Funded Postdoctoral position
Marseille, France

Efficient CO_2 Valorization via Peptide-Based Caged Catalysts

- **Institute:** Institut des Sciences Moléculaires de Marseille, iSm2.
- **Team:** Dr. C. Colomban, Dr. Y. Cotelle & Prof. Alexandre Martinez.

Offer.

Post-doctoral position of **2 years** (*starting date: beginning of 2024*), within the frame of the **A*Midex funded** project: "Efficient CO_2 valorization via peptide-based caged catalysts". Research will be conducted in the Chirosciences team.

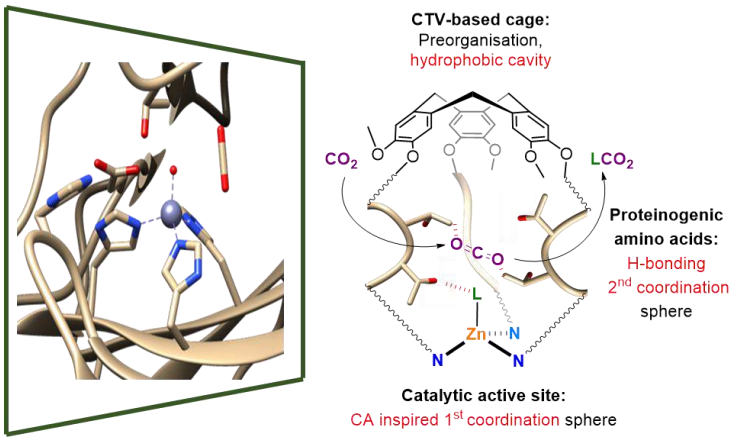
Project.

Metalloenzymes can catalyze reactions in a highly efficient manner thanks to biometals confined within a hydrophobic cavity. These edifices take advantage of their functional cavity by:

1) substrate recognition and positioning via non-covalent interactions,
2) active species stabilization,
3) product release.

Approaching the exceptional efficiency and selectivity of enzymes is the greatest challenge of bioinspired catalysis. Such artificial catalysts are indeed an attractive solution to several challenges facing our society today (*energy*, *climate change*), due the ability of native metalloenzymes to catalyze very difficult reactions (eg: *CO_2 conversion*, *CH_4 oxidation*, *N_2 fixation*), under mild conditions. However, artificial bioinspired catalysts usually only reproduce the first coordination sphere of the active site.

This project will target bioinspired catalysts confined in an amino acid-decorated cavity for CO_2 conversion. These catalysts will be minimalistic models of carbonic anhydrase (**CA**), an important class of enzymes that catalyze CO_2 hydration.



This goal will be reached by:

1) building unprecedented caged Zn catalysts displaying a cavity decorated with key amino acid moieties,

2) developing challenging reactions for the conversion of CO_2 into valuable building blocks.

Profile.

The candidate should demonstrate a strong background in organic synthetic chemistry. She/he must own a PhD academic degree in chemistry (organic, coordination or supramolecular chemistry, catalysis or related). A previous experience with peptide synthesis would be a plus.

Related references.

1. **C. Colomban** and co., *Chem. Commun.* **2023**, 59, 4288
2. **Y. Cotelle** and co., *ACS Cent. Sci.* **2021**, 7, 1874
3. **A. Martinez** and co., *Angew. Chem. Int. Ed.* **2018**, 57,14212

To apply.

Curriculum vitae, cover letter and reference letters, should be sent to:

cedric.colomban@univ-amu.fr and yoann.cotelle@univ-amu.fr.