

Beta Cell Screening

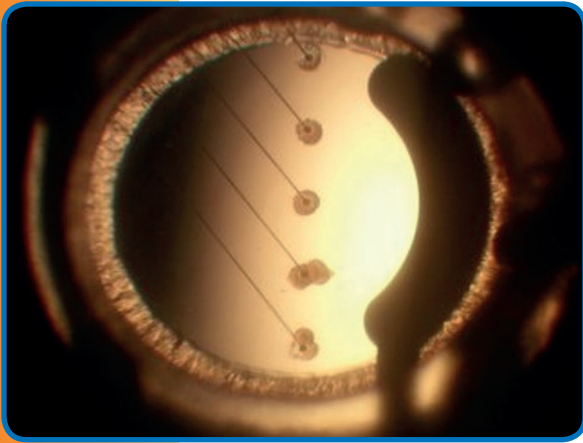
Acute and chronic recordings of glucose induced electrical activity in pancreatic beta cells

- *In vitro* electrophysiology for diabetes research
- MEA-based parallelized screening system for intact islets of Langerhans
- Two configurations for either long-term, incubator-ready chronic or non-invasive acute recordings

MEA-based parallelized screening of islets of Langerhans

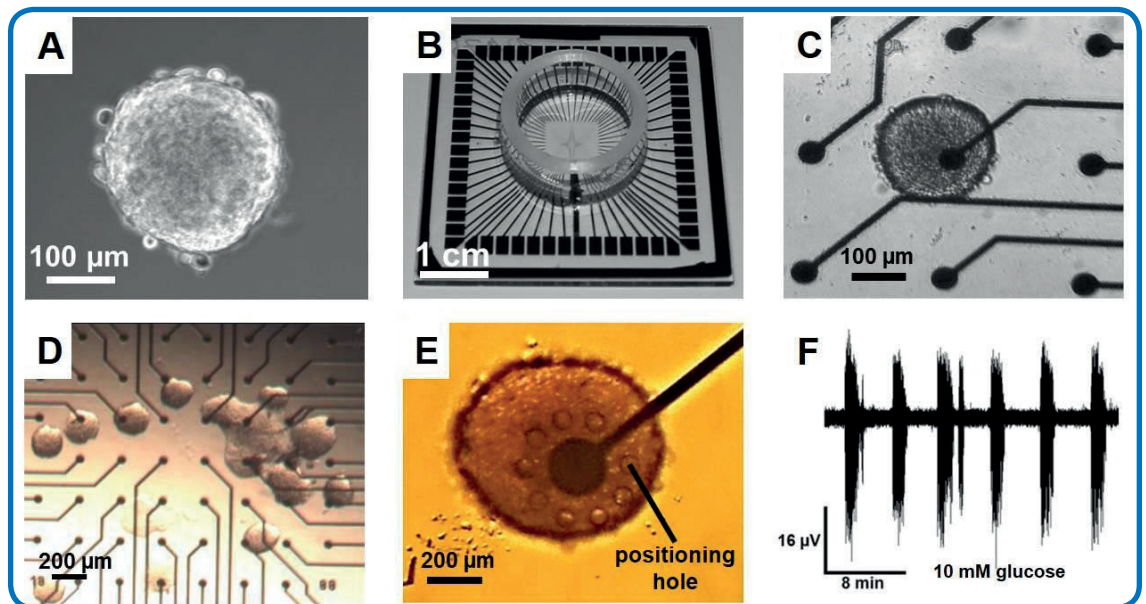
Glucose-dependent electrical oscillatory activity in beta cells within islets of Langerhans is important for understanding their physiology and pathophysiology. Electrophysiological recordings are both time consuming and technically challenging thus limiting academic research and industrial drug development. We offer MEA-based parallelized recording systems for multiple acute recordings on primary or stem cell derived islets of Langerhans and chronic recordings in an incubator system.

The MEA technology opens a new route to support the development of new drugs for the treatment of type 2 diabetes mellitus, as well as to elucidate beta cell pathophysiology e.g. during the progression of diabetes.



Advantages

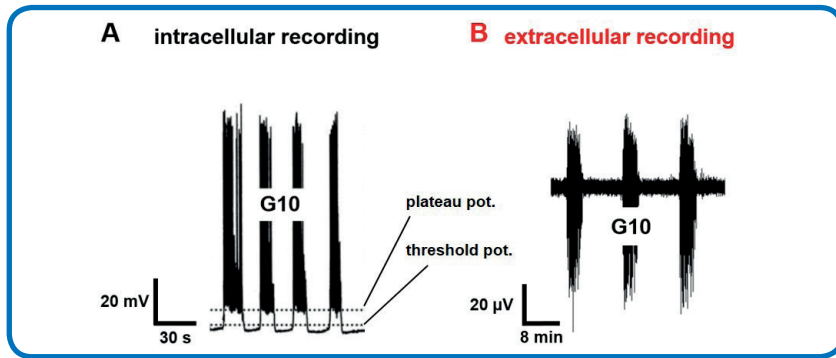
- Non-invasive method enables long-term *in vitro* research
- Simpler experimental handling and higher throughput than conventional methods compatible with the needs of academic and industrial laboratories
- Easier and faster to use than conventional, invasive methods such as patch-clamp and recording with intracellular electrodes
- Measurements from intact islets
- Suitable for diabetes research, e.g. drug development



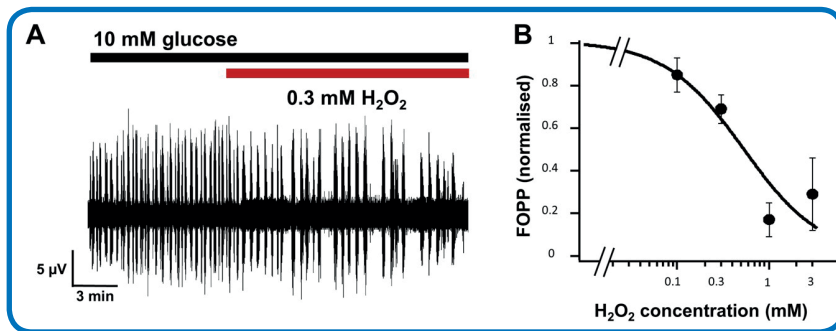
Islet recordings using MEA technology. A Microscopic view of a single murine islet of Langerhans. B Standard microelectrode array (MEA, Multi Channel Systems). C Islet of Langerhans placed on top of a MEA electrode during an acute measurement. D Microscopic view of islets cultivated on the electrode field of a MEA for long-term recordings. E View of a Beta-Screen electrode covered with an intact murine islet positioned via negative pressure through the positioning holes. F Typical field potential recording of a murine islet with characteristic oscillatory activity in 10 mM glucose.

Application

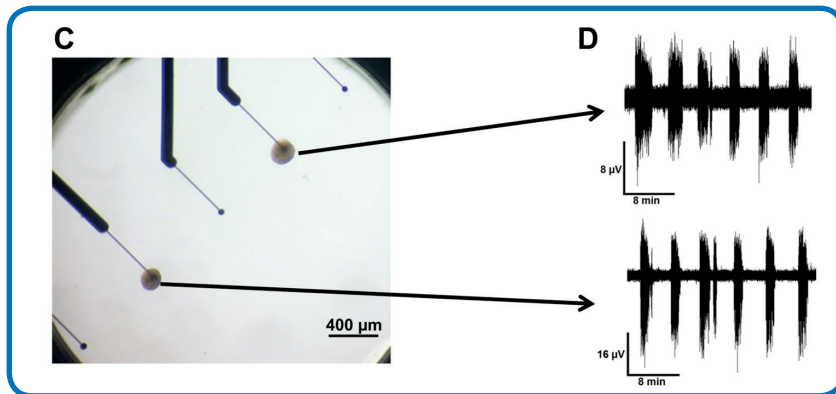
Electrophysiological recordings of multiple islets of Langerhans for diabetes research on beta cells.



Extracellular recordings with MEA technology are qualitatively comparable to intracellular measurements (Figure A taken from Drews et al., 2015)

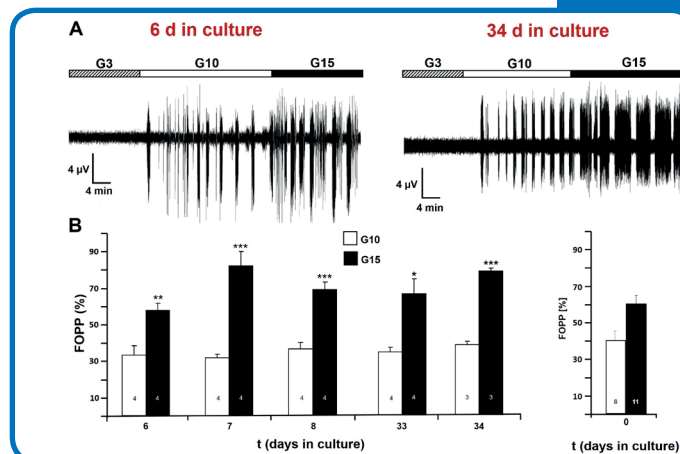


Investigate beta cell pathophysiological reactions e.g. induced by oxidative stress



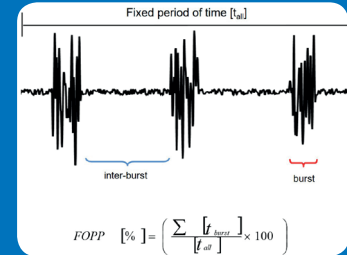
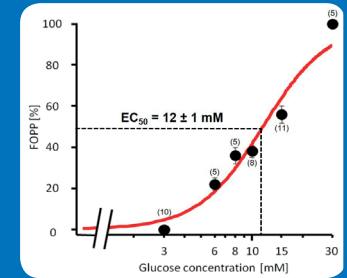
Higher throughput than conventional electrophysiological methods

Long term electrophysiological experiments made possible by non-invasive *in vitro* MEA technology

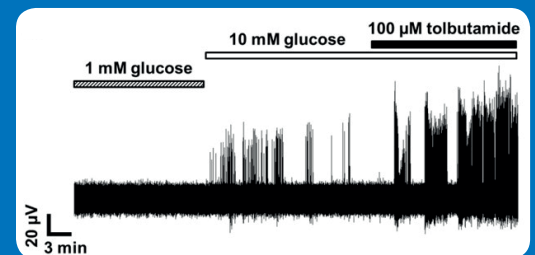


multichannel*
systems

Innovations in Electrophysiology



The fraction of plateau phase (FOPP) is the percentage of burst activity in a time interval. FOPP is a marker for insulin release.



Analysis of isolated human islets using MEA technology

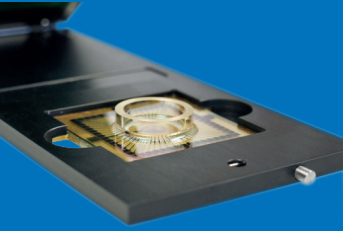
Acute recordings MEA2100-Beta-Screen-System



- Easy to use for electrophysiological recordings of up to 40 islets simultaneously
- Non-invasive and fast, medium throughput screening device
- Beta cell specific analysis software included
- Islets secured using suction
- Drug screening also possible with human beta cells



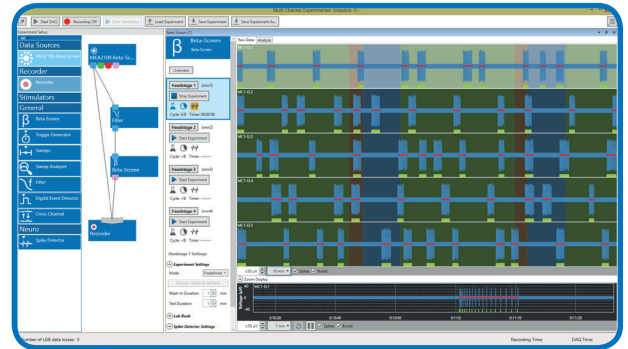
Chronic recordings with incubator-ready system MEA2100-Mini-System



- Small footprint, low heat emission
- Possibility for parallel operation of many headstages
- Ideal solution for continuous, undisturbed recordings and stimulation of samples in the incubator or on a microscope stage with environmental control

Beta-Screen software

The Beta-Screen software is specifically designed for long-term and acute beta cell recordings. It is a specialized tool set for spike/burst (oscillation) analysis and dose response experiments on pancreatic beta cells in islets of Langerhans.



Interface board multiboot

The MCS-IFB 3.0 multiboot is a new generation of interface board, which enables you to operate a wide range of MCS *in vitro* and *in vivo* headstages: MEA2100-HS, MEA2100-Mini-HS, MEA2100-Beta-Screen-HS, Multiwell-MEA-HS, CMOS-MEA-HS, W2100-RE, and ME2100-HS. This allows you to cost-effectively adapt the system to your lab's needs by pairing only one interface board with multiple recording systems.



For more information visit:
www.beta-screen.com



- Made
- in
- Germany

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