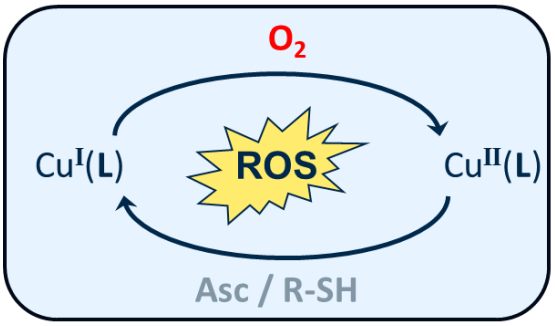
POST-DOC position at the Coordination Chemistry Lab - Toulouse

Carbene-derivatized peptides for Cu-based redox catalysis in living cells

The use of redox-active Cu-complexes for in cell catalysis, including the formation of cytotoxic reactive oxygen species (**ROS**), remains thwarted by their low stability in the presence of strong intracellular competitors such as glutathione (GSH) and metallothioneins (MT).



To tackle this challenge in medicinal inorganic chemistry, we aim to derivatize short **Cu-binding peptides** with N-heterocyclic carbenes (**NHC**) to achieve enhanced resistance towards reductive dissociation by GSH/MT, while keeping efficient redox cycling and hence O_2 activation towards the generation of ROS.

First, an NHC-amino acid derivative will be synthesized and incorporated in short peptides by solid-phase peptide synthesis (**SPPS**). Then, Cu-binding to such innovative molecular platforms will be characterized via a wide set of **spectroscopy** techniques (UV-vis, CD, EPR, NMR) and **electrochemistry** (CV). Then the stability and reactivity of the complexes will be tested in physiological-like conditions and eventually in biological media (plasma, cell culture medium, cell lysates) and on **cell cultures**, paving the way for their application as anticancer drugs and beyond.

Environment: The successful candidate will work in a dynamic and international environment at the Laboratoire de Chimie de Coordination (CNRS) in Toulouse, in the ALAMBIC team and "Molecular Design of Transition-Metal Pre-Catalysts" team, experts in Cu-peptide and NHC chemistry respectively. The technical and scientific environment of the laboratory and of the host teams is ideally suited to the project. The successful candidate will perform NHC and peptide synthesis, characterization by advanced spectroscopic techniques such as NMR, EPR, UV-Visible, circular dichroism, fluorescence and studies in cellular medium.

Profile: We are looking for a highly motivated and hard-working post-doctoral fellow with a background in molecular and inorganic chemistry and, ideally, with experience in cell culture. Candidates should have a keen interest in multidisciplinary projects in the field of bioinorganic chemistry. They should also be able to work autonomously and as part of a team.

Salary: approximately €2,400 net (depending on experience), in the framework of the CNRS-funded project "Carb@CUN".

Duration: 12 months. The position is available as soon as possible and cannot start later than 1st September.
Application : The application must include a complete CV summarizing your research experiences and including the names of at least two references. It should be sent to Drs. Christelle Hureau (christelle.hureau@lcc-toulouse.fr), Enrico Falcone (enrico.falcone@lcc-toulouse.fr) and Vincent César (vincent.cesar@lcc-toulouse.fr).

Application deadline : 15th June 2026.

References:

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