Doctoral position available

Title: Design, synthesis and biological evaluation of new photoswitchable neuropeptides involved in Pain modulation

Laboratory for Therapeutic Innovation and laboratory of Biotechnology and Cellular Signaling, LabEx MEDALIS, Illkirch, University of Strasbourg

Summary: Photopharmacology is a rapidly developing field, which uses light-activable (photochromic) ligands to gain spatio-temporal control of therapeutically relevant biological targets. Devoid of the requirement of genetic modification of target proteins, photopharmacology provides a viable alternative to optogenetics with high clinical potential. Photochromic ligands have proven successful in optically controlling ion channels, enzymes and antibiotics, with a very few photopharmacological tools reported for GPCRs. More particularly, no photoswitchable neuropeptide with in vivo activity has been reported to date. The goal of this project is to develop a strategy to generate photoswitchable neuropeptides that could be activated by light in living mice.

Program: The first part of the PhD program will focus on the conception and synthesis of photochromic neuropeptides. The second part of the PhD program will be devoted to the study of the activity of the photochromic peptides in vitro (binding and calcium mobilization functional experiments on target GPCRs). The PhD student will also have the possibility to participate in the evaluation of the most interesting derivatives in mice.

Scientific context: The thesis will be carried out jointly between two teams: Integrative Chemical Biology and Pharmacognosy (UMR 7200) leaded by Dr. Dominique Bonnet, and GPCRs, Pain and Inflammation (UMR 7242) headed by Dr. Frédéric Simonin. The team of Dr. Dominique Bonnet focuses on developing chemical tools and generic methods aiming at deciphering life mechanisms and accelerating the discovery of GPCR probes and drug candidates. The team of Dr. Frédéric Simonin is involved in the characterization of novel GPCRs in the context of the modulation of Pain. Both teams are part of the LabEx MEDALIS for drug discovery and the LabEx EURIDOL, which study pain and novel innovative treatments.

Financial support: CNRS, Prime80

Starting date: 1st October 2019

Profile of the candidate: We are looking for a motivated candidate with a Master degree in chemical biology or organic chemistry willing to work at the interface of chemistry and biology. The candidate should have solid background in organic synthesis and should be highly interested by interdisciplinary and collaborative work. Knowledge in biology/pharmacology will be a plus. Please provide a CV, a cover letter and the marks for Master 1 and 2.

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