

# IEEE BIOSENSORS 2023

IEEE BIOSENSORS CONFERENCE 2023

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LONDON

## BioSensors 2023 PROGRAM

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for more information!

[iee-biosensors.org](https://iee-biosensors.org)

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# Program at a Glance

	SUNDAY, JULY 30	MONDAY, JULY 31	TUESDAY, AUGUST 1
8:00	<b>Registration</b> Room: Balmoral Lobby	<b>Registration</b> Room: Balmoral Lobby	<b>Registration</b> Room: Balmoral Lobby
8:30			
9:00	<b>Opening Ceremony</b> Room: Balmoral (2 & 3)	<b>Plenary: Wearable Electrochemical Sensors: Towards Labs on the Skin and Under the Skin</b> Room: Balmoral (2 & 3)	<b>Microphysiological Systems with Integrated Biosensors</b> Room: Balmoral (2 & 3)
9:30	<b>Toward Point-of-Care Assessment of Hemostasis Using Miniaturized Dielectric Blood Coagulometry</b> Room: Balmoral (2 & 3)	<b>Coffee Break</b> Room: Balmoral (1)	<b>Coffee Break</b> Room: Balmoral (1)
10:00			
10:30			
11:00		<b>Platform One</b> Room: Balmoral (2 & 3)	<b>Platform Three</b> Room: Balmoral (2 & 3)
11:30	<b>Coffee Break</b> Room: Balmoral (1)		
12:00	<b>Circuits, Sensors, and Hybrid Packaging Approaches for Lab-on-CMOS Applications</b> Room: Balmoral (2 & 3)		
12:30		<b>Lunch</b> Room: The Boulevard Hotel Restaurant	<b>Lunch</b> Room: The Boulevard Hotel Restaurant
13:00			
13:30			
14:00	<b>Lunch</b> Room: The Boulevard Hotel Restaurant	<b>Platform Two</b> Room: Balmoral (2 & 3)	<b>Platform Four</b> Room: Balmoral (2 & 3)
14:30	<b>Minimalistic Optical Fiber Biosensors as a Tool for Detecting Pandemic Viruses: Tutorial and Perspectives in Biosafety</b> Room: Balmoral (2 & 3)		
15:00			
15:30		<b>Coffee Break/ Poster Session (1)</b> Room: Balmoral (1)	<b>Coffee Break/ Poster Session (2)</b> Room: Balmoral (1)
16:00			
16:30	<b>WiSe Session</b> Queen's Tower Rooms, Imperial College		
17:00			
17:30			
18:00			
18:30	<b>Welcome Reception</b> Queen's Tower Rooms, Imperial College		<b>Farewell Reception - 25th Anniversary Event</b> IET London: Savoy Place
19:00			
19:30		<b>Gala Dinner</b> Science Museum	
20:00			
20:30			
21:00			

# Welcome Message

Dear Colleagues, dear Friends,



On behalf of the entire Organizing Committee, we cordially welcome you to the *inaugural IEEE BioSensors Conference* (IEEE BioSensors 2023), which will be held in the iconic multicultural city of **London** in the UK.

With the launch of the first annual IEEE BioSensors conference, we are aiming to bring together the research community and industry to showcase and discuss the latest developments in biosensors. IEEE BioSensors is sponsored by the IEEE Sensors Council and is the only IEEE event exclusively dedicated to biosensors and biosensor-related systems, algorithms, and applications.

This 3-day event offers a rare opportunity to meet and network with leaders in the field of biosensors through the informal atmosphere of a focused international technical gathering. We hope the atmosphere, breadth and depth of research topics, combined with the quality of invited and contributed technical presentations, will make IEEE BioSensors a 'must attend' event for you every year.

IEEE BioSensors aspires to be the premier forum for reporting the latest research, development, and commercialization results in modern biosensor technology. You will hear from world experts about the latest in biosensor modalities, manufacturing and materials for biosensors, lab-on-chip technology, DNA chips, wearable and implantable biosensor systems, immunosensors, enzyme-based biosensors, environmental biosensors, instrumentation, algorithms, modeling, and machine learning for biosensors in addition to a growing number of new applications and business opportunities.

This year, our program will begin on **Sunday, July 30<sup>th</sup>**, with three **tutorials** offered on the topics of (i) Point-of-care blood-based systems, (ii) Lab-on-CMOS systems, and (iii) Optical fibre biosensors, given by **Prof. Pedram Mohseni**, **Dr. Matthew Johnson** and **Dr. Daniele Tosi** respectively.



The technical program covers two days of technical presentations (**July 31<sup>st</sup> and August 1<sup>st</sup>**). By design, this is a single-track conference with high quality oral presentations and exhibitions. Each presentation was carefully reviewed and selected by our Technical Program Committee after a evaluation by at least three independent reviewers – technical experts in the field.

Our **two keynote speakers**, **Prof. Joseph Wang** and **Prof. Andreas Hierlemann** will open each day with stimulating topics in the areas of flexible wearable electrochemical biosensors and microphysiological systems with integrated biosensors.

The contributed papers will be presented in oral and poster formats. Of the 20 lectures given for contributed papers, **four were identified as being of particularly high interest and were invited to have extended time**. These invited talks will kick off each of the platform presentation sessions.

## Welcome Message (Cont.)

In addition to the opening reception on July 30 and the banquet on July 31, the social program will include a farewell reception for additional networking. This event will also be a celebration of the 25<sup>th</sup> Anniversary of the IEEE Sensors Council. This farewell will be held at the prestigious IET Savoy Place, where we will **welcome Prof. Alison Holmes, OBE**, to give a perspective of how biosensors will help address the global challenge of antimicrobial resistance.

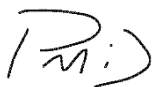
The Digest of Technical Papers for the 2023 IEEE BioSensors conference contains three-page versions of the "regular technical papers," all provided to attendees in an electronic form. Most presented papers will be available through IEEE *Xplore* after the symposium. In addition, some papers were submitted to a special biosensors issue of *IEEE Sensors Letters*, and the full version of those papers will be published in the journal rather than the conference proceedings.

The Technical Program Committee will also select one Best Student Paper (as well as first and second runner-up papers). The **Awards** will be announced Tuesday during the **Gala Dinner**, which will be held in the Science Museum.

We would like to express our special thanks to the Oversight Committee, the Technical Program Committee, and many experts who contributed their time to evaluate 125 paper submissions representing 24 countries from across the globe.

We thank the IEEE Sensors Council for sponsoring the IEEE BioSensors 2023 conference as well as our **Patrons and Exhibitors**. Our special **thanks also go to Caroline Kravec** and the entire staff at Conference Catalysts, LLC for administrative support.

Finally, we thank all speakers, presenters, and attendees for making the IEEE BioSensors 2023 conference such a productive event. We hope that you find the IEEE BioSensors 2023 inspiring, intellectually stimulating, professionally rewarding, and personally enjoyable; of course, we are looking forward to seeing you back next year for IEEE BioSensors 2024!



Pantelis Georgiou  
General Chair  
IEEE BioSensors 2023



Mike McShane  
Technical Program Chair  
IEEE BioSensors 2023

# 2023 Organizing Committee & TPC

## General Chair

Pantelis Georgiou, *Imperial College London, UK*

## Technical Program Chair

Mike McShane, *Texas A&M University, USA*

## Treasurer

Srinivas Tadigadapa, *Northeastern University, USA*

## Tutorial Co-Chairs

Sameer Sonkusale, *Tufts University, USA*

Sandro Carrara, *EPFL, Switzerland*

## WiSe Co-Chairs

Elena Gaura, *Coventry University, UK*

Ashleigh Ruane, *Cambridge University, UK*

Ruchi Gupta, *University of Birmingham, UK*

## Journal-Conference Synergy Chair

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Samuel Tang, *National Tsing Hua University, Taiwan*

Troy Nagle, *North Carolina State University, USA*

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Melina Kalofonou, *Imperial College, UK*

Michael Daniele, *North Carolina State University, USA*

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Rona Chandrawati, *UNSW, Australia*

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Takashi Tokuda, *Tokyo Institute of Technology, Japan*

Wei Gao, *California Institute of Technology, USA*

## Symposium Management

Conference Catalysts, LLC

# Patrons & Exhibitors

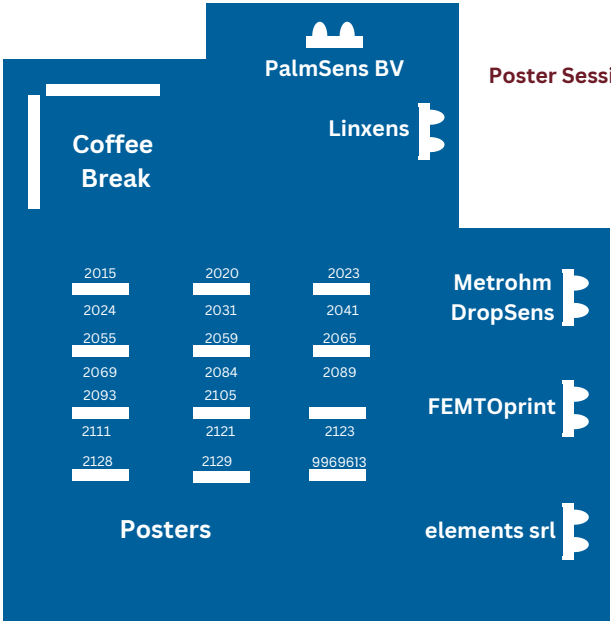
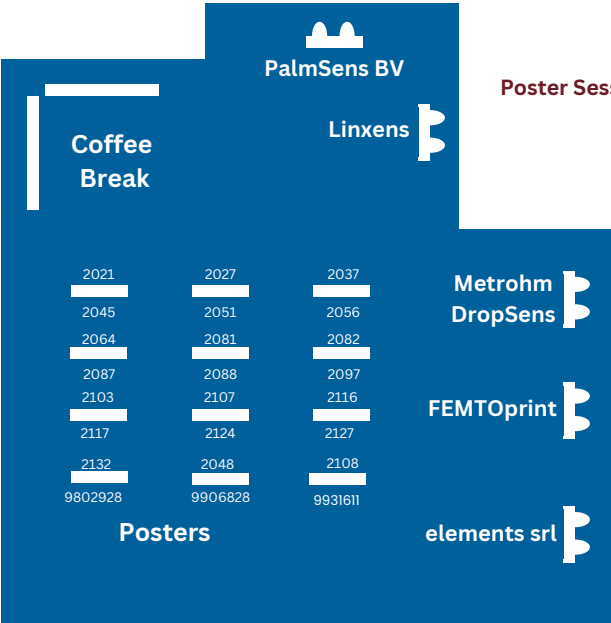
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Exhibitors

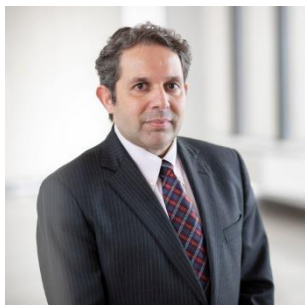


# Exhibit & Poster Hall Layout





# Tutorial Speakers



**Sunday, July 30<sup>th</sup> | 9:30 - 11:00**

## **Toward Point-of-Care Assessment of Hemostasis Using Miniaturized Dielectric Blood Coagulometry**

**Room:** Balmoral (2 & 3)

**Instructor:** Pedram Mohseni, *Case Western Reserve University, USA*

**Abstract:** Point-of-care (POC) diagnostic devices hold great promise to significantly impact healthcare delivery and address health disparities. These devices enable a shift in focus away from the utilization of high-cost specialized care

for the treatment of late-stage diseases toward predictive, preventative, and personalized health for more effective disease monitoring and management. In the developed world, POC technologies are expected to offer effective and feasible means of reducing healthcare costs and improving patient care, whereas in the developing world POC technologies are urgently needed to address pressing healthcare needs with affordable and accessible solutions.

In this tutorial, I will first provide an overview of the field of POC technologies for health diagnostics, especially as related to research-grade assays and commercially available products for POC hemostatic assessment. To showcase a salient example in more depth, I will next present our work on ClotChip® – a microfluidic sensor that utilizes dielectric spectroscopy for POC assessment of blood coagulation disorders with <10  $\mu$ L of whole blood. Specifically, I will analyze a simple circuit model that accurately captures the frequency-dependent dielectric behavior of human whole blood placed within a microfluidic channel. I will then discuss how temporal variation in the dielectric properties of a coagulating blood sample at 1 MHz (i.e., dielectric blood coagulometry) provides information about cellular (i.e., platelet) and non-cellular (i.e., coagulation factor) abnormalities in clot formation, as well as about the fibrinolytic system that regulates clot resolution to prevent thrombotic occlusions.

Finally, to establish the utility of ClotChip® as a platform technology for POC assessment of hemostasis, I will share our results from pilot clinical studies with ClotChip® on monitoring anticoagulation therapy with direct oral anticoagulants (DOACs) – a new class of FDA-approved blood thinners – as well as coagulation factor replacement therapy in hemophilia care management. Results from correlative studies between ClotChip® and clinically relevant blood coagulation assays such as rotational thromboelastometry (ROTEM) are also provided.

# Tutorial Speakers (Cont.)



**Sunday, July 30<sup>th</sup> | 11:30 – 13:00**

## **Circuits, Sensors, and Hybrid Packaging Approaches for Lab-on-CMOS Applications**

**Room:** Balmoral (2 & 3)

**Instructor:** Matthew L. Johnston, *Oregon State University, USA*

**Abstract:** The Lab-on-CMOS research community leverages the power and economies of scale of modern silicon integrated circuits, built up over the previous fifty years for high-performance computation and imaging, for low-cost chemical and biological sensing applications. The integration

of new materials, sensing modalities, and intelligent computation in CMOS-based sensor platforms promises a broad range of miniaturized diagnostic, therapeutic, and continuous monitoring systems.

The integration of fluid samples with silicon integrated circuit (IC) sensors is manageable in a laboratory setting through heterogeneous approaches, but a reliable, manufacturable fluid-IC interface solution continues to elude the Lab-on-CMOS community. The primary challenge is the need to integrate microfluidic channels on a chip surface that (due to wire bonds) is not planar. In addition, the area required for fluidic interconnect to an IC is cost prohibitive due to the large die area required to make a fluidic connection. In the presented approach, we leverage fan-out wafer-level packaging to co-locate ICs, sensors, and metallization in a planar substrate, combined with planar microfluidic delivery. This technique also enables co-integration of devices that cannot be manufactured in the same process.

This tutorial will focus on packaging and post-fabrication methods that enable Lab-on-CMOS SoC platforms, including fan-out wafer-level packaging, high-resolution 3D-printing of electrical interconnects, and post-fabrication of integrated microfluidic channels over IC sensors. The methods we present support a broad new paradigm of reconfigurable lab-on-chip applications, analogous to system-on-chip (SoC) or system-in-package (SiP) reconfigurable designs. In the future, a library of detector ICs, microfluidic actuator chips, signal processing ICs, and data transceivers could be arranged in any permutation, over-molded to form a planar substrate, and integrated with interconnects and microfluidic channels for biosensor applications.

# Tutorial Speakers (Cont.)



**Sunday, July 30<sup>th</sup> | 14:30 – 16:00**

**Minimalistic optical fiber biosensors as a tool for detecting pandemic viruses: tutorial and perspectives in biosafety**

**Room:** Balmoral (2 & 3)

**Instructor:** Daniele Tosi, *Nazarbayev University, Kazakhstan*

**Abstract:** The outbreak of pandemic viruses is a danger for the human ecosystem; the outbreak of COVID-19 pandemic resulted in a large socio-economic impact all over the world,

and was followed by a successive monkeypox outbreak which was reported in 2022. In addition, undetected activities related to weaponized pathogens for biological warfare, or unintended outbreaks, can cause significant danger. For this reason, the scientific communities have gathered significant interest in the development of devices for the recognition of viral pathogens that could work as point-of-care detectors, enabling features as real-time sensing, low limit of detection, multiplexing, safety.

Optical fiber biosensors are an excellent candidate for this task, as they enable real-time sensing, multiplexing, seamless integration into urban/lab environments, biocompatibility, remote sensing, and excellent biosafety standards. However, most technologies based on gratings or surface plasmon resonance cannot meet the demand for large sensing networks, and therefore are not a viable solution towards biosafety application. In this tutorial, we present a different approach that is based on what we define as “minimalistic” devices; hereby the approach is to simplify the fabrication of the device to the minimum number of steps, hence having a device with bill-of-material cost as low as few dollar cents, while using hardware commonly used in distributed sensing for enhancing the performance to ultralow limits of detection.

In this tutorial, we first present several minimalistic devices and architectures that can be used as candidates for biosensing, all based on single-mode fiber optics: ball resonators; reflector-less sensors; semi-distributed interferometers. We also draw the principles of multiplexing based on spatial division. Then, we report the first findings in viral sensing for the detection of vaccinia virus, which is the first proof of concept towards the label-free detection of poxviruses; detection is reported both at protein level, and targeting the virus itself.



**Sunday, July 30<sup>th</sup> | 16:35 – 16:55**

## **Embedding EDI in Research and Innovation – an EPSRC/UKRI perspective**

**Room:** Queens Tower Rooms, Imperial College

**Instructor:** Eirini Kokkali, *UK Research and Innovation, UK*

**Abstract:** My presentation will discuss inclusive research environments from an EPSRC/UKRI perspective. It will draw from UKRI's first EDI strategy, which sets out our ambition for a more diverse and inclusive research and

innovation system, and the EPSRC EDI action plan that seeks to create a culture within engineering and physical sciences research which values individual differences and enables everyone to prosper. I will also discuss the outputs of Tomorrow's Engineering Research Challenges, an extensive UK-wide community engagement initiative which highlighted inclusivity as a top priority for the engineering research ecosystem, and talk about ways to embed EDI in research activities.

**Sunday, July 30<sup>th</sup> | 16:55 – 17:15**



## **Building Inclusive Real-World Applications: From Sensors to API**

**Room:** Queens Tower Rooms, Imperial College

**Instructor:** Neeti Viswanathan, *Zimmer and Peacock, UK*

**Abstract:** We explore the concept of building inclusive real-world applications by leveraging sensors and APIs. In recent years, advancements in sensor technologies and the widespread availability of application programming interfaces (APIs) have opened up new possibilities for creating innovative solutions that cater to diverse user

needs. The integration of sensors and APIs enables the collection of real-time data from the physical world and its seamless integration into digital platforms. We highlight the importance of inclusivity in the development of such applications, emphasizing the need to ensure that they are accessible, usable, and beneficial for individuals from all backgrounds, abilities, and demographics.

By incorporating inclusive design principles into the development process, developers can create applications that consider the diverse needs and preferences of users. This includes considering factors such as visual impairments, motor disabilities, language barriers, and cultural differences. Additionally, as part of research and development we must discuss the potential challenges and opportunities of building inclusive real-world applications, such as privacy concerns, ethical considerations, and the potential for positive social impact.

Through case studies and examples, we will showcase the potential of sensor-enabled APIs to address real-world challenges and improve the lives of individuals across different domains, including healthcare, transportation, environmental monitoring, and more. It encourages developers, researchers, and industry professionals to embrace inclusivity as a fundamental principle when designing and implementing sensor-driven API applications to create a more equitable and accessible future.



**Sunday, July 30<sup>th</sup> | 17:15 – 17:35**

## **Learning faster together in Inclusive and Diverse Environments: A Success Story**

**Room:** Queens Tower Rooms, Imperial College

**Instructor:** Agnieszka Rutkowska, *Depixus, UK*

**Abstract:** Inclusive environments create safe and empowering spaces that foster success for all team members. A strong sense of belonging provides continuous support, enabling companies to thrive. True inclusion occurs

when every team member believes in and values one another, facilitating equal contributions to the team's and project's success. In this presentation, I will discuss the importance of inclusive environments for women scientists in male-dominated fields. Throughout my career, I have had the privilege of collaborating with inspirational experts in engineering and biology, where my expertise in bioelectrochemistry played a vital role in project progression. I will share examples from my own journey, highlighting strategies to leverage inclusion in the workplace, empowering employees, and fostering long-term success.



**Sunday, July 30<sup>th</sup> | 17:35 – 17:55**

## **Inclusive Researcher Development: The ReachSci model**

**Room:** Queens Tower Rooms, Imperial College

**Instructor:** Ashleigh Ruane, *Cambridge University, UK*

**Abstract:** ReachSci is a not-for-profit society at the University of Cambridge, founded in 2021 with the aim of improving access to research, globally. ReachSci organizes intensive research training programmes aimed at audiences from pre-University to those in postgraduate education. As

a program ran by students, we demonstrate just one route to inclusive researcher development.

### **Agenda**

- 16:30 Welcome
- 16:35 Embedding EDI in Research and Innovation – an EPSRC/UKRI perspective
- 16:55 Building Inclusive Real-World Applications: From Sensors to API
- 17:15 Learning faster together in Inclusive and Diverse Environments: A Success Story
- 17:35 Inclusive Researcher Development: The ReachSci model
- 17:55 Video Competition

# WiSe Video Competition Finalists

**Kirigami-inspired Net-like Graphene Strain Sensor for Motion Detection**



Kyung Ah Woo

**Responsible Innovation**



Tasnim Sarker, *Student*

**Responsible Innovation in Biosensors for Critical Diseases**



Ariadna Schuck, *Sungkyunkwan University*

**Renotion: Responsible Innovation in Biosensor for Human Enhancement**



Mohammad Solaiman, *The University of Texas at Tyler*

**Responsible Innovation in Biosensors and Biosensing**



Elvis Donmaaye Sangmen, *The University of Texas at Tyler*

**Video Competition from Rhythem Tahrin**



Rhythem Tahrin, *The University of Texas at Tyler*

# Plenary Speakers



**Monday, July 31<sup>st</sup> | 9:00 – 10:00**

## **Wearable Electrochemical Sensors: Towards Labs on the Skin and Under the Skin**

**Room:** Balmoral (2 & 3)

**Instructor:** J. Wang, *University of California, San Diego*

**Abstract:** Wearable sensors have received a major recent attention owing to their considerable promise for monitoring the wearer's health and wellness [1-3]. This presentation will discuss our recent efforts towards developing wearable bioelectronic systems, capturing non-invasively molecular

information, for obtaining comprehensive information about the wearer health, nutrition and wellness. Particular attention will be on wearable electrochemical sensors integrated directly on the epidermis or under the skin for continuous monitoring of sweat and ISF, and to multimodal devices fusing the monitoring of chemical and physical parameters on a single epidermal patch. The preparation, characterization and applications of such skin-worn bioelectronic platforms will be described, along with related energy and integration advances, and future prospects and challenges.

### References

- [1]. "Wearable biosensors for healthcare monitoring", J. Kim, A. S. Campbell, B. Esteban-Fernández de Ávila, and J. Wang, *Nature Biotechnology*, 2019, 37, 389.
- [2] "An epidermal patch for the simultaneous monitoring of haemodynamic and metabolic biomarkers", J. Sempionatto et al, *Nature Biomedical Engineering*, 5 (2021) 737–748.
- [3] "Wearable Chemical Sensors: Present Challenges and Future Prospects" A. J. Bandodkar, I. Jeeranpan, J. Wang, *ACS Sensors*, 2016, 1, 464.



**Tuesday, August 1<sup>st</sup> | 9:00 – 10:00**

## **Microphysiological Systems with Integrated Biosensors**

**Room:** Balmoral (2 & 3)

**Instructor:** Andreas Hierlemann, *Department of Biosystems Science and Engineering, ETH Zürich*  
*Professor*

**Abstract:** Recent technological advances in microfabrication techniques and the development of new biological model systems have enabled the realization of microphysiological systems capable of recapitulating

aspects of human physiology in vitro with great fidelity. Using microfluidic, microtechnological and microsensor structures and representative in vitro models of human organs, robust microphysiological systems can be developed that accommodate high-resolution microscopy and integrated biosensor readouts. Combination of multiple organs and integrated sensor modalities in different specific applications will be presented.

# Sensors Council 25th Anniversary Speaker



**Tuesday, August 1st | 18:15 – 18:35**

## **Opportunities to Improve the Management of Infectious Diseases and the use of Antimicrobials**

**Room:** IET Savoy Place

**Instructor:** Alison Holmes, *Imperial College London & University of Liverpool, UK*

**Abstract:** The potential and emerging role of biosensors and their application in the field of infectious diseases will be discussed. The opportunity to improve and inform the prevention, identification, management, and treatment of infectious diseases in a range of contexts is immense. The contribution to improved healthcare through the innovative application of sensors in research, observational studies, and behavioural change will also be considered. Opportunities provided by applying sensor technologies to enable the optimising of antimicrobial use will both improve clinical outcomes and contribute to global efforts to minimise antimicrobial resistance (AMR) and drug resistant infection.



# Technical Program: Sunday 30 July

8:00 – 9:00

## Registration

Room: Balmoral Lobby

9:00 – 9:30

## Opening Ceremony

Room: Balmoral (2 & 3)

Session Chair(s): Pantelis Georgiou, *Imperial College London, UK*

Mike McShane, *Texas A&M University, USA*

9:30 – 11:00

## Tutorial: Toward Point-of-Care Assessment of Hemostasis Using Miniaturized Dielectric Blood Coagulometry

Pedram Mohseni, *Case Western Reserve University, USA*

Room: Balmoral (2 & 3)

Session Chair(s): Sameer Sonkusale, *Tufts University, USA*

Sandro Carrara, *EPFL, Switzerland*

11:00 – 11:30

## Coffee Break

Room: Balmoral Lobby

11:30 – 13:00

## Tutorial: Circuits, Sensors, and Hybrid Packaging Approaches for Lab-on-CMOS Applications

Matthew L. Johnston, *Oregon State University, USA*

Room: Balmoral (2 & 3)

Session Chair(s): Sameer Sonkusale, *Tufts University, USA*

Sandro Carrara, *EPFL, Switzerland*

13:00 – 14:30

## Lunch

Room: The Boulevard Hotel Restaurant

14:30 – 16:00

## Tutorial: Minimalistic Optical Fiber Biosensors as a Tool for Detecting Pandemic Viruses: Tutorial and Perspectives in Biosafety

Daniele Tosi, *Nazarbayev University, Kazakhstan*

Room: Balmoral (2 & 3)

Session Chair(s): Sameer Sonkusale, *Tufts University, USA*

Sandro Carrara, *EPFL, Switzerland*

16:30 – 18:00

## WiSe Session

Room: Queen's Tower Rooms, Imperial College

Session Chair(s): Ashleigh Ruane, *Cambridge University, UK*

Ruchi Gupta, *University of Birmingham, UK*

18:00 – 20:00

## Welcome Reception

Room: Queen's Tower Rooms, Imperial College

# Technical Program: Monday 31 July

8:00 – 9:00

## Registration

Room: Balmoral Lobby

9:00 – 10:00

## Plenary: Wearable Electrochemical Sensors: Towards Labs on the Skin and Under the Skin

Joseph Wang, *University of California, San Diego*

Room: Balmoral (2 & 3)

Session Chair(s): Pantelis Georgiou, *Imperial College London, UK*

Mike McShane, *Texas A&M University, USA*

10:00 – 10:30

## Coffee Break/ Exhibits

Room: Balmoral (1)

10:30 – 12:00

## Platform One

Room: Balmoral (2 & 3)

Session Chair(s): Mike McShane, *Texas A&M University, USA*

Melina Kalofonou, *Imperial College London, UK*

10:30

## 2060: Determination of Patient-Derived Brain Cancer Cell Respiration Rates with Chip-Based Microsensors

Andreas Weltin{2}, Johannes Dornhof{2}, Jochen Kieninger{2}, Stefan Rupitsch{2}, Jürgen Beck{1}, Kevin Joseph{1}

{1}Medical Center - University of Freiburg, Germany; {2}University of Freiburg, Germany

11:00

## 2043: Recording Network-Based Synaptic Transmission and LTP in the Hippocampal Network on a Large-Scale Biosensor

Brett Addison Emery, Shahrukh Khanzada, Xin Hu, Livia Rossi, Diana Klütsch, Erdem Altuntac, Hayder Amin

German Center for Neurodegenerative Diseases, Germany

11:15

## 2092: Enhanced Multiplexed Sensor for the Quantification of Inflammatory-Related Biomarkers to Identify Sepsis Stages

Ariadna Schuck, Hyo Eun Kim, Minhee Kang, Yong-Sang Kim

Sungkyunkwan University, Korea

11:30

## 2053: A Bilateral *In Vitro* Model for Cardiovascular Disease Investigations Using Photoplethysmography Sensors

Redjan Ferizoli, Parmis Karimpour, James May, Panayiotis Kyriacou

City, University of London, United Kingdom

11:45

## 2104: Towards Electrochemical Control of pH for Regeneration of Biosensors

Christopher Sharkey, Jack Twiddy, Kaila Peterson, Angelica Aroche, Stefano Menegatti, Michael Daniele

North Carolina State University, United States

12:00 – 13:30

## Lunch

Room: The Boulevard Hotel Restaurant

# Technical Program: Monday 31 July (Cont.)

13:30 – 15:00

## Platform Two

Room: Balmoral (2 & 3)

Session Chair(s): Michael Daniele, *North Carolina State University, USA*  
Sara Ghoreishizadeh, *University College London, UK*

13:30

### 2091: Dielectrophoretic Actuation in a Microfluidic System with Coplanar Electrode Configuration

Sarah Günther-Müller, Steffen Strehle

Technische Universität Ilmenau, Germany

14:00

### 2114: Nanostructured Microfluidic Sensor Surfaces for Selective Cellular Wicking and Enrichment

E. Celeste Welch, Riley Flores, Anubhav Tripathi

Brown University, United States

14:15

### 2076: *In Vitro* Localized Entrapment and Targeted Delivery of Magnetically Loaded Anticancerous Drug on Magnetic Lab-on-a-Chip

Vinit Yadav, Preetha Ganguly, Prashant Mishra, Samaresh Das, Dhiman Mallick

Indian Institute of Technology Delhi, India

14:30

### 2028: Chitosan as Material for the Elaboration of Lab-on-a-Chip

Morgane Zimmer{1}, Stephane Trombotto{2}, Emmanuelle Laurenceau{1}, Anne-Laure Deman{1}

{1}Univ Lyon, Ecole Centrale de Lyon, Université Claude Bernard Lyon 1, CNRS, INSA Lyon, CPE Lyon, INL, France; {2}Université De Lyon, UCBL, CNRS, IMP, France

14:45

### 2039: Tunable Electroactive Biomimetic Bone-Like Surfaces for Bone Marrow-on-Chips

Danfeng Cao{1}, Jose G. Martinez{1}, Laetitia Skalla{1}, Erik Hultin{1}, Jan-Ingvar Jönsson{1}, Risa Anada{2}, Hiroshi Kamioka{2}, Edwin W.H. Jager{1}, Emilio S. Hara{2}

{1}Linköping University, Sweden; {2}Okayama University, Japan

15:00 – 15:30

## Coffee Break/ Exhibits

Room: Balmoral (1)

15:00 – 17:00

## Poster Session One

Room: Balmoral (1)

Session Chair(s): Pantelis Georgiou, *Imperial College London, UK*  
Mike McShane, *Texas A&M University, USA*

### 2021: MoS<sub>2</sub> Functionalized Paper Sensor for Quantification of Glucose: Experimental Observation and *Ab Initio* Calculations

Arijit Pal, Souvik Biswas, Koel Chaudhury, Soumen Das

Indian Institute of Technology Kharagpur, India

### 2027: Deep Neural Network of E-Nose Sensor for Lung Cancer Classification

Mu-Hsiang Kao{3}, Shih-Wen Chiu{1}, Meng-Rui Lee{2}, Min Sun{3}, Kea-Tiong Tang{3}

{1}Enosim Bio-Tech, Taiwan; {2}National Taiwan University Hospital, Taiwan; {3}National Tsing-Hua University, Taiwan

### 2037: Immobilization Strategy of Liposome Modified Cantilever Biosensor Arrays Combined with Microfluidic Channels

Carl Frederik Werner{1}, Yuya Takahashi{1}, Ryusuke Mitobe{2}, Masayuki Sohagawa{2}, Minoru Noda{1}

{1}Kyoto Institute of Technology, Japan; {2}Niigata University, Japan

# Technical Program: Monday 31 July (Cont.)

## **2045: ZnMxFe<sub>2</sub>-xO<sub>4</sub> (M=Cr, Bi) Nanoparticles-Modified Electrochemical Sensors: Effect on Sensitivity and First-Order Kinetic Rate Constant**

Mallikarjun Madagalam{2}, Mattia Bartoli{2}, Sandro Carrara{1}, Alberto Tagliaferro{2}  
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Politecnico di Torino, Italy

## **2051: A Pretreated Electrodeposited Nickel Oxide Film on Gold PCB Electrode for Solid-State Lactate Sensing**

Vinay Patel, Ameesha Bhargava, Arzoo Puri, Arnab Ghosh, Rohit Srivastava  
Indian Institute of Technology Bombay, India

## **2056: Label-Free Identification of Nonelectrogenic Cancer Cells Using Adhesion Noise**

Maximilian Ell{2}, Ralf Zeitler{3}, Roland Thewes{1}, Günther Zeck{2}  
{1}Technische Universität Berlin, Germany; {2}Technische Universität Wien, Austria;  
{3}zerodev, Germany

## **2064: Comparison of Bio Sensing Techniques for VEGF**

Adeem Alshammari, Sorcha Hulme, Harm van Zalinge, Ian Sandall  
University of Liverpool, United Kingdom

## **2081: A Mass-Based Aptasensor for Real-Time, Continuous Quantification of TNF-Alpha with Quartz Crystal Microbalance**

Lena Fasching, Pancheng Zhu, Atticus Mulder, Gabriel Spiller Beltrao, Yannick Neeleman, Alina Rwei  
Delft University of Technology, Netherlands

## **2082: Rapid Turnaround Fabrication of Peptide Nucleic Acid (PNA)-Immobilized Nanowire Biosensors by O<sub>2</sub>-Plasma Assisted Lithography of e-Beam Resists**

Osman Sahin{2}, Oguz Mustafa Albayrak{2}, Ayse Seray Guzel{1}, Devrim Gozuacik{1}, Murat Kaya Yapici{3}  
{1}Koc University Research Center for Translational Medicine, Turkey; {2}Sabanci University, Turkey; {3}Sabanci University, University of Washington, Turkey

## **2087: Effect of pH and Gel Electrolyte on Safe Charge Injection and Electrode Degradation of Platinum Electrodes**

Thomas Niederhoffer{2}, Anne Vanhoestenbergh{1}, Henry Lancashire{2}  
{1}King's College London, United Kingdom; {2}University College London, United Kingdom

## **2088: A Low-Cost Gold-Coated Optical Fiber Sensor for *In Situ* Microplastic Detection in Water**

Noppasin Ajchareeyasontorn, Jade Udomkittivorakul, Tatinee Changlor, Chanyanut Rungchaiwattanakul, Jenyuk Lohwacharin, Charusluk Viphavakit  
Chulalongkorn University, Thailand

## **2097: Pharmacologically and Electrically-Induced Network-Wide Activation of Olfactory Bulb with Large-Scale Biosensor**

Livia Rossi, Brett Addison Emery, Shahrukh Khanzada, Xin Hu, Hayder Amin  
German Center for Neurodegenerative Diseases, Germany

## **2103: Enzyme-Based Fluorometric Image-Sensing of Transdermal Gases for Monitoring Metabolisms**

Kenta Iitani{2}, Koji Toma{1}, Takahiro Arakawa{3}, Kohji Mitsubayashi{2}  
{1}Shibaura Institute of Technology, Japan; {2}Tokyo Medical and Dental University, Japan;  
{3}Tokyo University of Technology, Japan

## **2107: Multiwavelength Photoplethysmography and Bioimpedance Multimodal Signal Analysis Above the Radial Artery on the Wrist**

Justin McMurray, Samuel Idah-Oze, Kimberly Branan, Adrián Duarte, Samuel Sobarzo, Nathan Finley, Lauren Yamthe, Gerard Coté  
Texas A&M University, United States

# Technical Program: Monday 31 July (Cont.)

## **2116: Simulation and Fabrication of SU-8 Microfluidics Mixers Capped by Wafer-to-Wafer Bonding**

Matthaeus Henke{1}, Manuel Baeuscher{1}, Kai Zoschke{1}, Julia Ali-Röder{1}, Aleksandr Keller{2}, Biswajit Mukhopadhyay{1}, Piotr Mackowiak{1}, Martin Schneider-Ramelow{1}  
{1}Fraunhofer Institute for Reliability and Microintegration, Germany; {2}Technische Universität Berlin, Germany

## **2117: Multielectrode Multiplexing for Bioimpedance Surface Topography Mapping**

Steven Wong{1}, Jack Radford{2}, Daniele Faccio{2}, Timothy G. Constandinou{1}, Jinendra Ekanayake{1}  
{1}Imperial College London, United Kingdom; {2}University of Glasgow, United Kingdom

## **2124: Multimodal Approaches for Real-Time Mesoscopic Tissue Differentiation**

Steven Wong{1}, Jack Radford{2}, Philip Binner{2}, Vytutas Gradauskas{2}, Timothy G. Constandinou{1}, Jinendra Ekanayake{1}, Daniele Faccio{2}  
{1}Imperial College London, United Kingdom; {2}University of Glasgow, United Kingdom

## **2127: Nonionic Odorants Detection by Graphene FETs with Functional Peptides Designed by Molecular Dynamics Simulation and Machine Learning**

Yoshiaki Sugizaki{3}, Yasutaka Nishida{3}, Hiroko Miki{3}, Kou Yamada{3}, Masayoshi Tanaka{1}, Mina Okochi{1}, Yuhei Hayamizu{1}, Miyuki Tabata{2}, Yuji Miyahara{2}, Atsunobu Isobayashi{3}, Hideki Shibata{3}, Hideyuki Tomizawa{3}  
{1}Tokyo Institute of Technology, Japan; {2}Tokyo Medical and Dental University, Japan; {3}Toshiba Corporation, Japan

## **2132: Low-Cost Optical Transmittance Measurements for the Detection and Quantification of Agglutination in Dual-Phase Lab-in-Tubing Microfluidics**

Justin Farrell, Abdul Basit Zia, Ian Foulds  
University of British Columbia, Canada

## **2048: Novel Detection Methodology of Milk-Oligopeptides Fingerprints Using Ion-Sensitive BioFET**

Naveen Kumar{2}, César Pascual García{1}, Ankit Dixit{2}, Ali Rezaei{2}, Vihar Georgiev{2}  
{1}Luxembourg Institute of Science and Technology, Luxembourg; {2}University of Glasgow, United Kingdom

## **2108: Bioimpedance Spectroscopy System for Glioblastoma Spheroid Growth and Dissociation Characterization**

Riley Flores, E. Celeste Welch, Anubhav Tripathi  
Brown University, United States

## **INVITED JOURNAL AUTHOR 9802928: Vision-Based Continuous Sign Language Spotting Using Gaussian Hidden Markov Model**

Anjan Kumar Talukdar, M. K. Bhuyan  
Gauhati University, India

## **INVITED JOURNAL AUTHOR 9906828: Biochemical Blood Sensing Platform With CMOS Image Sensor and Software-Based Wavelength Filter**

Sangeeta D. Palekar{1}, Jayu Kalambe{1}, Rajendra M. Patrikar{2}  
{1}Shri Ramdeobaba College of Engineering and Management (RCOEM), India; {2}Visvesvaraya National Institute of Technology, India

## **INVITED JOURNAL AUTHOR 9931611: Classifying Gait Alterations Using an Instrumented Smart Sock and Deep Learning**

Pasindu Lugoda{1}, Stephen Clive Hayes{1}, Theodore Hughes-Riley{1}, Alexander Turner{2}, Mariana V. Martins{1}, Mariana V. Martins{1}, Kaivalya Raval{1}, Carlos Oliveira{1}, Philip Breedon{1}, Tilak Dias{1}  
{1}Nottingham Trent University, UK; {2}University of Nottingham, UK

19:00 – 22:00

**Gala Dinner**

Room: Science Museum

# Technical Program: Tuesday 1 August

8:00 – 9:00

## Registration

Room: Balmoral Lobby

9:00 – 10:00

## Microphysiological Systems with Integrated Biosensors

Andreas Hierlemann, *ETH Zürich, Switzerland*

Room: Balmoral (2 & 3)

Session Chair(s): Pantelis Georgiou, *Imperial College London, UK*

Mike McShane, *Texas A&M University, USA*

10:00 – 10:30

## Coffee Break/ Exhibits

Room: Balmoral (1)

10:30 – 12:00

## Platform Three

Room: Balmoral (2 & 3)

Session Chair(s): Mike McShane, *Texas A&M University, USA*

Sara Ghoreishizadeh, *University College London, UK*

10:30

## 2109: Toward the Quantification of Adeno-Associated Virus Titer by Electrochemical Impedance Spectroscopy

Junhyeong Wang, Mahshid Hosseini, Shriarjun Shastry, Eduardo Barbieri, Wenning Chu, Stefano Menegatti, Michael Daniele

North Carolina State University, United States

11:00

## 2063: Simultaneous and Continuous Monitoring of Plant Bioimpedance and Phytohormones

Abdullah Bukhamsi{1}, Ikram Blilou{1}, Jurgen Kosel{2}, Khaled Salama{1}

{1}King Abdullah University of Science and Technology, Saudi Arabia; {2}Silicon Austria Labs, Austria

11:15

## 2042: EIS Based Detection of Microcystin-LR in Water Using Stencil Printed Carbon Electrodes Decorated with Cysteamine Capped Gold Nanoparticles

Atindra Kanti Mandal, Tathagata Pal, Suparna Mukherji, Soumyo Mukherji

Indian Institute of Technology Bombay, India

11:30

## 2073: Detection of the Colorectal Cancer TP53 p.R248W Mutation on a Lab-on-Chip ISFET Platform

Katerina-Theresa Mantikas{2}, Nicolas Moser{2}, Costanza Gulli{2}, David Cunningham{3},

Pantelis Georgiou{2}, Constantinos Simillis{1}, Melpomeni Kalofonou{2}

{1}Cambridge University Hospitals NHS Foundation Trust, United Kingdom; {2}Imperial College London, United Kingdom; {3}Royal Marsden NHS Trust, United Kingdom

11:45

## 2008: Semi-Distributed Fiber-Optic Interferometer as a Simple and Rapid Sensor for Detection of Cancer Biomarkers

Aida Rakhimbekova{1}, Baizak Kudaibergenov{1}, Kuanysh Seitkamal{1}, Wilfried Blanc{2},

Luca Vangelista{1}, Daniele Tosi{1}

{1}Nazarbayev University, Kazakhstan; {2}Universite de Cote d'Azur, France

12:00 – 13:30

## Lunch

Room: The Boulevard Hotel Restaurant

# Technical Program: Tuesday 1 August (Cont.)

13:30 – 15:00

## Platform Four

Room: Balmoral (2 & 3)

Session Chair(s): Michael Daniele, *North Carolina State University, USA*  
Melina Kalofonou, *Imperial College London, UK*

13:30

### **2078: Improved Stability of Carbon Nanotube Electrolyte-Gated Field-Effect Transistors Through Lipophilic Membrane Encapsulation**

Anna Tagliaferri, Bajramshahe Shkodra, Mattia Petrelli, Pietro Ibba, Luisa Petti, Paolo Lugli, Martina Aurora Costa Angeli

Free University of Bozen-Bolzano, Italy

14:00

### **2034: Implantable Biosensor for Brain Dopamine Using Microwire-Based Electrodes**

Ali Meimandi{1}, Peilong Feng{2}, Marco Carminati{3}, Timothy G. Constandinou{2}, Sandro Carrara{1}

{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Imperial College London, United Kingdom; {3}Politecnico di Milano, Italy

14:15

### **2101: Improved Carbonization Process of Nano-Electrodes for Biosensor Systems**

Andalib Nizam{2}, Nickolay Lavrik{1}, Dale Hensley{1}, Nicole McFarlane{2}

{1}Oak Ridge National Laboratory, United States; {2}University of Tennessee, Knoxville, United States

14:30

### **2120: Flexible Piezoresistive Pressure Sensor Based on Graphene Nano Plateletes**

Azmal Chowdhury, Borzooye Jafarizadeh, Md Shariful Islam Sozal, Zhe Cheng, Neziha Pala, Chunlei Wang

Florida International University, United States

14:45

### **2125: Enhancing the Precision of AD5940 Segmental Bioimpedance Measurements Through Self-Calibration**

Santiago Scagliusi{2}, Pablo Pérez García{2}, Daniel Martín{2}, Gloria Huertas{2}, Alberto Olmo{2}, Alberto Yúfera{2}, Maggie Delano{1}

{1}Swarthmore College, United States; {2}Universidad de Sevilla, Spain

15:00 – 15:30

## Coffee Break/ Exhibits

Room: Balmoral (1)

15:00 – 17:00

## Poster Session Two

Room: Balmoral (1)

Session Chair(s): Pantelis Georgiou, *Imperial College London, UK*  
Mike McShane, *Texas A&M University, USA*

### **2015: Investigation of Titanium Nitride as Material for Nanoelectrodes in Biosensing Applications**

Nina Häselhoff{2}, Ulrich Hasenkox{1}, Martina Hübner{1}, Christopher Johnson{3}, Jonas Ott{1}, Daniel Pantel{1}

{1}Robert Bosch GmbH, Germany; {2}Robert Bosch GmbH / Westphalian University of Applied Sciences, Germany; {3}Robert Bosch LLC, United States

### **2020: Quantitative Estimation of Ascorbic Acid Using Graphene Oxide : Experimental Validation of First-Principle Analysis**

Souvik Biswas, Arijit Pal, Koel Chaudhury, Soumen Das  
Indian Institute of Technology Kharagpur, India

# Technical Program: Tuesday 1 August (Cont.)

## **2023: Electrochemical Detection of Human Immunoglobulin-G Using Gold Nanowires Immunosensor**

Nadia Moukri{4}, Bernardo Patella{4}, Chiara Cipollina{1}, Elisabetta Pace{2}, Alan O'Riordan{3}, Rosalinda Inguanta{4}  
{1}Fondazione Ri.MED, Italy; {2}Istituto di Farmacologia Traslazionale, Italy; {3}Tyndall National Institute, Ireland; {4}Università degli Studi di Palermo, Italy

## **2024: High Resolution, Biocompatible 3D Printing for Microfluidic Cell-Based Assays**

Mawla Boaks, Connor Roper, Adam Woolley, Kenneth Christensen, Gregory Nordin  
Brigham Young University, United States

## **2031: Design and Characterisation of a Broadband PCB Coaxial Sensor for Non-Invasive Skin Cancer Analysis**

Mohamed Zied Fritiss{1}, Patrick Poulichet{1}, Hakim Takhedmit{1}, Laurent Lanquetin{2}, Stephane Protat{1}, Patrice Vallade{1}, Elodie Richalot{1}, Olivier Français{1}  
{1}ESYCOM, CNRS UMR 9007, Université Gustave Eiffel, France; {2}Segula Technologies, France

## **2041: Toll-Like Receptor-4 Immobilized Carboxylic Terminated Carbon Interfaces Towards a Cost-Effective and Label-Free Detection of Gram -ve Bacteria**

Rahul Gangwar, Karri Trinadha Rao, Sajmina Khatun, Pravat Kumar Sahu, Challapalli Subrahmanyam, Aravind Kumar Rengan, Siva Rama Krishna Vanjari  
Indian Institute of Technology Hyderabad, India

## **2055: Bottom-Up Neurogenic-Inspired Computational Model**

Erdem Altuntac, Xin Hu, Brett Addison Emery, Shahrukh Khanzada, Gerd Kempermann, Hayder Amin  
German Center for Neurodegenerative Diseases, Germany

## **2059: Development of a Low-Cost Graphene Screen-Printed Paper-Based Electrochemical Sensor with Application of Lactate Detection: A Biological Biomarker**

Julia Moreira{3}, Duane Moraes{3}, Milleny Souza{1}, Gabriela Jantch{1}, Bruna Serafini{3}, Iara Fernandes{2}, Willyan Carreira{1}, Priscila Lora{3}

{1}BIOSENS, Brazil; {2}Universidade do Vale do Rio dos Sinos, Brazil; {3}Universidade do Vale do Rio dos Sinos / BIOSENS, Brazil

## **2065: Mussel Inspired Polydopamine Surface Chemistry as a One Step Method for Bioreceptor Immobilisation on Silicon Photonic Biosensors**

Shrishty Bakshi, Kezheng Li, Pin Dong, Steven Johnson, Thomas Krauss  
University of York, United Kingdom

## **2069: Ovenized Dual-Mode Piezoelectric MEMS Resonator for Bovine Serum Albumin (BSA) Sensing**

Alkausil Tamboli, Akshay Kale, Filip Hrnčirik, Mario De Miguel Ramos, Andrew Flewitt  
University of Cambridge, United Kingdom

## **2084: Evaluation of the Improvement of an LMR-Based Planar Biosensor by Depositing a Low Refractive Index Intermediate Thin-Film**

Melays Benítez Perez{1}, Pablo Zubiate{1}, Abián Bentor Socorro{2}, Ignacio Del Villar{1}, Ignacio Raul Matias{2}  
{1}Public University of Navarra, Spain; {2}Public University of Navarra, IdiSNa, Spain

## **2089: Development of Plasmonic ZnO@Ag Core-Shell Nanostructures Embedded PDMS Pillars as Hot-Spots for SERS Detection**

Aleena Unnikrishnan{1}, Dinesh Veeran Ponnuvelu{2}  
{1}Dhanalakshmi Srinivasan University, India; {2}Dhanalakshmi Srinivasan University, India

## **2093: Multi-Functional HD-MEA Platform for High-Resolution Impedance Imaging and Electrophysiological Recordings of Brain Slices**

Hasan Ulusan, Roland Diggelmann, Julian Bartram, Chloe Magnan, Sreedhar Kumar, Andreas Hierlemann  
ETH Zürich, Switzerland



# Technical Program: Tuesday 1 August (Cont.)

## **2105: Preliminary Study on Development of a Point-of-Care for the Detection of Non-Treponemal Antibodies on Congenital Syphilis**

Bruna Serafini{3}, Duane Moraes{3}, Julia Moreira{3}, Mariana Meireles{1}, Rodrigo Bernasconi{3}, Felipe Kadel{4}, Tatiana Louise A. Rocha{2}, Priscila Lora{3}  
{1}BIOSENS, Brazil; {2}Universidade do Vale do Rio dos Sinos, Brazil; {3}Universidade do Vale do Rio dos Sinos / BIOSENS, Brazil; {4}Universidade Federal do Rio Grande do Sul, Brazil

## **2111: Indirect Sandwich Aptamer Assay Coupled Structurally Stabilized Hairpin Assisted Hybridization Chain Reaction for Femtomolar Detection of Cardiac Troponin I**

Sayantan Tripathy, Suhash Reddy Chavva, Angela Michelle Tan San Juan, Gerard Coté, Samuel Mabbott  
Texas A&M University, United States

## **2121: A High-Order Membrane Resonator as Density-Viscosity Sensor for Sweat Analysis**

Xinyu Jiang, Zhenming Liu, Farrokh Ayazi  
Georgia Institute of Technology, United States

## **2123: 3D-Printed Optogenetic Stimulator Integrated with a Recording Channel**

Keonghwan Oh{2}, Jihong Lim{1}, Hyunjoo Jenny Lee{1}, Sohmyung Ha{2}  
{1}Korea Advanced Institute of Science and Technology, Korea; {2}New York University, United States

## **2128: Handheld ISFET Lab-on-Chip Detection of TMPRSS2-ERG and AR mRNA for Prostate Cancer Prognostics**

Joseph Broomfield, Melpomeni Kalofonou, Sylvia Franklin, Sue Powell, Thomas Pataillot-Meakin, Nicolas Moser, Charlotte Bevan, Pantelis Georgiou  
Imperial College London, United Kingdom

## **2129: Smartphone-Based Point-of-Care Multiplexed-Genes Detection of Mycobacterium Tuberculosis on a Low-Cost Paper/Polymer Hybrid Microfluidic Device**

Hamed Tavakoli, Jianjun Sun, Xiujuan Li  
University of Texas at El Paso, United States

## **INVITED JOURNAL AUTHOR 9969613: Inductive Power Line Harvester with Flux Guidance for Self-Powered Sensors**

Steven W. Wright{1}, Michail E. Kiziroglou{2}  
{1}Imperial College London, UK; {2}International Hellenic University, Greece

18:00 – 20:00

**Farewell Reception – 25<sup>th</sup> Anniversary Event**

Room: IET London: Savoy Place