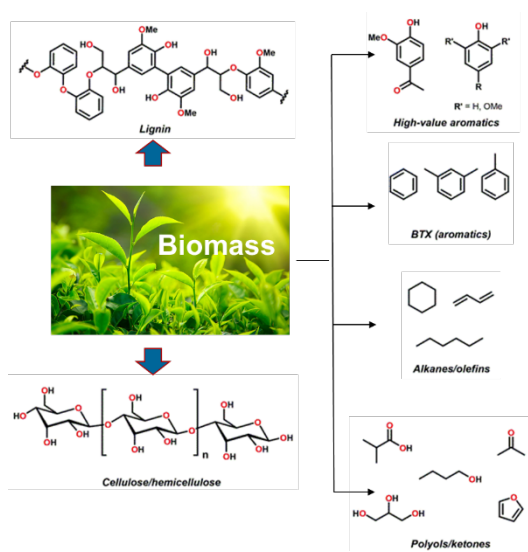


<b>Title</b>	<b>Catalyst Design for Innovative Sustainable Chemical Transformations</b>
<b>PI</b>	LICINI Giulia
<b>Research Group</b>	Molecular Recognition and Catalysis
<b>Curriculum</b>	Scienze Chimiche
<b>Contact</b>	<b>web:</b> <a href="http://www.chimica.unipd.it/giulia.licini">www.chimica.unipd.it/giulia.licini</a>
	<b>email:</b> <a href="mailto:giulia.licini@unipd.it">giulia.licini@unipd.it</a>

**Project description:**

Catalysis is a Key Element to sustainability, which allows the efficient conversion of readily available starting materials into products for industry, health, environment, and nutrition, in high yields and avoiding unwanted by-products. In our group we developed homogeneous catalysts based on non-noble, Earth abundant transition metals and highly symmetric multidentate ligands, able to effectively perform oxidations (oxygen transfer processes and aerobic oxidative C-C bond cleavage) or activate small molecules ( $\text{CO}_2$ ). Aim of this project will be the fine-tuning of these privileged ligands (ligand design, metal ion, additive) in order to explore even more challenging catalytic transformations. We intend to develop new catalysts for an effective biomass valorisation (aerobic oxidative lignin-cellulose and unsaturated fatty acids valorisation) and  $\text{CO}_2$  fixation also taking advantage of non-conventional reaction conditions (micellar catalysis, IL, MW, catalyst anchoring on suitable supports, etc.) The elucidation of the reaction mechanism (characterization of the reactive species, spectroscopic, kinetic and computational studies) will be also a major goal for a deeper understanding of the system and a more rational optimization. The project will be carried out in the frame of COST Actions FP1306. ([http://www.cost.eu/COST\\_Actions/fps/Actions/FP1306](http://www.cost.eu/COST_Actions/fps/Actions/FP1306)) and CM1402 Crystallize (<http://www.cost-crystallize.com/>)

**Publications:**

Amadio, E.; Di Lorenzo, R., Zonta, C. Licini, G. *Coord. Chem. Rev.*, **2015**, 255, 2165–2177; Badetti, E.; Romano, F.; Marchiò, L.; Taşkesenlioğlu, S.; Daştan, A.; Zonta, C.; Licini, G. *Dalton Trans.*, **2016**, 45, 14603–14608; C. Miceli, J. Rintjema, E. Martin, E. C. Escudero-Adán, C. Zonta, G. Licini, A. W. Kleij *ACS Catal.*, **2017**, 7, 2367–2373

**Collaborations/Network:**

Arjan Kleij – ICIQ, Tarragona (Spain)  
 Kristin Bartik – ULB Bruxelles  
 Fabrizio Cavani – UNIBO, Bologna  
 Kari Rissanen, University of Jyväskylä, Jyväskylä, (Finland)