

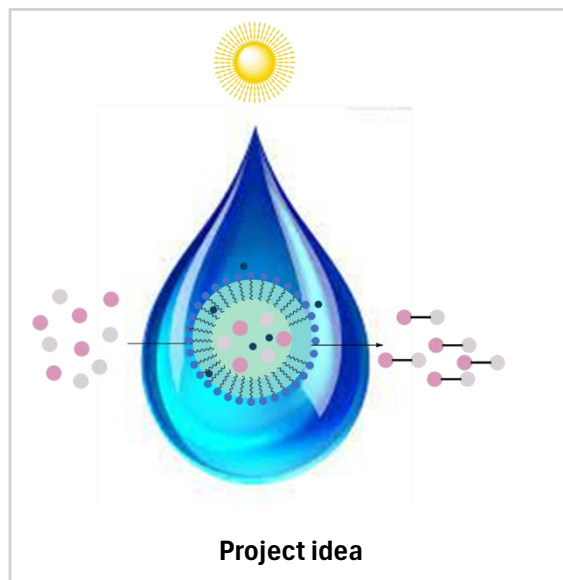
BIOINSPIRED ENERGY TRANSFER (EnT) PHOTOCATALYSIS IN MICELLAR SYSTEMS

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The production of useful chemical compounds, such as medicines, cosmetics, and plastics, is based on organic synthesis. Environmental protection, and therefore the guidelines of the European Union, requires the development of innovative, green technologies. The use of solar energy as the only source of energy and water as a solvent in which technological processes are carried out is undoubtedly an attractive approach. Nature shows that organic reactions can take place in water, and already in 1886, Ciamician demonstrated that light can be used to induce chemical reactions.

The vast majority of photochemical reactions are carried out in organic solvents, which are generally dangerous to the environment, expensive to dispose of, and constitute over 60% of waste generated in chemical processes. **Therefore, an alternative to expensive and harmful organic solvents is being sought. The simplest solution, unfortunately not the easiest, is water. This task is difficult due to the limited solubility of most reagents in water. To eliminate this problem, we want to use micellar solutions as part of the planned work.**

Micelles are spherical, ellipsoidal, cylindrical, or single-layer nanostructures that are formed as a result of the spontaneous organization of amphiphilic molecules. The surfactant molecules are composed of hydrophobic and hydrophilic components. They are widely used in cosmetic and biomedical chemistry. In cosmetology, its unique structures are used to dissolve impurities under mild conditions or as carriers of active substances in therapeutic cosmetics. **Their wide use in various fields of science encourages us to investigate their potential in organic chemistry, in particular, in photochemistry, where the topic is still fresh and has not been sufficiently researched.**



Our project focuses on photocatalysis in micellar systems that use light as an energy source and eliminate the need to use organic solvents. In collaboration with prof. Vullev, Andersson, Chaładaj and dr. Cmoch the structure of such systems will be evaluated. Such innovative technologies constitute an attractive path to more ecological chemical processes.