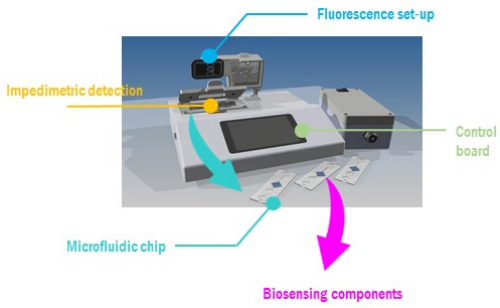
PhD position - Interdisciplinary project

Saliva-based MIcrofluidic "Lab-on-chip" devicE for Paediatric Respiratory Viral Illness diagnostics (SMILE)

Our **Group for Functionalized Biomaterials** (GBF, SCI-SB-SG) at the Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland (https://www.epfl.ch/labs/gbf/) offers a **PhD position** for the ***Design and engineering of DNA biosensors for dual fluorescence / capacitive detection and discrimination of respiratory viruses***, in the frame of an **Interdisciplinary Project** in collaboration with SUPSI (Dr Igor Stefanini, Department of Innovative Technology, Lugano), the Swiss Tropical Health Institute (Prof. Daniel Paris, Department of Medicine, Basel) and the Centre Suisse de Recherches Scientifiques (Prof. Benjamin Koudou, Research and Development, Abidjan). The project is funded by the Swiss National Science Foundation.

Lower respiratory tract infections (LRTI) are a leading cause of mortality and morbidity in children worldwide, especially among the population of low-and middle-income countries (LMICs). LRTI stand as the most common childhood illnesses and account for almost half of the hospitalizations below the age of five. While 70% of LRTI in young children are caused by viral pathogens, the lack of access to rapid, accurate and cost-effective diagnostics in primary health care structures in LMICs massively contributes to complications, extended hospital stays and long-time sequelae. The SMILE project will iteratively develop and optimize a highly sensitive, accurate and cost-effective microfluidic device (MFD) for the early diagnosis of Respiratory Syncytial Virus (RSV), Metapneumovirus (HMPV), Parainfluenzavirus (HPIV), Influenza A & B (IAV, IBV) and Highly Pathogenic Avian Influenza (HPAI) in low volume saliva samples. In addition, the environmental screening strategy will target SARS-CoV-2, IAV/IBV and RSV as key indicators of epidemic outbreaks. Team contributions include the fundamental engineering of DNA biosensors for viral RNA screening using probe design, surface chemistry, functional nanoparticles (***EPFL***) with microfluidics technology, optoelectronics, prototyping (***SUPSI***), followed by application and diagnostic validation in human clinical samples, biobank, reference diagnostics, regulatory requirements, training and oversight (***Swiss TPH***) in the clinical setting of Switzerland and Ivory Coast, through patient recruitment, sample management, documentation (***CSRS***).

At EPFL, the recruited PhD student will address the design, production and characterization of the ***functional sensing units*** of the virus screening device according to a dual sensing concept (virus detection through bioimpedance measurements and virus identification through fluorescence microscopy). The biosensing components will be embedded in a MFD (https://doi.org/10.1016/j.biosx.2022.100302), specially designed for point-of-care diagnostics.



Group for Functionalized Biomaterials

EPFL SB ISIC SCI-SB-SG
Prof. Sandrine Gerber
CH B1 425
Station 6
CH - 1015 Lausanne
Switzerland

Phone : +4121 693 93 72
E-mail : sandrine.gerber@epfl.ch
Web Site : https://www.epfl.ch/labs/gbf/

Your profile. We are looking for highly motivated candidates holding a ***Master degree in chemistry***, with previous research experience in ***surface functionalization for the development of biosensing materials***. As the project is highly interdisciplinary, we search for candidates willing to collaborate with researchers from diverse backgrounds (engineers, biologists, clinicians). Fluency in English (written and oral, C1 level) is required.

What we offer. Our group at EPFL is part of one of the world's leading chemistry departments and is located in the EPFL Lausanne Campus, offering state of the art laboratory infrastructure and high-end analytical facilities, on the shore of Leman Lake. The successful candidate will join a motivated team developing multifunctional bio- and nano-materials for applications in therapeutics delivery, bioimaging and biosensing. Close collaboration with our partners at SUPSI, Swiss TPH and CSRS will offer several opportunities for contributing to the evaluation of the biosensing materials produced in our group, in the MFD both on standardized and clinical samples.

Application package. All applications should include, in a single pdf file:

i) a motivation letter
ii) a CV highlighting education, background, scientific and technological skills and past research experience
iii) a copy of the BSc and MSc degrees and a transcript of the grades for Bachelor/Master studies
iv) the contact information of three referees
v) a summary of previous research work (at least 2 pages with chemical details)

Starting date: February 1st 2026
Duration of PhD studies at EPFL: 4 years

Important information. PhD application at EPFL is a dual process, requiring to apply also to the chemistry doctoral school (https://www.epfl.ch/education/phd/edch-chemistry-and-chemical-engineering/). Only candidates successful with both applications to the doctoral school and a research group can start their PhD.

Motivated candidates should send their application file via e-mail to Sandrine Gerber (sandrine.gerber@epfl.ch).

Deadline for application: October 26th 2025

Applications which are incomplete or sent after the deadline will be neither considered nor answered.

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