

Postdoctoral position in bioinorganic chemistry / biomass valorization in Marseille

Offer description

A postdoctoral position (expected starting date: end 2024 – beginning 2025) is available at the “Institut des Sciences Moléculaires de Marseille” (iSm2, UMR 7313) within the frame of an ANR-funded project.

Project

The project is centered on the development and evaluation of bioinspired synthetic catalysts for the valorization of recalcitrant polysaccharides from biomass (such as cellulose or chitin) for biosourced chemicals or biomaterial applications. The natural resistance of these polysaccharides to deconstruction is however largely responsible for the high cost of conversion. In Nature, organisms such as fungi and bacteria produce various enzymes with oxidative or hydrolytic activities which act in a synergistic manner to deconstruct recalcitrant biomass substrates. Among oxidative components, Lytic polysaccharide monoxygenases (LPMOs) are copper-containing enzymes that key players promoting polysaccharide oxidation and lysis.

We aim at developing **bioinspired catalysts** for the oxidation of recalcitrant polysaccharides for biofuel or biomaterial applications. Their activity will be screened on soluble substrates and on extended polysaccharides. The best catalysts will be used to design hybrid catalysts or artificial enzymes.

This work will be performed within the framework of an ANR-funded project (INSPIRE; ANR-23-CE43-0012). Four different partners of complementary expertise (chemistry, catalysis, biotechnology, material science) and using approaches ranging from fundamental to more applied fields will be involved. Our main objectives are (i) Designing metal-based catalysts and hybrid protein-complex catalysts (ii) Evaluating their activity on polysaccharides and their mode of action (iii) Characterizing oxidized polysaccharides using physico-chemical techniques and (iv) back-optimizing the catalysts' selectivity and efficiency to approach application requirements.

The candidate will be involved in the following tasks :

- the synthesis of new ligands/complexes
- The spectroscopic and redox characterizations of the catalysts
- the preparation and characterization of hybrid protein-complex catalysts
- The catalytic studies on soluble model substrates and on polysaccharides

Keywords: bioinorganic chemistry, copper, biomass, polysaccharides, catalysis

Candidate profile and skills

The candidate should possess a Ph.D in chemistry. Expected competences:

- synthetic/coordination chemistry (design, synthesis and characterization of transition metal complexes)
- Use of analytical methods such as HPLC
- Knowledge in catalysis or biocatalysis
- Knowledge on polysaccharides and protein chemistry would be a plus

Application

Applications have to be submitted **exclusively** online *via* the CNRS job portal (<https://emploi.cnrs.fr/Offres/CDD/UMR7313-ARISIM-004/Default.aspx?lang=EN>)

- A CV including a 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

Incomplete applications will be discarded.

Contact details

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