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Smart MedTech

Opening Keynote



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Abstract

Coming soon

Biography

Coming soon

Medtech-Innovation through the Fusion of Microelectronics with Sensors



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Abstract

The „Vivalytic“ system from Bosch is an open platform for the automation of complex molecular diagnostics workflows. It can be used anywhere, at any “point-of-need”, by anybody without requiring extensive training. The combination of microelectronics, microsystems and microfluidics technologies yields a strongly miniaturized and fully automated system at a very reasonable cost. During the SARS-CoV-2 pandemic, rapid PCR-tests for the detection of COVID-19 could be integrated onto the platform and brought to market within a very short development time, early enough to fight the global pandemic and help restrict the spread of the disease. Supported by public funding from the BMBF (Acronym: “Vivalytic Light”, 16ME0174/5), new microelectronic solutions were developed for a more efficient “Vivalytic Light Analyzer” optimized for assays of lower complexity, as well as a new generation of “Vivalytic Light Cartridges”, and even faster PCR-workflows to discover SARS-CoV-2-and other infections. In particular, this is preparing for future pandemic outbreaks.

Beyond infectious disease cases, molecular diagnostics gives insight into the root-causes of many severe illnesses, including cancer. Guided by genetic profiling, targeted cancer therapies are moving away from a “one drug fits all” to a “the right drug for the individual patient” strategy. Liquid biopsies from cancer-patients’ blood-tests provide an ideal input probe to the “Vivalytic” platform, with novel microstructures performing upfront sample extraction and preparation from blood. In future, combined solutions like that will gain significance for the improvement of quality and outcome of cancer therapies.

Biography

Dr. Franz Laermer joined the Corporate Sector Research and Advance Engineering of Robert Bosch GmbH, Stuttgart, Germany, in 1990. He started the development of new key technologies and sensor functions for the upcoming field of Micro-Electro-Mechanical Systems (MEMS) at Bosch. His activities were mainly focused on new microstructuring, surface-micromachining and sacrificial layer etching technologies, as well as micro-accelerometers, gyroscopes and pressure sensors for the automotive area. Dr. Franz Laermer is the co-inventor of the "**Bosch Deep Reactive Ion Etching Process**" (“BOSCH-DRIE”) for microstructuring silicon. This key microstructuring technology revolutionized MEMS and is the root of all of today’s silicon-based MEMS. He holds more than 200 patents.

Since 2003, he is responsible for TOP-level innovation projects covering new MEMS application fields beyond automotive, including the biomedical area. Since 2009, he is Chief Expert for Microsystems, Microfluidics and Molecular Diagnostics. His newer work laid the foundation for the VIVALYTIC Molecular Diagnostics Platform of the newly founded Bosch Healthcare Solutions Business Division (BHCS GmbH). In 2018 he was established as the first **Research Fellow** at Bosch.

Dr. Franz Laermer was awarded with the prize “**European Inventor of the Year 2007 – Category Industry**” by the European Commission and the European Patent Office (together with co-inventor Andrea Urban), for the invention, development and sustainable success of the “BOSCH-DRIE”-process. In 2014 he received the “**2014 IEEE Jun-ichi Nishizawa Medal Award**” from the Institute of Electrical and Electronics Engineers (IEEE), USA, and in 2019 the “**Technology Prize of the Eduard-Rhein-Foundation**”, Germany.

