MEA Systems

HIGH THROUGHPUT ELECTROPHYSIOLOGY

Applications

- Cardiac & neural toxicity testing
- Preclinical drug screening
- Phenotypic disease models
- Stem cell research

Features

- Muse: 64 channel single-well system
- Maestro: 768 channel multiwell system
- Simultaneous stimulation & recording
- SBS-compliant multiwell MEA plates
- User-friendly software

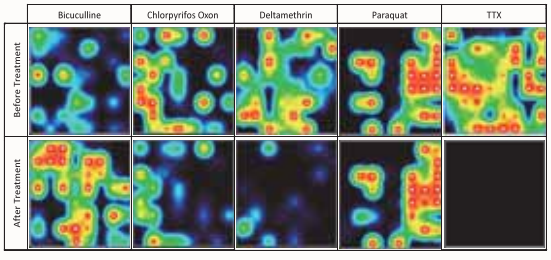
High throughput electrophysiology for systems-level toxicity testing and drug screening

Axion's MEA systems provide a scalable solution for electrophysiology research. The single-well Muse system offers fully integrated stimulation and recording within a single culture well, while reducing the cost and complexity of MEA research. The multiwell Maestro enables *in vitro* analysis of neural and cardiac networks on an unprecedented scale. This high throughput format makes the Maestro an ideal candidate for large-scale cellular analysis in secondary screening, toxicology and safety applications.

Neural and Cardiac Applications

Neural

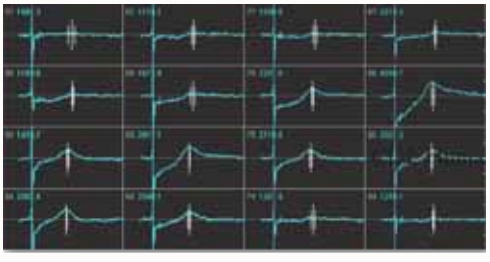
Axion provides high fidelity systems for *in vitro* neurophysiology applications. The ability to evaluate the cellular activity of networks provides a label-free means to address *in vitro* effects of compounds on synaptic connectivity, or alterations in network behavior in neuronal disease models.



Network activity maps before and after dosing

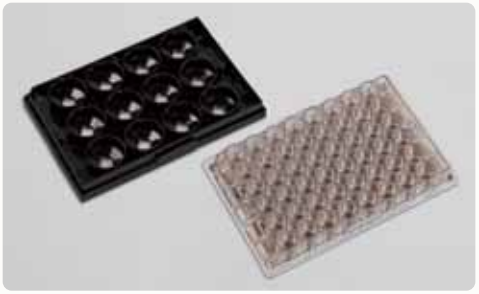
Cardiac

New cardiac features in AxIS allow researchers to measure beat rate, QT interval, action potential amplitude, and conduction velocity from cultures of primary or stem cell derived cardiomyocytes. This provides an ideal *in vitro* assay for applications ranging from cardiac disease models to drug safety and toxicology.



Field potential measurements from cardiomyocytes

Microelectrode Arrays



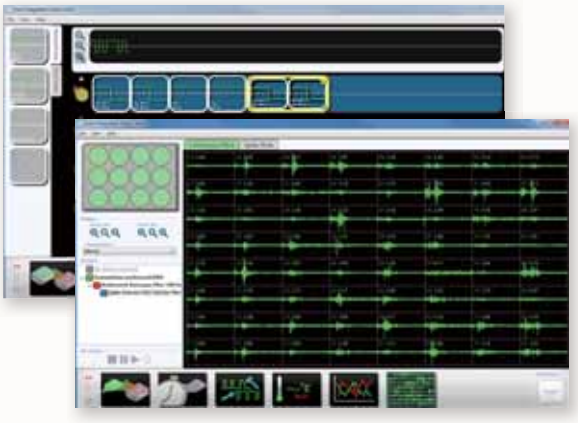
Microelectrode arrays (MEAs) consist of a grid of tightly-spaced extracellular electrodes, each capable of simultaneously monitoring the activity of multiple cells non-invasively. Having multiple electrodes in an array extends the recording range across a relatively large area, revealing detailed information about systems-level signal propagation.

Axion's MEAs

Axion's multiwell Maestro plates allow scientists to conduct 12, 48, or 96 simultaneous experiments in an industry-standard microtiter format. By significantly improving productivity, Axion has finally made MEA technology practical for applications requiring high throughput capability, such as toxicology, drug screening and safety pharmacology. Furthermore, the flexible hardware and software makes the system easily adaptable to new sources of electrically active cell types.

Axion's Integrated Studio

Axion's Integrated Studio (AxIS) simplifies the process of performing MEA experiments. Our easy-to-use software provides intuitive access to critical information and complete control of experimental parameters. AxIS allows concurrent monitoring of channel recordings, adjustment of digital and analog filters, and design of stimulus waveforms in an easy-to-use modular layout. The intuitive waveform palette and drag-and-drop interface of the stimulus design module provides unprecedented ease of use without compromising flexibility. AxIS' unique combination of simplicity and functionality establishes a new software standard for network electrophysiology research.



Axion's Integrated Studio (AxIS) Software

Specifications: Muse and Maestro

Recording		Stimulation	
Total Voltage Gain	1200 (61dB)	Stimulation Modality	Current with compliance voltage
Input Referred Noise	< 3μVRMS (200Hz-3KHz)	Stimulation Voltage (max.)	±1.5V
Low Frequency Corner	0.1Hz — 500Hz (adj.), 40dB/dec	Stimulation Current (max.)	±250μA
High Frequency Corner	3KHz — 20KHz (adj.), 20dB/dec	Simultaneous Stim. Values	1
Sample and Hold Capability	Simultaneous in all channels	Simultaneous Stimulation Channels	8 (Muse), 64 (Maestro)
Sample Rate	12.5KHz (Maestro), 25KHz (Muse)	Artifact Recovery Time	
Temperature Control		Stimulating Channels	< 3ms
Range	Ambient + 5°C to 45°C	Recording Channels	< 2ms
Resolution	±0.1°C		