CRETUS

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

RESEARCH CONTRACT TO DELEVOP A PhD

ASSESSING THE REMOVAL OF CONTAMINANTS OF EMERGING CONCERN (MICROPOLLUTANTS, PATHOGENS AND ANTIBIOTIC RESISTANCES) DURING SEGREGATED WASTEWATER TREATMENT - ARES

Position's characteristics

An opportunity to develop a PhD with financial support for a 4-years period is offered by the Group of Environmental Biotechnology (Biogroup) of the University of Santiago de Compostela (https://biogroup.usc.es/).

The contract is associated to the ARES project described below and financed 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 Doctorate Taxes will be paid by the grant, as well as a fellowship to perform a 3-month research stay abroad during the PhD period.

The contract starting date would be approximately **December 2023 – January 2024**.

Project description

The main objective of the ARES project is to understand the integrated behaviour of selected contaminants of emerging concern (CECs), comprising organic micropollutants (antibiotics), antibiotic resistant genes (ARGs) and pathogens (bacteria and viruses), using an innovative treatment scheme for segregated treatment of domestic wastewater separated in two fractions (Black and Grey Water) or the sludge purged from Septic Tanks.

In the first part of the project treatment will be carried out at laboratory scale, using a first anaerobic methanogenic reactor for the removal of organic matter and a second anoxic/aerobic stage for nitrogen removal. The effluent of this biological systems will be treated using tertiary membrane filtration. The main aim of this part of the work is to analyse, under controlled conditions, CEC removals in the different units as well as to understand in more detail the interrelationships between the operating conditions and the obtained results. For this purpose, the removal of antibiotics, the microbial population, the evolution of pathogens and of selected ARGs will be regularly assessed. The results of this stage will be further validated at pilot scale in a real environment.

The 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 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 around 25 PhD students providing a stimulating and multidisciplinary work environment to conduct your research.

ARES 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 students 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 lidership", "Writing and presentation skills to improve the impact of research", "Tools to better plan their agendas", etc.

Research area

Development of technologies for innovative wastewater treatment for the removal of contaminants of emerging concern, promoting safe water reuse.

Research team

Juan M. Garrido (juan-m-garrido) and Francisco Omil (francisco-omil).

Brief work description

- Set-up and operation of lab-scale bioreactors under different operational conditions to study the removal of CECs.
- Monitoring of organic micropollutants during the different treatment options.
- Use of microbiological and genetic tools to follow microbial population, pathogens and of selected ARGs, in close collaboration with the microbiologists that participate in the project.

Requirements

- Bachelor in Chemical Engineering, Biotechnology or similar areas.
- Master's degree in chemical or environmental engineering, or at least have in total 300 ECT credits passed considering Bachelor + Master subjects.
- Adequate training in wastewater treatment
- Good level in English and ability to travel abroad to attend project meetings or conferences.
- Commitment to perform a PhD Thesis.

Selection process

Applications must be sent to sonia.suarez@usc.es (including in the subject: "ARES position") before 1st October 2023.

Applications must contain the following documents:

- Motivation letter (not 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 and Master)
- Curriculum Vitae

The selection process will include a personal interview to those candidates that based on the previous information fulfil the position requirements.