Fraunhofer EMFT

Quantifying biological impacts

Quartz resonator to analyze cyto-mechanics.
©Fraunhofer EMFT/Bernd Müller

Applications

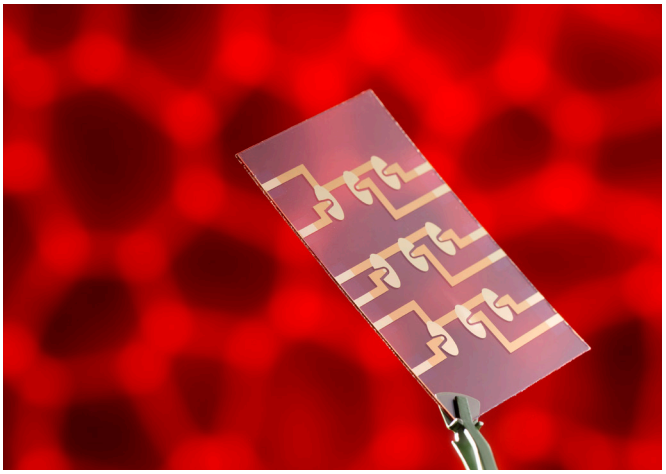
Experiments with living human or animal cells, so-called cell-based assays, have emerged to an enormously powerful and widespread tool in fundamental and applied biomedical research. Mammalian cells – isolated from different organs or tissues of the donor organism and cultured in the lab *in vitro* – serve as living model systems in high-throughput analysis without using test animals. Cell-based assays support fundamental biomedical studies, drug development, cytotoxicity screening as well as approaches from personalized medicine.

Cell and tissue samples grown in a 37 °C incubator.
©Fraunhofer EMFT/Bernd Müller

Service Offering

Fraunhofer EMFT is pursuing the concept of growing living cells directly on the surface of physical transducers (noble metal or polymer electrodes, piezo-resonators, optrodes) and to follow the cells' response to chemicals, drugs or microorganisms non-invasively and label-free in real time. Key parameters of cell physiology, like cell viability, cell proliferation or cell migration rates, become experimentally accessible in medium throughput.

Besides the development of tailor-made assays, Fraunhofer EMFT offers proof-of-concept studies as well as consulting on all aspects of cell monitoring from an initial selection of assay formats to data analysis.



Multi-electrode layout for parallel analysis of multiple cell samples in microfluidic chips. ©Fraunhofer EMFT/Bernd Müller

Scientist working with cell samples in a flow hood. ©Fraunhofer EMFT/Bernd Müller

Advantages

The individual physical transducers provide:

- quantitative analysis of the integrated cell response to a test substance
- continuous, non-invasive monitoring of cell physiology in real time
- no need for additional reagents/chemical indicators (label-free)
- completely automated data recording

Fraunhofer Institute for Electronic Microsystems and Solid State Technologies EMFT

Fraunhofer EMFT
Universitätsstraße 31
93053 Regensburg
www.emft.fraunhofer.de/en

Prof. Dr. Joachim Wegener
Area of competence:
Cell-based Sensor Technology
Phone +49 941 943-4546
Joachim.Wegener@emft.fraunhofer.de

Dr. Stefanie Michaelis
Area of competence:
Cell-based Sensor Technology
Phone +49 941 943-4048
Stefanie.Michaelis@emft.fraunhofer.de

Fraunhofer EMFT is participant in the Forschungsfabrik Mikroelektronik Deutschland