

Post doctoral position available for 30 months in the Blood-Brain Barrier Laboratory, Université d'Artois, Lens, France.

The candidate will work at the Blood Brain Barrier (BBB) Laboratory, UR 2465, from September 2023 to March 2026 (30 months).

The laboratory has 32 years of expertise in the field of the blood-brain barrier (BBB). Its research have been focused on the in vitro modelling of the BBB using animal and human cells and also the characterization of BBB properties under physiological and pathological conditions such as stroke and cancer. A part of the work of the laboratory includes the evaluation of drugs, nanoparticles and cells crossing through the BBB (website: lbhe.univ-artois.fr).

The recruited candidate is expected to work under the supervision of Pr Marie-Pierre Dehouck and Dr Caroline Mysiorek. The offered job is a part of an european project ERA-NET NEURON IMatrix (JTC 2022- cerebrovascular). If you need more information on the project contact mpierre.dehouck@univ-artois.fr

If you are interested in this job, please send CV, motivation letter and letters of recommendation in a single pdf file to drh-emplois@univ-artois.fr. Please mention «ERANET Neuron» in the title of the mail.

The deadline for application is June 30th.

The project (english version): Theragnostic targeting of extracellular matrix metalloproteinases and blood brain barrier disruption in subacute ischemic stroke.

Despite the remarkable progress in the care of acute stroke with thrombolysis and mechanical thrombectomy during last years, the clinical management of subacute ischemic stroke still remains limited due to the lack of effective treatments. Hence, establishing novel theragnostic ¹⁹F nanoprobes targeting the neurovascular unit can contribute to accelerate the approval of promising therapies for clinical subacute stroke. For this reason, the aim of IMatrix is to explore the diagnostic and therapeutic potential of targeting matrix metalloproteinases on Blood-Brain Barrier disruption (BBBd), vascular inflammation, leucocyte infiltration and haemorrhagic transformation during secondary ischemic damage using fundamental and clinical research approaches. Likewise, the evaluation of the dynamic of subacute ischemic stroke in humans is a necessary preliminary step for future clinical trials targeting these pathophysiological mechanisms. Together with the use of a large portfolio of specific imaging and contrast agents able to image BBBd and the use of human blood biomarkers will help us to gain new insights into the potential of targeting neurovascular unit as novel therapeutic approach for subacute ischemic stroke. Finally, the knowledge obtained in the framework of IMatrix has a strong translational potential that can easily be transferred to other neurological and neurodegenerative diseases with consequently benefits to patient quality of life and potential treatment cost savings.

Le projet (version française) : ciblage théragnostique des métalloprotéases de la matrice extracellulaire et rupture de la barrière hémato-encéphalique dans l'accident vasculaire cérébral (AVC) subaigu.

Malgré les progrès remarquables, au cours des dernières années, dans la prise en charge des AVC aigus avec la thrombolyse et la thrombectomie mécanique, la prise en charge clinique de l'AVC ischémique subaigu demeure limitée en raison du manque de traitements efficaces. Ainsi les objectifs de ce projet sont d'explorer et de valider le potentiel diagnostique et thérapeutique du ciblage des métalloprotéases (MMP) matricielles en utilisant des nanosondes intelligentes. Ces sondes permettraient à la fois de moduler l'activité des MMP ayant des effets délétères sur la barrière hémato-encéphalique (BHE), de surveiller le trafic des leucocytes à travers la BHE et de mesurer la perméabilité de la BHE pendant la phase subaiguë de l'AVC. L'étude de la dynamique de l'AVC ischémique subaigu chez l'Homme sera une étape nécessaire pour de futurs essais cliniques ciblant ces mécanismes physiopathologiques. L'utilisation d'un grand nombre d'agents d'imagerie et de contraste ainsi que l'utilisation de biomarqueurs sanguins humains aideront à acquérir de nouvelles connaissances sur le potentiel de ciblage de l'unité neurovasculaire dans le cadre de l'AVC ischémique subaigu. Les connaissances acquises dans le cadre du projet IMatrix pourront être transférées à d'autres maladies neurologiques et neurodégénératives avec pour conséquence une amélioration de la qualité de vie des patients et des économies sur les coûts de traitement.

Tasks :

- Optimisation of the human in vitro BBB model in the frame of brain ischemia studies, development of ischemia-reoxygenation conditions to mimic the cerebral ischemia in vitro, study of the permeability of BBB in vitro.
- Scientific watch on the project, drafting of protocols and results of experiments, presentations at scientific meetings and congresses, preparation of scientific articles.

Qualification :

PhD in a field related to cell biology or physiology ; No later than three years after obtaining the PhD degree. Experience in vitro models and nanoparticles is a plus.

Skills :

- Cellular biology: Culture of human cells (endothelial cells, pericytes, astrocytes, microglial cells). Use of a controlled atmosphere chamber, phase contrast microscopy, fluorescence microscopy. Biochemistry: RT qPCR, Western-blot, Elisa assay.
- Excellent communication skills in English (written & verbal).
- Proactive team spirit and also able to work independently.