



Funded by
DFG Deutsche
Forschungsgemeinschaft
German Research Foundation

3-year postdoctoral position in physical-chemical modification of surfaces to unravel biological mechanism of implants' tissue integration

A three-year post-doctoral/research engineer position supported by the International France-Germany ANR-DFG grant "**Amino-coat**" is available at the Institute of Materials Science of Mulhouse (IS2M) UMR CNRS 7361, France (<http://www.is2m.uha.fr/>) under the direction of Dr Arnaud Ponche from the "Biomaterials-Biointerfaces" research group and Dr Florence Bally-Le Gall from the "Functional polymers engineering" research group. The successful candidate will also work in collaboration with the group of Pr Matthias Schnabelrauch at INNOVENT, Jena, Germany (<https://www.innovent-jena.de/en/>).

Project Title:

Aminocoatings for improving implants' tissue integration: understanding underlying biological mechanisms

Cells can respond to extracellular cues of very different natures that can be, for instance, biochemical factors or topography. It was shown that when cells grow on groove patterns, they align along the groove direction. This response can be inhibited by the deposition of a nanometric poly(allylamine) plasma polymer coating. Understanding how the cells integrate these signals is essential to develop efficient tissue engineering strategies.

The **Amino-coat** project aims at elucidating the mechanism by which chemical signals can mask topographical cues during the cell response to geometrically grooved titanium substrates. The project associates biologists specialized in cell/materials interactions from Dr K. Anselme's group at IS2M and from Pr J.B. Nebe's group (German coordinator of the project) at the University of Rostock, Germany (<https://zellbiologie.med.uni-rostock.de/arbeitsgruppen>) and physicists specialists in cell modelling (Dr J.L. Milan group) from the Aix-Marseille University, France (<https://ism.univ-amu.fr/en/qiboc>).

The post-doc researcher will need a solid formation in physico-chemical analysis and surface functionalization, and a good knowledge in protein adsorption and grafting at biomaterial surfaces. He/she will be in charge of the functionalization of surfaces with amino-rich nanolayers by various techniques (plasma polymer, self-assembled monolayers) and their physico-chemical characterization. He/she will proceed to the qualitative and quantitative analysis of serum proteins adsorbed on these various amino-rich surfaces (experience in liquid chromatography techniques is strongly recommended). Afterwards, he/she will participate to the preparation and analysis of samples for *in vitro* cellular experiments. He/she should be highly motivated, dynamic, resourceful and willing to integrate a multidisciplinary team and international network, open to new ideas and concepts, and have a strong taste for interdisciplinary sciences at the interface of chemistry, biology, and physics.

The Institute of Materials Science of Mulhouse gathers about 180 people including 60 permanent researchers with skills in chemistry, physics and biology. Mulhouse is in the typical Alsace region in eastern France at the border with Germany (Freiburg im Breisgau) and Switzerland (Basel). It has a direct access to Paris (less than 3 hours by TGV) and to an international airport (Euroairport, 20km).

To apply please follow this link: <https://bit.ly/2UPKZUx>