Postdoctoral fellow in design of copper-based bioinspired catalysts and nanostructured electrodes for the oxygen reduction reaction

Laboratories	The project is led by CIRE and BIOCEN teams from Département de Chimie Moléculaire (DCM, CNRS/UGA).
Team	The recruited researcher will be under the supervision of Alan Le Goff (DR CNRS, équipe BIOCEN) et Catherine Belle (équipe CIRE). A. Le Goff has a strong expertise in the efficient immobilization and wiring techniques for bioinspired catalysts and metalloenzymes involved in the activation of energy-related small molecules (H2, CO2, O2). Partner 1 has also developed the functionalization of CNTs with enzymes and bioinspired models for glucose and hydrogen fuel cells. In this field, he authored more than 100 publications (H-index = 50) and 10 patents C. BELLE (DR CNRS) has a strong expertise in bioinorganic chemistry, and specifically biomimetic/bioinspired model complexes of Cu-containing enzymes (Catechol oxidase, tyrosinase and methane mono-oxygenase), publishing first rate articles (65) and book chapters (3) on the topic.
Location	Département de Chimie Moléculaire, Grenoble
Context and scientific objectives	The objective of the project is the development of novel bio-inspired copper catalysts for ORR able to compete with Pt and enzymes in terms of overpotential. These complexes will be immobilized at carbon nanotubes by taking advantage of clickable multivalent scaffolds. Finally, these novel nanohybrid catalysts will be implemented in a fully bioinspired Pt-free H2/air fuel cell.
Project name	**CO**operation between "**CL**Icked " bioinspired **CO**pper Complexes at carbon Nanotube hybrid electrodes for Oxygen Reduction (***COCLICO)***
Project description	The objective of the project is the development of novel bio-inspired copper catalysts for ORR able to compete with Pt and enzymes in terms of overpotential. These complexes will be immobilized at carbon nanotubes by taking advantage of clickable multivalent scaffolds. Finally, these novel nanohybrid catalysts will be implemented in a fully bioinspired Pt-free H2/air fuel cell. End of the project 31/02/2026
Mission	Design of copper-based bioinspired catalysts and nanostructured electrodes for the oxygen reduction reaction.
Responsibilities	• Experimental works : Synthesis of copper-based coordination complexes: Electrochemistry, electrocatalysis & Surface functionalization and Integration in non-PGM fuel cells • Analysis and management of analytic data • Keep a laboratory notebook • Bibliographic monitoring of the project • Contributions/proposals fo the project evolution • Writing results for publications/presentations at symposium

Expected results	• Novel catalysts for oxygen reduction reaction at high potentials • Novel platinum-free bioinspired fuel cells • Publication of results in a top journal in the field
Skills	• Organic synthesis, coordination chemistry • Molecular electrochemistry • Electrochemistry • Catalysis • Electrocatalysis • Soft skills: Dynamism, Listening skills, Autonomy, Enthusiasm and Perseverance
Experience	From 2 to 5 years, beginner accepted
Eduction	Thesis in chemistry
Applications Close	3/11/2024
How To Apply	Send the application including CV, cover letter and at least one letter of recommendation to the project leaders: alan.le-goff@univ-grenoble-alpes.fr and Catherine.Belle@univ-grenoble-alpes.fr
Funding	Labex Arcane: https://arcane.univ-grenoble-alpes.fr