

Construction of a hybrid photocatalytic system for hydrogen production

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch Fortsetzungsanträge)

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The goal is to construct a molecular device for light-driven production of hydrogen gas. For this purpose two natural enzymes are exploited: photosystem I (PSI), the primary photoreductant in oxygenic photosynthesis, and HydA1, a hydrogen producing [FeFe]-type hydrogenase. Using computational protein design and genetic engineering techniques to introduce specific modifications to HydA1 and PSI, and to add artificial protein extensions an efficient functional interface between the two enzymes will be constructed. This venture is expected to result in a working light-driven hydrogen evolving device, which in the longer run may be combined with a water-oxidizing (photo) catalyst that will replace the exogenous electron donor. Furthermore, general rules and guidelines for designing specific protein-protein interfaces that will allow the generation of effective electron-transfer complexes of any desired kind are envisaged.

Projektbeteiligte

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