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From Charge Separation to Molecular Compressors

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Our group has been interested in "*artificial photosynthesis*" for many years as well as in "*chemical topology*" and "*molecular machines*". The work was carried out by very talented professional researchers (CNRS or Members of our University) supervising outstanding PhD students or postdoctoral fellows.

The first part of the talk will be devoted to the area of artificial photosynthesis, including (1) the exciting field of "water splitting" (or "photochemical cleavage of water"), (2) models of the Photosynthetic Reaction Centre (such as that the bacterium *Rhodospseudomonas viridis*) and (3) light-driven charge separation in multicomponent systems incorporating transition metal complexes and porphyrins.

In the second part, we will briefly explain how our group became interested in **catenanes** and **rotaxanes** whereas we were mostly transition metal-oriented chemists. Such species led to the very active field of research known as "molecular machines". We will focus on a porphyrin-incorporating [4]rotaxane acting as a molecular compressor and a switchable receptor. Such highly sophisticated molecules are reminiscent of biological systems although they are much simpler.