

PRESS RELEASE

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A-LEAF, a full device for artificial photosynthesis

ICIQ leads a project awarded with €8 million by the European Commission

- Project A-LEAF: “An Artificial Leaf: a photo-electro-catalytic cell from earth-abundant materials for sustainable solar production of CO₂-based chemicals and fuels” receives funding from the FET Proactive 2016 call within the Horizon 2020 programme.
- With nearly 8 million euros, A-LEAF is **one of the biggest artificial photosynthesis research projects** funded by the European Commission.
- A-LEAF aims to build a photovoltaic device able to reproduce the complete process of photosynthesis to obtain clean fuels and raw materials using exclusively sunlight, water and CO₂.
- **Coordinated by Prof. José Ramón Galán-Mascarós from ICIQ**, the project counts with 13 partner institutions from 8 different countries. A-LEAF will start next January 2017 and will last 48 months.

The A-LEAF project seeks to respond to the world's challenge of finding new sustainable alternatives to fossil fuels. Our society has been using fossil fuels as a primary source of energy and as raw materials for synthesizing complex organic compounds with added value such as drugs, polymers or agrochemicals. The A-LEAF project aims to design, build and validate a device able to mimic this photosynthetic process as carried out by green plants. Our objective is to achieve direct transformation of water and CO₂, through the action of sunlight, into oxygen and organic matter (e.g. methanol, methane). The organic products will then be used as fuels, extracting their stored energy from their recombination with oxygen back to the original feedstock (water and CO₂) in an environmentally neutral closed-cycle.



Photosynthesis can be divided into several processes, including light absorption by a chromophore, charge separation and two chemical transformations: one where sunlight turns water into oxygen and releases protons and electrons; and another where these protons and electrons convert CO₂ into carbohydrates, organic matter. Scientists have created artificial platforms able to reproduce many of these sub-processes, but no integrated platform has been realized up to date.

A-LEAF is a multidisciplinary Project that brings together materials chemistry, computational chemistry, surface physics, engineering and state-of-the-art characterization techniques. The final objective of the consortium is the validation of a prototype able to transform CO₂ into added-value products in a sustainable and cost-efficient way to be transferred to the European industry.

The A-LEAF project is coordinated by Prof. José Ramón Galán-Mascarós from the Institute of Chemical Research of Catalonia (ICIQ). The project's consortium also counts with two other groups from the ICIQ and 12 more partner institutions: ETH Zurich, Universiteit Leiden, IMDEA Nanociencia, EPFL, Technische Universität Wien, Universitat Jaume I de Castelló, Imperial College, Technische Universität Darmstadt, Forschungszentrum Jülich, Université de Montpellier, INSTM and COVESTRO.

About the Institute of Chemical Research of Catalonia (ICIQ)

ICIQ is member of the [Barcelona Institute of Science and Technology](#) and one of the most prestigious chemistry research centres worldwide. 19 research groups work on catalysis (improvement and discovery of more efficient chemical reactions, sustainable processes and drug design) and renewable energies (water splitting, photovoltaics, transformation of CO₂ into fuels and materials). ICIQ is a Severo Ochoa Excellence Centre, has been awarded 14 European Research Council (ERC) grants and 9 of their researchers are ICREA professors.

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