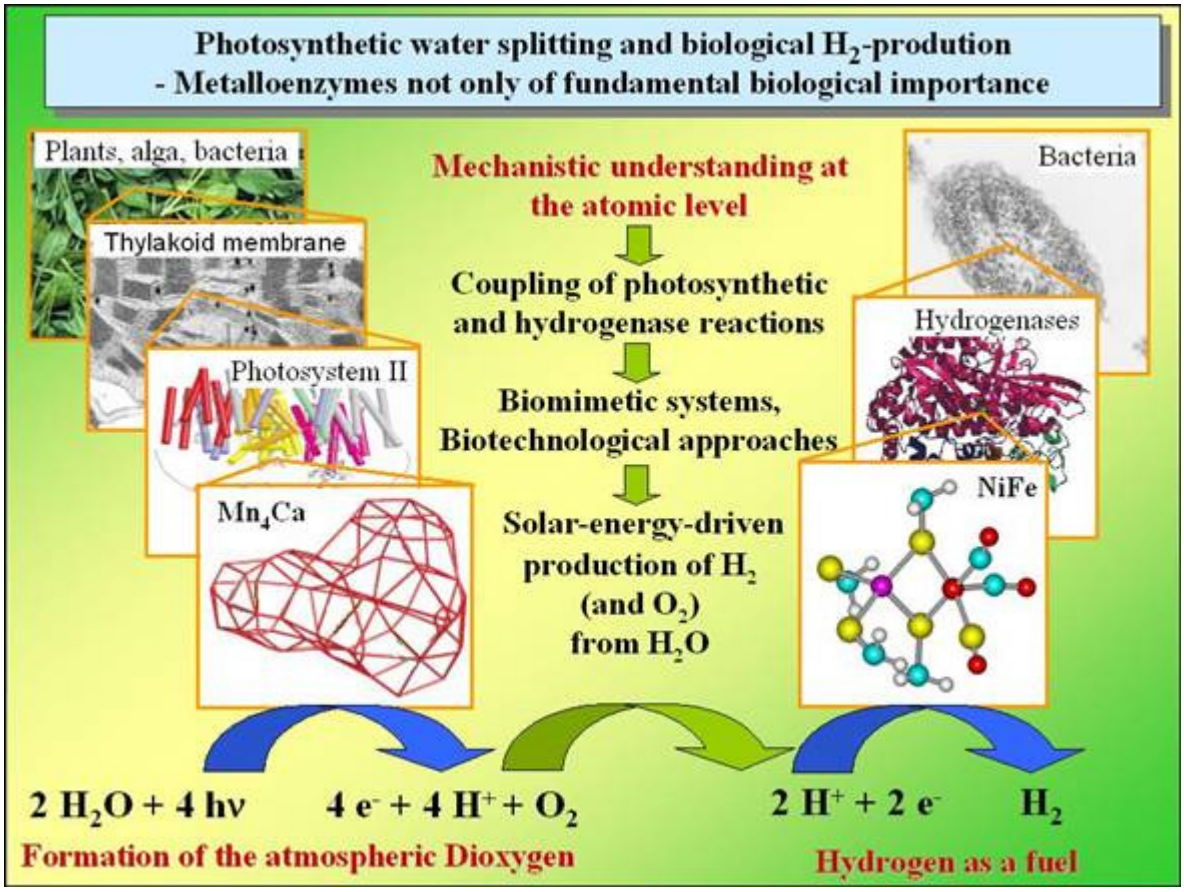
Catalysis by biological metal centers - application perspective: Hydrogen as a fuel produced from water by using solar energy



The sensing, utilization and production of molecular hydrogen by hydrogenases is investigated in cooperation with Prof. B. Friedrich (HU Berlin). Hydrogenases are connected to the research on Photosystem II by a long-term perspective: Solar energy drives the splitting of water (water oxidation, PSII function). The obtained 'energized electrons' (reducing equivalents) are used to produce of dihydrogen (reduction of protons, hydrogenase function). Since dihydogen is likely to fuel future cars, after exhaustion of the oil resources in 30-40 years, the light-driven hydrogen production is of significant interest.

Respective biomimetic and biotechnological approaches are explored in the framework of a joint project of nine German research groups (funded by the BMBF, see BioH2 Website) as well as in the consortium of groups from nine European countries (funded by the European Community, see SOLAR-H2 Website). Biomimetic compounds are also characterized in cooperation with the Swedish Consortium of Artificial Photosynthesis (centered at the Uppsalla University, see Website).

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