

## Technology Transfer portfolio

December 2022

Technology transfer has always been a priority in our group. In addition to the high number of RDI projects and technology transfer contracts, LEQUIA researchers are inventors or several patents and co-founders of two spinoff companies: SISTLTech (2003) and [Ecomemb](#) (2022).

### Expertise

- > Biological treatment and resource recovery from wastewater
- > Microbial electro-technologies
- > Advanced adsorption and oxidation processes
- > Membranes for water treatment
- > Environmental decision support systems
- > Socio-natural systems



*Pilot plant for the electro-bioconversion of carbon dioxide*



*Recycling of membranes for water treatment*

### Patents and utility models

- > Automated real time control system for membrane bioreactors Smart Air MBR®. Universitat de Girona, OHL Medio Ambiente INIMA SAU. Inventors: Rodríguez-Roda, J. Comas, M. Poch, G. Ferrero, J. Sipma, P. Clara, S. Rovira, H. Monclús, J. Canals. ES2333837B1.
- > Bioelectrochemical system for water treatment. Universitat de Girona. Inventors: J. Colprim, M.D. Balaguer; S. Puig, N. Pous. EP2925679B1.
- > Reactor for wastewater treatment. Universitat de Girona, Inbrooll Ind S.L. Inventors: V. Salvadó, T. Serra, J. Colomer, N. Pous, M. Font, I. Pijoan, J. Scheerer. ES1234189U.

## Biological treatment and resource recovery from wastewater

- > Technologies anammox and partial nitrification to remove nitrogen from wastewater
- > Struvite and k-struvite precipitation for phosphorous recovery
- > Panammox® process to treat landfill leachates
- > Biminex® process to reduce excess sludge in WWTPs
- > Sanitation reactor by filtration with Daphnia

## Bioelectrochemical systems

- > Bioremediation of water contaminated with nitrates and sulphates
- > Bioconversion of CO<sub>2</sub> into added value compounds
- > Biogas upgrading
- > Removal of nitrogen and organic matter from wastewater
- > Operational parameters, design and scale-up of bioelectrochemical systems

## Advanced adsorption and oxidation processes

- > Analysis of contaminant gases
- > Analysis of odour causing compounds
- > Adsorption processes for gas and water treatment
- > Biogas upgrading: removal of siloxanes and organic volatile compounds
- > Modification of activated carbon to obtain new adsorbents
- > Thermal and oxidative regeneration of adsorbents

## Membranes for water treatment

- > *Fouling* and *clogging* phenomena
- > Integration of membrane bioreactors (MBR) at different scales
- > Monitoring and automatic control
- > Removal of pharmaceutical compounds from wastewater
- > Decision Support systems for the integrated supervision of MBRs
- > Application of MBRS to gas treatment
- > Osmotic MBRs for wastewater treatment
- > Recycling of reverse osmosis membranes for water treatment

## Environmental Decision Support Systems (EDSS)

- > Multi-criteria decision support systems in the water cycle
- > Integration of artificial intelligence and modelling in EDSS to manage complex systems: software Novedar\_EDSS (design of WWTPs) and DrinkIA (operation of DWTPs)
- > Life Cycle Assessment (LCA) of sanitation systems
- > Integrated control of urban water cycle. Knowledge-based modelling of operational microbiological problems in wastewater treatment

## Socio-natural systems

- > Study of the ethic and political dimension of technologies
- > Urban planning, circular economy and urban transitions
- > The hydro-social cycle: decision making and conflicts associated with the urban water cycle and its governance