

BELÉN GARCÍA MERINO

PhD Student on Chemical Engineering
University of Cantabria
Department of Chemical and Biomolecular Engineering
Av. de los Castros s/n
39005 Santander
Cantabria
España

Telephone: +34 942200931
Email: gmerinob@unican.es



RESEARCH

- **Title:** Contribution to the design of microfluidic systems for the capture and separation of biomolecules from biofluids.

- **Description:**

In recent years, the presence of microbial pathogens or their toxins in the bloodstream is receiving special attention, as it can derive in severe cases in sepsis. The separation of these toxins from the blood can lead to an early diagnosis and is essential to result in a successful treatment. Due to the limitations of the conventional systems for the separation of biomolecules from biological fluids, the use of magnetic nanoparticles is proposed according to good properties, such as their high specific surface area, easy functionalization, chemical stability and superparamagnetic behavior.

The purpose of this thesis is to contribute to the selective capture of toxic compounds, as a first stage before being separated from the biofluid. To this end, a continuous methodology will be developed for the synthesis, functionalization and characterization of the magnetic nanoparticles. Additionally, those functionalized nanomaterials will be integrated with microfluidic devices, due to its numerous advantages such as low cost, continuous systems, improved mass transfer and low nanoparticle aggregation, which increase the separation efficacy and allows the integration of the adsorption and separation stages into one single device.

- **Congress contributions:**

B. García-Merino, M. Fallanza, E. Bringas, I. Ortiz. **Contribution to the design of microfluidic systems for the removal of biomolecules.** Student conference SC-ICCE 3 of the international congress AnQUE-ICCE, June 17-18, 2019, Santander (Spain). Poster presentation.

B. García-Merino, M. Mantecón- Oria. **Design of feedback controllers using simulation tools.** Student conference of the 10th world congress of chemical engineering WCCE10, September 30-3, 2017, Barcelona (Spain). Poster presentation.

- **R&D Projects:**

Title: **Separaciones microfluidicas de elevado rendimiento. Retos y oportunidades. (RTI2018-093310-B-I00).**

Participant entities: Ministerio de Ciencia, Innovación y Universidades, Agencia Estatal de Investigación y Fondo Europeo de Desarrollo Estatal.

Duration, since 01/01/2019 to 31/12/2021

Main researcher: Inmaculada Ortiz Uribe