



LABORATOIRE D'ELECTROCHIMIE MOLECULAIRE
Université Paris Diderot – Paris 7
Unité Mixte de Recherche CNRS / Paris 7 N°7591

‘Biomacromolecular systems, electron transport at the nanoscale ‘



Post-doctoral position available

Funding: ANR (National agency for research) – PIRIBIO program (Interdisciplinary research program on molecular and cellular systems) – “CASCADE” project

Salary 2500 € (net income). Duration: 1 year.

Host laboratory :

Laboratory of Molecular Electrochemistry (LEM) –University Paris Diderot - Paris 7, CNRS UMR 7591, Paris, France

Starting date : From October 2012.

Laboratories involved in the project:

- [Laboratory of Molecular Electrochemistry \(LEM\)](#) – The Biomacromolecular Systems-Electron Transport at the Nanoscale group. University Paris Diderot - Paris 7, CNRS UMR 7591, Paris.
- [Institute of Plant Molecular Biology.](#) Vegetal Virology group - INRA UMR 1332, Bordeaux.
- [Laboratory of Chemistry and Biology of Membranes and Nano-Objects \(CBMN\)](#) Chemical Biophysics group –CNRS UMR 5248, Bordeaux.

Profile and requirements:

The candidate should:

- Hold a doctoral degree in chemistry, physics, biology or biophysics.
- Have some experience in nanoscience and local probe microscopies (AFM,...), preferably applied to the imaging of bio-objects.
- Have some experience of, or a strong interest for, reconstituted biomolecular systems.

It is important that the candidate is open for team work and collaborations with researchers of different fields (chemistry, physics, biology). Proficiency of French language is not mandatory.

Description of the “CASCADE” project:

Atomic Force Electrochemical Microscopy (AFM-SECM) for the Functional Imaging of Enzymatic Cascades.

The aim of the ANR Cascade project is to develop original strategies allowing enzymatic cascades to be reconstituted onto solid surfaces, and functionally probed *in situ* by atomic force electrochemical microscopy (AFM-SECM). Within the framework of this project, it is notably proposed to use virus shells (capsids) as nano-scaffolds for the spatially controlled assembly of enzymes and redox macromolecules.

During the proposed one year contract the candidate will be in charge of establishing the proof of concept of addressing electrochemically redox-labeled macromolecules localized *by design* on a virus capsid. For this demonstration, we'll make use of the plant virus-based biotechnology workhorse potato virus A, produced by the biology (INRA) group associated to the project.

Several key experimental steps can be foreseen:

- Development of a process allowing the virus to be immobilized on a conducting substrate (HOPG, gold) in such a way that it can be imaged by AFM and AFM-SECM.
- Redox functionalization of anti-PVA antibodies, specific for proteins located at one of the extremities of the virus, by flexible PEG chains bearing a redox ferrocene group.
- The ultimate result will correspond to the successful AFM-SECM imaging of surface immobilized virus/redox-antibody complexes.

The candidate will carry out his/her research work in interaction with permanent researchers and will benefit from the know-how of the group in AFM-SECM imaging and redox bio-labeling.

How to apply:

Send a CV accompanied by a motivation letter by email to:

Dr Christophe Demaille, demaille@univ-paris-diderot.fr

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