

PhD position in Grenoble

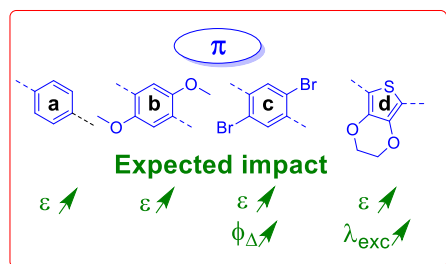
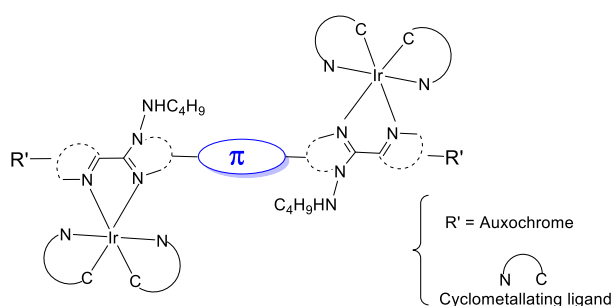
Binuclear Iridium(III) complexes for high photodynamic therapy Efficiency

Topic: New drugs for photodynamic therapy

Organizations: Département de Chimie Moléculaire (DCM) and Institut for Advanced Biosciences (IAB)

Project Leaders: Pierre-Henri Lanoë & Amandine Hurbin

Project Description: The project aims to develop new drugs for photodynamic therapy (PDT). PDT exploits photoactivatable compounds for therapeutic use against cancer and age-related macular degeneration (AMD). It consists of treating a patient with a molecule, called a photosensitizer (PS), by topical (cream), tablet, or injection route. This PS compound should ideally accumulate preferentially in the area to be treated and then, once a peak concentration is reached, the curative treatment will be carried out by light irradiation of this area. The photosensitizers used must be harmless in the absence of light and the toxicity should be activated under light irradiation. In addition, the use of two photons excitation (TPE) bring spatial resolution and deeper depth penetration in biological tissue. The project is aiming to the development of PSs capable of producing singlet oxygen, responsible for cell death, with high quantum yields ($\phi_{\Delta} > 70\%$). Our preliminary results on new PSs based on multi-nuclear iridium(III) complexes showed their high potential in the field of PDT, as they exhibit a better efficiency compared to a mononuclear model compound. The PhD student will develop a series of new complexes and will validate their safety and efficacy *in vitro*, in order to bring out one or more candidate molecules for application in PDT. **The successful candidate** will work on three axis: (i) she/he will be in charge of the design and



she/he will be in charge of the design and synthesis of the ligand and new complexes in the **DCM**, as well as the characterization of the compounds by HRMS, NMR spectroscopy and by luminescence spectroscopy, (ii) she/he will perform at the **IAB** the *in vitro* PDT studies, and (iii) two photon absorption characterization at **Ecole Normale Supérieure de Lyon**.

Methods and Materials: Organic & inorganic synthesis physico-chemical characterization, absorption & emission characterization, cell culture, flow cytometry, confocal imaging, phototoxicity studies

Requirements: Master's degree in chemistry or a related field, background in molecular synthesis and coordination chemistry, including characterization techniques, interest in cellular biology will be a strong asset, strong motivation to work on both synthetic chemistry and biology, good written and oral communication skills in English.

Application Process: Interested candidates should submit their CV, motivation letter outlining research interests and relevant experience in the domain, copies of academic transcripts and degrees, and names and contact information of two references to the **project leaders:** Pierre-Henri Lanoë (pierre-henri.lanoë@univ-grenoble-alpes.fr) and Amandine Hurbin (amandine.hurbin@univ-grenoble-alpes.fr). **APPLICATION DEADLINE: 10/05/2023**