

Internship on microfluidic systems for healthcare applications

Location: CEA Leti – Grenoble

Length: 6 months

Start: February 2023

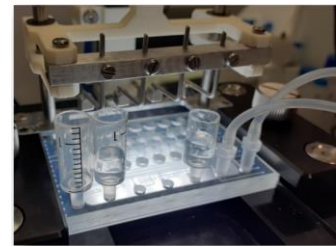
About CEA-Leti and host laboratory

At the heart of the Minatec campus for innovation in micro and nanotechnologies, CEA-LETI is an applied research center in microelectronics and information and health technologies. One of his core mission is to ensure technological transfer from research to industries. In collaboration with public hospitals and universities, the Department of Micro and Nano technologies for healthcare and biology develops new technologies to invent tomorrow's medical diagnostic and therapeutic innovations. Inside this department, the lab of Microfluidic Systems and Bioengineering gathers a multidisciplinary team to design and produce microfluidic systems for healthcare and biology applications, from biological protocol integration to sample preparation for the future of medicine.

Position description

The LSMB, in collaboration with researchers from the Institut de Recherche Interdisciplinaire de Grenoble (IRIG) at CEA, developed an innovative method for biomarkers detection (oligonucleotides, proteins, ...) based on aptamers and/or antibodies coupled on magnetic beads with LAMP isothermal amplification. This method integration for cardiac biomarkers detection is currently on going using a digital microfluidic chip developed in the lab. This chip is pneumatically actuated and allows the handling of volumes above the microliter.

The internship objective is to associate various microfluidic techniques in order to obtain a high sensitive detection. Indeed, to rapidly diagnose cardiovascular diseases (e.g. heart attack), it is crucial to reach high-performance detection levels. The internship will be more particularly focused on the development and the integration of different microfluidic techniques that will be validated using LAMP amplification. This new approach will open novel perspectives for the future of healthcare, needing sensitive, rapid, robust, integrated and portable analysis devices.



Tasks and responsibilities

- System sizing : design the architecture of the chips coupling different microfluidic techniques
- Design and manufacturing of an experimental bench comprising the microfluidic chips and an optical system for fluorescence measurement
- Experimental study on a representative biological protocol to validate microfluidic steps sequences

Profile

- Engineering/Master student with a major in physics, microsystems for health
- Knowledge or experience in microfluidics (applied to biology)
- Design of 3D systems (SolidWorks)
- Motivated by experimental work
- Attracted by a multidisciplinary environment and technological innovation
- Attracted by biological applications of microsystems
- Good communication skills to share information and results within different teams

Contact

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