Giovedì 31 gennaio alle ore 15:30 presso l’Aula H
Dipartimento di Scienze Chimiche, via Francesco Marzolo 1

Dott. Thomas Zadrozny
CEO Pro-Active sprl
Avenue du Hoef 26, 1180, Brussels Belgium.

terrà il seminario:

Nanocellulose printed electronics biosensing platforms
The GREENSENSE project

The presentation is about Printed Electronics as one of the fastest growing technologies in the world, it is of vital interest to industries as consumer goods, healthcare, aerospace, electronics, media and transport. Paper and plastic are two types of flexible materials in the development of future flexible electronic devices. Paper-based electronics made from cellulose, have the advantages of low cost, recyclability and can be expected to have a significant impact in the reduction of "electronic trash" and in providing new opportunities to industry. Unfortunately, the surface properties of conventional paper (porosity and surface roughness) are not suitable for printed electronics and, typically plastic coatings based on fossil-oil polymers (polyethylene, waxes, ethylene vinyl alcohol, polyvinylidene chloride) are applied. Nevertheless, this approach is disfavored by limitations in fossil-oil reserves, poor recyclability of coated papers, and lack of biodegradation, which create environmental and economic concerns. Among the different alternatives (polysaccharides like starch, chitosan, alginate, proteins and lipids), NC-based films with strength, high aspect ratio, transparency and low porosity and smooth surface roughness are a promising potential alternative. Today there a great interest in producing high performance NC-based electronics that are flexible, transparent and eco-friendly. Moreover, the versatility of NC films makes them suitable as a biocompatible platform for immobilization of bioactive molecules, which use is paramount in biosensors and diagnostics.

GREENSENSE aims to develop a sustainable, wireless and autonomous NC-based biosensing platform for quantitative DoA (Drug-of-Abuse) analysis. By using nanocellulose (NC) at an affordable cost, it will integrate different printed electronics components (a Near Field Communication (NFC) antenna, an energy storage (E. storage) device and a display), a new developed printed biosensor and an integrated microchip. The NC properties will be tailored (rheology, surface chemistry, fibre/crystal dimensions, transparency, conductivity, porosity and thickness) to produce films and inks. The NC-based films (free-standing NC and NC-coated paper films) will be used as: a) substrate for the printed electronic components and b) lamination film for the encapsulation of the final biosensing platform and the NC will be used as c) ink component in the formulation of different functional inks (conductive, electrochemical, dielectric and electrolytes).

Il Direttore del Dipartimento
Michele Maggini