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Current position

Since October 2019

CNRS researcher in the “Alzheimer and amyloids bioinorganic chemistry” Group – *Coordination Chemistry Laboratory (LCC) – UPR CNRS 8241, Toulouse* (headed by Dr. Christelle Hureau)
“Syntheses and studies of fluorescent Cu-targeting drugs in Alzheimer disease context”

Previous positions

2018 - 2019

Post-doctoral PRESTIGE Fellow and **Marie Curie Fellow** in the “Alzheimer and amyloids” Group – *Coordination Chemistry Laboratory (LCC) – UPR CNRS 8241, Toulouse* with Dr. Christelle Hureau
“Studies of Cu-chelators and Effect of the N-truncation of A β peptides on the ROS production by their copper complexes in the context of Alzheimer disease”

2015 - 2018

Post-doctoral Fellow (Wenner-Gren Foundation) in the “bio-physical and bio-inorganic chemistry” Group – *Department of Chemistry, Ångström Laboratory – Uppsala University – Sweden* with Dr. Gustav Berggren
“Design and preparation of artificial hydrogenases - chemistry and biology in synergy”

2014

PhD in inorganic and bio-inorganic chemistry
Laboratory of Chemistry and Biology of Metals, UMR 5249 – CEA-CNRS-UGA, Grenoble – France
Supervisors: Dr. Stéphane Ménage and Dr. Stéphane Torelli
“Structure-activity relationships in copper complexes bio-inspired from nitrous oxide reductase”

Education

2014 PhD in Inorganic and Bio-Inorganic Chemistry – *Laboratory of Chemistry and Biology of Metals – UMR 5249 – CEA-CNRS-UGA, Grenoble – France*

2011 Master’s Degree (Bio-Organic & Bio-Inorganic Chemistry) – *Joseph Fourier University – Grenoble – France*

Career interruption

Maternity leaves:

- From September to December 2017
- From March to September 2021

Publications

Author of 26 articles published in international peer-reviewed journals

- 26 C. Rulmont, J-L. Stigliani, C. Hureau, **C. Esmieu***; Rationally designed Cu(I) ligand to prevent the CuA β -generated ROS production in the Alzheimer’s disease context. *Inorg. Chem.* **2024** *Chem.* 63, 5, 2340–2351

- 25 M. P. Ferreira, C. B. Castro, João Honorato, S. He, W. Gonçalves Guimarães Júnior, **C. Esmieu**, E. E. Castellano, A. F. de Moura, D. R. Truzzi, O. R. Nascimento, A. Simonneau and C. G. C. Marques Netto; Biomimetic catalysis of nitrite reductase enzyme using copper complexes in chemical and electrochemical reduction of nitrite, *Dalton Trans.*, **2023**, 52, 11254-11264.
- 24 M. Lefèvre, L. Lantigner, L. Andolfo, C. Bacquié, **C. Esmieu**, F. Bedos, and C. Hureau; Reduced Schiff-base derivatives to stop the Reactive Oxygen Species production by the Cu(A β) species: a structure activity relationship. *Comptes Rendus. Chimie*, Online first (**2023**), pp. 1-11
- 23 K. P. Malikidogo, M. Drommi, E. Atrián-Blasco, J. Hormann, N. Kulak, **C. Esmieu***, and C. Hureau; Ability of Azathiacyclen Ligands to Stop Cu(A β)-Induced Production of Reactive Oxygen Species: [3N1S] is the Right Donor Set, *Chem. Eur. J.* **2023**, e202203667
- 22 M. Lefèvre, K. P. Malikidogo, **C. Esmieu**, and C. Hureau; Sequence–Activity Relationship of ATCUN Peptides in the Context of Alzheimer’s Disease, *Molecules*, **2022**, 27(22), 7903
- 21 K. P. Malikidogo, M. Drommi, C. Rulmont, **C. Esmieu**, C. Hureau; Hybrid Bis-Histidine Phenanthroline-Based Ligands to Lessen A β -Bound Cu ROS Production: An Illustration of Cu(I) Significance, *Molecules* **2021**, 26(24), 7630-7644.
- 20 L. Berthonnaud, **C. Esmieu**, S. Mallet-Ladeira and C. Hureau; Solid-state and solution characterizations of [(TMPA)Cu(II)(SO₃)] and [(TMPA)Cu(II)(S₂O₃)] complexes: application to sulfite and thiosulfate fast detection, *J. Inorg. Bio*, **2021**, 225, 111601
- 19 C. N. Beuning, L. J. Zocchi, K. P. Malikidogo, **C. Esmieu**, Pierre Dorlet, Debbie C. Crans, and Christelle Hureau; Measurement of interpeptidic Cu^{II} exchange rate constants of Cu^{II}-amyloid- β complexes to small peptide motifs by tryptophan fluorescence quenching, *Inorg. Chem.*, **2021**, 60, 7650-7659
- 18 N. Queyriaux, **C. Esmieu**, A. Kumar Gupta, L. Vendier, S. Ott; M. Orio, and L. Hammarström; Electrochemical, spectroscopic and computational investigations of a series of polypyridyl ruthenium(II) complexes: reduced states characterizations, *Eur. J. Inorg. Chem.*, **2021**, 1263-1270
17. **C. Esmieu**, R. Balderrama-Martínez-Sotomayor, A. Conte Daban, O. Iranzo, and C. Hureau; Unexpected trends in copper removal from A β peptide: when less ligand is better and Zn helps, *Inorg. Chem.*, **2021**, .60, 1248-1256
16. **C. Esmieu***, G. Ferrand, V. Borghesani, C. Hureau; N-truncated A β peptides impact on Cu and Cu (A β)-generated ROS: Cu (I) matters!, *Chem. Eur. J.*, **2021**, 27, 1777-1786
15. V. C-C. Wang, **C. Esmieu**, H. J. Redman, G. Berggren and L. Hammarström; The reactivity of molecular oxygen and reactive oxygen species with [FeFe] hydrogenase biomimetics: roles of the reversibility and second coordination sphere, *Dalton Trans.*, 2020, 49 (3), 858-865
14. **C. Esmieu#**, D.Guettas#, A. Conte Daban, L. Sabater, P. Faller, C. Hureau; Copper-targeting approaches in Alzheimer’s disease: how to improve the fallouts obtained from in vitro studies, *Inorg. Chem.*, **2019**, 58, 20, 13509-13527.
13. A. Aster, S. Wang, M. Mirmohades, **C. Esmieu**, G. Berggren, L. Hammarström and R. Lomoth; Metal vs. ligand protonation and the alleged proton-shuttling role of the azadithiolate ligand in catalytic H₂ formation with FeFe hydrogenase model complexes, *Chem. Sci.*, 2019, **10**, 5582-5588.

12. **C. Esmieu**, M. Orio, S. Ménage and S. Torelli; Influence of the copper coordination spheres on the N₂O activity by a mixed-valent copper complex containing a {Cu₂S} core, *Inorg. Chem.*, **2019**, *58*, 17, 11649-11655.
11. **C. Esmieu**, M. Guo, H. J. Redman, M. Lundberg and G. Berggren; Synthesis of a miniaturized [FeFe] hydrogenase model system, *Dalton Trans.*, 2019, **48**, 2280-2284.
10. B. Németh, **C. Esmieu**, H. J. Redman and G. Berggren; Monitoring H-cluster assembly using a semi-synthetic HydF protein, *Dalton Trans.*, 2019, **48**, 5978-5986.
9. A. Wegelius, N. Khanna, **C. Esmieu**, G. D. Barone, F. Pinto, P. Tamagnini, G. Berggren and P. Lindblad; Generation of a functional, semisynthetic metalloenzyme in a photosynthetic microorganism, *Energy Environ. Sci.*, **2018**, *11*, 3163-3167
8. **C. Esmieu**, P. Raleiras, and G. Berggren; From protein engineering to artificial enzymes – biological and biomimetic approaches towards sustainable hydrogen production, *Sustainable Energy Fuels*, **2018**, *2*, 724-750.
7. L. S. Mészáros, B. Németh, **C. Esmieu**, P. Ceccaldi and G. Berggren; *In Vivo* EPR characterization of semi-synthetic [FeFe] hydrogenases, *Angew. Chem. Int. Ed.*, **2018**, *57* (10), 2596-2599.
6. N. Khanna#, **C. Esmieu**#, L. S. Mészáros#, P. Lindblad and G. Berggren; *In vivo* activation of an [FeFe] hydrogenase using synthetic cofactors, *Energy Environ. Sci.*, **2017**, *10*, 1563-1567 (# **equally contributed to this work**)
5. **C. Esmieu**, M. Orio, J. Mangue, J. Pécaut, S. Ménage and S. Torelli; Valence localization at a bio-inspired mixed-valent {Cu₂S}²⁺ motif upon solvation in acetonitrile: effect on nitrous oxide reductase (N₂O) activity, *Chem. Eur. J.*, **2017**, *24*, 5060-5063.
4. **C. Esmieu**, G. Berggren; characterization of a monocyanide model of FeFe hydrogenase – Highlighting the importance of the bridgehead nitrogen for catalysis, *Dalton Trans*, **2016**, 45(48), 19242-19248.
3. **C. Esmieu**, M. Orio, L. Le Pape, C. Lebrun, J. Pécaut, S. Ménage, and S. Torelli; Redox-innocent metal-assisted cleavage of S-S bonds in a disulfide-containing ligands, *Inorg. Chem.*, **2016**, *55*(12), 6208–6217.
2. **C. Esmieu**, M. Orio, S. Torelli, L. Le Pape, J. Pécaut, C. Lebrun and S. Ménage; N₂O reduction at a dissymmetric {Cu₂S}-containing mixed-valent center, *Chem. Sci.*, **2014**, *5*, 4774-4784.
1. **C. Esmieu**, M. Cherrier, P. Amara, E. Girgenti, C. Marchi-Delapierre, F. Oddon, M. Iannello, A. Jorge-Robin, C. Cavazza, S. Ménage; An artificial oxygenase built from scratch: Substrate binding site identified using a docking approach, *Angew. Chem. Int. Ed.*, **2013**, *52* (14), 3922-3925.

Communications

17 oral communications in national and international conferences including 1 invited Lecture EuroBIC 17, Münster, Germany, **2024**, **1** International Symposium on Applied Bioinorganic Chemistry (ISABC), Ioannina, Greece, **2023**, **1** Inorganic Reaction Mechanisms & Inorganic Biochemistry Discussion Group Meeting, Manchester, UK, **2019**, **1** FrenchBIC, Carry-le-Rouet, France, **2018**, **1** *Young researcher lecture*, EuroBIC 13, Budapest, Hungary, **2016**, **2** Swedish Consortium for Artificial Photosynthesis, Uppsala University, Sweden, **2016/2017**

9 posters in national and international conferences including 1 EuroBIC 16, Grenoble, France, **2022**, **1** JCC2019 (Journée de chimie de coordination), Montpellier, France, **2019**, **2** ICBIC 16 et 19, Grenoble, France

in **2013** and Interlaken, Switzerland in **2019**, **1** Gordon research seminar/conference Renewable Energy: Solar Fuels, Barga, Italy, **2016**, **1** ISF-1, Uppsala, Sweden, **2015**, **1** EuroBIC 12, Zurich, Switzerland, **2014**

Supervision of graduate and undergraduate students

- Co-supervisor of the Ph.D of Léonie Berthonnaud **2018-2022**
- Director of the Ph.D of Clément Rulmont **2020-2023**
- Co-director of the Ph.D of Marielle Drommi and Margot Lefèvre **2021-2024**
- Director of the Ph.D of Romain Carrasco **2024-2027**
- Supervisor of undergraduate students ± 2 /year since **2019**

Outreach activities

- Intervention in schools for the "Journées Internationales des Femmes et Filles de Sciences", **2022** and **2023**
- Intervention in high schools, Fermat Toulouse **2024**
- Participation in the "Echappées Inattendues" micro-conferences organized by the CNRS **2024**; "Microscopic Journey in Therapeutic Field"

Awards

- **2020** Young researcher grant from The French National Research Agency (ANR) for the project "Copperation" n° ANR-20-CE07-0009
- **2019** Best poster award at the JCC2019 conference
- **2018** Postdoctoral co-funding of the Prestige program through the coordination of Campus France, (Marie Curie FP7 action)
- **2016** Travel grant (EuroBIC'13) from the Wenner-Gren Foundation (<https://www.swgc.org>)
- **2016** Two-years postdoctoral scholarship from the Wenner-Gren Foundation (<https://www.swgc.org>)
- **2015** Poster entitled "Synthetic biology meets synthetic chemistry - In vivo activation of an apo-hydrogenase using synthetic complexes" selected for a flash poster presentation at ISF-1 (International Solar Fuels Conference)
- **2013** Poster entitled "N₂O reduction, a binuclear copper center can do it!" awarded as Best Poster at ICBC'16 (International Conference on Bio-Inorganic Chemistry)
- **2013** PhD Best Publication Award of the Chemistry-Biology Department, Grenoble University

Other

- Member of the organizing committee of the conferences **Gecom-concoord 2024** and **MBP 2024**