

## Master Project Proposal

**Title:** IL-17 driven tissue inflammation upon sciatic nerve injury

### **Synopsis:**

With an average prevalence of 3% worldwide, traumatic injury to the peripheral nervous system (PNS) affects the quality of life of patients. While most research is focusing on associated pain and muscle disorders, it remains unknown whether and how nerve injury influences other tissues. This is a critical point to address, as patients with sciatica can also suffer from physiological and psychological comorbidities<sup>1-3</sup>.

The present project aims at unveiling a new paradigm on the immune contribution to tissue pathophysiology, by deciphering how a local inflammation of the sciatic nerve can impact organ functions. Based on our preliminary results, we postulate that IL-17 modulates the communication from the sciatic nerve to the lungs and the gut, in a microbiota dependent manner.

To test this hypothesis, the Master student will submit Il17<sup>-/-</sup> versus Il17<sup>+/+</sup> littermate control mice to a model of sciatic nerve crush, which is well established in the host laboratory. At different timepoints after nerve injury, the student will (i) analyze cell suspensions from the lungs, gut and respective draining LNs by flow cytometry, (ii) characterize tissue architecture by histology and (iii) assess tissue immune functions in response to a second - organ targeted - inflammatory challenge. A potential role for the microbiome as a mechanistic link between the PNS and the lungs/gut will be tested by treating animals with a broad spectrum cocktail of antibiotics, or - conversely – supplement their drinking water with short chain fatty acids (SCFA).

We envision that this project will reveal new inter- organ communication routes, by focusing on the key contributions of IL-17 to tissue pathophysiology upon nerve injury. This departs decisively from the current state of the art of the conventional view featuring IL-17 as a trigger of local inflammation or tissue surveillance against pathogens<sup>4-5</sup>.

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[Webpage of the group](#)

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