

INTERREG 2 SEAS program/MultiDes project : post doc recruitment

A post 6 month doctoral position is available (from 1st October 2011) at the Laboratory "Unité des Matériaux et Transformations" (UMET, UMR8207, Lille 1) located at Villeneuve d'Ascq, France. This position is opened in the framework of the "INTERREG 2 SEAS" cooperation program between Lille1 and Lille 2 labs and the University of Greenwich, England. The acronym of the project is MultiDes : multi-drug eluting stent.

Scientific background of the project

Drug-eluting stents have revolutionized the field of interventional cardiology and have provided a significant innovation for preventing coronary artery restenosis. Atherosclerosis is the most common form of vascular disease and a leading cause of death and disability in the developed world especially in France and UK.

It is a disease process in which fatty substances (plaque), such as cholesterol, are deposited on the inner lining of blood vessels. In order to treat atherosclerosis, patients undergo coronary stent implantation after balloon angioplasty.

In the last two decades, a new generation of coronary stents has been recognized as the most effective for the treatment of vascular diseases: the Drug-eluting stents (DES). These stents are expandable slotted metal tubes acting as a scaffold that provides structural support to blood vessels and deliver biologically-active agents directly to the target site to prevent restenosis.

Summary of the task

Our strategy will consist of modifying the **metallic surface** by covalent functionalisation with functional groups in order to achieve in a second step a coating of the stent with polyelectrolytes through a **Layer-by Layer** approach. One of the polymers will be based on **cyclodextrins** in order to achieve the complexation of the appropriate drugs and to control their *in situ* release while the second one of the opposite charge will present controlled biodegradation properties. These polymers will be accurately immobilized onto the metallic scaffold, forming a multilayer drug delivery vehicle towards some antiproliferative drugs. The appropriate methods for the **surface characterization** will be used : SPR, spectrophotometric titrations, colloidal titration, microscopy, IR.

Qualifications required

The recruit must have ability in polymer chemistry in general, and in the use of polysaccharide and L-b-L based systems. Some experience in surface modification of metallic surfaces by functional groups would also be welcome. Preliminary experiences in biomaterials modification for drug delivery properties will be also appreciated, as well as mastering the physico-chemical and surface characterizations techniques would be also welcome (SPR, colloidal titration, SEM).

A good level (oral/written) in English language is required in the framework of this international project.

Salary: 2300€ net/month

To apply: send an e-mail and a motivation letter with a CV mentioning some contacts, to Pr Bernard Martel (bernard.martel@univ-lille1.fr) ; tel : 00 (0)3 20 43 46 35