

# ***Modeling and control of the combined microalgae production and wastewater treatment process***

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Microalgae have a large potential to produce valuable substances like food or pharmaceutical compounds, in addition to some important applications performed by these microorganisms such CO<sub>2</sub> mitigation, wastewater treatment and biofuel production.

The main objective of the research activity consists in the combination between two different processes in the same photobioreactor: microalgae biomass production and wastewater treatment in an efficient and less energy cost way, to contribute in better reproducible conditions with competitive market costs compensation for the permanent non-stationary behavior of the process, taking advantage of nutrients provided by wastewater to the culture, removing any toxic metabolic products and controlling important internal cellular parameters (temperature, pH) in order to optimize the biomass production.

The focus of this project will address issues that are related to improve the efficiency, productivity, design and optimization of large-scale raceway combined wastewater treatment and microalgae production processes cultivated in outdoor conditions by means of using adequate modeling and control strategies.