Ecole Nationale Supérieure de Chimie de Paris
Chimie ParisTech | PSL University
Institute of Chemistry for Life & Health Sciences
Synthesis, Electrochemistry, Imaging & Analytical Systems for Diagnostic (SEISAD) Team
11 rue Pierre &Marie Curie | 75005 Paris | France

PROJET FINANCÉ PAR L'ANR - PROJECT FUNDED BY THE ANR

Position : Postdoctorate or Research Engineer in preclinical MRI bioimaging for the evaluation of theranostic agents of polyrotaxanes for the diagnosis and therapty against arthritis.

The main objective is the development of a supramolecular platform for biomedical applications such as multimodal imaging, early stage diagnosis and ultimately medical treatment of arthritis. The innovative modular approach is based on building and synthetizing multimodal multifunctional polyrotaxanes, and on assessing their suitability as improved imaging agents for the detection of specific biochemical signatures (molecular imaging), with markers for imaging, or vectors for targeting against arthritis.

The diagnosis, treatment and monitoring of the therapeutic efficiency at the earliest possible stage of diseases benefit from such theranostic compounds.

Arthritis (osteoarthritis (OA) and rheumatoid arthritis (RA)) in ageing societies is the first burden of disabling disease after 40 years old, with poor effective symptomatic therapies and lack of efficient treatment, then limited stage diagnosis and treatment monitoring. Yet, this will allow to treat earlier the disease, avoid the progression and limit the disabling aspect of the disease. Anatomical and functional dynamic MRI studies have been developed to diagnose and understand these arthritic pathologies.

The present work deals with MRI preclinical applications and development methods to assess the theranostic polyrotaxanes vectors in solution with relaxivities measurements, in vitro with cytotoxicity tests then in vivo on mice models of arthritis with biodistribution studies and joint inflammations studies after treatment.

The works will be performed on our micro MRI imaging facility (l'ENSCP Chimie Paris tech in relationship with the plateforme d'imagerie in vivo optique LIOPA UTCBS http://piv.parisdescartes.fr/modalites-imagerie/optique/ within the 'plateformes d'imageries du Vivant de Paris Descartes (PIV) network'. One of the expertise of your facility remains in molecular imaging biodistribution studies for the development of new imaging probes then for diagnosis and therapy evaluation. The polyrotaxanes are developed by the team of Pr. B. Hasenknopf (Sorbonne Université, Paris, ANR Rotaximage) and are dedicated here for the arthritis diagnosis and treatment (Pr. Rannou, Institut Cochin, Paris).

The bioimaging facility is well equiped with a micro IRM Bruker 7T, 5 cameras for fluorescence and bioluminescence imaging and a recent camera NIR II.
The profile is a postdoctoral or research Engineer in bioimaging.

MISSIONS

- In vitro cytotoxicity tests
- Development and execution of MRI and optical imaging protocoles in preclinics in vivo for the evaluation and biodistribution, Image processing and biostatistics.
- Manage the bioimaging facility in vitro and in vivo
- Care of the arthritic murine models with the biologists' partner.
- Histology.
- Results communications

EXPERTISES

- Preclinical MRI, theory, practise and image processing.
- General biology and murine models.
- Cells culture
- General knowledges in chemistry and MRI imaging probes.

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FORMER TRAINING : PhD in Preclinical or Clinical Bioimaging, Diplomas in the biomedical profession with research in Bioimaging, cells and small animal biology. Specific master's degree in bioimaging, Platform Engineering / Imaging, nanomaterials for health and imaging, or Engineering School Authorization for animal experimentation (designer, surgery or experimenter level) Professional experience in bioimaging mandatory.

AVAILIBILITY: From January 2020, during 15months.

LOCATION: Equipe SEISAD Synthèse Electrochimie, Imagerie et système analytiques pour le Diagnostic de l' ENSCP, Institute of Chemistry for Life and Health Science/ Plateforme LIOPA UTCBS, 11, rue Pierre et Marie Curie 75005 Paris, France

CONTACT : Send CV and motivation letter, references to
Dr. Bich-Thuy Doan, (bich-thuy.doan@chimieparistech.psl.eu)