



University of Pavia

Ph.D. School of Electrical and Electronics Engineering and Computer Science

SEMINAR

Optical biosensors: Detection Strategies and Fluidic Designs

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Abstract:

Recognizing and quantifying specific biomolecules in fluid samples are constantly needed in many research fields and are increasingly exploited to create novel sensing devices for a variety of applications, including human diagnostics, environmental monitoring and biodefense. A generic biosensor comprises some kind of molecular recognition element and a signal transduction system enabling the sensitive detection of specific targets in a solution. Different kinds of optical approaches can be used for this purpose, mostly relying on absorbance, fluorescence emission, light scattering or surface reflection. A continuous effort has been devoted to develop methods enabling faster, simpler, more accurate and more sensitive detection. In this context, the design of the fluidic cell also plays a crucial role and, in particular, the interplay between diffusion and convection may substantially affect the detection performance. Different assay formats, optical detection schemes and fluidic designs will be here addressed and discussed in relation to their potential applications.

Bio:

Marco Buscaglia was born in Milan (Italy) on May 27th 1973. In 1998 he earned the “laurea” degree *cum laude* in Electronics Engineering at the University of Pavia. Then, he entered the Ph.D program in Electronics and Computer Engineering of the University of Pavia under the supervision of prof. V. Degiorgio and earned the Ph.D degree in 2002. From 2002 to 2004 he had a post-doc fellowship at the Laboratory of Chemical Physics, NIDDK, National Institutes of Health (NIH), Bethesda, MD (USA), under the supervision of dr. W. A. Eaton. From January 2005 he is Researcher (faculty member) of Applied Physics at the University of Milan, with teaching duties of Medical Physics in various programs of study of the Faculty of Medicine. From 2012 he is member of the Department of Medical Biotechnology and Translational Medicine. His research studies have mostly focused on the experimental investigation of molecular fluids, bio-molecules and colloidal suspensions with various kinds of optical methods. His current research activity is mainly devoted to the development of novel label-free optical biosensors and to the study of inter- and intra-molecular interactions of proteins and nucleic acids. He is co-founder and vice-president of Proxentia, a spin-off company of the University of Milan, providing analytical devices based on novel optical technologies.

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Seminar in English