

Post-doctoral position available in the blood-brain barrier laboratory (Partner 2), Artois University, Lens, France.

Post-doctoral candidate will work at the Blood-brain barrier (BBB) laboratory. BBB-Lab is recognized as world expert in the modeling of the BBB. This team has carried out pioneering works in establishing animal models of the BBB which has been used to investigate BBB physiology and distribution of compounds for pharmaceutical industries. New BBB models have also been used to better characterize the BBB physiology in stroke (FP7 Eustroke and EU Joint programs). In 2013, the team set up a human in vitro model of the BBB which is now widely used for mechanistic studies and for permeability screenings, and consisting to cultivate CD34⁺-cells with brain pericytes.

Applications are invited for a 24 months post-doctoral fellowship under the supervision of Pr Fabien Gosselet. The ideal start date is around September 2018.

The successful candidate will test passage of nanoparticles across in vitro models of blood-brain barrier and effects of endothelial cells progenitors on BBB physiology.

Please read the below summary for more information and please send CV and motivation letter to fabien.gosselet@univ-artois.fr (<http://lbhe.univ-artois.fr/membres-lbhe/fabien-gosselet>).

Your responsibilities:

- Passage of nanoparticles across BBB
- Effects of endothelial cell secretome on BBB permeability and physiology
- Co-supervision of research students in the lab (B.Sc., M.Sc. and Ph.D. students)
- Preparation of scientific publications, contribution to grant applications

Your qualifications:

- PhD or equivalent in cell or molecular biology or related fields
- A knowledge of a wide range of methods in biochemistry and molecular biology
- Experience with in vitro models of BBB
- Experience with nanoparticles
- High motivation to do research
- A convincing record of publications; experience with grant applications is an asset

- Fluency in English, knowledge of French is a plus.

Summary of the project

Dr. Anna Rosell will be the coordinator of a new H2020 project (EURONANOMED call).

Title: New MAGnetic Biomaterials for Brain Repair and Imaging after Stroke (MAGBBRIS)

By engineering novel magnetic nano-biomaterials we will achieve tissue repair in the context of an ischemic event. We will take advantage of nanotechnology to deliver therapeutic growth factors, secreted by progenitor cells, into the injured brain. According to the World Health Organization, 15 million persons suffer a stroke worldwide each year. However, the only available treatment is the acute thrombolytic therapy (pharmacological or mechanical) which is being administered to less than 10% of stroke patients due to strict selection criteria. In contrast, neuro-repair treatments could offer the opportunity to include most stroke patients by extending the therapeutic time window.

MAGBBRIS will demonstrate that growth factors, secreted by endothelial progenitor cells, with proved potential to induce tissue repair, can be encapsulated in magnetic biomaterials and be successfully and safely transplanted into mouse brains to induce tissue repair. In the ischemic brain, the secretome will be retained by an external magnetic field in the vasculature, improving vascular remodelling and neurogenic tissue regeneration after stroke.

Our approach will provide an advanced therapy that could be translated to a clinical stage as noninvasive, safe and available to most stroke patients. Biomaterials will be fully validated including among others aspects cytotoxicity and therapeutic properties both in vitro and in vivo; advanced imaging techniques (PET, MRI and Optical Imaging) will be used to monitor and guide the delivery of the biomaterials and to assess the therapeutic effect in vivo over time in a mouse model of cerebral ischemia. We will test the potential translation to humans by proving the feasibility of secretome production to industry level in accordance with GMP standards, and by designing a wearable magnetic device prototype for stroke patients.

This consortium is made up by highly multidisciplinary materials-science, biomedical and clinical research with industrial partnership. The project will provide a new medicinal product ready to be tested in a preclinical multicentric study.

MAGBBRIS Partners

Coordinator, Dr. Anna Rosell, Vall d'Hebron Research Institute. Barcelona, Spain.

Partner 1 : Dr. Anna Roig, Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC). Institut de Ciència de Materials de Barcelona (ICMAB). Bellaterra, Spain.

Partner 2 : Pr. Fabien Gosselet, University of Artois, Faculty Jean Perrin. Lens, France.

Partner 3 : Dr. Maria Picchio, Ospedale San Raffaele IRCCS. Milano, Italy.

Partner 4 : Dr. Filip Jelen, Pure Biologics Ltd. Wrocław, Poland.

Partner 5 : Dr. Peter Kopcansky, Institute of experimental physics, Slovak Academy of Sciences, SAS. Kosice, Slovakia.

Kick-off meeting, March 2018.

Recrutement sur un AAPG ANR 2017

Acronyme : **CNS-Antidote**

Défi 9: Liberté et sécurité de l'Europe, de ses citoyens et de ses résidents - PRC

Ingénieur de Recherche 2C

Dans le cas des empoisonnements par les composés organophosphorés OPs, le traitement conventionnel consiste en l'injection d'un antidote constitué d'une oxime capable de réactiver l'acétylcholinestérase (AChE) phosphorylée. L'efficacité des oximes actuellement administrées est très dépendante de la nature de l'OP utilisé (les antidotes à large spectre sont actuellement inexistantes). De plus, ces oximes traversent difficilement la barrière hémato-encéphalique (BHE) pour réactiver l'AChE du SNC. En 2015, les partenaires du consortium ont découvert et breveté deux nouvelles familles de réactivateurs hybrides capables de réactiver l'AChE inhibée par un large spectre d'OPs avec une efficacité sans pareille *in vitro*.

L'objectif du projet CNS-Antidote est de valider l'efficacité thérapeutique de nos meilleurs réactivateurs hybrides *in vivo* mais également de s'assurer de leur capacité à passer la BHE humaine grâce à notre modèle cellulaire breveté en 2014 (patent WO2014203087 A1: A human blood-brain barrier model derived from stem cells. Cecchelli R., Sevin E., Feirrer L., Aday. S.). Cette potentialité à pénétrer le cerveau sera vérifiée par des études électroencéphalographiques réalisées chez la souris humanisée pour l'AChE et intoxiquée par différents OPs, puis traitée par un réactivateur choisi afin d'identifier les candidats cliniquement actifs au niveau du SNC pour des études ultérieures menées sur le singe cynomolgus et l'Homme.

Dans le cadre de ce projet, un Ingénieur de Recherche sera recruté pour 18 mois à partir du 1er mars 2018 et travaillera sous la direction du Pr Marie-Pierre Dehouck.

L'ingénieur sera chargé d'étudier le transport à travers la BHE *in vitro* des réactivateurs de l'AChE.

Compétences exigées:

Connaissance de la BHE et de sa modélisation.

L'ingénieur recruté devra être autonome en culture de cellules et savoir réaliser des co-cultures cellules endothéliales humaines et péricytes;

La maîtrise technique du modèle *in vitro* murin pourrait être nécessaire et serait un plus.

Il devra savoir mettre en œuvre, analyser et interpréter les expériences de transport des molécules à travers la BHE *in vitro*.

Il serait souhaitable qu'il connaisse la technique d'immunofluorescence;

Et qu'il ait une bonne maîtrise de l'anglais.

Un CV et une lettre de motivation sont à adresser à mpierre.dehouck@univ-artois.fr et christophe.landry@univ-artois.fr