

## RESEARCH CONTRACT TO DEVELOP A PHD

### INTEGRATED BIOFACTORY FOR THE MULTIPRODUCT VALORISATION OF PIG MANURE- BIOPIGMA

#### Position Overview

The Group of Environmental Biotechnology (Biogroup) of the University of Santiago de Compostela (<https://biogroup.usc.es/>) is offering an opportunity to undertake a fully funded PhD.

This 4-year contract is associated with the BIOPIGMA project described below and funded by the Spanish Research Agency (former FPI fellowships). The contract includes a monthly salary of 1,260 € (year 1 and 2), 1,350 € (year 3) and 1,680 € (year).

In addition, the University tuition fees for the Doctoral Program will be paid by the grant, as well as a fellowship to perform a 3-month research stay abroad during the PhD period.

The expected starting date is **December 2024 – January 2025**.

#### BIOPIGMA project description

The main objective of the BIOPIGMA project is the study and optimization of biotechnologies for the treatment and valorization of pig manure. In addition, a techno-economic analysis of the data obtained with these biotechnologies will be carried out to compare them with the treatment technologies already implemented. The aim is to develop treatment trains, both for the liquid (LPMF) and solid (SPMF) fractions, that allow transforming current pig farms into biofactories capable of producing valuable bioproducts while minimizing the environmental impact.

Specifically, this PhD thesis will focus on LPMF management by evaluating the application of (1) purple phototrophic bacteria (PPB) to obtain protein-rich biomass while recovering water; (2) aerobic granular sludge (AGS) technology as a solution to remove organic matter and nitrogen prior to the PPB step, to reduce the footprint of the PPB process and potential light intensity problems if raw LPMF is treated.

In addition, to minimize greenhouse gas (GHG) emissions from the proposed biofactory, exhaust gas streams (containing CO<sub>2</sub> and N<sub>2</sub>) from the AGS unit will be integrated as substrates for PPB. Exhaust gas streams from other bioreactors will be analyzed to perform mass balances and numerically evaluate their possible integration into PPB units.

## Work environment

The PhD candidate will be incorporated into a research team with expertise in environmental and chemical engineering as well as microbiology applied to wastewater. He/she will be part of the **Group of Environmental Biotechnology** (Biogroup - <https://biogroup.usc.es/>) from the University of Santiago de Compostela. The group has access to high-quality resources and a solid network of collaborations at the international level. So, the candidate will work at state-of-the-art lab facilities with the support of experienced researchers and technicians. Biogroup staff is composed by 14 full/assoc. professors, 7 postdocs, and ~25 PhD candidates offering a stimulating and multidisciplinary work environment.

BIOPIGMA researchers belong to the **singular research centre CRETUS** (<https://cretus.usc.es/en/home-cretus/>) composed of 39 main researchers working in the field of Environmental Technologies, that bring to the centre around 70 PhD candidates and 25 postdocs. They form a multidisciplinary team comprising chemists, biologists, physicists, engineers, economists, and psychologists. CRETUS aims to develop and assess innovative environmental technologies with an interdisciplinary and holistic perspective, to ensure safe water, healthy soils, and sustainable cities and industries. Through CRETUS, the candidate has access to a **mentoring programme**, that looks for a continuous accompaniment of PhD students during their research, ensuring that their training adapts to their future professional perspectives. Among the courses offered are “Information Design Lab” for improving the visual presentation of data and information, “Development of Scientific Leadership”, “Writing and presentation skills to improve the impact of research”, “Tools to better plan their agendas”, etc.

## Research area

Development of innovative technologies for waste(water) treatment and valorization for achieving organic matter and nutrient removal, promoting safe water reuse.

## Research team

Anuska Mosquera ([anuska-mosquera](#)), Ángeles Val ([angeles-val](#)) and Alba Pedrouso ([alba-pedrouso](#)).

## Brief work description

- Set up and operate lab-scale bioreactors under different operational conditions to study the granulation process and purple photobacteria performance with the liquid fraction pig manure.
- Monitoring and analysis of the solid, liquid, and gas phases during the different treatment processes.
- Data analysis, report writing, and publication of research results in scientific journals.

### Requirements

- Bachelor's in Chemical Engineering, Biotechnology, or similar areas.
- Master's degree in Chemical or Environmental engineering, or at least have passed in total 300 ECTS considering Bachelor + Master courses.
- Solid background in wastewater treatment
- Good English level and ability to travel for project meetings or conferences.
- Strong commitment to completing a PhD Thesis.
- Driving license.

### How to apply

Send your application to [anuska.mosquera@usc.es](mailto:anuska.mosquera@usc.es) (including in the subject line: "BIOPIGMA position") before 5<sup>th</sup> November 2024.

Applications must contain the following documents:

- Motivation letter (no more than 1 page), indicating the contact details of the candidate and a brief description of the reasons why he/she should be selected.
- Academic record (Bachelor's and Master's degree)
- Curriculum Vitae

The selection process will include a personal interview for those candidates who, based on the above information, meet the position requirements.