Instituto de Medicina Molecular João Lobo Antunes

Master Project Proposal

Title: Modelling multiomics data for Precision Medicine

Synopsis: CD4 T cells are the organisers of immune responses. They sequentially differentiate from thymocytes into circulating naïve and memory T cell subsets, while committed to conventional or regulatory lineages, and define an ecology of cell types efficiently limiting autoimmunity and pathology of the immune responses.

In this project, we propose an unbiased approach to the discovery of potential interactions between biological pathways required for the homeostasis of human T cells. Namely, we propose to mine available data of human CD4 T cells and analyse respective transcriptomes and epigenomes during their differentiation using machine learning methods.

Our long-term aim is to identify relevant targets to modulate T-cell imbalances in future therapies for patients with immune-mediated diseases.

Key words: RNA-seq, ATAC-seq, Machine Learning, T cells, Human Genomics, Computational Biology

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