

# ***Bio-MEMS and Medical Microdevices II***

**Sander van den Driesche**  
*Editor*

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**Sander van den Driesche**, Universität Bremen (Germany)
- 3 Biosensors and Medical Sensors I  
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- 6 Microfluidics and Lab-on-a-Chip III  
**Manuel Delgado-Restituto**, Instituto de Microelectrónica de Sevilla  
(Spain)

## Introduction

The Bio-MEMS and Medical Microdevices II conference took place 5–6 May 2015 in Barcelona, Spain. This conference is part of the SPIE Microtechnologies 2015 symposium. Thirty-five contributions including a key note talk and two invited talks were divided over six oral sessions, a plenary session, and a poster session.

There were three main trends visible during this year's conference: label-free bio-sensing, single cell isolation techniques, and stereolithography technology. New label-free bio-sensing techniques and methods were presented to investigate biological samples such as single cells, biopsies, and organs. In most of these contributions light was used as main source for medical analysis - from the visible spectrum up to the infrared wavelength region. Harvesting specific cells such as bacteria or tumour cells from complex samples (e.g. blood, lymph fluid, or bronchoalveolar lavage) is the basis for diagnosing infections and metastatic cancer. Single cell isolation techniques contributions showed new insights improving the current diagnostic options. Contributions concerning stereolithography technology were also strongly present at this conference. The potential and compatibility of 3D printing for biomedical applications enables a next generation in rapid prototyping.

Technological aspects of neural and wireless interfaces, water toxicity tests based on changes in swimming patterns exhibited by marine species, and droplet microfluidics were further topics that were addressed during the conference.

Plenary speaker Stefan Harrer, IBM Research Australia, gave an overview of sensors and analytics for the emerging field of precision medicine entitled "Measuring life: sensors and analytics for precision medicine."

The two invited talks, Sabeth Verpoorte (University of Groningen, Netherlands) "Building better organ chips using micro technologies," and Peter Ertl (AIT Austrian Institute of Technology GmbH, Austria), "Monitoring dynamic cell-to-cell interactions of tumor, tissue and stem cells in multifunctional lab-on-a-chip systems," covered many of their publications showing a very attractive scientific overview for the audience. On the second day Andreu Llobera (Centro Nacional de Microelectrónica) presented the EU project "Living photonics: monitoring light propagation through cells (LiPhos)." The topic of this talk highlights one of the trend of this year's conference, label-free bio sensing.

On the following pages you will find the full papers of the authors who presented their work at the conference. I would like to thank all contributing authors for making this conference a success. Also, I would like to thank the co-chairs, Ioanna Gioroudi (Technische Universität Wien, Austria) and Manuel Delgado-Restituto (Instituto de Microelectrónica de Sevilla, Spain), for

their assistance and for chairing sessions. Special thanks go to the symposium chair, Ulrich Schmid (Technische Universität Wien, Austria), the symposium co-chairs, Thomas Becker (EADS Deutschland GmbH) and Jacopo Iannacci (Fondazione Bruno Kessler, Italy), and to the SPIE staff. Finally, I would like to thank the programme committee for promoting the Bio-MEMS and Medical Microdevices II conference, and for reviewing the abstracts.

**Sander van den Driesche**