

Biosensors and Biochips: state-of-art and perspectives.

Abstract

Biosensors and biochips are expected to be core instruments for next social revolution, especially for biomedical applications, just as happened in early 70's with transistors in consumer electronics. Point-of-care, early detection, self-medication can solve most of patient's minor problems with extraordinary savings on health care expenses. In this short course, state-of-art and future perspectives of these subjects will be reviewed and explored. A multi-disciplinary approach, based on physic, materials science, engineering and biochemistry, will be exploited in design and fabrication of several devices.

Syllabus

- Introduction and motivations (3 hours);
- Transduction and sensing (3 hours);
- Bioprobes and assays (3hours);
- Microfluidics (3 hours);
- Final remarks and test (2 hours+1 hour).

Credits: 15 hours, 4 credits


Luca De Stefano, PhD

L. De Stefano short CV

Luca De Stefano graduated cum laude in Physics and received a PhD in Physics in 1996 by University of Naples "Federico II". From 1996 to 2001, he worked in a research center of ENEL (Italian electric power company) focusing on optical monitoring of environmental pollution and materials characterization by several techniques such as electron microscopy, infrared spectroscopy, x-ray diffraction. In 2001, he joined the Institute for Microelectronic and Microsystems of National Research Council in Naples, where he heads a small research team in the fields of biophotonics and optical microsystems for biochemical sensing. Main topics are the fabrication and characterization of porous silicon based photonic devices; the study of the optical properties of marine diatoms microshells; the design and realization of hybrid devices based on bio/non-bio interfaces. He is a contract professor at the Faculty of Biotechnology Science at University "Federico II" of Naples, teaching a course on biosensors and biochip. He presented his work to more than 150 national and international conferences, many of which he has been invited to. He is author or co-author of more than 100 scientific articles published on peer reviewed journals, more than 50 conference proceedings, and eight between books and book chapters. He holds one European patent, and seven Italian patents. He is coordinator of the Workgroup Optical Biosensors and Biophotonics of The Optical and Photonic Italian Society (SIOF), and member of the European Optical Society (EOS). He is reviewer for many high impact factors scientific journals: Nature





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