

電子科学研究所 学術講演会

主催：北海道大学 電子科学研究所
共催：高分子学会北海道支部

講演者：**Prof. Lourdes Basabe-Desmots**
(MICROFLUIDICS CLUSTER UPV/EHU, Spain)

タイトル：**Lab-on-a-chip technology
for cell culture, cell monitoring and
cell characterization through optical sensors**

会場：北海道大学 創成科学研究棟 4階セミナー室BC

日時：令和5年7月7日(金) 13:30~14:15

概要：

The research field of "Lab-on-a-Chip" is having a great impact in many fields such as in-vitro biomedical and industrial diagnostics (Pei 2020) in the form of point-of-care diagnostics tests (Spencer 2020; Zhao 2020) The integration of sensors and microfluidic technology allowed the performance of sample preparation and analytical assays in an automated manner, using small amounts of samples and reagents. On the other hand "Organ-on-a-Chip" is an emerging application of the Lab-on-a-Chip technology, which aims to provide analytical platforms for cellular systems to enable in-vitro preclinical trials. The expected reduction on research cost and animal testing is being translated into a hype of emerging companies in this field, such as Sphero, Mimetas, Hespero, Beonchip, ect. However, the integration of sensors on cell culture chips to monitor cell behavior is still rare and necessary. In this talk I will discuss the activities of the Microfluidics Cluster UPV/EHU focused on the development of sensors and methods for their integration in microfluidic devices for cell culture and monitoring, including our latest development on plasmonic nanosensors on optical fibers (Calatayud-Sanchez A. 2022).



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主催：北海道大学 電子科学研究所
共催：高分子学会北海道支部

講演者：**Prof. Fernando Benito-Lopez**
(MICROFLUIDICS CLUSTER UPV/EHU, Spain)

タイトル：**Materials with Multiple Functionalities
and Their Applications in Microfluidics**

会場：北海道大学 創成科学研究棟 4階セミナー室BC

日時：令和5年7月7日(金) 14:15~15:00

概要：

The discovery of new materials and their continuous development are making a great impact on the evolution of human civilisation. In particular, responsive materials play an important role due to their remote controllability, easy adaptability in micro-technologies, non-invasiveness and biocompatibility. Moreover, their integration into devices improves operability increasing their marketability value.^{1,2}

In this contribution we present the use of novel types of smart materials, based on alginate hydrogels, ionogels and magnetic materials for biosensing and actuation purposes in microfluidics. Their applicability on microtechnology is demonstrated for the rapid sensing of biomarkers in body fluids such as sweat and blood as well as for their application in environmental analysis. In addition, superhydrophobic magnetic particles are evaluated as novel magnetic manipulation systems in water medium and when integrated into microfluidic devices.³

1 Lai, J. J. et al. *Lab Chip* **2009**, 9 (14), 1997–2002.

2 Garcia-Rey, S. et al. *Sens. Actuators B*, **2023**, 382, 133514

3 Gunatilake, U. B. et al. *J. Mat. Chem. A*, **2022**, 10, 12832-12841



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