Master internship

Adhesive proteins and surfaces

- **Description**

-Context :

Some adhesives produced by animals, such as some crustaceans and arthropods, are composed exclusively of proteins. These proteins are able to self-assemble onto the surface of the materials, leading to the adhesion process. The composition and functioning of these adhesive proteins are a source of inspiration for the development of new biomimetic and biocompatible adhesive products.

-Internship topic:

The mechanisms leading to the adhesive properties of these proteins in relation to material surfaces remain to be elucidated. Indeed, the nature of the surface with which the protein comes into contact (e.g., its hydrophilic or hydrophobic properties) or its topography seem to influence the self-assembly of the proteins. In the laboratory, we produce and purify recombinant proteins inspired by these adhesives found in nature. As part of an ANR project, we are seeking to understand how proteins change conformation and how material surfaces influence the behavior of these proteins. To do this, we are studying these proteins in presence of model materials (glass, polymers) and surfaces synthesized at the Materials and Physical Engineering Laboratory (LMGP).

The intern, recruited within the LMGP laboratory, will be in charge of the study of the self-assembly (formation of fibers and aggregates) of the recombinant proteins in contact with these surfaces. He/she will use techniques involving biochemistry, spectroscopies (infrared and fluorescence), and imaging (atomic force microscopy).

- **Host laboratory**

The internship will take place within the IMBM team at the Laboratory of Materials and Physical Engineering (LMGP, Interfaces between Materials and Biological Matter - IMBM – www.lmgp.grenoble-inp.fr). The LMGP offers a multidisciplinary environment and three research teams. The laboratory has gained an international reputation in the fields of growth and functionalization of crystalline materials, nanomaterials, thin-film structured materials, and protein interactions with materials. At the laboratory, the IMBM team is interested in protein interactions with interfaces, particularly their adsorption/desorption and self-assembly through their interactions with interfaces. Located in the heart of an exceptional scientific environment, the LMGP offers candidates an enriching workplace. This project is in collaboration with the ERRMECe (Extracellular Matrix-Cell Relations Research Team) laboratory at CY Cergy Paris University, which investigates the relationships between cells and their various biotic and abiotic environments.

- **Requested profile**

The ideal candidate is a student in a Master's program or in last year of engineering school, with core courses on chemistry/biochemistry (and possibly in material sciences). The student should be able to work in a team, have good communication skills (report, presentation…) and good knowledge of at least one of the languages used in the lab: French, English.

- **Funding**

Allowance of ≈ 600 €/month.

Funding : Agence Nationale pour la Recherche
Starting date : January or February 2026 – Duration : 6 months.

- **Contacts :** send *C.V.* and motivation letter to :

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