

Julián Sánchez Caldas

PhD student

Project: Digitalization tools for up-scaling bioprocesses: A modeling approach coupling metabolism and hydrodynamics

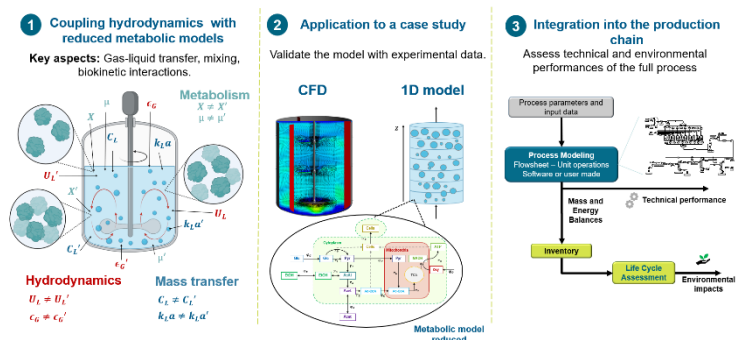
Supervisors: Arnaud COCKX (TIM), Jérôme Morchain (TIM) and Carlos Robles (SOPHyE)

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Key words: Metabolic Modeling · Hydrodynamics · Scale-up

Background

My research focuses on developing modeling tools for the scale-up of bioprocesses, particularly coupling metabolism and hydrodynamics to improve industrial applications. By integrating computational models, I aim to optimize gas-liquid mass transfer, microbial growth, and reaction kinetics.



Currently working on

- ✓ Developing and validating a modeling framework that couples metabolism and hydrodynamics for a better understanding of bioprocess scale-up.
- ✓ Implementing digitalization tools to enhance bioprocess performance predictions by integrating numerical simulations with experimental data.

Scientific communications

- Congress: **In progress:** Impact of Variable Volume due to Water Production in Biological methanation: 1-D modeling approach (ECCE, ECAB, CIBIQ – 2025 Lisbon/Portugal)
- Poster presentation at PhD Day, showcasing advances in Digitalization tools for up-scaling bioprocesses (2025)

Contact me

Phone: +33 07 67 79 18 48

✉ Email: sanchez-cald@insa-toulouse.fr LinkedIn: www.linkedin.com/in/juliansanchezcaldas