Nanostructured materials | Jožef Stefan Institute Ljubljana, Slovenia

SEMINAR

Wednesday, 20.11.2024, 13:00, Kolar's Lecture Hall

Natural and Organic Materials applied in Biotechnologies for Drug Delivery, Unconventional Computing and Biosensing.

Pasquale D'Angelo, IMEM-CNR & BIOTECHTRONICS Lab

This talk aims at making an excursus on some of the research activities developed within the Biotechtronics Lab of the Institute of Materials for Electronics and Magnetism -IMEM-, at the Italian National Research Council -CNR-.

The Biotechtronics Lab has been recently established to conduct research activities on biotechnologies and bioelectronics, with a special focus on biosensing, drug delivery systems (DDS) and unconventional computing (UC), but also with an eye on the development of neuromorphic devices, tools for tissue engineering, "alive" electronics (i.e. peptide electronics), novel multifunctional materials for food industry and biomedical purposes and, more recently, gas sensors (for VOCs) and 2D materials.

We combine the use of functional synthetic polymers (such as conducting polymers) and/or natural materials (like protein-based ones), additive manufacturing techniques (such as direct writing, non-contact routes for 3D printed electronics and extrusion methods for solids, pastes and liquid precursors) and 'green' synthesis approaches for sustainability (for instance, preparing dedicated inks from dispersion and/or precursors materials to be post-processed after deposition), in order to develop the as-designed devices/platforms and systems. Specifically, among devices and applications we implement @ Biotechtronic Lab, I will provide some examples of: (i) electronic/electrochemical biosensors, such as Organic Electrochemical Transistors, for biomarkers/biosystems detection/monitoring; (ii) DDS in form of free or aggregate micro-nanocarriers and free standing microchambers with electrically-driven triggering for release of loads, (iii) UC approaches and protein-based electronics, (iv) multifunctional biopolymeric composites for tissue engineering and (v) wearable electronics for healthcare monitoring (biosignalling, integrable pressure sensors).

Kindly invited.