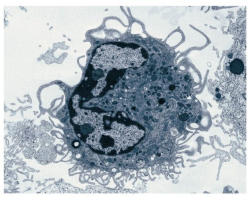
Created in 2018 and directed by Prof. Thomas Marichal, the Immunophysiology Lab is located within the GIGA Institute at the University of Liège. Thanks to its fundamental and translational research, it is revolutionizing our understanding of the immune system and its central role in the proper functioning of the body.

Since its creation, the Immunophysiology Lab has raised €9 millions in public funding, including 2 European grants (one ERC Starting Grant and one ERC Consolidator Grant) and 2 WELBIO grants from the Walloon Region. In addition, the laboratory has received 2 Baillet Latour Biomedical Awards for private sponsorship. Publishing in the best scientific journals in its field (Nature Immunology, Science Immunology, Immunity), the laboratory is involved in around ten research projects thanks to its 5 post-doctoral researchers, 5 doctoral students, 2 bioinformaticians and 2 PIs (principal investigators): Prof. Coraline Radermecker and Prof. Thomas Marichal, both veterinarians by training.



Prof. Thomas Marichal, head of the Immunophysiology Lab - © FNRS

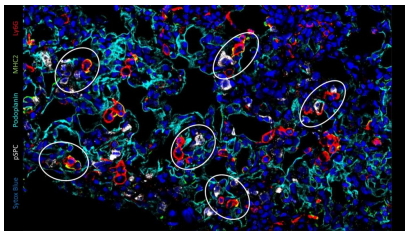
The Immunophysiology Lab is devoting its work to one organ: the lung, and its innate immune cells, the myeloid cells (macrophages, neutrophils and macrocytes). Previously known for their role in host defence against bacteria and viruses, these cells in fact have much more diverse functions. Hence, the laboratory has two main lines of research: understanding the role of myeloid cells in the development and normal functioning of the lung in mammals; and using clinical samples (human, horses, dogs) or preclinical (mouse) models to understand the dysfunction of myeloid cells in respiratory diseases (infections, asthma, COPD, etc.).



Macrophage observed by electron microscopy - © ULiège / Marc Thiry

With this in mind, the ERC Consolidator grant is enabling Prof. Marichal to study macrophages, whose presence is increased in diseased or inflamed lungs. He is using innovative transgenic tools to identify the trajectory and life cycle of macrophage sub-populations, some of which are involved in repairing the pulmonary alveoli and in influencing long-term immunity to many exposures. Understanding these processes are crucial to provide robust foundations for the future development of ad hoc treatments.

At the same time, the Immunophysiology Lab is working on lung neutrophils, which are present in the blood vessels of the lungs of healthy individuals, but also on more translational projects with cohorts of patients from the CHU of Liège suffering from asthma attacks: samples are taken to analyze the immune behavior in relation to the surrounding tissues, then the stabilized patients are re-sampled 6 months later in order to identify, by means of new samples, the persistence of immune and pathological events. *In vitro* modelling is also carried out using lung organoids, brought into contact with viruses and immune cells to study the reaction of the lung's immune system.



Following infection, in areas of the lung undergoing repair, atypical macrophages (in orange) are located close to type 2 alveolar cells (in white). © ULiège / Cecilia Ruscitti

The Immunophysiology Lab works with experts in myeloid cells such as Andres Hidalgo, a specialist in neutrophil biology at Harvard University (USA), and Florent Ginhoux, a macrophage specialist at Gustave Roussy (France). These collaborations enable the exchange of tools and the identification of conserved features of myeloid cells evolving in different pathological contexts.

Immune cells do not just have an immune function: they are a system in their own,

infiltrating every organ and essential to body homeostasis. On the strength of this conceptual revolution, the Immunophysiology Lab intends to exploit this immune valence to help define new therapeutic targets and new treatments for inflammatory, neoplastoc, neurodegenerative and metabolic diseases.

Immunophysiology Lab

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