demmers JA, de Lanerolle P, Santos SC (2011). VEGFR2 Translocates to the Nucleus to Regulate Its Own Transcription. PLoS One 6:e25668. *(IF: 2.74, Citations: 55. Source: Web of Science*).

Henriques CM, Rino J, Nibbs RJ, Graham GJ, Barata JT (2010). IL-7 induces rapid clathrin-mediated internalization and JAK3-dependent degradation of IL-7R alpha in T cells. Blood 115:3269-77. (*IF: 17.794, Citations: 77. Source: Web of Science*).

Publications in Peer Reviewed Journals

Marques FG, Carvalho L, Sousa JS, Rino J, Diegues I, Poli E, Pina F, Saude L, Santos SCR (2020). Low doses of ionizing radiation enhance angiogenesis and consequently accelerate post-embryonic development but not regeneration in zebrafish. Scientific Reports 10(1):3137 *(IF: 3.998. Source: Web of Science).*

Ongoing Research Projects

2017/2020: PPBI – Plataforma Portuguesa de Bioimagem. Coordinator: José Henriques. Funding Agency: Portugal 2020. Reference: PINFRA/22122/2016. Amount: 306 178,00€. Total Amount: 865 695,43€.

Internationalization

The Bioimaging Unit is a Zeiss labs@location Partner, integrating a community of leading research facilities with expertise in specific applications of technologies that provide in depth knowledge and scientific support to Zeiss customers community. The Bioimaging Unit is also a node of the Portuguese Platform of Bioimaging (PPBI), a consortium of imaging facilities in Portugal which has been included in 2020 as a Node of the Euro-Bioimaging European Research Infrastructure Consortium.

Flow Cytometry Unit

Major Interests/Objectives

The Flow Cytometry Unit provides a state-of-the-art flow cytometry service to iMM researchers as well as external groups from other research institutes. We aim at training researchers in the adequate use of the instruments and also on flow cytometry principles, experiment planning, as well as, data analysis and interpretation. The facility is equipped with 4 cell analyzers (1 BD LSRFortessa X-20, 2 BD LSRFortessa - one of them equipped with a High Throughput Sampler - and 1 BD Accuri C6), 2 cell sorters (BD FACSAria IIu and BD FACSAria III) and one imaging flow cytometer (Amnis ImageStreamX). Besides providing a Cell Sorting service, we also ensure quality control and maintenance procedures on all instruments and the implementation of the Quality Management System, according to ISO 9001.

Director

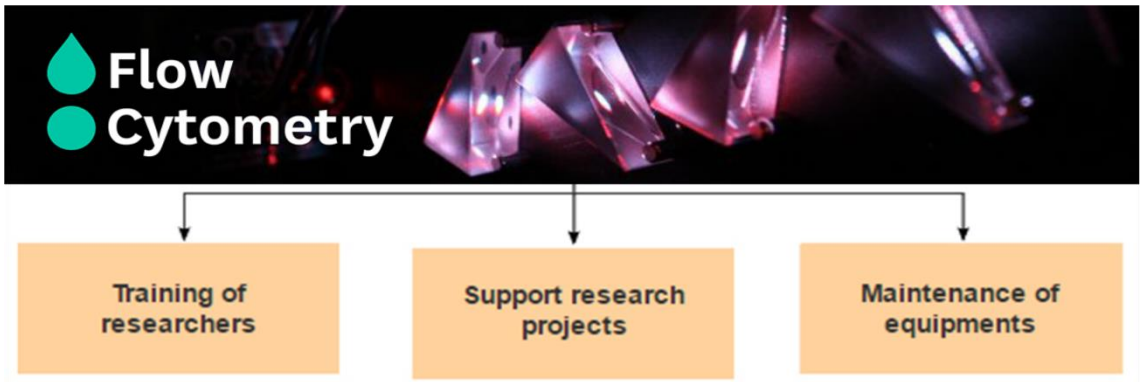
José Miguel Rino Henriques, PhD (Left February)

Marc Veldhoen, PhD – Commissary

Team

Andreia Sofia Ramalho dos Santos	Technician
Rute Regina Ferreira Gonçalves	Technician

Graphical Abstract



Keywords

Flow Cytometry, Cell Sorting, Imaging Flow Cytometry, Single Cell Analysis.

Major Achievements

In 2020, a total of 163 users from 28 research labs, 7 of them from outside the iMM, used the Flow Cytometry Unit. During the year, we trained 56 new users in at least one flow cytometry analyzer. The Flow Cytometry Unit is one of the founders of FLxFlow - a Portuguese network for Flow Cytometry created in 2017, which aims at bringing together the know-how of 4 core flow cytometry facilities in the Lisbon area, enabling advanced training and access to cutting-edge applications to the scientific community.

Selected Publications

Pereira PD, Serra-Caetano A, Cabrita M, Bekman E, Braga J, Rino J, Santus R, Filipe PL, Sousa AE, Ferreira JA (2017). Quantification of cell cycle kinetics by EdU (5-ethynyl-2'-deoxyuridine)-coupled-fluorescence-intensity analysis. Oncotarget 8(25):40514-40532. (*IF: 5.312, Citations: 4. Source: Web of Science*).

Publications in Peer Reviewed Journals

Ferreira C, Barros L, Baptista M, Blankenhaus B, Barros A, Figueiredo-Campos P, Konjar S, Lainé A, Kamenjarin N, Stojanovic A, Cerwenka A, Probst HC, Marie JC, Veldhoen M (2020). Type 1 Treg cells promote the generation of CD8+ tissue-resident memory T cells. Nature Immunology 21(7):766-776. *(IF: 20.479, Citations: 3. Source: Web of Science).*

Comparative Pathology Unit

Major Interests/Objectives

Our mission is to achieve the highest level of quality in supporting researchers through: (1) training dissection skills and basic recording of macroscopic findings; (2) preparing the samples through state of the art histology, including routine technique, paraffin, cryo-embedding and sectioning, special stains and immunohistochemistry; and (3) creating meaningful data from gross pathology observations and histopathology, with pathology reporting and document review for pathology content. Originality, integrity, sympathy and productivity while maintaining the highest level of technical proficiency and ethical principles is our motto; and we hope to keep up with your pace in the years to come.

Director

Tânia Gilot Mendes de Carvalho Barão, DVM, PhD, Experimental Pathologist (Left April)

Luísa Figueiredo, PhD, Group Leader - Commissary

Team

Ana Margarida Biscaia Fernandes dos Santos	Senior Technician
Ana Margarida Pereira Cristóvão Pinto	Senior Technician
Ana Rita Correia Pires	Senior Technician
Pedro Jorge Filipe Pereira	Senior Technician (Left November)
Pedro Reis Ruivo	Veterinarian

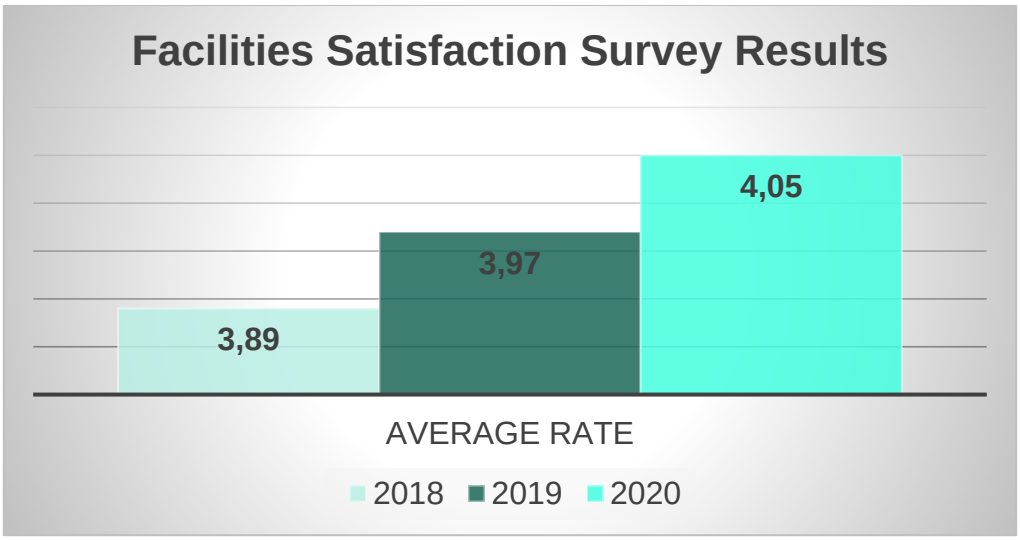
Keywords

Histology, Experimental Pathology, Immunohistochemistry, Laboratory Animals.

Major Achievements

Quality and performance of our Unit was maintained during an atypical year and we even had an increased 66% demand on our most technical demanding techniques, resulting in 9% increase on our annual billing. Our methodology during this year allowed us to build-up on an important key performance indicator (KPI), like our turnaround time: We are currently with a turnaround time of 1 weeks from sample (in) to slide (out).

Our efforts allowed us to improve another important KPI, which is our average rate on annual “Facilities Satisfaction Survey”: 3.89 in 2018, 3.97 in 2019 and 4.05 in 2020! Our Best Result Ever!



Publications in Peer Reviewed Journals

Gil Marques F, Poli E, Malaquias J, Carvalho T, Portêlo A, Ramires A, Aldeia F, Ribeiro RM, Vitorino E, Diegues I, Costa L, Coutinho J, Pina F, Mareel M, Constantino Rosa Santos S (2020). Low doses of ionizing radiation activate endothelial cells and induce angiogenesis in peritumoral tissues. Radiotherapy and Oncology 141:256-261. *(IF: 4.853, Citations: 3. Source: Web of Science)*.

Cascão R, Vidal B, Carvalho T, Lopes IP, Romão VC, Goncalves J, Moita LF, Fonseca JE (2020). Celastrol Efficacy by Oral Administration in the Adjuvant-Induced Arthritis Model. Frontiers in Medicine (Lausanne) 8(7):455. *(IF: 3.9), Citations: 0. Source: Web of Science)*.

Pitrez PR, Estronca L, Monteiro LM, Colell G, Vazão H, Santinha D, Harhouri K, Thornton D, Navarro C, Egesipe AL, Carvalho T, Dos Santos RL, Lévy N, Smith JC, de Magalhães JP, Ori A, Bernardo A, De Sandre-Giovannoli A, Nissan X, Rosell A, Ferreira L (2020). Vulnerability of progeroid smooth muscle cells to biomechanical forces is mediated by MMP13. Nature Communications 11(1):4110. *(IF: 13.611, Citations: 0. Source: Web of Science)*.

Matias I, Dias S, Carvalho T (2020). Modulating the Metabolic Phenotype of Cancer Microenvironment. Advances in Experimental Medicine and Biology 1219:403-411. *(IF: 2.324, Citations: 2. Source: Web of Science)*.

Fonseca-Gomes J, Loureiro JA, Tanqueiro SR, Mouro FM, Ruivo P, Carvalho T, Sebastião AM, Diógenes MJ, Pereira MC (2020). In vivo Bio-Distribution and Toxicity Evaluation of Polymeric and Lipid-Based Nanoparticles: A Potential Approach for Chronic Diseases Treatment. International Journal of Nanomedicine 15:8609-8621. *(IF: 5.115, Citations: 0. Source: Web of Science)*.

Figueiredo-Campos P, Blankenhaus B, Mota C, Gomes A, Serrano M, Ariotti S, Costa C, Nunes-Cabaço H, Mendes AM, Gaspar P, Pereira-Santos MC, Rodrigues F, Condeço J, Escoval MA, Santos M, Ramirez M, Melo-Cristino J, Simas JP, Vasconcelos E, Afonso Â, Veldhoen M (2020). Seroprevalence of anti-SARS-CoV-2 antibodies in COVID-19 patients and healthy volunteers up to 6 months post disease onset. European Journal of Immunology 50(12):2025-2040. *(IF: 4.298, Citations: 2, Source: Web of Science)*.

Hanscheid T, Vieira S, Ferreira P, Carvalho T, Belo S, Grobusch MP (2020). The fluorescent acid-fast stain, auramine-O, stains schistosome eggs and may be an aid for detection. An old technique with a useful future? Travel Medicine and Infectious Disease 35:101569. *(IF: 4.589, Citations: 0, Source: Web of Science)*.

Paramos-de-Carvalho, D., Martins, I., Cristóvão, A. M., Dias, A. F., Neves-Silva, D., Pereira, T., ... & Jacinto, A. (2020). Depletion of senescent cells improves functional recovery after spinal cord injury. bioRxiv. *(IF: no, Citations: 0, Source: pubMed)*.

Acknowledgments in Peer Reviewed Journals

Mello-Vieira J, Enguita FJ, de Koning-Ward TF, Zuzarte-Luís V, Mota MM (2020). Plasmodium translocon component EXP2 facilitates hepatocyte invasion. Nature Communications 11(1):5654. *(IF: 13.611, Citations: 0, Source: Web of Science)*.

Information Systems Unit

Major Interests/Objectives

Our mission is to help researchers reach their maximum productivity by using adequate Information Technology resources. Our aims are:

- Provide state-of-the-art information technology infrastructure and support services
- Contribute to improve productivity of researchers and research outcomes
- Facilitate and optimize management business processes

We intervene mainly in the following areas:

- Information Technology (IT) support to iMM users
- Planning, implementation and maintenance of the infrastructure that stores, processes and protects research data
- Design, implement and integrate information systems to facilitate scientific and management processes

Also, with Covid19, our mission is to help to ensure the traceability and the testing result continuity.

Director

Stéphane Correia Martins (Started April)

Team

André Filipe Cardoso Gonzalez Fragoso	Information Systems Senior Technician
Pedro André Lozano Luiz de Castro	Information Systems Senior Technician
Ricardo da Silva Martinho	Information Systems Technician

Keywords

IT Support Data Protection, Information Integration, Web Services, Applications.

Major Achievements

We have expanded our storage system to meet the needs of Labs.

We have maintained the IT system even on home working without fatal errors.

We have helped to ensure the COVID-19 testing.

Rodent Unit

Major Interests/Objectives

The aim of the Rodent Unit is to support scientific projects associated with animal experimentation, working towards a state-of-the-art animal-based research while maintaining the highest standards of animal welfare. The Rodent Unit strictly follows Portuguese and international laws and recommendations governing good practices and animal welfare. The facility is highly committed to providing training and education in Laboratory Animal Science. In addition to normal husbandry routines, the Rodent Unit also provides specialized services such as colony management and assisted reproduction techniques.

Director

João Pedro Louro Machado Simas, DVM, PhD

Team

Ana Filipa Peixoto da Cunha	Caretaker
Ana Patrícia da Silva Almeida	Technician (Left November)
Cecília Gonçalves Simão	Caretaker
Daniel Corte Real Gomes da Costa	Veterinarian
Emílio Jurandir do Carmo	Caretaker (Started January)
Felícia Maria Augusto Ramos	Caretaker
Filipe Fernandes Delgado	Technician (Left October)
Iolanda Safira Sousa Moreira	Rodent Unit Area Manager
Márcia Pereira da Silva	Animal Welfare Officer
Mariana Coelho Quintanilha Mantas	Caretaker
Mihaela Elena Morari	Caretaker
Olena Pavlovska Borges Pinho	Caretaker
Pedro Manuel Nogueira Santos	Senior Technician
Pedro Manuel Ribeiro de Araújo	Caretaker (Started June)

Keywords

Rodents, Laboratory Animal Science, Animal Welfare, 3R's.

Major Achievements

The conclusion of a project aiming to improve the operation of the support infrastructure that included improvement works in the HVAC system and management software. With this, the facility will operate to a better level of environmental and sanitary control.

Ongoing Research Projects

2017/2020: CONGENTO - Consortium for Genetically Tractable Organisms. Coordinator: João Pedro Simas. Funding Agency: Portugal 2020. Reference: 027947/2017. Amount: € 560 086,20. Total Amount: € 1 363 313,52.

Invited Lectures and Seminars

Berryhill G. Caring for Immuno-Deficient Mice from Nude to NS, Webinar, October 1, 2020.

Berryhill G. Predictive Cancer Models Using Patient-Derived Xenograft Mice, Webinar, October 1, 2020.

Communications in National Conferences

Silva M. Monitoring and follow up of projects – the iMM's implementation process, V Simpósio Nacional ORBEAs, Lisbon, Portugal, December 16, 2020. *(Online Presentation)*

Advanced Teaching

Course. 1st Edition of the Laboratory Animal Science Course for Functions A and D CONGENTO-harmonized program, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, November 1-16, 2020.

Zebrafish Unit

Major Interests/Objectives

We provide the necessary tools & technical support to internal or external research groups wanting to initiate and/or develop research projects using zebrafish.

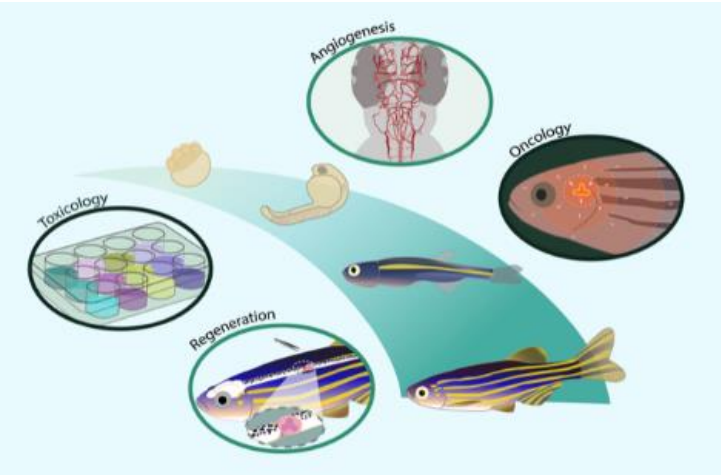
Director

Maria Leonor Tavares Saúde, PhD, Invited Associate Professor

Team

Aida Gonçalves Lino Barros	Senior Technician
Ana Filipa Carvalho Marques Dias	Postdoctoral Researcher (Left January)
Lara Margarida Marques Saraiva de Carvalho	Zebrafish Unit Area Manager
Mariana Antas Rebocho da Costa	Lab Technician (Left May)

Graphical Abstract



Keywords

Zebrafish, Development, Regeneration, Disease Models, Small-Molecule Screening.

Major Achievements

We successfully implemented of a new live diet – rotifers - for zebrafish larvae that allowed us to achieve higher rates of growth and survival.

Publications in Peer Reviewed Journals

Marques FG, Carvalho L, Sousa J, Diegues I, Pina F, Poli E, Rino J, Saúde L, Constantino Rosa Santos S (2020). Low doses of ionizing radiation enhance angiogenesis and consequently accelerate post-embryonic development but not regeneration in zebrafish. Scientific Reports 10(1):3137. *(IF: 3.998, Citations: 1. Source: Google Scholar).*

Ongoing Research Projects

2017/2020: CONGENTO - Consortium for Genetically Tractable Organisms. Coordinator: João Pedro Simas. Funding Agency: Portugal 2020. Amount: 560 086,20€. Total Amount: 1 363 313,52€.

Invited Lectures and Seminars

Carvalho L. Zebrafish Housing Systems. CONGENTO Course on Laboratory Animal Science Course for Function A (+D) (former FELASA Category B). *(Online Course)*

Carvalho L. Zebrafish Behaviour and Welfare. CONGENTO Course on Laboratory Animal Science Course for Function A (+D) (former FELASA Category B). *(Online Course)*

Organization of Conferences

Zebrafish Unit. Co-Organizer. CONGENTO Course on Laboratory Animal Science Course for Function A (+D) (former FELASA Category B – New available theoretical online course.

Science and Society

12th grade student´s visit from Quarteira Secondary School. February 11, 2020.

Amsterdam's Medical Faculty – MFAS student´s visit, March 4, 2020.

Administrative Facilities

Communication Office

Major Interests / Objectives

The Communication is iMM's first line of interaction with society providing updated, reliable and relevant information on all of iMM's thematic areas, as well as promoting the very best scientific successes made by its research teams. Its mission is to support the internal and external communication of iMM's activities as well to advice iMM Direction on Public Affairs issues.

With the firm belief that science should inform decisions because it impacts everyone's lives, the Communication targets a wide range of audiences (policy makers, public opinion, patients' associations, medical societies, schools, academia, industry, media, arts, amongst others). It serves as spokesman for the institute and it's responsible to manage iMM's image aligned with the institute values and mission.

The Communication Office is responsible for the overall image of iMM, our day-to-day activities encompass Media Relations, Science and Society Outreach, Conferences and Events, Institutional Visits, Awareness Campaigns, Social Media, Internal Communication and Public Affairs Training.

Director

Ana Inês Jones Manteigas Domingues, PhD

Team

Ana Cláudia Marques da Silva	Communication Officer
Gonçalo Martins Farinha de Figueiredo Ribeiro	Trainee (Started December)

Keywords

Corporate and Institutional Communication, Science Communication, Public Affairs, Digital Communication, Social Media, Outreach, Science In and For Society.

Major Achievements

In 2020, we increase awareness and visibility, improve the public information about iMM, improve internal communication and reach new publics.

Due to COVID-19 pandemic, we had to reorganize the type and mode of iMM outreach events to promote a more effective dialogue between our scientists and society.

Regarding the internal communication, we created new internal communication channels, for example iMMagine website, to provide more and better information available for everyone at iMM.

In 2020, Communication Office also improve the network with iMM facilities and informal groups, such as Finance and Operations Office (Safety and Compliance, Pre-Award, Project Management and Legal), Training Hub, Centro de Diagnóstico Molecular COVID-19, Tech Transfer Office, PDA, PhD Committee and Get2Gether.

Invited lectures and Seminars

Domingues I. Está na altura de falar de incerteza. SciCom PT, Online Event, May 14, 2020.

Domingues I. Host. Q&A | Master in Biomedical Research, Online, June 17, 2020.

Organization of Events

Organization of the Out of Our Box Seminar with Helena Chapman (Associate Program Manager, Health and Air Quality Applications, NASA Applied Sciences Program), Online, October 22, 2020.

Organization of the Out of Our Box Seminar with Vítor Cardoso (CENTRA – Centro de Astrofísica e Gravitação, Instituto Superior Técnico), Online, November 26, 2020.

Science and Society

Co-Organization with Clara Artur (Assistant to the Board of Directors). Horizontes iMM: Uma Pergunta a Três – Porque é que o cancro nos escapa?, Colégio Efanor, Porto, Portugal, January 8, 2020.

Co-Organization with Clara Artur (Assistant to the Board of Directors). Horizontes iMM: Uma Pergunta a Três – Porque é que o cérebro deixa de comunicar com o corpo, Colégio Efanor, Porto, Portugal, February 19, 2020.

Organization of webinars related to COVID-19 pandemic:
- Vamos falar de Ciência: SARS-CoV-2, March 26, 2020;
- Vamos falar de Ciência: Números, vírus e o nosso sistema imunitário, April 8, 2020.

Co-Organization with COLife Communication Offices. Como aceder a informação fidedigna, Online, April 16, 2020.

Co-Organization with COLife Communication Offices. Sharing Information Together: Vamos falar de vacinas, Online, April 29, 2020.

Co-Organization with COLife Communication Offices. Sharing Information Together: Cientistas na era COVID-19, entre o confinamento e a retoma, Online, May 15, 2020.

Organization of the Q&A | Master in Biomedical Research, Online, June 17, 2020.

Co-Organization with Training Hub. LisbonBioMed Q&A Session, Online, November 24, 2020.

Organization of the iMM European Researchers' Night Online Event, A scientist in the making, November 27, 2020.

Finance and Operations Office

Major Interests/Objectives

The Finance and Operations Office operates under an agile organizational model with six departments - Pre-Award, Project Management, Purchases and Procurement, Accounting, Legal and Safety and Compliance each with a dedicated Area Manager empowered to design and implement the strategy for each department, aligned with iMM overall priorities.

The Finance and Operations Office main purpose is to maintain an extremely agile structure to give the best possible support to the scientific community, viewed as internal clients. The six areas working collaboratively, allow for a unified 360º view of the full science management loop, starting with pre-award counselling and application revision to post-award financial and operational follow-up, coordinated by the project management team in proximity with the purchases team, responsible for maintaining full compliance in procurement alongside with internal legal counseling. The process ends with the accounting booking processes and reporting executed by the accounting team. Finally, all safety procedures regarding lab management are fully integrated in this process as a vital part of iMM's operations infrastructure. The Finance and Operations Office is also responsible for all audit processes coordination and to assure the liaison with all financing bodies and develops, upon request, specific studies on relevant matters with nationwide impact for the Portuguese scientific landscape.

Pre-Award – Proposal design support; Support in consortium formation - identifying missing competences; Liaison with funding agencies; Administrative and financial grant support; Support to grant writing namely impact (dissemination, communication, exploitation) and implementation sections; Budgeting support and validation; Ethics compliance advice; Support on intermediate reporting closer with project management and with lab managers.

Core Services:

- Dissemination of interesting funding opportunities for iMM's community
- Tailored support to match project idea with open or forthcoming calls
- Support in grant preparation:
    - provide administrative and institutional information
    - provide advice on financial and ethics compliance
    - ensure compliance with both funding agencies and iMM's regulations
    - perform proposal review and proofreading

- manage and consolidate consortium information

- Negotiation of contracts and agreements
- Support in Institutional funding-related initiatives

Accounting – iMM statutory accounts and tax returns; Cost accounting; Reporting and compliance with funding bodies accounting practices; Dedicated report building on cash flow and HR costs.

Core Services:

Accounting is divided in three major areas:

- Invoicing – iMM Invoicing, Supplier Invoicing and Invoice Archive Management
- Payments and refunds – Accounts Payable, Refunds and Advance Payments
- Tax/Fiscal – Human Resources (social security and withholding tax) and Suppliers (VAT; withholding tax; income statements)

Project Management – From contractual start to final report submission; Related-support to researchers; Execution control through project life cycle; Coordination of internal and external audits to projects; Risk monitoring to foresee future tendencies in cost evolution.

Core Services:

- Monitoring of project financial execution
- Ensuring projects deadlines are met
- Preparation and submission of financial reports
- Preparation and monitorization of financial audits
- Administrative support in interactions with funding agencies

Purchasing Office – Tendering according to Portuguese and European legislation; Verification of the validity of expenses associated with a research project; Placing the order to the supplier; Tracking delivery times and updating the researcher on lead times.

Core Services*:*

- Procurement - to help make informed, best-value (money, quality and time) purchasing decisions by establishing transversal contracts and agreements with a wide supplier network.

- Purchasing - to maintain, interpret, and enforce the purchasing policy (according to funding bodies) while ensuring that all expenses are eligible, by approving purchases with the help of all departments and handling the dispatching of all Purchase Orders to vendors.
- Logistics - to manage incoming products from suppliers by handling importation procedures and customs clearance while also checking-in and register in our internal system.

Legal – Institutional and Researcher's support; Main areas of expertise: Intellectual Property; Consortium Agreements; Public Law and Employment.

Core Services:
Preparation and revision of agreements and other acts (namely in the areas of labor commercial and public law, intellectual property and corporate & governance) and ensure the legal adequacy of processes, providing the optimum balance between the management promptness and efficiency with the legal utmost clarity and safety.

The Finance and Operations Office through its Director also provides support to the Executive Director in all matters regarding financial and management strategy while being responsible for overall budget submission and follow-up execution of the operational budget of all iMM facilities. The Finance and Operations Office is also requested to give support in matters concerning inter-institutional collaborations. Finally, the Finance and Operations Office is accountable for promoting Quality Management System actions regarding up-to-date procedures, reports and assessments per facility and fulfilment of ISO 9001 requirements.

Director

Fausto da Costa Santos Lopo de Carvalho, Master/MBA

Team

Assistant to the Board of Directors:

Ana Clara Pereira Faria Artur	Assistant to the Board of Directors

Pre-Award:

Joana Cristina Costa	Pre-Award Area Manager
Marija Petkovic Garcia	Grants Officer
Sílvia da Conceição Santos Pereira da Costa	Grants Officer

Project Management:

Ana Maria Branco Alves	Project Manager
Andreia Sofia Gonçalves Almeida Vaz Veiga	Senior Project Manager
Eduarda Maria Seabra Rosmaninho	Project Manager
Madalena Gil Martins Reis	Project Management Area Manager
Maria José Flores Marques Antunes	Senior Project Manager
Mariana Advirta da Silva Matos Pereira	Project Manager (Started March)

Accounting:

Maria Elisabete Santos Liberato	Senior Accounting Administrative Technician
Maria Fernanda Gonçalves da Veiga Vila-Chã	Administrative Technician
Maria José Serra da Silva	Senior Accounting Administrative Technician
Pedro Miguel da Rosa Santos	Senior Accounting Administrative Technician
Sandra Paula da Silva Duarte	Accounting Area Manager
Vera Cristina Felício da Conceição Rêgo	Senior Accounting Administrative Technician

Purchasing and Procurement:

Alexandre Manuel Raposo de Jesus	Purchasing and Procurement Area Manager
Ana Rita Fonseca Vicente	Senior Purchasing Administrative Technician
Lúcia Cristina Manso Alves	Purchasing Administrative Technician
Manuel Carlos Nunes Abalada	Administrative Trainee (Started March)
Sandra Isabel Francisco Lopes	Senior Purchasing Administrative Technician
Vânia Isabel Estevens Polido Marques Paula	Senior Purchasing Administrative Technician

Legal:

Inês Bilé da Silva Plácido	Legal Counsel

Safety and Compliance:

Ana Francisca Barroca Lemos	Technician
Cláudia Sofia Palmeiro Alves da Costa	Technician
Maria Jardim Caramelo Dias Cabral	Technician
Sara Diana Pinheiro dos Santos	Safety and Compliance Area Manager

Washing Room:

Ana Cristina dos Santos Anunciação	Technician
Anilda Sofia Araújo Almeida	Technician (Left January)
Bashir Shamshudin Habib Alibhai	Technician
Daiani Barcelos Barbosa	Technician (Started January)
Edna Neias Ferreira Gomes	Senior Technician
Leonardo Giraldo Carraça	Technician (Started January. Left January)

Front Office:

Ana Rita Matos Dias	Administrative (Left August)

Keywords

- Pre-Award – Call alignment with institutional strategy; Horizon Europe capacity build up
- Project Management – Digital invoicing; VAT in Science and Facility Cost Management
- Purchases and Procurement – New Purchasing system; VAT in Science; Booking System
- Accounting – Digital Invoicing; VAT in Science; Accuracy control on monthly closing
- Safety and Compliance – Safety audit; Equipment listing and control; New equipment maintenance software
- Legal – Capacity building on specific legal expertise

Major Achievements

The year of 2020 was challenging in all possible ways. The pandemic situation of caused by COVID-19 forced the teams to adapt to new work and communication methodologies. iMM started a new operation fully dedicated to COVID-19 testing only after a few weeks after the shut down in March 2020. iMM operations had to respond quickly, contracts had to be written and reviewed at fast pace to allow iMM to be fully compliant with the new diagnostic service provided while stocks had to be planned in a worldwide shortage scenario for covid-19 related lab products. In September the COVID-19 a dedicated team, recruited for this activity, moved to a new physical space in Estádio Universitário and additional scientific equipment was purchased to fully equip this new facility. Managing the added responsibilities coming from this new activity while maintaining the level of quality of every normal daily tasks at iMM was the best possible performance indicator for the Finance and Operations team.

Pre-Award:

Dissemination of 500+ funding opportunities; Support to 365 applications to 48 different International and 25 different National Funding Programmes, namely in eligibility, legal, technical and administrative aspects, as well as the ethics and data management requirements; Preparation of specific material of support for applications to the FCT call for IC&DT projects and the FCT call for Scientific Employment; Writing and proof-reading of institutional proposals, namely to the FCT CoLab call and the FCT 'Laboratórios Associados' call; Increased compliance of iMM researchers with the Pre-Award regulations; Project implementation monitoring and advice on selected on-going projects (e.g. H2020 ERC, FET Open and Widening, "la Caixa" Foundation Health Research).

Accounting:

Accounting continued to ensure strict compliance with the closing deadlines on a monthly basis while performing the classification and recording of accounting documents in the projects, allowing for full compliance with the submission of payment requests to the financing bodies.

Detailed financial analysis by LAB Code alongside with Cash-Flow specific controls and Human Resources dashboards continued to be a priority and were delivered as planned. Balance Sheet and Income Statement maps were updated on a bi-annual basis and, in 2021, this exercise will be done on a quarterly basis. Changes in iMM financial ERP started to be put in place to accommodate not only the VAT refund in research projects but also to allow for digital invoicing and archiving of accounting documents enhancing process optimization of accounting booking. Finally, the accounting team played an important role on invoice issuing and control of the COVID-19 operation at iMM.

Purchasing and Procurement:

The year of 2020 was a breakthrough year for the Purchasing and Procurement because it reflected the adjustment of strategy from the previous year: despite the disruption of the worldwide supply-chains, the department was able to leverage its work with the suppliers to reduce or, in some case, nullify the disruption to the researchers, maintaining a fast response time and reducing by half the number of null or reworked orders.

The department was still able to provide a fast response to the new COVID molecular testing by iMM, by ensuring that there were sufficient Personal Protection Equipment's and testing supplies, despite the worldwide shortage.

The second semester of 2020 also laid the groundwork for new systems that will allow the automation of processes, with a new Purchasing System directly connected to the accounting software, or for more sources of information to the researchers.

There was also an increase on the time available for pick-up of products by the researchers, without impacting work and allowing for the distancing of personnel in the warehouse, with a new person dedicated to this function.

Project Management:

In 2020, the Project management team continued to support iMM laboratories liaising communication with financing bodies, ensuring timely project reporting and compliance. COVID-19 intensified the regular contacts as the underlying uncertainty to this pandemic impacted project rules and deadlines with the need for further clarifications. Project Management Team shown great flexibility by rapidly adapting to remote work and doing it with low impact in daily tasks. The paper dependence tasks were revisited to ensure smooth transition the new reality.

The agile F&O department backed the creation of a COVID-19 diagnostic task force, a swift iMM response to this pandemic. Project management through teamwork and commitment stepped in the administrative and operational part of this task force.

Legal:

The Legal department gave support to the successful implementation of all COVID-19 related activities and private donor relations. Several contracts had to be written and reviewed at very short notice and the expertise and know-how of iMM legal department allowed iMM to operate in an always compliant level.

Safety & Compliance:

The year of 2020 was a challenging and rewarding year for Safety & Compliance because, while still maintaining its support to researchers, the team was responsible for implementing the internal measures for the prevention of COVID-19 at iMM, being one of the main points of contact with the stakeholders FMUL, UL and IPDJ.

Safety & Compliance gave support to the task forces created to address different COVID-19 related needs at iMM, by finding them the right places to work, giving technical support regarding equipment and safety measures. In the second semester, the team helped prepare a new laboratory space from scratch, in a different building, for the COVID Molecular Diagnostics Unit and the COVID Serology Unit.

Regarding non-COVID matters, in the first semester the working spaces of the Legal and HR Office were remodeled, and in the second semester, the remodeling works of the Animal Behavior Rooms began. Following iMM's risk assessment, chemical safety cabinets were acquired and installed in selected facilities and labs.

In the Washing Room, a new washing equipment was acquired as well as and more common glassware, allowing iMM to transition from disposable to reusable lab material.

Human Resources Office

Major Interests/ Objectives

The purpose of the Human Resources Office is to develop, implement and support programs and processes that add value to iMM and its employees, leading to improvements in employee well-being, empowerment and growth, while committed to iMM's key activity: Research. The mission is to provide effective human resource management through the development and implementation of policies, programs and services that contribute to the pursuit of iMM's Vision "to promote individual freedom and ambition, not a culture of individuality", and the common goal of "creating new knowledge that will impact human health". In order to increase the response capacity to internal requests and to improve the welcoming of new members, HR Office reinforced the team.

Director

Sofia Isabel Lopes dos Santos Vicente dos Santos, University Degree

Team

André Daniel dos Santos Brás Pereira	HR Administrative Technician
Cláudia Aurora Mira Soeiro	Senior HR Administrative Technician
Pedro Humberto Fernandes Monteiro Leite	Administrative Trainee (Left June). HR Administrative Technician (Started June)
Sara Duarte Pifano da Costa Eiras	Senior HR Administrative Technician (Started June)
Sérgio Miguel Cargaleiro Delgado Figueiredo Lopes	Senior Administrative Technician (Left March)

Keywords/Research Areas

The Human Resources team has solid technical and soft skills that aim to promote Talent. Our goal is to select and support the most prepared candidates whether is a researcher or support staff to maintain the excellence of iMM.

Major Achievements

The Human Resources Office in 2020 had several major achievements: 1. UNIT4 training and vacation scheduling management; 2. Members academic degree competence information and CIÊNCIA-ID inserted in UNIT4; 3. Construction of the new career by law and respective evaluation system for *FCT Laboratórios Associados* call; 4. Recruitment process of two Head of Facility; 5.

Support to the COVID-19 operation through the team's recruitment; 6. Resuming occupational medicine appointments (90 appointments);
7. Issuing mandatory circulation statements in several moments throughout the confinement period; 8. Adapting and ensuring the welcoming process of new members while working from home; 9. Launching the online Onboarding sessions; 10. Conflict management; 11. *MyID Programme* follow-up through *My Step* mentoring sessions.

During 2020, due to the demands of the COVID-19 Pandemic period, our focus was to ensure the daily tasks and several deadline fulfilments being most of the time working from Home Office.

With the admission of a new member in June, Sara Eiras, the team was reinforced to be able to reply to all of the legal accounting demands of Payroll. Sara's initial training was a challenge since it happened in a 'virtual way' and to know totally iMM it wasn´t an easy task.

Regarding the *MyID Programme,* the Workshops were put in standby, but all the follow-up My Step sessions took place online and, fortunately, we continue with a very good success rate.

Regarding the *FCT Laboratórios Associados* call, new career by law and respective evaluation system was built and ready to come into effect in 2021.

Below we showcase the principal facts and figures related to the work developed all year round in comparison with previous years:

A) Number of Recruitment and Selection (R&S) interviews conducted:

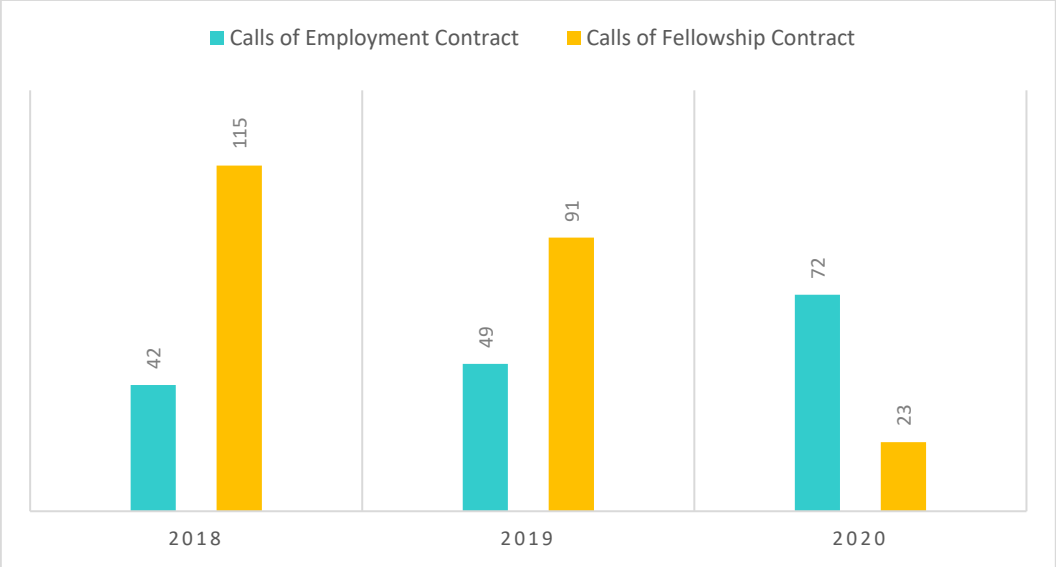
	1st Interviews	2nd Interviews	Final Interviews	Total
2018	27	15		27
2019	77	24	11	112
2020	161	54	16	231

B) Number of Follow-up interviews conducted:

	1st Follow-up Interviews	2nd Follow-up Interviews	3rd Follow-up Interviews	Exit Interviews	Total
2017	4	3		3	10
2018	17	14	13	2	46
2019	45	34	10	6	95
2020*	48	79	8	3	138

*The 1st, 2nd and 3rd interviews, since 2020, were 'conducted' through an online questionnaire.

C) Number of New Employment and Fellowship Contract Calls per Year:



D) Number of Employment and Fellowship Contract per Year:

In the near future, all our new projects will continue to be guided by iMM's main goal: "Institute that offers a vibrant scientific environment, aiming to nurture innovative ideas (…) leveraged by high-quality human resources, increasing expenditure in infrastructures and knowledge transfer to the society".

Technology Transfer Office

Major Interests/Objectives

We stimulate the valorization of knowledge produced at iMM through:

- The creation of a favorable internal environment to foster innovation and speed up the translation of promising ideas and results into new medical solutions;
- The protection and licensing of intellectual property;
- The promotion of entrepreneurship and the creation of start-ups;
- A closer interaction with industry (at national and international level) leading to new collaborations;
- The participation in relevant European networks and initiatives related with translational research (e.g.: EATRIS), open innovation (e.g.: Open Innovation Test Bed – "SAFE-N-MEDTECH" and "INNO4COV-19") and business acceleration.

Director

António Pedro Alves da Silva, University Degree

Team

Bárbara Sofia Lopes Gomes	Senior Technology Transfer Officer
Beatriz Paisana Ferreira Bouza da Costa	Technology Transfer Trainee (Started October)

Keywords

Technology transfer, innovation, entrepreneurship, intellectual property, business development

Major Achievements

Our IP portfolio was strengthened with 20 new inventions and 37 patents filed in different territories. 8 license agreements have been set with companies to exploit iMM IP. Efforts to create 5 new start-up companies are undergoing, having 1 of them (undisclosed) been already established with a seed round of 2 million Euro backed by one of the leading early-stage investors in Europe.

We have also been involved in the creation of an Investment Fund in Portugal entirely dedicated to early-stage investment in Life Sciences, with a target closure of 50 million Euro and under evaluation by the European Investment Fund.

137 collaborations with industry were promoted and 47 formalized. We are leading a new H2020 funded project (INNO4COV-19) to reinforce our collaborations with industry in the development of innovative solutions to tackle the COVID-19 pandemic.

Organization of Conferences

We have organized visits of industry to iMM, including:

- Ono Pharma (February);
- Sysmex R&D (February).

We have also organized a workshop on intellectual property in the context of the Ribomed project (October).

Training Hub

Major Interests/Objectives

General Aim: To provide training opportunities for a successful science-related career to researchers at different stages in their careers.

Specific Objectives:

- Ensure full running of ongoing Master, PhD, and Postdoctoral Programs: launch calls; administrative execution; managerial support to PhD students/Postdoctoral researchers' activities; support MSc/PhD students and Postdoctoral researchers throughout their training; production of overall metrics, and reporting.
- Coordinate the "Master Program @ iMM";
- Coordinate the "Training Program for the Next Step";
- Run CAML Advanced Courses: cover all organizational aspects in articulation with IFA, FMUL;
- Organize Courses, Workshops, Seminars;
- Manage the Monday Lectures seminar series;
- Support candidate's applications to PhD fellowships at iMM (FCT, "la Caixa" Foundation");
- Coordinate university students' visits (e.g. Job Shadowing Days) and traineeships at iMM (summer internships, CoLabs).

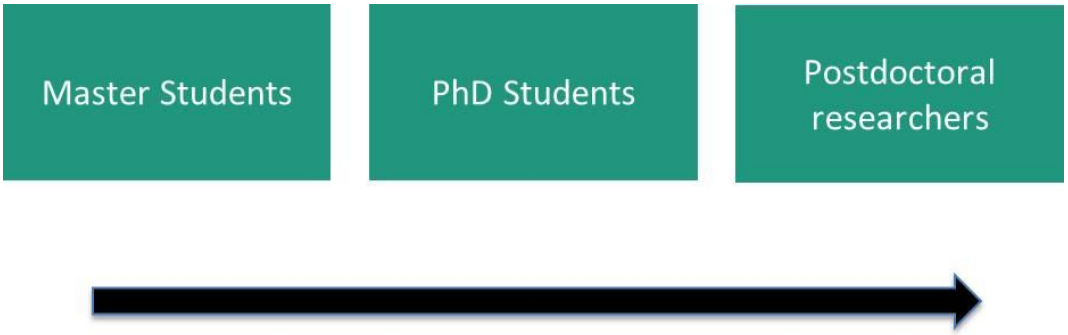
Director

Domingos Manuel Pinto Henrique, PhD

Team

Ana Filipa Duarte Nunes Almeida	Training Hub Area Manager

Graphical Abstract



Keywords

Advanced-Training, Master Program, PhD Program, Postdoctoral Program, Courses/Workshops.

Major Achievements

Specific Achievements:

- Overall managerial and administrative execution of the LisbonBioMed PhD Program, including the production of metrics, and reporting;
- Implementation of the "Merit Award João Lobo Antunes" to award the best Doctoral Theses;
- Implementation of the new Master in Biomedical Research, in articulation with IFA-FMUL;
- "Master Program @ iMM": assembly and dissemination of iMM´s Master project proposals/vacancies; "Best Master Thesis" Awards;
- "Training Program for the Next Step": personalized reviewing and mock interviews of full applications (including cover letters, research projects and CVs) for PhD, postdoctoral, and group leader positions;
- Organization of courses, seminars, visits, and traineeships at iMM.

Transversal managerial support to:

- FCT fellowships: applications, renewals, periods abroad, thesis committees and defenses, general queries;
- PhD students/Postdocs-driven initiatives.

Advanced Teaching

Nunes F. Organizer. Scientific Writing Course: Writing your grant proposal (Hands-on Course). Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 15-21, 2020.

Henrique D. Organizer. LisbonBioMed Course: Towards a Creative and Critical Mind. Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 27-31 and March 2-6, 2020.

Nunes F. Organizer. Workshop: Research ethics and scientific misconduct. Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, January 30, 2020.

Henrique D. Organizer. Course: Introduction to Data Management Plans – Ready for BioData Management? Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, March 6, 2020.

Nunes F. Organizer. Webinar: Strategies for managing our well-being during COVID times. May 28, 2020.

Nunes F. Organizer. (Online) Workshop: Resilience & Well-being in Academia. November 12, 2020.

Science and Society

Virtual Lab Visits in the context of the CoLab Sessions, organized in collaboration with the IEEE-IST EMBS (Engineering in Medicine and Biology Society) – Student Chapter, December 11-17, 2020 (fourty Instituto Superior Técnico (IST) engineering students).

Spin-Offs

GenoMed, Diagnósticos de Medicina Molecular SA

Major Interests/Objectives

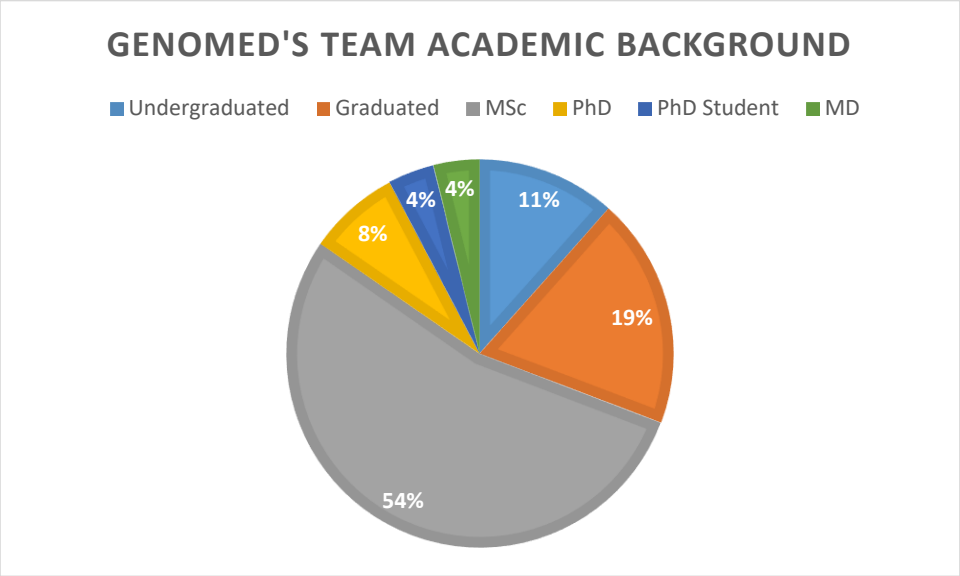
GenoMed is a spin-off company of iMM created in 2004. GenoMed's mission is to provide cutting-edge technology transfer services relevant for medical applications. Currently, GenoMed offers more than 700 different tests that are used in diagnosis, prognosis and therapeutic follow-up. The main medical areas covered include Oncology, Haematology, Cardiology, Neurology, Gastroenterology/Hepatology, Nephrology, Endocrinology/Metabolic diseases, Obstetrics/Gynecology, Pneumology, Dermatology, Ophthalmology, Otorhinolaryngology, Pediatrics, Urology and Pharmacogenetics. Additionally, GenoMed provides parental and ancestry DNA testing.

Director

Teresa Porta Nova, MSc, Executive Director/Technical Director

Diana Antunes, MD, Clinical Director/Clinical Geneticist

Team



Keywords/Research Areas

Molecular Diagnosis, Oncology, Genetics, Rare Diseases.

Major Achievements

In 2020, we implemented 19 new NGS panels for several medical specialties such as cardiology, neurology, among others. Those panels have been designed together with the clinicians, in an Open Innovation format, in order to respond to their patient's needs.

A partnership was celebrated with a molecular and anatomical pathology laboratory to carry out molecular tests for Mozambique and Cape Verde population.

Looking forward to developing projects related to the Oncology and Pharmacogenetics fields, contracts with the pharmaceutical industry were established.

Publications in Peer Reviewed Journals

Kim SH, Da Cruz Paula A, Basili T, Dopeso H, Bi R, Pareja F, da Silva EM, Gularte-Mérida R, Sun Z, Fujisawa S, Smith CG, Ferrando L, Sebastiao APM, Bykov Y, Li A, Silveira C, Ashley CW, Stylianou A, Selenica P, Samore WR, Jungbluth AA, Zamarin D, Abu-Rustum NR, Helin K, Soslow RA, Reis-Filho JS, Oliva E, Weigelt B (2020). Identification of recurrent FHL2-GLI2 oncogenic fusion in sclerosing stromal tumors of the ovary. Nature Communications 11(1):44. *(IF: 12.121. Citations: 1. Source: Web of Science)*.

Gromicho M, Coutinho AM, Pronto-Laborinho AC, Raposeiro R, Tavares J, Antunes D, de Carvalho M (2020). Targeted next-generation sequencing study in familial ALS-FTD Portuguese patients negative for C9orf72 HRE. Journal of Neurology 267(12):3578-3592. *(IF: 3.956. Citations: 0. Source: Web of Science)*.

Kidd K, Vylet'al P, Schaeffer C, Olinger E, Živná M, Hodaňová K, Robins V, Johnson E, Taylor A, Martin L, Izzi C, Jorge SC, Calado J, Torres RJ, Lhotta K, Steubl D, Gale DP, Gast C, Gombos E, Ainsworth HC, Chen YM, Almeida JR, de Souza CF, Silveira C, Raposeiro R, Weller N, Conlon PJ, Murray SL, Benson KA, Cavalleri GL, Votruba M, Vrbacká A, Amoroso A, Gianchino D, Caridi G, Ghiggeri G, Divers J, Scolari F, Devuyst O, Rampoldi L, Kmoch S and Bleyer AJ (2020). Genetic and Clinical Predictors of Age of ESKD in Individuals with Autosomal Dominant Tubulointerstitial Kidney Disease Due to UMOD Mutations. Kidney International Reports 5(9):1472-1485. *(IF: 3.336. Citations: 0. Source: Web of Science).*

Velasco A, Tokat F, Bonde J, Trim N, Bauer E, Meeney A, de Leng W, Chong G, Dalstein V, Kis LL, Lorentzen JA, Tomić S, Thwaites K, Putzová M, Birnbaum A, Qazi R, Primmer V, Dockhorn-Dworniczak B, Hernández-Losa J, Soares FA, Gertler AA, Kalman M, Wong C, Carraro DM, Sousa, Reis RM, Fox SB, Fassan M, Brevet M, Merkelbach-Bruse S, Colling R, Soilleux E, Teo RYW, D'Haene N, Nolet S, Ristimäki A, Väisänen T, Chapusot C, Soruri A, Unger T, Wecgowiec J, Biscuola M, Frattini M, Long A, Campregher PV, Matias-Guiu X (2020). Multi-center real-world comparison of the fully automated Idylla™ microsatellite instability assay with routine molecular methods and immunohistochemistry on formalin-fixed paraffin-embedded tissue of colorectal cancer. Virchows Archive. Epub ahead of print. *(IF: 2.906. Citations: 0. Source: Web of Science).*

Silveira C*, Sousa AC*, Janeiro A*, Malveiro S, Teixeira E, Brysch E, Pantarotto M, Felizardo M, Madureira R, Nogueira F, Guimarães C, Matos C, Canário D, Bruges-Armas J, Carmo-Fonseca M (2020). Detection and quantification of EGFR T790M mutation in liquid biopsies by droplet digital PCR. Translational Lung Cancer Research. Accepted for publication. *(IF: 5.132. Source: Web of Science).*

da Silva EM, Beca F, Sebastiao APM, Murray MP, Silveira C, Da Cruz Paula A, Pareja F, Wen HY, D'Alfonso TM, Edelweiss M, Weigelt B, Brogi E, Reis-Filho JS, Zhang H (2020). Stromal MED12 exon 2 mutations in complex fibroadenomas of the breast. Journal of Clinical Pathology. *(IF: 2.460. Source: Web of Science).*

Other National Publications

Gomes AC, Barbosa PS, Coutinho A, Cruz I, Carmo-Fonseca M, Lopes LR (2020). Whole-genome DNA sequencing: The key to detecting a sarcomeric mutation in a 'false genotype-negative' family with hypertrophic cardiomyopathy. Revista Portuguesa de Cardiologia 39(4):227. *(IF: 0.96. Citations: 0. Source: Web of Science).*

Ongoing Research Projects

2020/Present: Infogene, funded by Lisboa2020, Portugal2020 from European Regional Development Fund (FEDER); Coordinator: Brígida Meireles.

2020/Present: Mutational Status of IGHv genes in CLL patients. Jansen/ Keypoint. Coordinator: Sónia Matos.

2020/Present: Development and optimization of the diagnostic route for NTRK1, NTRK2 and NTRK3 fusion detection. Roche Farmacêutica Química, Lda. Coordinator: Ana Carla Sousa.

2020/Present: Clinical Trial in metastatic breast cancer (FOENIX-MBC2_TAS-120-201). Determination of high-level *FGFR1* amplification and *FGFR2* amplification by Fluorescence *in Situ* Hybridization (FISH). Taiho Oncology, inc./UBC. Coordinator: Sónia Santos.

2018/Present: Next Generation Sequencing (NGS) to test BCR-ABL1 mutations in patients with CML and ALL Ph+ treated with TKIs. Incyte. Coordinator: Sónia Matos.

2017/2020: MyCardioGeneTest, funded by Lisboa2020, Portugal2020 from European Regional Development Fund (FEDER); Coordinator: Brígida Meireles.

Communications in International Conferences

Pavlova S, Malcikova J, Radova L, Bonfiglio S, Sutton L-A, Brieghel C, Spina V, Rapado I, Baran-Marszak F, Porret NA, Rosenberg D, Martínez Laperche C, Catherwood M, Garcia-Marco JA, Serrano A, Fernández-Rodríguez C, Tausch E, Quinn F, Van de Corput L, Bilbao C, Thiede C, Stoj A, Cowland JB, Chatzidimitriou A, Bidet A, Vynck M, Piras G, Biderman B, Sloma I, Largeaud L, Valk PJM, Davis Z, Gameiro P, Galieni P, Matos S, Pepek M, Pandzic T, Luna I, Kahre T, Laird S, Alcoceba M, Tazon-Vega B, Rodríguez AE, Davi F, Rosenquist R, Rossi D, Niemann CU, Ghia P, Pospisilova S, on behalf of European Research Initiative on CLL (ERIC) - TP53 Network. Interlaboratory Comparison of NGS Methods for Detecting TP53 Variants <10% VAF: The First Phase of Eric Multicenter Study on Prognostic and Predictive Impact of Low-Frequent TP53 Variants in CLL. 25th EHA Meeting - Virtual Meeting, June 11-14, 2020. *(Poster Presentation)*

Silveira C, Sousa AC, Corredeira P, Martins M, Sousa AR, Da Cruz Paula A, Selenica P, Brown DN, Golkaram M, Kaplan S, Zhang S, Liu L, Weigelt B, Reis-Filho JS, Costa L, Carmo-Fonseca M. Liquid biopsy detects therapy response in advanced breast cancer. EACR Virtual Conference on Liquid Biopsies, November 18-19, 2020. *(Poster Presentation)*

Maggioni G, Tentori CA, Voso MT, Pleyer L, Metzeler KH, Middeke JM, Desterro J, Carmo-Fonseca M, Travaglino E, Fazi P, Piciocchi A, Dufour A, Esteve J, Pratcorona M, Mancini V, Lussana F, Spiekermann K, Thiede C, Stölzel F, Botelho de Sousa A, Tormo M, Acha P, Arnan M, Fracchiolla N, Hentrich M, Sippel C, Heilmeier B, Lemos M, Nunes A, Matos S, Diaz M, Garrido A, Gallardo D, Vives S, Salamero O, Todisco E, Basilico CM, Passamonti F, Machherndl-Spandl S, Heibl S, SierraJ,* Sole F,* and Della Porta MG*. Acute myeloid leukemia with in isocitrate dehydrogenases (IDH) 1 and 2 mutations. A real-world study from the European IDH research group. 62nd ASH Annual Meeting – Virtual Meeting, December 2-11, 2020. *(Poster Presentation)*

Borralho Nunes P, Alves-Vale C, Brodbeck Ilgenfritz R, Tortosa F, Guerreiro H, Matos S. A case report of indolent T-cell lymphoproliferative disorder of the gastrointestinal tract – a rare differential to consider in gastric biopsies. Virtual 32nd Congress of the ESP and XXXIII International Congress of the IAP, December 6-8, 2020. *(Poster Presentation)*

Industry Contract Research

2020/Present: Mutational Status of IGHv genes in CLL patients. Jansen/ Keypoint. Coordinator: Sónia Matos.

2020/Present: Development and optimization of the diagnostic route for NTRK1, NTRK2 and NTRK3 fusion detection. Roche Farmacêutica Química, Lda. Coordinator: Ana Carla Sousa.

2020/Present: Clinical Trial in metastatic breast cancer (FOENIX-MBC2_TAS-120-201). Determination of high-level *FGFR1* amplification and *FGFR2* amplification by Fluorescence *in Situ* Hybridization (FISH). Taiho Oncology, Inc./UBC. Coordinator: Sónia Santos.

2018/Present: Next Generation Sequencing (NGS) to test BCR-ABL1 mutations in patients with CML and ALL Ph+ treated with TKIs. Incyte. Coordinator: Sónia Matos.

Advanced Teaching

Matos S. Lecture. Genética Aplicada à Hemato-oncologia – Biologia Molecular. Curso de Pós-Graduação em Medicina Laboratorial (5th edition). Instituto de Ciências da Saúde da Universidade Católica Portuguesa e Centro de Medicina Laboratorial Germano de Sousa, Lisbon, Portugal, May 29, 2020.

Santos S. Lecture. Genética Aplicada à Hemato-oncologia – Citogenética. Curso de Pós-Graduação em Medicina Laboratorial (5rd edition). Instituto de Ciências da Saúde da Universidade Católica Portuguesa e Centro de Medicina Laboratorial Germano de Sousa, Lisbon, Portugal, May 29, 2020.

RoPlaVac

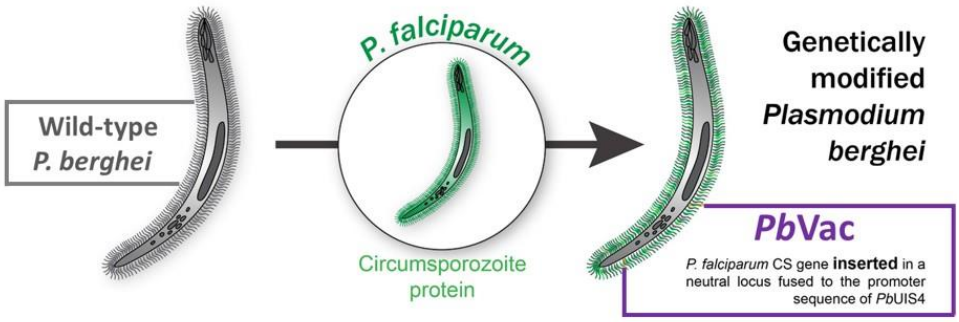
Major Interests/Objectives

We are a spin-off company of iMM, created in 2014. Our mission is to develop medical solutions against malaria, one of the most prevalent diseases worldwide. Malaria is caused by *Plasmodium* parasites, injected into their mammalian host as sporozoites, through the bite of an infected mosquito. Currently, RoPlaVac is engaged in three main endeavours: (1) Development of a new whole-organism vaccine against malaria, based on the use of genetically modified rodent *Plasmodium* parasites; *Plasmodium* sporozoite cryopreservation, (2) Development of an effective method to cryopreserve *Plasmodium* sporozoites for use in research and vaccination; (3) Development of a cell culture-based method to produce infective *Plasmodium* sporozoites for use in research and vaccination.

Director

Miguel Prudêncio, PhD, Group Leader at Instituto de Medicina Molecular João Lobo Antunes – Prudêncio Lab

Graphical Abstract



Team

António Manuel Barbeiro Mendes	Senior Postdoctoral Researcher
Maria Manuel Dias da Mota	Group Leader
Rui Miguel Prudêncio Cunha Pignatelli	Group Leader

Keywords/Research Areas

Keywords: Malaria, *Plasmodium*, Vaccines, Sporozoites, Cryopreservation.

Research Areas: Vaccination; Anti-malarial strategies.

Major Achievements

- Worldwide maintenance of patent covering RoPlaVac's novel vaccination strategy against malaria;
- Publication of first-in-humans clinical evaluation of the first vaccine candidate employing RoPlaVac's patented technology;
- An effective cryopreservation method for *Plasmodium* sporozoites is under optimization in collaboration with the company SmartFreez;
- A novel *in vitro* system for development of *Plasmodium* sporogonic stages was employed to assess the transmission-blocking activity of known antiretroviral compounds.

Selected Publications

Reuling IJ, Mendes AM, de Jong GM, Fabra-García A, Nunes-Cabaço H, van Gemert GJ, Graumans W, Coffeng LE, de Vlas SJ, Yang ASP, Lee CK, Wu Y, Birkett AJ, Ockenhouse CF, Koelewijn R, van Hellemond JJ, van Genderen PJJ, Sauerwein RW, Prudêncio M (2020). Safety and efficacy of a genetically modified rodent malaria parasite against Plasmodium falciparum malaria: an open-label randomized phase 1/2a trial. Science Translational Medicine 12, eaay2578. *(IF: 16.304. Source: Web of Science).*

Azevedo R, Mendes AM, Prudêncio M (2020). The impact of antiretroviral therapy on malaria parasite transmission. Frontiers in Microbiology 10:3048. *(IF: 4.236. Citations: 2. Source: Web of Science).*

Azevedo R, Mendes AM, Prudêncio M (2019). Inhibition of Plasmodium sporogonic stages by ivermectin and other avermectins. Parasites & Vectors 12(1):594. *(IF: 2.824. Citations: 5. Source: Web of Science).*

Azevedo R, Markovic M, Machado M, Franke-Fayard B, Mendes AM, Prudêncio M (2017). A bioluminescence method for *in vitro* screening of *Plasmodium* transmission-blocking compounds. Antimicrobial Agents and Chemotherapy 61(6). *(IF: 4.904. Citations: 5. Source: Web of Science)*.

Mendes AM, Reuling IJ, Andrade CM, Otto TD, Machado M, Teixeira F, Pissarra J, Gonçalves-Rosa N, Bonaparte D, Sinfrónio J, Sanders M, Janse CJ, Khan SM, Newbold CI, Berriman M, Lee C, Wu Y, Ockenhouse CF, Sauerwein RW, Prudêncio M (2018). Pre-Clinical Evaluation of a P. berghei-Based Whole-Sporozoite Malaria Vaccine Candidate. NPJ Vaccines 3(54). *(IF: 5.699. Citations: 3. Source: Web of Science).*

Mendes AM, Machado M, Gonçalves-Rosa N, Reuling IJ, Foquet L, Marques C, Salman AM, Yang ASP, Moser KA, Dwivedi A, Hermsen CC, Jiménez-Díaz B, Viera S, Santos JM, Albuquerque I, Bhatia SN, Bial J, Angulo-Barturen I, Silva JC, Leroux-Roels G, Janse CJ, Khan SM, Mota MM, Sauerwein RW, Prudêncio M (2018). A Plasmodium berghei Sporozoite-Based Vaccination Platform against Human Malaria. NPJ Vaccines 3(33). *(IF: 5.699. Citations: 9. Source: Web of Science).*

Ongoing Research Projects

2021/2022: Generation, characterization and in vivo evaluation of a novel live malaria vaccine Coordinator: Miguel Prudêncio. Funding Agency: GSK Tres Cantos Open Lab Foundation. Amount: 160 000,00€.

2018/2021: Enabling strategies for enhanced whole-sporozoite malaria vaccines. Coordinator: Miguel Prudêncio. Funding Agency: Fundação para a Ciência e a Tecnologia. Amount: 234 000, 00€.

2017/2021: Production and maintenance of *Plasmodium*-infected mosquitoes. Coordinator: Miguel Prudêncio. Funding Agency: Merck. Amount: 112 000,00€.

Publications in Peer Reviewed Journals

Reuling IJ, Mendes AM, de Jong GM, Fabra-García A, Nunes-Cabaço H, van Gemert GJ, Graumans W, Coffeng LE, de Vlas SJ, Yang ASP, Lee CK, Wu Y, Birkett AJ, Ockenhouse CF, Koelewijn R, van Hellemond JJ, van Genderen PJJ, Sauerwein RW, Prudêncio M (2020). Safety and efficacy of a genetically modified rodent malaria parasite against Plasmodium falciparum malaria: an open-label randomized phase 1/2a trial. Science Translational Medicine 12, eaay2578. *(IF: 16.304. Source: Web of Science).*

Azevedo R, Mendes AM, Prudêncio M (2020). The impact of antiretroviral therapy on malaria parasite transmission. Frontiers in Microbiology 10:3048. *(IF: 4.236. Citations: 2. Source: Web of Science).*

Invited Lectures and Seminars

Prudêncio M. *Plasmodium* Liver Infection and Antimalarial Strategies - Overview of Work from 2019. iMM Internal Seminar, Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal, December 16, 2020.

Internationalization

Joana Carneiro da Silva – University of Maryland;

Stephen L. Hoffman - Sanaria, Inc.

Jim Davies - MalarVx

Chris Janse and Shahid Khan - Leiden University;

Clemens Kocken - Biomedical Primate Research Centre, Rijswijk;

Robert Sauerwein - University of Nijmegen.

Patents/Prototypes

"Genetically modified rodent Plasmodium parasites as platforms for a whole-organism malaria vaccine" (WO 2013156949 A1, also published as CN104302313A, EP2838554A1, US20150071966). Patent applications filed in Angola, Australia, Brazil, China, India, Japan, Mozambique, South Africa, United States, and European Patent (Euro-PCT), November 2014. Patent granted in India (07.08.2015), Mozambique (17.08.2015), South Africa (23.12.2015), Japan (2015), Australia (03.02.2017), USA (15.02.2017), China (20.11.2017), Europe (11.05.2018) and Hong-Kong (20.07.2018).

Advanced Teaching

Prudêncio M. MSc Class. Vaccination against malaria - Development and clinical evaluation of a new vaccine. Masters in Clinical Microbiology and Emerging Infectious Diseases, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, May 7, 2020.

Prudêncio M, Mendes A, Nunes-Cabaço H. MSc Class. Vaccination against malaria - Development and clinical evaluation of a new vaccine. Masters in Biochemistry / Masters in Molecular Genetics and Biomedicine / Masters in Bioorganic Chemistry, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Lisbon, Portugal, May 20, 2020.

Prudêncio M. MSc Class. Basic principles of writing a scientific article. Masters in Molecular Biology and Genetics, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, September 23-25, 2020.

Prudêncio M. MSc Class. Malaria - The quest for an effective vaccine. Masters in Biomedical Research, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, October 26, 2020.

Prudêncio M, Mendes A, Nunes-Cabaço H. MSc Class. Malaria Vaccines. Integrated Masters in Medicine, Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal, November 24, 2020.

Prudêncio M. MSc Class. Animal models in malaria research. Masters in Evolution and Developmental Biology, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal, December 4, 2020.

Technophage, SA

Major Interests/Objectives

TechnoPhage is a highly innovative clinical stage biopharmaceutical company focused on the development of proprietary biological drugs and repurposed compounds. Within the biologics arm, TechnoPhage is developing two classes of drugs, namely light-chain single-domain antibodies and bacteriophage cocktails. TechnoPhage currently has 10 drug products into their development pipeline, each of which is being developed to treat medical indications such as diabetic foot ulcer infections, nosocomial pneumonia, age-related macular degeneration, plus other neurological and infectious diseases. We are in clinical stage with TP-102, a bacteriophage cocktail targeting diabetic foot ulcer infections that has an IND application cleared by the FDA, and is now also ready to start a Phase I/IIa clinical trial in Israel. Within the repurposing of chemical drugs, TechnoPhage has two chemical compounds concluding preclinical phases, ready to enter First in Human studies; one that targets the on/off period related to Levo-DOPA induced dyskinesia and the other has been developed for spinal cord injury.

TechnoPhage was the promoter and, since 2019, is also an associate of a private non-profit association called VectorB2B – drug developing products composed by Portuguese private and public partners. VectorB2B is a business development platform that gathers the scattered capacities of prominent academic and industrial shareholders in the sector of health biotechnology, and transforms them into viable economical assets, by providing integrated services in drug discovery and screening, project design and implementation, contract research and contract manufacturing. In 2020, TechnoPhage launched its oncology platform, also becoming one of the resident companies of JLABS – Johnson & Johnson Innovation, in Beerse Belgian, which consists of a premier life science incubator program. JLABS is a global network of open innovation ecosystems, enabling and empowering innovators to create and accelerate the delivery of life-enhancing health and wellness solutions to patients around the world. As a leader in innovation, JLABS helps entrepreneurs in pharmaceutical, medical device, consumer, and health tech bring healthcare solutions to patients and consumers.

Overall, TechnoPhage has a strong IP position with over 90 patents granted or validated in Europe and a total of over 170 patents and patent applications in various jurisdictions.

More information on TechnoPhage is available at www.technophage.pt.

Director

Miguel Garcia, PharmD, PhD, MBA

Team

Alexandra Wagner	Production scientist
Ana Almeida	Technician
Ana Filipa Martins	Senior Scientist
Ana Neves	IP and Legal Affairs Manager
Ana Raquel Barbosa	Senior Scientist
Clara Leandro	Head of Infection
Daniela Jones Dias	Head of Pre-clinical development
Diana Chapela Pires	Senior Scientist
Helena Dordio	Qualified Person
Lúcia Figueira	Production scientist
Luís Marques	Process development scientist
Manuel Garrido	Production Specialist
Manuela Teixeira	Financial Manager
Olawatomide Adeoye	Formulation scientist
Roberta Zoppi	Antibody scientist
Sofia Volker Corte-Real	Scientific advisor
Susana Gonçalves	Operations Director

Keyword /Research Areas

Infection, Bacteriophages, Neuroscience, Small Domain Antibodies, Repurposing, GMP Manufacturing.

Major Achievements

Based on 14 years of R&D, TechnoPhage is now in a clinical stage company with a position to bring its products to commercial stage. In 2019 we put up and running a new facility for GMP manufacturing of biologics. Technophage also is now part of VectorB2B a nonprofit association with the mission to provide services from its partners. During 2020, the IND application of TP-102 was cleared by the US FDA for Phase I/IIa clinical trial.

Selected Publications

Vaz RL, Chapela D, Coelho JE, Lopes LV, Ferreira JJ, Afonso ND, Sousa S, Outeiro TF (2020). Tapentadol Prevents Motor Impairments in a Mouse Model of Dyskinesia. Neuroscience 424: 58–71. *(IF: 3.056. Citations: 1. Source: Web of Science).*

Vaz RL, Sousa S, Chapela D, van der Linded HC, Willemsend R, Correiac AD, Outeiro TF, Afonso ND)2020. Identification of antiparkinsonian drugs in the 6-hydroxydopamine zebrafish model. Pharmacology Biochemistry and Behavior 189:172828. *(IF: 2.519. Citations: 3. Source: Web of Science).*

Ongoing Research Projects

Phage4BacID - Bacteriófagos no Diagnóstico e Prevenção de Infeções Multirresistentes em Portugal e no Mundo (033603); PT2020 Co-Promoção, coordinated by Technophage and co-promoted by INESC-MN and IST.

Organization of Conferences

Phage4BcID online seminar. Virtual event with the participation of members of the consortium of the R&D project, September 30, 2020.

Prizes, Honors and Awards

TechnoPhage, PME líder. IAPMEI, Portugal, December 31, 2020.

Patents/Prototypes

Main relevant patents of TechnoPhage filed in EU:

Patent Name	International Application Number	Date of Filing
Phage 1: Antibacterial Phage, Phage Peptides and Methods of Use Thereof	PCT/PT2010/000003	05-02-2010
Phage 2: Antibacterial Phage, Phage Peptides and Methods of Use Thereof	PCT/PT2011/000031	19-09-2011
TP-102: Compositions Comprising Cocktails of Antibacterial Phages and Uses Thereof For The Treatment Of Bacterial Infections	PCT/PT2013/000016	19-03-2013
CellectAB: Cell-Based Methods for Coupling Protein Interactions and Binding Molecule	PCT/PT2014/000016	03-03-2014
Technobodies: Engineered rabbit antibody variable domains and uses thereof	PCT/PT2008/000018	30-04-2008
TA-111: Antibody molecules and peptide delivery systems for use in Alzheimer's disease and related disorders (collaborative shareholder FMUL)	PCT/IB2016/050467	29-01-2016
TZ-113: Compositions For Use In Treating Parkinson’s Disease And Related Disorders	PCT/PT2016/050010	26-05-2015

TP-122 PSA: Cocktail Compositions Comprising Respiratory Antibacterial Phages and Methods of Use Thereof	PCT/PT2017/050028	04-12-2017
TP-122 KLE: Cocktail compositions comprising respiratory Antibacterial phages and methods of use thereof	PCT/PT2020/050058	21-12-2020
TZ-161: Eletriptan Hydrobromide for treatment of spinal cord injury and improvement of locomotor function	PCT/IB2020/062306	21-12-2020