

## **PhD Thesis Position Open in Advanced Drug Delivery and Biomaterials, Louvain Drug Research Institute, Université catholique de Louvain, Brussels, Belgium**

The Advanced Drug Delivery and Biomaterials research group of the Louvain Drug Research Institute of the Université catholique de Louvain (UCL) in Brussels, Belgium, aims to develop new drug delivery systems for two main challenges of the pharmaceutical industry, namely the delivery of biotech-based drugs (proteins, vaccines, nucleic acids) and poorly soluble drugs. The scientific approach is multidisciplinary and mechanistic-driven. It involves i) the development of new formulations, ii) their physico-chemical characterization, iii) the demonstration of their efficacy *in vitro* and *in vivo*, iv) the understanding of their mechanisms of action. The research themes include transdermal drug delivery, polymeric nanocarriers, pulmonary drug delivery and drug delivery in tissue engineering (<http://www.uclouvain.be/en-269736.html> ).

The research of Prof. Rita Vanbever within the Advanced Drug Delivery and Biomaterials research group focuses on pulmonary drug administration aspects, that is, the formulation of inhalation dry powders, the study of the pulmonary fate of diverse molecules following delivery to the lung *in vivo*, the assessment of the potential of vaccine delivery to the lung for protection against respiratory infections as well as the development of formulation strategies to sustain drug release within the lung.

### **Project Description :**

Lung cancer remains the leading cause of cancer-related deaths worldwide. Current treatment approaches for patients with lung cancer offer limited clinical benefit and there is an urgent need for additional effective adjuvant therapies. Among the new approaches developed to fight lung cancer, immunotherapy has considerably advanced over the last years. The goal of the present project is to optimize immunotherapy strategies in lung cancer by locally co-delivering liposomes-encapsulated toll-like receptor (TLR) agonists and immune checkpoint inhibitors. In the first part of the project, we will optimize the encapsulation of TLR agonists in liposomes, assess the efficacy of the liposomes to arrest tumor growth in murine lung cancer models and investigate their pulmonary fate and potential toxicity for the lung in mice. In the second part of the project, we will combine the liposomes containing TLR agonists selected in the first part to immune checkpoint inhibitors and assess the therapeutic efficacy of the combination. We will also investigate the pulmonary fate of the antibodies and we will evaluate the potential toxicity of the combined treatment for the lung in mice. The project will be done at UCL, Brussels. The position is open to PhD candidates who have been granted or will apply to a PhD fellowship in their home country.

### **Your Profile:**

- You have recently obtained a master degree in pharmacy, biology or biomedical sciences.
- You have a background or keen interest in drug delivery, polymer-drug conjugates, lung cancer, cell culture methods and animal studies.
- You possess good communicational skills in English. While a knowledge of French would be useful, it is not an absolute requirement.

If you are interested, please send a letter of application along with your curriculum vitae and the names and contact information of 2 references, by email to Prof. R. Vanbever at: [rita.vanbever@uclouvain.be](mailto:rita.vanbever@uclouvain.be)