

Two-year postdoctoral position in coordination / bioinorganic chemistry in Marseille

Offer description

A postdoctoral position (expected starting date: autumn 2023) is available at the "Institut des Sciences Moléculaires de Marseille" (iSm2, UMR 7313) within the frame of an ANR-funded project.

Project

In this project, we aim at preparing bioinspired mononuclear copper complexes inspired by the active site copper containing metalloenzymes with the aim to understand the determinants to perform strong C-H bond activation and to prepare bioinspired catalysts. High-valent copper oxygen species have been proposed as key oxidizing intermediates for strong C-H bond activation. To date, very few mononuclear high-valent copper-oxygen intermediates have been isolated and characterized.

In this project we aim at (i) designing mononuclear copper complexes for the stabilization of high-valent copper species, (ii) isolating and characterizing reactive intermediate species, (iii) determining spectroscopic, thermodynamic and kinetic properties of these reactive intermediates using both experimental and theoretical approaches, and (iv) evaluating their properties for C-H bond activation.

The project will thus cover different fields including

- the synthesis/characterization of new ligands/complexes
- the generation and identification of reactive intermediate species (including at low temperature)
- the use of spectroscopic characterization tools and electrochemistry
- catalytic studies for substrate oxidation.

Through the consortium of the project, one important aspect will rely on the use of original techniques such as cryo-spectroelectrochemistry and sequential-collisions mass spectrometry.

The candidate will join the Biosciences group of ism2 (<https://ism2.univ-amu.fr/fr/biosciences/biosciences>) that has a strong expertise in the study of metalloenzymes and in the development of bioinspired metal complexes. The candidate will evolve in a multidisciplinary environment (chemistry / biology / biophysics). In particular, the group is involved in structure-function relationships studies of several metalloenzymes. Knowledge on enzymatic systems will therefore be available to strengthen the development of bioinspired complexes.

Keywords: bioinorganic chemistry, copper, dioxygen activation, mechanism

Candidate profile and skills

The candidate should possess a doctorate in chemistry, preferably in *synthetic bioinorganic chemistry*, e.g. *coordination chemistry / physical chemistry*. Expected competences:

- synthetic chemistry and coordination chemistry (design, synthesis and characterization of transition metal complexes)
- competences in electrochemistry and in spectroscopic tools for the characterization of coordination complexes are necessary
- Knowledge on DFT calculations are a plus

Application

Application has to be submitted exclusively online via the CNRS job portal (<https://emploi.cnrs.fr/Offres/CDD/UMR7313-ARISIM-003/Default.aspx?lang=EN>)

- A CV including a brief summary of the thesis work and of other research experiences
- a motivation letter

In one of the above files, please include the name of two references

Contact details

Dr. A. Jalila Simaan, Institut des Sciences Moléculaires de Marseille, mail : jalila.simaan@univ-amu.fr
<https://ism2.univ-amu.fr/en-gb/annuaire/biosciences/simaanjalila>