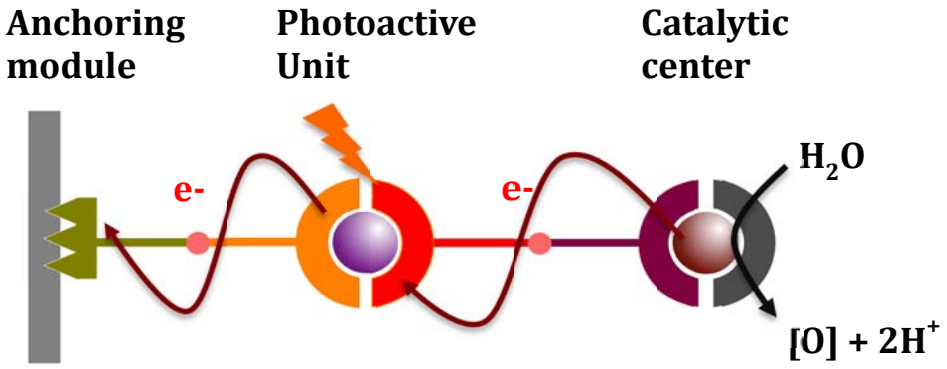
Retrosynthesis of O_2, how and for what?

Ally Aukauloo
Institut de Chimie Moléculaire et des Matériaux
Université Paris Sud
ally.aukauloo@u-psud.fr

Nature has provided us with the main clues how to use solar energy to power multielectronic catalytic events. A key feature is that nature uses molecular metal complexes based on earth abundant metal ions at the active catalytic sites of most enzymes participating in the main energetic transduction pathways. Therefore, replicating these activities using synthetic molecular complexes is a central research theme. Photosystem II, the enzyme responsible for the water oxidation can be conceptualised as being made up of two parts: a photoactive unit and a catalytic module held at optimised distances through the protein matrix. We are involved in the design of modular assemblies of photoactive units and molecular based catalytic unit for the photoactivation of water or O_2. We will discuss on our work to develop a library of modular ensembles for the study of light induced electron transfer and our effort in the understanding of water activation in the oxygen atom transfer reactions. We will also present our latest results in the field of molecular catalyst for the production of H_2.



Modular assembly for the development of molecular photocatalysts.

1. Baron et al. Chem.Commun 2011, 47, 11011–11013. Inorg. Chem. 2012, 51, 5985-5987.
2. El Ghachtouli et al. Energy. Environ. Sci. **2011**,4, 2041-2044, Inorg. Chem. **2012**, 51, 3603–3612, ChemSusChem **2012**, 5, 2147 – 2150
3. Herrero et al. Chem. Commun. 2010, 7605-7607, submitted
4. F. Avenier et al Angew. Chem. Int. Ed. **2013**, 52, 3634-3637
5. M. T. D. Nguyen et al. Coord. Chem. Rev. 2012, 256 2435– 2444, El Ghachtouli et al. ChemSusChem 2013, 2226-2230

CV :

_ 1994 : Thèse de Doctorat Université de Bourgogne/Université de Cologne
_ 1994-95 : Attaché temporaire d'enseignement et de recherche (ATER) - Université de Bourgogne
_ 1995-1999 : Maitre de Conférences à l'Université Paris Sud
_ 1999-2000 : Détachement à Stanford University USA
_ 2000-… : Animation du thème Photosynthèse Artificielle
_ 2005-… : Conseiller scientifique au CEA de Saclay
_ 2007-2012 : Responsable scientifique des projets Européen SOLAR-H (H2)