Project: Photosystem 2-redox dye modified hydrogels integrated in large pores inverse-opal ITO electrodes

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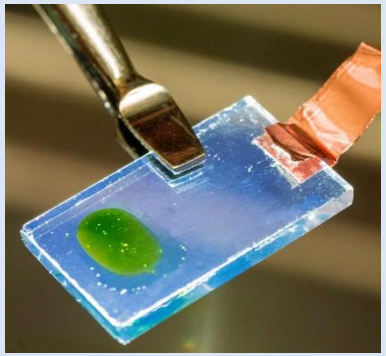

Period of STMS (begin- and end date): 19th Feb – 5th Mar
Host institution (address): University of Cambridge, Department of Chemistry, Lensfield Road, CB2 1EW Cambridge, UK
Mentor(s) (name and contact data): Prof. Dr. Erwin Reisner (Cambridge)
Dr. Nicolas Plumeré (Bochum)

Aims & subject of work (480 characters, no spaces; Calibri 12):

The aim of the project is to develop a photosystem-based photovoltaic cell, where water can be used as electron donor. For this the compatibility of different polymers and inverse opal ITOs should be tested in the presence of PS2. The functionality could be determined by measuring the currents given during an illumination. It is possible to do an exact determination of the PS2 amount, which enables us to calculate the turn-over frequency and turn-over number of immobilized PS2.

Argumentation of necessity of STSM (100 characters, no spaces; Calibri 12):

The STSM allowed to establish a multidisciplinary collaboration on a new light energy conversion system based on physical, chemical and biological components.

Workplan/timeschedule followed (4 bullets max., Calibri 12):

- Optimization of polymer electrode interaction
- Preparation of new protein, polymer and electrode samples
- Additional photocurrent measurements

Main results and outcome (conclusions):

It is possible to gain very high photocurrent densities from PS2 immobilized in redox-active polymers applied on inverse opal ITOs. Also the turn-over frequency is better than previous measurements on flat electrodes or without the polymer. So it is very promising to set up a device where the developed electrode can be used as anode and the electrons out of the watersplitting can generate electrical energy by photoconversion.