

<b>Title</b>	<b>Gold(I) complexes with N-heterocyclic carbene ligands for catalytic, bio-medical and luminescence applications</b>
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**Project description:**

The compounds, that we want to develop in this program, are based on two symbiotic units (Au centers and N-heterocyclic carbene ligands) that, combined together, afford organometallic complexes with enhanced catalytic efficiency, antiproliferative activity and luminescence properties. The strong NHC-Au bond promotes catalytic activity and prevents the potential decomposition of the complex under catalytic or physiological conditions. A library of NHC-Au complexes with variable nuclearity, Au oxidation state, nature, charge and functionalization of the ligands and counteranions will be prepared. The performance of the complexes as catalysts in technologically relevant transformations involving activation of C-C multiple bonds will be investigated. Their use as anticancer agents will be also assessed, within national and international collaborations. Finally, the luminescence properties of the complexes, mainly due to the so-called aurophilic interaction, will be investigated.

The PhD student will acquire experience in the above mentioned application fields as well as in the synthesis of organometallic compounds in inert atmosphere (Schlenk procedures, dry-box), and in the techniques for their characterization (NMR, MS, X-ray crystal structure solving, absorption and emission spectra).

**Publications:**

1. R. De Marco, M. Dal Grande, M. Baron, L. Orian, C. Graiff, T. Achard, S. Bellemin-Laponnaz, A. Pöthig, C. Tubaro, *Eur. J. Inorg. Chem.* **2021**, 4196–4206.
2. M. Monticelli, M. Baron, C. Tubaro, S. Bellemin-Laponnaz, C. Graiff, G. Bottaro, L. Armelao, L. Orian, *ACS Omega* **2019**, 4, 4192-4205.
3. E. Marcheggiani, C. Tubaro, A. Biffis, C. Graiff, M. Baron, *Catalysts* **2020**, 10, 1.
4. A. Biffis, M. Baron, C. Tubaro, *Adv. Organomet. Chem.* **2015**, 203-288.
5. M. Baron, E. Battistel, C. Tubaro, A. Biffis, L. Armelao, M. Rancan, C. Graiff, *Organometallics* **2018**, 37, 4213-4223.

**Hosting group(s) for the period abroad (tentative list, may change):**

Dr. Stéphane Bellemin-Laponnaz (CNRS-University of Strasbourg)