


Engineering Bio-Inspired Systems for the Conversion of Solar Energy to Hydrogen

 *Timeline* | 04/2019 to 09/2024

 *Budget* | 1,500,000 €

 *ICIQ People* | [E. Romero Research Group](#)

 <https://cordis.europa.eu/project/id/805524>

 *Call* | H2020-ERC-2018-STG

SUMMARY

The overall objective is to engineer bio-inspired systems able to convert solar energy into a separation of charges and to construct devices by coupling these systems to catalysts in order to drive sustainable and effective water oxidation and hydrogen production.

The global energy crisis requires an urgent solution, we must replace fossil fuels for a renewable energy source: Solar energy. However, the efficient and inexpensive conversion and storage of solar energy into fuel remains a fundamental challenge. Currently, solar-energy conversion devices suffer from energy losses mainly caused by disorder in the materials used. The solution to this problem is to learn from nature. In photosynthesis, the photosystem II reaction centre (PSII RC) is a pigment-protein complex able to overcome disorder and convert solar photons into a separation of charges with near 100% efficiency. Crucially, the generated charges have enough potential to drive water oxidation and hydrogen production.

Following the approach Understand, Engineer, Implement, Dr. Elisabet Romero will create a new generation of bio-inspired devices based on abundant and biodegradable materials that will drive the transformation of solar energy and water into hydrogen, an energy-rich molecule that can be stored and transported.

