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ONISILOS

MSCA COFUND 2020

The Onisilos-MSCA project will use the Surface-Enhanced Raman Scattering (SERS) effect of nanoparticles, primarily gold, silver, and their combinations, to advance Point-Of-Care Testing technology. By integrating the SERS effect with the Raman technique, the project aims to swiftly identify bacteria in urine based on their distinct chemical properties.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Grant Agreement No 101034403

Dr Adrián Fernández Lodeiro completed his Bachelor's degree in Chemistry from the University of Santiago de Compostela, Spain, and his PhD in Environmental Chemistry at the Department of Chemistry at the Nova University of Lisbon, Portugal, focusing on novel methods for the synthesis of metallic nanoparticles with applications in sensing, catalysis, and biomedicine. The Onisilos-MSCA project will use the Surface-Enhanced Raman Scattering (SERS) effect of nanoparticles, primarily gold, silver, and their combinations, to advance Point-Of-Care Testing technology. By integrating the SERS effect with the Raman technique, the project aims to swiftly identify bacteria in urine based on their distinct chemical properties.

The research will be conducted within the NIDL group led by Prof. Dr. Chrysafis Andreou from the Electrical and Computer Engineering Department and with Prof. Dr. Andreas Anastasiou from the Department of Mathematics and Statistics. The project aims to acquire data over time to be analyzed using Change Point Detection methodology, enabling early behaviour change detection and faster results, reducing turnaround time from days to hours. An additional objective is the rapid detection of antimicrobial resistance. Additionally, the project aims to develop a user-friendly microfluidic device for efficient urine analysis, laying the basis for a reliable and accessible Point-Of-Care technology. Integrating advanced nanotechnology with microbiology aims to improve pathogen detection methods, signifying a considerable advancement in healthcare.

Through interdisciplinary collaboration, the project aims to establish a robust framework for developing an advanced diagnostic system. The implications of this project extend beyond urinary tract infections, potentially impacting the detection and diagnosis of various infectious diseases. Incorporating SERS technology and Change Point Detection into point-of-care devices can enhance healthcare accessibility by enabling rapid and cost-effective diagnostics, particularly in resource-limited settings.

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