



PhD student on Aerogels for Biomedical Applications

Project title: Advances in aerogels for biomedical applications through sustainable solutions and Artificial Intelligence tools (ECOAEROGEL2HEAL)

PhD Position: Full-time contract (4 years)

Place: [AerogelsLab](#), Department of Pharmaceutical Technology (University Santiago de Compostela, Spain).

PhD Supervisor: Prof. Carlos A García-González

Application deadline: 31.October.2024

Start date: February-March 2025

Summary of the project: A boom in aerogel technology and research has emerged in recent years, with the IUPAC Association recently identifying it among the Top Ten Emerging Technologies. Significant progress in biomedical applications of aerogels was recently made with proof-of-concept evaluations of aerogels as carriers in drug delivery and as scaffolds in regenerative medicine, assessing stability, toxicology, and in vivo efficacy of aerogel formulations. However, aerogel production must now align with the current European context, emphasizing the scarcity of raw materials, circular economy approaches, green sustainable technologies, and the advent of artificial intelligence (AI), to sustain and further extend the niche markets of these materials while reducing manufacturing costs. The main objective of ECOAEROGEL2HEAL is to provide technological solutions for scaling up and producing aerogel-based materials in biomedicine under the current industrial context of circular economy principles employing sustainable technologies and AI tools. Scientific-technological research and innovations in this project will focus on aerogels for biomedical uses (colonic, pulmonary, skin drug delivery, and bone regenerative medicine) with an emphasis on (i) process integrations and scale-up with rational use of raw materials and energy, (ii) circular economy principles for alternative aerogel sources, (iii) personalized solutions through resource- and cost-efficient uses, and (iv) the use of AI tools to maximize the performance of the aerogel production process and optimize the characteristics of aerogels.

Background and skills:

- ✓ Completed MSc degree in Pharmacy, Biology, Biotechnology, Engineering (Biomedical, Materials, Process, Chemical), Biochemistry, Chemistry or related discipline.
- ✓ Fluent in English.
- ✓ Hands-on experience in materials synthesis and characterization (aerogel experience is a benefit)
- ✓ Teamwork spirit, enthusiastic

How to apply: Applications submissions (CV and certificate with subject grades) to the e-mail: carlos.garcia@usc.es