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# CELISE Kick-off Meeting

## Biological Processes in Environmental Engineering – R&D Group

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# Sustainable production of Cellulose-based products and additives to be used in SMEs and rural areas

Funded from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101007733.

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18/03/2022

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# GPBIA – Research Areas

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- **Conventional Processes (*aerobic & anaerobic*) of Wastewater Treatment**
- **Agro-Industrial high-strength Wastewater Valorization.** Alternative Treatment Processes with simultaneous obtaining of value-added products.
- **Agro-ecology tools in Environmental Microbial Systems (*bacteria, yeasts and filamentous fungi*).** Soil and groundwater **bioremediation technologies**. **Biocontrol technologies** (fungal spoilage in food and filamentous bacteria in wastewaters treatment units)
- **Consolidated Bioprocessing (CBP)-based Technologies for biofuels & organic acids production using wastewaters and lignocellulosic wastes as feedstocks.**
- **Fermentation technologies.** Upstream processing. Reactor design. Modelling & optimization of operation variables. Scale-up.
- **Metabolically engineered yeasts as platforms for chemicals production.** Stable tools for genome edition in *Saccharomyces*, *Kluyveromyces* and non-conventional yeasts.



# GPBIA – Capabilities

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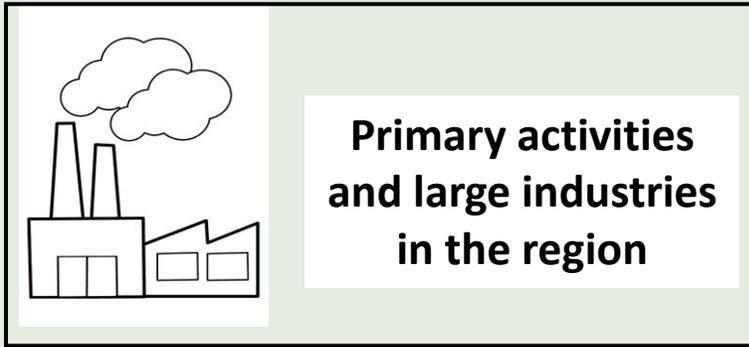
- **Wastewater characterization and Evaluation of Performance of wastewaters treatments units** (physicochemical, DAF, lagoons, activated sludges, anaerobic digestors, etc.)
- **Biodegradability Tests** (aerobic and anaerobic). **Specific Methanogenic Activity tests.** **Determination of Biogas composition (methane content)**
- **Microbial diversity evaluation** in soils as well as in wastewaters treatments units.
- **Bioprocesses and Fermentation technologies.** Optimization of operation variables for microbial growth, substrate consumption and added-value compounds production. Kinetic modelling and process simulation.
- **Pre-treatment (conditioning) of Lignocellulosic biomass.** Hydrolysis processes (acid, alkaline & auto-hydrolysis). Bio-detoxification of hydrolysates. Enzyme dosage optimization.
- **Development of Metabolically engineered yeasts for biofuels, enzymes and organic acids production.**



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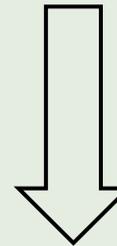
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## AGRO-INDUSTRIAL WASTES & WASTEWATERS

**SOLUTION**

**Add value through  
BIOLOGICAL PROCESSES**



- ✓ Environmental sustainability
- ✓ Environmental care
- ✓ Energy saving
- ✓ Competitiveness



- ✓ Inexpensive and renewable raw materials
- ✓ Profitable and friendly production processes
- ✓ Products with market value
- ✓ Improve the global economy of industrial processes





# GPBIA – Staff & Current Projects

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## PROJECTS

- **Reactors and Biological Processes Relevant to Environmental Engineering and Biotechnology.**
- **Wastewater Treatment Processes from Beverage Industries with Simultaneous Obtaining of Ethanol and other Value Added Products**
- **Bioethanol production from cellulosic-based agro-industrial wastes**
- **Bioethanol and unicellular protein production from dairy whey**
- **Evaluation of alternative yeast inocula for the production of 2G and 3G ethanol.**
- **Monitoring, characterization, treatment and / or valorization of organic pollutants present in water, soils and urban or industrial wastewaters.**
- **Integrated anaerobic-aerobic systems for the treatment of industrial wastewaters**



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