Doctoral student CIFRE

About Us

Are you looking for a challenging environment with technical projects leading to advances in patient health? Our company is for you!

Institut Georges Lopez (IGL) is one of the leaders in organ preservation for transplantation in the world. From preservation solutions to perfusion machines, IGL designs, manufactures and markets innovative products to improve the success of organ transplants.

We want to strengthen our teams by recruiting a doctoral student for a period of 36 months on our site in Lissieu (69).

Description of the project

You will participate in a research project on the development of a medical device for biomarker analysis and tissue characterization in the context of organ transplantation.

We propose to develop a multimodal probe (NIRS, LIF) that will be able to measure different optical biomarkers during the different steps of the transplantation procedure:

We will develop models for biomarker quantification based on simulation of light propagation (Monte Carlo method) under different tissue conditions during transplantation steps. We will also develop fluorescence multi-excitation strategies and models to extract the fluorophore from different autofluorescence baselines. We will then investigate the ability of quantified biomarkers to assess graft viability through machine learning and classification approaches, and against reference physiological state parameters.

Our team has a long experience in the realization of NIRS and LIF systems in the in vivo and clinical context and in biomarker quantification models.

The optical set-up will be characterized by experiments on phantoms. Experimentation on animal models will also be studied. Finally, an in vivo experiment on human organs will be conducted.

You will work both on the development and modeling of optical setups, signal processing and data analysis.

In this project, three structures will be involved in the scientific supervision: the Georges Lopez Institute (IGL), the CREATIS laboratory, and the clinical partners.

Your main missions will be the following:

- Gather user needs

- Identify the most appropriate technologies (spectroscopy, imaging, etc.) for the selected applications (tissue characterization, perfusate/blood analysis, etc.), develop them, and explore new ways to meet the scientific challenges identified
- Participate in the development of electromedical devices according to applicable standards and IGL procedures, in collaboration with the R&D teams
- Integrate the developed technology into organ perfusion systems in collaboration with the Development Project Manager
- Participate in product/process risk analysis
- Perform laboratory characterization and in vivo experiments on animal models, humans, and human organs under surgical conditions
- Acquire data from tissue, perfusate/blood samples
- Participate in conferences
- Write scientific papers and articles

Your profile:

You have a higher education, Bac+5 in engineering school or university equivalent with a specialization in biomedical, biophysics, data analysis, or modeling.

You have an attraction for multidisciplinary work in the medical and biomedical field.

You are organized, curious, and have the desire to go deeper into technical subjects.

We invite you to contact us to obtain more details about the scientific context and issues, as well as the proposed methodology to address the problem.

Contact us at:

rh@groupe-cair.com