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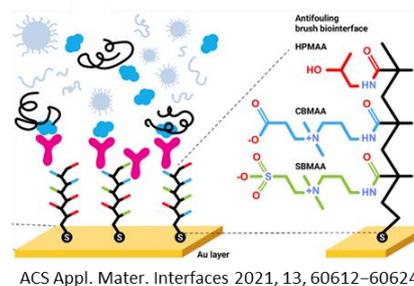
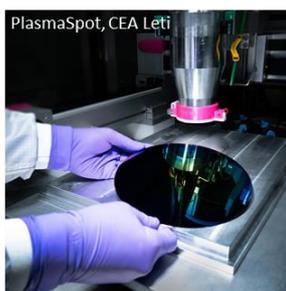
PhD offer – Surface chemistry, polymer and biosensors

**ZWITTERIONIC BIFUNCTIONAL NANO-COATING FOR APTASENSORS DEVELOPMENT,
A new linker for biological probes that hinders non-specific adsorptions**

Supervisors: Hippolyte Durand ([CEA Leti](#)) & Eric Peyrin ([DPM](#))

Project description. Biosensors have proved immensely useful in numerous vital areas, such as healthcare, food safety, environmental monitoring, and forensics. But the field of biosensor development frequently encounters the issue of non-specific signals. These signals often limit the performance of biosensors and complicates industrial transfers. The literature is full of solutions that highlight the blocking of these non-specific interactions with different types of chemical or biological entities (albumin, casein, PEG, PVP, ethanolamine...). However, an alternative functionalization approach with **a linker that offers both the ability to immobilize biological probes while ensuring the blocking of non-specific interactions** represents an innovative path for the development of biosensors.

This PhD project aims to explore the design and surface functionalization with a **bifunctional nano-coating** responding to this approach. Regarding the blocking, zwitterionic polymers will be at the heart of the development. Indeed, numerous studies demonstrate their ability to



drastically reduce the interactions of complex biological environments with surfaces that are functionalized with them. Furthermore, it is possible to exploit the chemical functions of certain types of zwitterions to immobilize biological probes on demand. A plasma-assisted functionalization method will be used, ensuring continuity with current PhD projects, to produce the bifunctional nano-coating. Then, biosensors will be prepared with aptamers that will be immobilized on silicon transducers (QCM-d and photonic chip) via the bifunctional nano-coating. The objective of the thesis is to obtain a proof of concept of a biosensor functionalized with this new linker that ensures the reduction of non-specific signals while ensuring the specific and selective detection of the model target considered (Tyrosinamide) in model and complex environments derived from biomedical sector, such as serum or plasma.

Funding. Labex Arcane PhD grant

Starting date. October, 1st 2026.

Locations. [CEA Leti](#) and [DPM](#), Grenoble, France

Candidate profile. The candidate should have a master's degree in material chemistry (polymers) and knowledge in biology, with an appetite for multi-disciplinary projects related to healthcare, especially biosensing. Polymeric thin films produced by plasma assisted process and their physico-chemical characterization will be key topics. The work will be performed both in pharmaco-chemistry lab and cleanrooms.

Applications. Contact hippolyte.durand@cea.fr and eric.peyrin@univ-grenoble-alpes.fr

