

Neuchatel, October 3, 2025

PhD student position in Wearable Biosensors for Saliva Analysis

The MEMS and Printed Microsystems group led by Dr. Danick Briand from the Soft Transducers Laboratory at the EPFL (Swiss Federal Institute of Technology) has PhD students openings in the fields of wearable biosensors for saliva analysis.

Requirements

- M.Sc. in Bio-engineering, Chemical Engineering, Electrical engineering, Micro-engineering, or related field;
- Strong experimental skills and interest in soft sensing technologies;
- Ability to collaborate closely with colleagues in a multicultural setting;
- Fluent in English. French is a plus.

Objectives and description

The Swiss SensDent project, «Removable Denture with Continuous Biosensing and Precise Drug Delivery», aims to achieve real-time saliva sensing and precise intraoral drug delivery integrated in a removable smart denture. The project targets the integration an advanced micro-system comprising sensors, micro-fluidics, and a sophisticated drug delivery system. The complex 3D printed microchannel manifold ensures precise drug delivery to various zones of the denture and the underlying gingiva and mucosa. Finally, by designing and implementing intelligent control system to automate the entire process, we aim to enable precise and timely medication dosing based on sensor data. This breakthrough technology will provide real-time monitoring, precise and controlled dosing, and improved effectiveness in treating both oral and systemic conditions.

The PhD project aims to develop a saliva sensor platform to be embedded in smart denture. The platform will include biochemical sensors embedded into a microfluidic system for the detection of various relevant analytes in saliva. Sensors will be made of electrochemical cells and transistors on soft and flexible substrates. Their fabrication will be processed mainly using additive manufacturing (i.e. printing). Bio-functionalisation will be performed for the selective detection of the analytes. 3D printing will be considered for the sensors integration within the micro-fluidic system. The platform will be combined with 3D printed drug delivery system and a data acquisition module to be developed by the CSEM. One PhD position will focus on the development of printed biosensors while the other will address the embedding of sensors in 3D printed fluidic micro-structures.

Context

This project is funded in the framework of the Swiss National Science Foundation (SNF) and will be performed in collaboration with research groups from CSEM (sensors and electronics) and from University of Bern (Saliva and Digital Dental Technologies research labs). This research activity is carried out at the EPFL-EnviroMEMS group (Dr. D. Briand) leader in printed flexible electronics and sensors. The laboratory is located in the Neuchatel campus of the EPFL, with state-of-the-art facilities for processing soft materials on large areas based on additive manufacturing and digital printing. Collaboration on the biosensors' development will happen with Prof. Sandro Carrara, Director of the EPFL-BCI lab, also located in Neuchâtel.

The candidate must have strong interests in sensors design and processing, be adept at thinking at a system level, and enjoy building and testing working devices. The candidate must be highly motivated, independent, yet able to work closely and harmoniously with colleagues in this lab and partner labs.

Contract details

- Generally up to 4 years
- Start date: early 2026
- Excellent facilities (state of the art soft processing facility)
- Work location is in Neuchâtel, at EPFL-Microcity, Switzerland.
- The main language used for technical discussions in the lab is English.

To apply for the position, please email a CV, cover letter, university transcript, and list of three references to danick.briand@epfl.ch. In addition, students must be admitted to the [EDMI](#) doctoral school at the EPFL.

Further information about our lab can be found at <http://lmts.epfl.ch/EnviroMEMS>