

Nano & Molecular Catalysis

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The group has established a highly interdisciplinary activity on the study of novel bio-inspired catalytic systems, molecular materials and functional hybrid architectures. Main topics include: (i) artificial photosynthesis: development of multi-redox routines powered by light irradiation for water splitting, CO₂ fixation and stereoselective light-driven reactions for the synthesis of biologically relevant molecules with application to flow photochemistry; (ii) design of synthetic enzymes (synzymes), bio-conjugate nanomaterials and hybrid membranes for the interaction with diverse biological targets involved in ROS-related diseases, with applications in catalysis and nanomedicine; (iii) computational modeling in collaboration with ITM-CNR: DFT calculations of spectroscopic properties of organic and organometallic systems and MD simulations of ionic liquids and ionic liquid crystals.

- *Hydrogen Evolution by FeIII Molecular Electrocatalysts Interconverting between Mono and Di-Nuclear Structures in Aqueous Phase*, ChemSusChem, **2017**, 10, 4430–4435.
- *Photo-assisted water oxidation by high-nuclearity cobalt-oxo cores: tracing the catalyst fate during oxygen evolution turnover*, Green Chem., **2017**, 19, 2416-2426.
- *Merged Heme and Non-Heme Manganese Cofactors for a Dual Antioxidant Surveillance in Photosynthetic Organisms*, ACS Catal., **2017**, 7, 1971-1976.
- *Tuning Iridium Photocatalysts and Light Irradiation for Enhanced CO₂ reduction*, ACS Catal., **2017**, 7, 154-160.
- *Dynamic Anti-Fouling of Catalytic Pores Armed with Oxygenic Polyoxometalates*, Adv. Mater. Interfaces, **2015**, 2, 1500034-1500034.