Postdoc Position in Bio/Medicinal Inorganic Chemistry

Luminescent Sensor to Detect the Labile Cu(II)-Pool, a Diagnostic Parameter for Wilson's and Alzheimer's disease

PostDoc position for **2 years** on the project " Luminescence detection of exchangeable Copper(II) traces in biological fluids" financed by ANR in the group of Biometals and Biological Chemistry (BCB) headed by Prof. Dr. Peter Faller, Institut de Chimie, UMR 7177 University of Strasbourg / CNRS; Group webpage: https://bcb.chimie.unistra.fr/

Interdisciplinary project with several collaborators from different disciplines, Group of G. Ulrich (ICPEES, Strasbourg): synthesis and characterization of organic fluorophores; O. Seneque (CEA, Grenoble) synthesis and characterization of Lanthanide-Antenna units; N. Djebrani-Oussedik and A Poujois (Hôpital Lariboisière Paris, and Reference center for Wilson's disease): measure of clinical relevant blood plasma samples.

Project:

Background: Copper is an essential trace element for most living beings. Most copper is tightly bound to proteins. Only very little copper is labile bound to biomolecules and can rather rapidly be exchanged or transferred. This exchangeable pool mainly exists extracellularly, where Cu is predominantly present in its oxidized form Cu(II). The project's aim is to elaborate a ratiometric or turn-ON luminescent Cu(II)-sensor, that is able to measure specifically labile/exchangeable Cu(II)-concentrations in biological systems, from simpler cell culture medium to the challenging blood plasma. Such a Cu(II)-sensor would be very useful as a tool to understand the Cu metabolism and might have applications for diagnosis of diseases with increased exchangeable Cu pool concentrations such as Wilson's or Alzheimer's disease.

PostDoc project: The project consist of the assembly of the different units of the Cu(II)-sensors on a peptide backbone. The sensor has a peptidic Cu(II)-binding unit, one or two luminophores (either fluorophore or Ln-Antenna) which are provided by the collaborators. The main task is to synthesize the peptide backbone with integrated Cu(II)-binding site and conjugate the luminophores. Next step will then be to test the sensor, in different biological fluids from buffer solution up to blood serum, and last on clinical relevant samples.

Recent references related to the topic from the group:
Falcone et al. *Chem Commun*. 2020, 56:4797, Okafor et al. *Chem Sci.* 2022, 13:11829 , Falcone et al. *J Inorg Biochem*. 2021, 221:111478, Falcone et al. *Dalton Trans*. 2019, 48: 14233.

Methods to be used: mainly bioinorganic chemistry with spectroscopy (Luminescence, fluorescence, NMR, EPR, CD, etc), but also peptide synthesis and inorganic complexation, biochemical techniques (chromatography,…).

Profile searched: Candidate with a recent PhD in (bio)chemistry or related discipline. Experience in biochemistry or biological inorganic chemistry would be welcome, but are not a prerequisite.

Starting date: First months of 2024 (to be determined)
Salary: Net ca. 2100 Euros/month
Applications: CV with coordinates of scientist able to give a recommendation and letter of motivation, should be send from now and before end of October 2023 to pfaller@unistra.fr