

Application instruction for LIMMS internship FY 2024

On the “Study of endothelial barriers with microvessel models” at Matsunaga laboratory, LIMMS/CNRS-IIS, The University of Tokyo

1. Internship description

- **Location:** LIMMS/CNRS-IIS (IRL 2820), Tokyo, Japan
- **Internship title:** Study of endothelial barriers with microvessel models
- **Internship duration:** 5 to 6 months
- **Accommodation support:** 60 000 yens / month for maximum 6 months (360 000 yens max. per person)
- **Expenses:** Airplane tickets and incidental expenses are not covered by LIMMS.
- **Contract:** Up to 6 months. An internship contract between IIS-UTokyo and the French school will be finalized, which will define the rules and obligations (both overseas travel accident insurance and liability insurance) during the stay at LIMMS/CNRS, IIS UTokyo.
- **Starting & Ending dates:** The internship should start on the 1st of February 2024 or beyond and finish before the 31st of March 2025.
- **Visa:** Students who will participate in the program for more than 90 days must have a visa. An administrative procedure takes about 3 months.

Background

Blood vessels play a pivotal role in transporting essential molecules required for the proper functioning of organs. However, the permeability of these vessels is highly organ-specific, meaning that it varies significantly depending on their location within the body. Our team in Tokyo is expert in *in vitro* microvessel models: we have developed a sophisticated system capable of generating artificial microvessels within a microfluidic chip (Pauty et al., *Nanotheranostics*, 2017). This innovative system employs acupuncture needles and pre-fabricated PDMS chips, enabling us to fabricate microvessels in collagen scaffolds and study vascular functions, including angiogenesis and barrier function. We are currently trying to tackle the challenge of mimicking the vascular function in different context, including the brain-blood barrier (BBB).

Internship scope

This internship will be supervised by a postdoctoral researcher and a Ph.D. student already in the lab. The selected candidate will utilize a patented technology developed in collaboration with LAAS-CNRS (Cacheux et al., *Science Advances*, 2023) that enables the direct, dynamic, and contactless measurement of tissue permeability. Probing the permeability of the vascular barriers is particularly challenging, as this interface is highly impermeable and dynamically responding to mechanical stimulation. The selected candidate will be involved in technological development to achieve the required sensitivity, conduct biological experiments, and model the experiments using e.g., finite element methods.

Requirements

The successful candidate should possess the following qualifications:

- Experience in experimental techniques, including cell culture, microscopy, and immuno-staining.
- Proficiency in English, as the Matsunaga lab is an international environment where effective communication with fellow lab members from diverse backgrounds is crucial.

2. Please send the following items to LIMMS direction <limmsadm@iis.u-tokyo.ac.jp>

1. CV

2. Motivation letter

- Candidates are kindly advised to send LIMMS direction the requested documents with an e-mail subject “internship title” FY2024 followed by the candidate’s full name. Sending documents with a different e-mail subject might be at risk of being overlooked.

3. Submission Deadline (Closing date) for applications is 15 October 2023.

- Please note that due to our administrative procedure, we cannot accept your applications AFTER the deadline.
- Due to a large number of applications, it is not possible to reply to you if you are not shortlisted. If you have not heard from us within one month of the closing date, please assume that your application has not been successful on this occasion.

4. Notification of results

- After approval by the screening committee in LIMMS, notification of the acceptance will be sent both to the intern and the host professor of LIMMS.