PhD project call for applications
https://igdr.univ-rennes1.fr/en/application-igdr-phd-program

Characterization and pre-clinical manipulation of the interaction between MAIT cells and the intestinal microbiota

The newly created Host-Microbiota Interactions lab is recruiting a PhD candidate at the Institute for Genetics and Development in Rennes (IGDR), a 200-person structure affiliated with the CNRS, the University of Rennes 1 and Inserm. IGDR provides a rich and vibrant environment for basic and translational research characterised by multidisciplinary approaches in biology, biophysics, bioinformatics and biomedical sciences. IGDR is located on the biomedical campus of Rennes and is supported by state-of-the-art core facilities for flow cytometry, imaging, proteomics, animal facility etc.

We are interested in microbe-specific T lymphocytes called MAIT cells, with a focus on the question of how they interact with the microbiota in the gut. The gut microbiota plays essential roles in regulating host biology, but few molecular interactions have been characterized to date. We identified a new and intriguing interaction between gut microbiota metabolites and MAIT cells (Legoux et al, Science 2019). Preliminary data also indicate that MAIT cells protect the host during intestinal inflammation. MAIT cells are abundant in humans and are programmed to respond quickly upon stimulation, making them attractive targets for clinical intervention.
The goals of this PhD project are:

- to determine how MAIT-microbiota interactions provide host protection during intestinal inflammation
- to manipulate MAIT cells to alleviate this pathology in mouse models

Keywords
Immunology; T cells; microbiota; colitis;

Expected profile
Curiosity and enthusiasm for science. Previous experience with mouse work would be appreciated.

Related publications
Legoux[#], Bellet, Daviaud, El Morr, Darbois, Niort, Procopio, Salou, Gilet, Ryffel, Balvay, Foussier, Sarkis, El Marjou, Schmidt, Rabot and Lantz[#]. Microbial metabolites control thymic development of Mucosal Associated Invariant T cells. **Science** 2019 366: 494-499. [#]Co-corresponding authors.

Legoux*[#], Gilet*, Procopio, Echasserieau, Bernardeau, Lantz[#]. Molecular mechanisms of lineage decisions in metabolite-specific T cells. **Nature immunology** 2019 20: 1244-1255. *Equal contribution. [#]Co-corresponding authors.

Salou*, Legoux*, Gilet*, Darbois, du Halgouet, Alonso, Richer, Goubet, Daviaud, Menger, Procopio, Premel, Lantz. A common transcriptomic program acquired in the thymus defines tissue-residency of MAIT and NKT subsets. **Journal of Experimental Medicine** 2019 216:133-151. *Equal contribution.

Lantz, Legoux. MAIT cells: programmed in the thymus to mediate immunity within tissues. **Current Opinion in Immunology** 2019. 58:75-82. Review.

Legoux*, Salou*, Lantz. MAIT cell development and function: the microbial connection. **Immunity** 2020 4:710. Review. *Equal contribution.

Salou*, Legoux*, Lantz. MAIT cell development in mice and humans. **Molecular Immunology** 2021 130:31. Review. *Equal contribution.