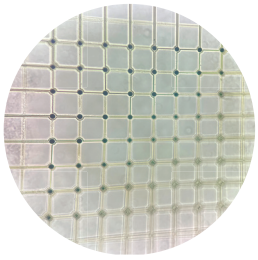
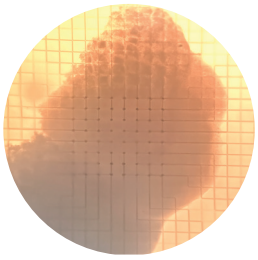
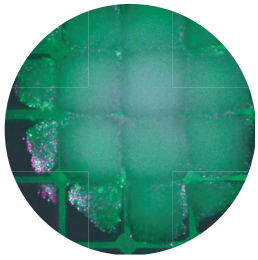
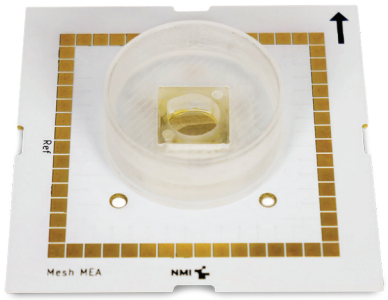
Introducing Mesh MEA

Generate true-to-life recordings from inside an organoid.









Record electrical activity from inside an organoid without compromising its structure. Multi Channel Systems' Mesh MEA is a unique microelectrode array (MEA) chip consisting of 60 electrodes on a slim, 7µm-thin polyimide mesh that enables cells to grow around the electrodes.

multichannel systems

An Affiliate of Harvard Bioscience, Inc.

Why Use Mesh MEA?

- **Record from inside an organoid:** The cellular migration around the electrode-containing mesh enables monitoring signals from the organoid internal regions without compromising its structure.
- **Collect electrophysiological data from an intact organoid:** The mesh scaffold keeps the organoid suspended in a solution and protects and holds it in place, preventing morphological deformations of the organoid.
- **Improve organoid maintenance:** A perfusion system acts as a partial compensator for the lack of organoid vascularization.
- **Long-term experiments:** The undamaged organoid morphology and the longevity of maintenance allow multiple measurements in a single organoid.
- **Flexible experimental settings:** A user-defined air-liquid interface can be leveraged to facilitate organoid development and improve compound testing capabilities.

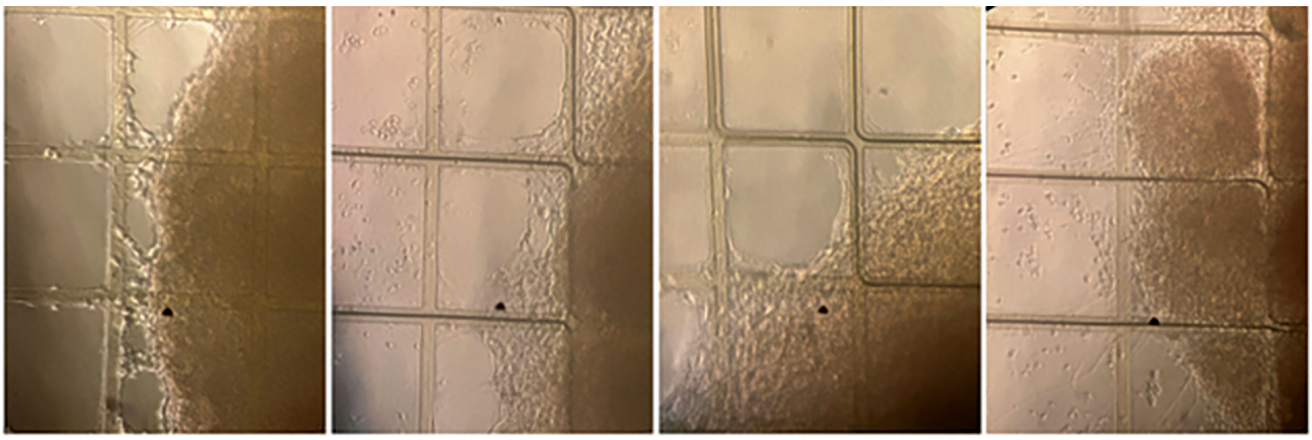


Figure 1: Example images of the neuronal migration of human brain organoids on the Mesh MEA. Photos courtesy of Hsieh's lab, Department of Neuroscience, Developmental and Regenerative Biology at the University of Texas at San Antonio.

Classic 2D MEA vs. Mesh MEA

Classic microelectrode arrays fail to record data from inside organoids. Our novel Mesh MEA platform mitigates these experimental challenges by preventing structural deformations and permitting the recording of electrical data from the inner sections of self-organizing 3D cultured organoids.

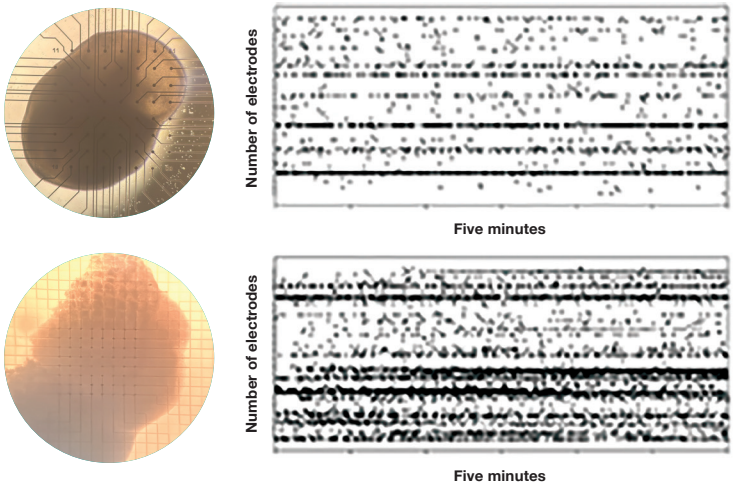


Figure 2: Neural activity of human brain organoids cultured in a 2D MEA2100 Mini platform (top panel) and in a 3D Mesh MEA platform (bottom panel). Raster plots show an increased neural spiking activity over time in organoids cultured in a Mesh MEA compared to classical MEA (MEA2100 Mini). Data courtesy of Hsieh's lab, Department of Neuroscience, Developmental and Regenerative Biology at the University of Texas at San Antonio.

Powered by NMI Technology

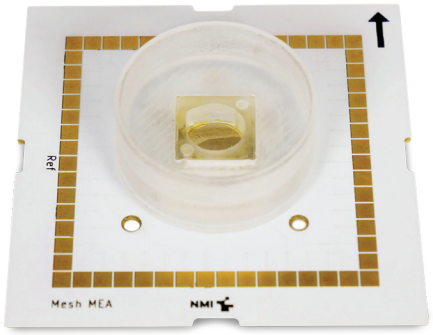
Mesh MEA technology was developed by Dr. Peter D. Jones and his research group at **NMI Natural and Medical Sciences Institute** (www.nmi.de). We're grateful for their contribution.

NMI
Natural and Medical
Sciences Institute

Applications

Mesh MEA is designed for emerging applications using organoids in research and discovery, precision medicine, safety pharmacology, and toxicology. The system is suitable for all manner of 3D shapes, including:

- Cerebral, hippocampal, or midbrain organoids and neurospheres
- Cardiac organoids, spheroids, or cardiac bodies
- Pancreatic islets
- Retinal organoids
- 3D cell cultures and bioprinting organoids



Key Features

Mesh MEA is designed for emerging applications using organoids in research and discovery, precision medicine, safety pharmacology, and toxicology. The system is suitable for all manner of 3D shapes, including:

- 60-electrode flexible chip embedded in a slim 7 µm-thin polyimide mesh that promotes growth of cells around the electrodes
- Interelectrode distance of 200 µm and electrode (TiN) diameter of 30 µm
- Data is sampled at 50 kHz per channel at a 24-bit resolution
- Real-time signal detection and feedback
- Freely programmable digital signal processing
- Multiple inputs/outputs, including digital, analog, and audio
- SuperSpeed USB 3.0 ports
- Voltage and current stimulation possible
- Optical access from bottom
- Compatible with Multi Channel Systems' MEA2100 series

Learn More!

Contact your local sales representative, or scan the QR code.

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