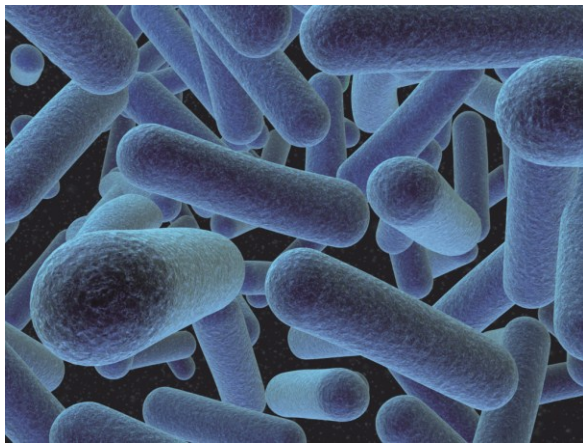


## Semester project: The Gut-Brain connection

Prof. Theo Lasser and Dr. Taoufiq Harach

The Laboratoire d'Optique Biomédicale is offering a master project related to the diagnosis of Alzheimer in waste products.



The present project relates to a simple, fast and non-invasive diagnostic concept of waste products for Alzheimer's disease. In an initial project phase, as to establish a baseline for Alzheimer diagnosis, we intend to extend our pre-clinical studies demonstrating the presence of brain-derived A $\beta$  amyloidogenic material in waste products of transgenic mouse models of Alzheimer's disease and Alzheimer diagnosed patients. Furthermore, this project builds upon the preliminary results of our laboratory that demonstrate the potential role of intestinal

microflora in the diagnosis of Alzheimer's disease. Indeed, during the last two years, we have generated a unique mouse model of AD without gut microbiota.

The project aims at determining the impact of gut microbiota on Alzheimer pathologies in mouse models of the disease. To this end, the candidate is expected to perform brain analyses, using both postmortem histological and biochemical assessment as well as state-of-the-art in vivo transcranial optical imaging.

### Skills and Knowledge for the project:

Basic knowledge in life sciences and especially neurosciences:

- Motivation to learn in vivo techniques such as animal preps, neurosurgery and laparotomy.
- *Cell culture* SOPs
- Knowledge of classical biochemical techniques in the detection of proteins

Genuine interest in microscopy and advanced optics

Willing to work in a stimulating interdisciplinary environment at the interface between physics and neurobiology

Good oral and written skills in English.

If you are interested please contact Dr. Taoufiq Harach (taoufiq.harach@epfl.ch), or Prof. Theo Lasser (theo.lasser@epfl.ch)