Photocatalytic oxidation of water at the surface of liposomes

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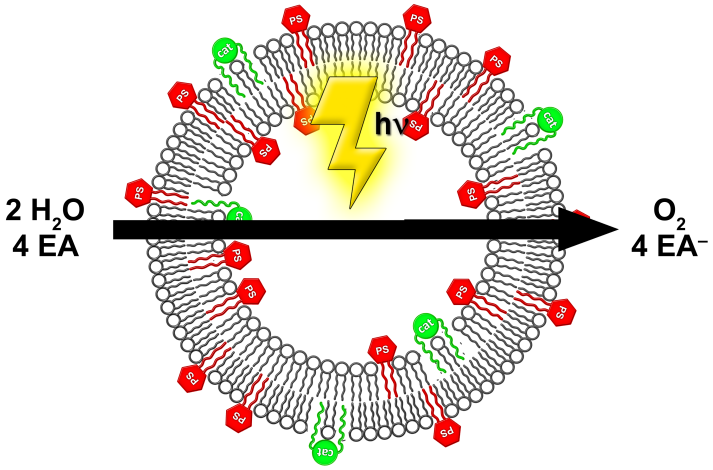
The past decades have led to a great increase in the availability of water oxidation catalysts with high TOFs and TONs.[1] Under photocatalytic water oxidation conditions, these novel catalysts are fast and stable enough to not be the limiting factor in the photocatalytic cycle anymore. Instead, the photosensitizer degrades during the photoreaction, thus limiting the overall efficiency and TON of the system. Supramolecular systems such as liposomes influence greatly the stability and rates of (photo)catalytic processes.[2] In this work, both a water oxidation catalyst and a photosensitizer were anchored to the surface of a lipid bilayer by means of a long alkyl tail. The stability of the photosensitizer is increased by anchoring, which leads to higher TONs for the photocatalytic oxidation of water, compared to homogeneous conditions. Furthermore, the efficiency of the system was shown to depend very much on the local concentration of photosensitizer and catalyst, indicating that fast hole transfer from the photosensitizer to the catalyst is essential for the stability of the system.[3][4]



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