



Postdoctoral position

Biosensors based on electrochemical detection into microfluidic chips

Scientific context. Recent advances in microfluidics, and electrochemical sensing methods have steered the way for the development of novel and potential wearable biosensors for healthcare monitoring. Electrochemical biosensors are particularly suitable due to their many advantages, including fast response, miniaturization, convenient operation, and portability. They have been developed in recent years to achieve real-time and non-invasive monitoring of biomarkers in biofluids such as sweat, tears and saliva. In particular, innovative flexible microfluidic devices for skin applications have been designed in proof-of-concept demonstrations. However, for clinical diagnosis, these devices face the challenge of continuously monitoring biofluids in fluctuating flow conditions.

Research project. To address this problem inherent to the performance of amperometric sensors, the project aims to implement an electrochemical biosensor on a microfluidic chip with an electrochemical module capable of determining the flow rate in real time. Due to the growing interest of patch-type microsystems in sweat analysis, the principle will be applied to the determination of lactate which is a biomarker in sweat of ischemic events and sepsis. This strategy should pave the way for the design of flexible devices optimized for accurate monitoring of biofluids on body's skin, without disturbing the underlying biological mechanism of secretion.

Environment. The work will involve two research groups, the PASTEUR laboratory at Ecole normale Supérieure and the i-CLeHS institute at Chimie ParisTech. The postdoctoral candidate will benefit from theoretical and experimental expertise of both groups, and from clean room facilities for microfabrication.

Required qualifications. Applicants must hold a PhD in Physics, Materials Science, Chemistry, Biotechnology, Engineering, or a related discipline. Preference will be given to talented and motivated candidates with prior research experience in electroanalytical chemistry. Skills in microfabrication and microfluidics are not compulsory but will be considered positively.

Application. Applicants should send their CV along with a cover letter to laurent.thouin@ens.psl.eu and fethi.bedioui@chimieparistech.psl.eu

Starting date ASAP between September - October 2022.

Contract period between 12-14 months, depending on the starting date (postdoc will end on 31/12/2023).