

Marie Skłodowska Curie Action – Postdoctoral Fellowship 2023
Expression of interest – Hosting offer
(MSCA-PF-2023)

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Department /Institute /Centre	Name	Laboratory of Bioinstrumentation and Nanomedicine, Centre for Biomedical Technology.	
	Address	Campus UPM de Montegancedo, km38 M40, Pozuelo de Alarcón	
	Province	Madrid	
Research Area		Social Sciences and Humanities (SOC) Economic Sciences (ECO) Information Science and Engineering (ENG) Environment and Geoscience (ENV)	Life Sciences (LIF) Mathematics (MAT) Physics (PHY) Chemistry (CHE)
Brief description of the Centre/Research Group <i>(Max. 1600 caracteres con espacio: información sobre el centro / grupo de investigación / personal científico, destacando los aspectos más relevantes de los mismos. Incluir URL si es posible.)</i>	<p>The Center for Biomedical Technology is a research and technology centre of the Technical University of Madrid that brings together researchers from different disciplines on biomedical technologies, in collaboration with other external institutions. Its mission is to address major challenges that scientists are facing today in Biomedicine and Health and whose success requires a stable and interdisciplinary collaboration, including both basic and translational research. More than 200 researchers of excellence from several countries meet to work together in thirteen laboratories. In particular the Laboratory for Bioinstrumentation and Nanomedicine our main aim is the development of new devices for medical or social use in order to help practitioners and other related workers to improve people's health and wellbeing. We co-create new solutions from sharing with final users and other stakeholders the process by which the problem is first identified and afterwards its solution is designed, implemented and finally is validated to measure the real added value. We specially contribute to that process in the prototype design and implementation stages where we can apply our expertise in electronics (new developments and/or integration of commercial sensors) and software development (instrumentation control and machine learning). Our target as final outcome is the deployment of technology ready to be transferred to the health sector and the society.</p> <p>http://www.ctb.upm.es/</p>		



Expression of Interest – UPM Supervisor

Project description	<p>Quartz crystal resonator (QCR) is becoming an increasingly popular technique that can be employed as part of experimental and modeling investigations on the mechanical behavior of biological fluids and microorganisms paying especial attention to rheological properties like viscoelasticity or to bacterial adhesion. The usefulness of QCR derives from this technique's ability to probe binding and interactions under dynamic conditions, in real time. With QCR, multiple variables affecting bacterial adhesion can be studied, including the roles of substrate composition, chemical modification, solution ionic strength, environmental temperature, shear conditions, and time. Recent studies demonstrate the utility of QCR in developing new bacterial adhesion models and studying different stages of biofilm formation. The Sauerbrey equation can be used for studies that examine the adhesion of various conditioning proteins onto rigid surfaces where the proteins of interest do not adsorb significant amount of water (are not viscoelastic). Viscosity measurement is used in helping the diagnosis of a number of diseases. We focus on QCR techniques because it needs less sample and can be more compatible with other complementary techniques like electrochemical and optical ones for future biosensor capabilities improvements. The availability of some biological fluids like cerebrospinal fluid, etc. is so scarce that it is not possible to correctly assess viscosity using conventional techniques, although viscosity is related to viral or bacterial disease allowing to discriminate in a very fast way the origin of the disease. Therefore, new methodologies based on QCR could help making diagnosis faster.</p>
Applications: documents to be submitted and deadlines	CV, letter of motivation, before the 30 th of April 2023