

- **ORGANISATION**

Université Paris Saclay (France)

- **RESEARCH FIELD**

Biophysics, Biology

- **APPLICATION DEADLINE: 30-06-2023**

- **OFFER STARTING DATE: 01-09-2023**

- **PRCI – ANR/DFG**

FluPepDye: Development of new peptide based NIR probe conjugates for specifically and selectively detecting amyloid early biomarkers

CE17: translational health research

Post-Doctoral position: Biophysical evaluation of the peptide based NIR probe conjugates: Investigation of their photophysical properties upon binding with different preparations (monomer, oligomers, fibrils) of different amyloid proteins (*A β 1-42*, *α -synuclein*, *tau* and *hIAPP*) *in vitro* and *in cells*.

The Post-Doctoral fellow chosen for this position will take part in the ANR-DFG PRCI project FluPepDye. FluPepDye is based on a Franco-German consortium, composed of organic chemists, medicinal chemists, and biophysicists. The coordination of the project is ensured by Dr. Nicolo Tonali (Université Paris-Saclay), in collaboration with the German scientific leader coordinator Prof. Norbert Sewald (University of Bielefeld).

Objective of FluPepDye: FluPepDye is a project aiming to develop new selective Near Infra-Red fluorescent cyclopeptides for specifically detecting early biomarkers of different amyloid pathologies. The current molecular biomarkers detected in diagnostic for amyloidosis remain the late-stage amyloid deposits and the used probes do not show sufficient protein specificity. Our basic research project aims to design new probes able to detect the aggregation at an early stage preceding the formation of insoluble deposits, thus anticipating the onset of symptoms. They will be implemented by rationally designed cyclopeptides, capable of driving selectivity for specific amyloid proteins involved in neurodegeneration or type II diabetes. Through a cross-coupling approach, the fluorophore will be connected to the cyclopeptide by a biphenyl link whose torsional rotation restriction allows the fluorescence to turn on upon binding to aggregates. This project will provide useful research tools for future early diagnosis.

Objective of the recruited post-doctoral researcher:

The post-doctoral researcher enrolled in this position will be involved in the evaluation of the photophysical properties of the probes, their binding affinity to amyloid peptides, their fluorescence intensity enhancement upon binding, their binding properties, the prediction of their metabolic stability in plasma and their blood-brain barrier/membrane permeability. The researcher will perform on the most promising conjugates the evaluation in cells and ex vivo, through a viability assay in the presence of oligomers and probes, followed by confocal microscopy to evaluate their interaction/localization. Ex vivo experiments will be performed using histochemistry on fixed mouse brain tissues of aged APP/PS1 double transgenic AD mouse models, to ascertain whether these derivatives could detect soluble and/or insoluble aggregate subspecies in tissues.

The Post-doctoral researcher will be enrolled by the University of Paris-Saclay (<https://www.universite-paris-saclay.fr/en>) under the supervision of Dr. Nicolo Tonali (FLUOPEPIT/BioCIS, <https://www.biocis.universite-paris-saclay.fr/?-FLUOPEPIT-&lang=en>) and will participate to all the meetings and activities organized by the international consortium.

Candidate profile:

The ideal candidate for this position is a highly motivated, excellent researcher with a PhD degree in biology, biophysics, biochemistry, or medicinal chemistry. The candidate should enjoy the challenge of novel scientific concepts and have a highly motivated, persistent, and results-oriented attitude. We are looking for candidates interested to work in a multidisciplinary research environment, who have excellent communication skills and are self-motivated, critical, and trustworthy. The candidate should be able to work well both independently and in an interdisciplinary team. A good knowledge in biophysical assays (CD, DLS, fluorescence spectroscopy, CE, IMS-MS, TEM, SPR), in cell culture and in confocal microscopy will be appreciated.

Good oral and written communication skills in English are essential.

Good organizational and planning skills are necessary.

Duration: 24 months

Contact information

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