BIOENGINEERING SEMINAR

“Exploring Fusion Between Electronics and Life Science”

Friday – April 1, 2016 – 2:00 p.m.
EPFL – room SV1717.1

Prof. Yuji Miyahara
Director and Professor,
Institute of Biomaterials and Bioengineering,
Tokyo Medical and Dental University, Tokyo (Japan)

host: Prof. Carlotta Guiducci

Background

Yuji Miyahara has been working in the field between electronics and biotechnology for more than 30 years. He has developed several types of biosensors, microTAS and sensing technologies for detection of biomolecules and cell functions. He has been investigating direct interaction between biomolecular charges and solid-state devices. Field effect transistors (FETs) have been used to detect biomolecular recognition or cell functions via electrostatic interaction or enzymatic reactions. One of the typical examples of the solid-state biosensors is FET-based genetic analyses. Genotyping and DNA sequencing have been demonstrated in combination with single-base extension reaction.

We also propose an oocyte-based field effect transistor (oocyte-based FET) for drug transport analysis, in which target transporters are expressed at the cell membrane of the oocyte. Non-destructive monitoring of the uptake kinetics of substrates mediated by membrane-bound transporters can be realized with oocyte-based FET. Discrimination of transporting ability among genotypes of the transporters could be realized using the oocyte-based FET.

The bio-FET platform is suitable for a simple, miniaturized and inexpensive system for biomarker detection and high-throughput analysis in clinical diagnostics and molecular biology.

Yuji Miyahara received the Prize of Progress from The Institute of Electrical Engineers of Japan in 2005, and the Yamazaki Teiichi Prize from Foundation for Promotion of Material Science and Technology of Japan in 2006.

→ For further information, please visit: http://www.tmd.ac.jp/bsr/index_en.html

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