

[Online]

Disposable sensors for next-generation diagnostics

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(Meeting room number) 543 800 2088

Live link: <http://live.bilibili.com/1906044084>

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Abstract:

Disposable sensors are low-cost and easy-to-handle sensing devices for short-term or single-shot measurements. Over the last decade, they have become increasingly important for different applications, including from environmental, forensic, pharmaceutical, agricultural, and food monitoring to diagnostics, especially the point-of-care testing and wearables. In this talk, first a short introduction to disposable sensors will be given. Afterwards, a broad spectrum of different biosensing approaches for next-generation on-site testing will be presented: (i) Multiplexed on-site therapeutic drug monitoring of antibiotics from invasive and non-invasive samples toward personalized antibiotherapy, (ii) CRISPR-powered electrochemical biosensors for nucleic-acid-amplification-free, simultaneous and on-site detection of multiple RNAs and other biomolecules for COVID-19 management, (iii) wearable microfluidic immunosensing devices for lab-on-a-bird applications and beyond, (iv) low-cost electrochemical paper-based wearable sensors that can be integrated to any type of facemask for wearable and continuous monitoring of breath biochemistry and/or testing of the infectious diseases such as coronaviruses from exhaled breath, and (v) light-controlled dynamic bioassays using optogenetic switches (OptoAssays) for wash- and pump-free point-of-care diagnostics.

Biography:

I am an Associate Professor of Sensors and Wearables for Healthcare at the Technical University of Munich (TUM) since October 2024. The research interest of my group is the development of bioanalytical materials, sensors and microsystems, as well as their combination with data science and artificial intelligence for One-Health: human and animal health, and the shared environment. Our focus is on disposable sensing devices for point-of-need testing and wearable applications.

Having completed my studies in microsystems engineering, I graduated from the Technical Faculty of the University of Freiburg, Germany. I received my PhD degree with summa cum laude in 2016. Between June 2017 – June 2019, I worked as a visiting researcher at the Department of Bioengineering at the Imperial College London, UK. Since September 2019, I am an Associate Editor of the journal "Biosensors and Bioelectronics" (Elsevier). I am also editorial board member of the journals "Advanced Sensor Research" (Wiley) and "The Innovation Materials" (Cell Press). Up to date, I have received different awards and prizes for my research and contribution to the field of biosensors and analytical chemistry. I am a member of the German Society for Biomedical Engineering (VDE|DGBMT), American Chemical Society, International Society of Electrochemistry (ISE) and the Society for Electroanalytical Chemistry (SEAC).