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Vortragsankündigung

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Es spricht: **Prof. Dr. John H. Golbeck**, Department of Biochemistry and Molecular Biology, The Pennsylvania State University, USA

Zeit: **Mittwoch, 22. Juli 2009 17:15 Uhr**

Ort: **TU Berlin**
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Thema: **Wiring Photosystem I for Light-Induced Hydrogen Generation**

Abstract: We have shown that Photosystem I/dithiol molecular wire/Pt nanoparticle bioconjugates photocatalytically produce dihydrogen at linear rates when continuously illuminated. In an effort to maximize H_2 production, the pH and ionic concentration of the solution, the identity and mobility of the electron donor, the illumination intensity, and the length and degree of saturation of the molecular wire were investigated. Optimal conditions include cross-linked plastocyanin, reconstituted spinach PS I, and the use of 1,4-benzenedithiol to connect the PS I to the Pt nano particle. The system is buffered in 50 mM MES, pH 6.0, and included 10 mM NaCl and 10 mM $MgCl_2$. Illumination of this optimized bioconjugate generates H_2 at a rate of 312 µmol H2 mg Chl^{-1} h^{-1}. We have also designed a biological/organic hybrid electrochemical half-cell that couples PS I with a [FeFe]-H_2ase. A covalently bonded molecular wire connects the FB iron sulfur cluster of PS I with the distal Fe/S cluster of the [FeFe]-H_2ase. The result is that the low-potential electron can be transferred without loss and at high rates directly to the H_2ase enzyme. Because this method does not depend on inefficient solution chemistry, the highly reducing electron can be transferred from PS I to the H_2ase with 100% efficiency *in vitro*. At this writing, we have demonstrated proof-of-concept and we are currently optimizing the system to obtain high rates of H_2 production.

Organisator: Prof. Dr. Bärbel Friedrich (HU Berlin)

Gäste sind herzlich willkommen!

Prof. Dr. Matthias Drieß
Sprecher des Exzellenz-Clusters UniCat