# Research scientist –Modelling of coupled microbial and physico-chemical phenomena in environmental biotechnology processes

Antony (92)

## Type of profile

- Starting to consolidator research scientist (< 12 years after PhD)

## Position

Irstea is the French National research Institute for environmental and agricultural science and technologies. Its strategic action plan targets domains such as bioeconomy, biodiversity, the management of natural resources and environmental risks. Within a well-established national and European network, 1200 employees in 9 different research centers across the country are conducting research actions in relation to the development of public policies or in partnership with industrial stakeholders. Irstea holds a Carnot label testifying its high degree of contractual involvement with public or private partners. Irstea and INRA (French Institute for Agronomic Research) are going to merge on January 1st, 2020.

You will be hired in the Ecotechnologies Department and in the PROSE (Environmental biOtechnology PRoceSses) Research Unit located in Antony (92) near Paris. The PROSE unit research activities are focused on understanding and optimizing the functioning environmental biotechnology processes such as wastewater treatment plants, solid waste treatment and storage facilities or the development of innovative bioelectrochemical processes for future environmental biorefineries.

You will be hired as a research scientist and project manager, working under the responsibility of the head of unit. Your objective will be to develop generic modelling approaches to represent bio-physico-chemical phenomena in mixed culture biotechnology reactors. For that, you will combine your own know-how with the existing expertise of PROSE team members on bioprocess engineering, mass transfer phenomena, biokinetic models, microbial thermodynamics and ecology. You will particularly study how the coupling of microbial and physical processes at the micro- to millimetric-scale could give rise to elementary biomass structuration patterns (characteristic size and structure of microbial aggregates/biofilms, spatial distribution of microbial activities,…), which properties play a key role for macroscopic performances of bioprocesses.

You will especially be in charge of:

- Proposing and leading collaborative research projects on the modelling of coupled bio/physico/chemical processes in mixed culture environmental biotechnology reactors, in connection with your colleagues of the Unit and external partners (academic, institutional or industrial partners),
- Managing small project-groups involving permanent and non-permanent staff members (master and PhD-student, postdocs,…),
- Contributing through your activity to expand the scientific reputation of the PROSE Unit and Irstea (writing scientific publications, organizing scientific events, presenting to scientific conferences, participating to scientific committees,…,
- Contributing to the collective life of the PROSE Unit and Irstea.

## Profile

You have an academic background in chemical or process engineering, physics, mathematics or mathematical modelling of biological systems. You hold a PhD in bioprocess modelling completed by a postdoctoral experience preferably outside France. You have a good expertise in numerical methods and you are proficient in using at least one numerical platform (Matlab, COMSOL,…) allowing the coupled modelling of bio/physico/chemical processes. An experience on spatialized models (such as Individual Based Models) is expected. Your scientific expertise is proven by a strong publication track record in international peer reviewed journals and presentation in scientific conferences. You like interdisciplinary team interactions.

## Working and salary conditions

- **Contract and salary:**

First contract of 2 or 3 years
Attractive salary to be negociated in function of your qualifications

- **Working conditions:**

Office located at 2nd floor with elevator
Irstea-Antony can be easily reached by public transportation (RER B and C, bus)
Car parking possible
Building accessible for disabled people

## Contact persons

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