



3 years PhD candidate position:

Metal complexes tracking with optical imaging

Job type: PhD program fellowship (acquired funding from the University of Lorraine)

Duration: October 2023-2026 (36 months)

Monthly gross salary: 1975.00 €

Keywords: Organic chemistry; Coordination chemistry; Medicinal chemistry; Optical imaging.

Description: Numerous metal complexes display high therapeutic potential, cisplatin for example is a gold standard in the treatment of solid tumors. Many metal-based drug candidates are under intense evaluation in the hope of providing a treatment for resistant cancers.^[1-3] Yet, metal complexes are prompt to biotransformations, *i.e.* modification of their coordination sphere *via* transmetalation, transchelation and so forth.^[4-6] Identifying such biotransformations is necessary to avoid unwanted formation of toxic metabolites and make them more likely for clinical translation.

Objectives: Therefore, the aim of this project is to develop a novel approach utilizing optical imaging to track the biotransformations of metal-based drug candidates in view of rationalizing their further pharmacomodulation. This will allow to establish a relationship between metal's coordination sphere, metal-ligand interaction, and the complexes' biotransformations to rationalize drug design.

Working program:

- Retrosynthetic design and subsequent synthesis of functionalized ligands and coordination to abundant metals
- Characterizations of the synthesized molecules (NMR, mass spectrometry, UV-Vis absorbance, fluorescence)
- Optical imaging *in vitro*

Skills you will acquire: The hired PhD candidate will develop strong interdisciplinary skills in chemical synthesis, physico-chemical characterizations and optical imaging. Hands-on biological testing on cell models is a possibility. This project will involve collaborations between a group of organic and coordination chemistry, a group of molecular biologists and a group of theoretical calculations. Short scientific exchanges abroad are possible.



Working environment: The 'Laboratoire Lorrain de Chimie Moléculaire' (L2CM) is a dynamic laboratory bringing together chemists developing organic and inorganic small molecules or nano-sized objects to solve societal problematics in health and energy transition. The position is on our site in Nancy, in the team 'Ingénierie de Complexes Métalliques' (InCoMe) which combine strong expertise in organic chemistry, coordination chemistry, bioinorganic chemistry, photophysics and physico-chemistry.

Requirements: We are looking for a highly motivated candidate possessing a master degree or equivalent in organic chemistry and/or coordination chemistry. Additional experience in optical imaging will be highly valued. Autonomy, strong reliability and team-work spirit are required. Ability to work in cooperative environments at the chemistry-biology interface is needed for collaboration with biologists and theoretical chemists.

Co-Supervisors: Katalin Selmeczi & Mathilde Bouché

Laboratoire Lorrain de Chimie Moléculaire (UMR7053), Nancy, France

Application (deadline 28th of April 2023): Send a CV, motivation letter, M1 & M2 marks and a brief summary of your research experience to:

Dr. Katalin Selmeczi (katalin.selmeczi@univ-lorraine.fr)

Dr. Mathilde Bouché (mathilde.bouche@univ-lorraine.fr)

L2CM (UMR 7053) - Boulevard des Aiguillettes, 54506, Vandoeuvre-Lès-Nancy

References :

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