PARTNER PRESENTATION AND INTEREST IN HORIZON EUROPE PARTICIPATION

The National Institute for Research and Development in Microtechnologies – IMT Bucharest, Laboratory 2: Environmental and Biomedical Sensors

Organization type: Research Institute

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Short description of the organization:

IMT Bucharest is a non-budgetary public research unit, established in 1993 and supervised by the Romanian Ministry of Research, Innovation and Digitalization since 1996 when it became a national institute. Being an internationally competitive organization, IMT has been involved in world class research in the fields of micro- and nanoelectronic components and systems, including smart sensors, micro- and nanotechnology for biomedical applications, integrated devices, systems and platforms, portable self-powered devices for medical monitoring, multichannel probes for bio-signal acquisition, and CAD of electromechanical microstructures. In terms of integrated systems IMT has also seen success in the implementation of implantable electrodes, neural interfaces, Wi-Fi communication, biocompatible materials. IMT employs 200 people with differing expertise in the fields of electronics, computer science, physics, chemistry, and biology. The institute is structured in 4 R&D centers, grouping 11 laboratories specialized in the following areas: Microsystems for biomedical and environmental applications; Nanobiotechnology; Molecular nanotechnology; Micro-nano photonics; Micromachined structures, microwave circuits and devices; Simulation, modelling, micro-and nano-fluidics; Reliability. More info at www.imt.ro.

Expertise:

The Laboratory of Microsystems for Environmental and Biomedical Applications (Head Dr. Carmen Moldovan), has been working for over 15 years on the development of biomaterials, formulations, biomarkers, sensors, transducers, implantable electrodes and microfluidic chips and systems (e.g organ on chip) for both biomedical and environmental applications. Some recent applications developed in the lab include sensors for the quantification of glucose in saliva, platforms for the early detection of myocardial infarct and the development of electrodes for an advanced arm prothesis, as well as a series of nanoelectronic sensors for monitoring of gases, water, and food, as well as the effect of their degradation on human health. Our team includes electrical engineers, physicists, biochemists and electrochemists, with a broad range of expertise covering aspects of design, simulation, experimental development, fabrication, testing and characterization.

Short CV of lead contact person:

Dr. Carmen Moldovan is the Head of the Research Centre for Integration of Technologies and Head of Laboratory of Microsystems for Biomedical applications. She graduated on Electronics and Telecommunications at Politehnica Bucharest and holds a PhD in Microelectronics. Her research activity is focused on development of chemosensors and biosensors, implantable micro-nanoelectrodes and neuronal microprobes, ISFETs, nanowire transistors, M(N)EMS, BioMEMS, microfluidic platforms, readout design, signal processing, data acquisition for microsensor arrays and energy harvester for self-autonomous systems and Platforms. Carmen is/ was involved in more than 20 EU projects and more of 35 National projects and her scientific activity was published in

more than 120 papers and she holds 8 Patents (https://www.scopus.com/authid/detail.uri?authorId=7003563437).

Calls of interest:

HORIZON-CL4-2023-RESILIENCE-01-33: Smart sensors for the Electronic Appliances market (RIA)
IMT will use its expertise in the development and manufacturing of smart sensors to develop sensor technologies based on novel substrates for the development of novel decentral personal health monitoring systems or the identification of pathogens in the environment.
HORIZON-HLTH-2024-STAYHLTH-01-02-two-stage: Towards a holistic support to children and adolescents' health and care provisions in an increasingly digital society
IMT will use its expertise in sensor technology and its collaboration with healthcare professionals to develop sensors systems to assist in the wellbeing of the next generations.
HORIZON-HLTH-2023-ENVHLTH-02-01: Planetary health: understanding the links between environmental degradation and health impacts
IMT will use its expertise in both environmental monitoring and healthcare monitoring through sensor systems to assess the impact of environmental factors on human health and well-being.
HORIZON-HLTH-2024-ENVHLTH-02-06-two-stage: The role of environmental pollution in non-communicable diseases: air, noise and light and hazardous waste pollution
IMT will use its expertise in both environmental monitoring and healthcare monitoring through sensor systems to assess the impact of environmental factors on human health and well-being.
HORIZON-HLTH-2023-CARE-04-03: Environmentally sustainable and climate neutral health and care systems
IMT will use its knowledge on biosensor development and manufacturing to produce devices with a lower impact on the environments without compromising their performance.
HORIZON-HLTH-2024-TOOL-05-06-two-stage: Innovative non-animal human-based tools and strategies for biomedical research
IMT will use its knowledge in microfluidic systems and bioreactors to develop organ-on-a-chip platforms that simulate living organs in laboratory conditions.

Previous projects:

Moore4Medical (June 2020 – May 2023)

EU project funded under the H2020-ECSEL-2019-1-IA-two-stage call. The 'Accelerating Innovation in Microfabricated Medical Devices' aims to accelerate innovation of technologies for emerging medical domains such as: implantable devices, organ-on-chips, drug adherence systems and more.

ARMIN (June 2019 – May 2023)

International project funded under the Norway/EEA Grant EEA-RO-NO-2018-0390. The 'Arm neuroprothesis equipped with artificial skin and sensorial feedback' aims to fabricated a prototype of a personalized arm neuroprothesis that allows for sensorial feedback through artificial skin.

CardioFRET (June 2020 – May 2022)

National project aiming to develop microbiosensors with rapid detection using Forster resonance (FRET) technology for the early diagnosis of acute myocardial infarction.