

Mikołaj Feculak M. Sc.

3rd year of education at the Doctoral School

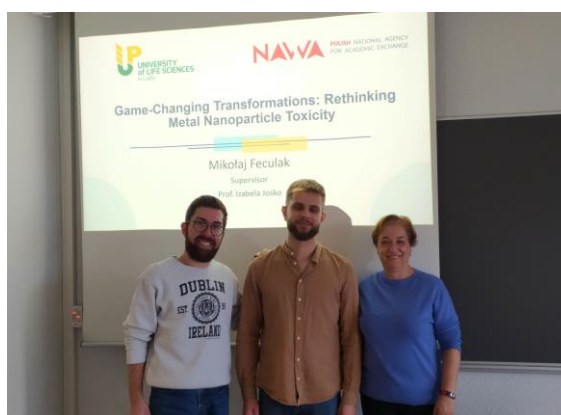
Discipline: Agriculture and Horticulture

Analytical Chemistry Department

Faculty of Chemistry

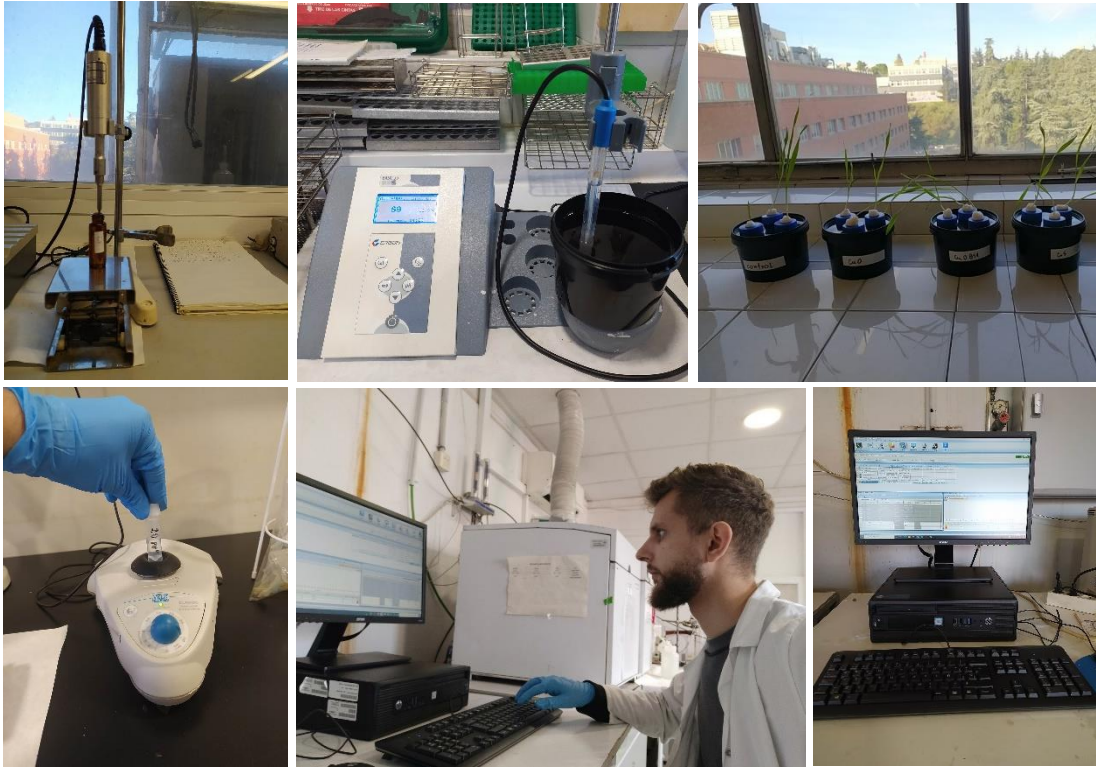
Universidad Complutense de Madrid

From September 26, 2024, to December 24, 2024, I participated in an international internship as part of the project “Actions towards the internationalization of the Doctoral School of the University of Life Sciences in Lublin (I-SDUPL)” funded by the NAWA STER program. The internship was conducted at Complutense University of Madrid under the academic supervision of Prof. Yolanda Madrid and focused on advanced analyses of copper oxide nanoparticles (CuO ENPs) in the context of their impact on the environment and plants.

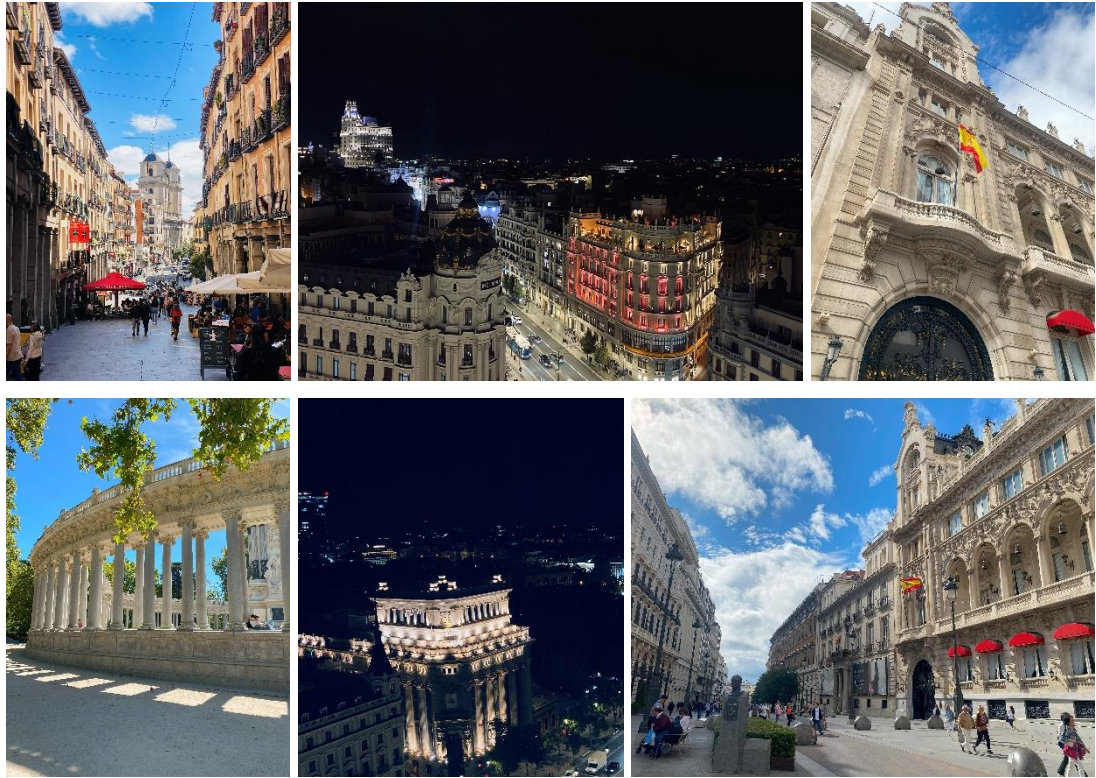


The primary area of my activities involved the application of the **single particle ICP-MS** method to analyze the biodistribution of nanoparticles in plant tissues. During the internship, I honed my skills in the precise preparation of samples for analysis, which included developing experimental protocols, appropriately preparing plant material, and controlling variables that influence the accuracy of results. I also acquired practical knowledge in operating an inductively coupled plasma mass spectrometer (ICP-MS), which enabled me to measure the concentration and distribution of nanoparticles in both environmental and biological samples.

I also engaged in the analysis and interpretation of data obtained through sp-ICP-MS, which allowed me to evaluate the effects of chemical and biological transformations of nanoparticles on their bioavailability and mobility. Additionally, I gained the ability to identify key experimental parameters in studies on nanoparticle interactions with plants.



Beyond the scientific aspects of the internship, my stay in Madrid was an excellent opportunity to explore Spanish culture and everyday life. I had the chance to visit the city's major landmarks, such as the Royal Palace, the Prado Museum, and Retiro Park. I also enjoyed traditional Spanish cuisine, which helped me better understand the unique character of the region.



Participating in this internship significantly enhanced my competencies in advanced nanomaterial analytics, supporting my further academic development and contributing to the internationalization goals of the Doctoral School at the University of Life Sciences in Lublin. Moreover, the connections I established during this experience may lead to future collaborations.