|  |  |
| --- | --- |
| **Title** | **Supramolecular Catalysis and Sensing within Confined Systems** |
| **PI** | **ZONTA Cristian** |
| **Research Group** | **Molecular Recognition and Catalysis** |
| **Curriculum** | **Scienze Chimiche – Chemical Sciences** |
| **Location** | Dipartimento di Scienze Chimiche – via Marzolo 1, 35131 Padova |
| **Contact** | **web:** | **www.chimica.unipd.it/cristiano.zonta** |
|  | **email:** | cristiano.zonta@unipd.it |

**Project description:**

In the last years we have been interested in the application of tris(2-pyridylmethyl)amine **TPMA** metal complexes in catalysis and molecular recognition.[1,2] **TPMA** are an important class of chelating ligands in coordination chemistry. These ligands are highly modular tetradentate molecules that effectively coordinate to transition metals, main group elements and lanthanides. Depending on the associated metals, different applications have been reported: catalysis (hydrolysis, oxidation, polymerization,…). PI’s group developed a novel supramolecular cages built from the self-assembly of **TPMA** zinc complexes through imine condensation chemistry e rearrangement.

Main objective of PhD project is the synthetic preparation of these novel system with the final goal to exploit the molecular confinement characteristics of these systems for the application into novel catalytic and recognition approaches. As example, the PhD will examine the catalytic properties of cages formed by linking two **TPMA** metal complexes, to take advantage of the properties strictly related to confined spaces and exploiting the presence of active metal sites inside the cavity. This allows to perform catalysis on the basis of: shape (catalysis by confinement), the nature of the metal centres (metal catalysis) and the presence of multiple metal sites (multimetal catalysis).

**Related Publications**: C. Bravin, E. Badetti, F.A. Scaramuzzo, G. Licini, C. Zonta *J. Am. Chem. Soc.* **2017**, 139, 6456. C. Bravin, J. A. Piekos, G. Licini, C. A. Hunter, C. Zonta *Angew. Chem. Int. Ed*. **2021**, *60*, 23871. F. Begato, R. Penasa, G. Licini, C. Zonta *ACS Sens.* **2022**, *7*, 1390.

**Hosting group(s) for the period abroad:** Christpher A. Hunter – University of Cambridge (UK), Miquel Costas – University of Girona (Spain), Agnieszka Kaczor – Jagellonian Kracow (Poland).