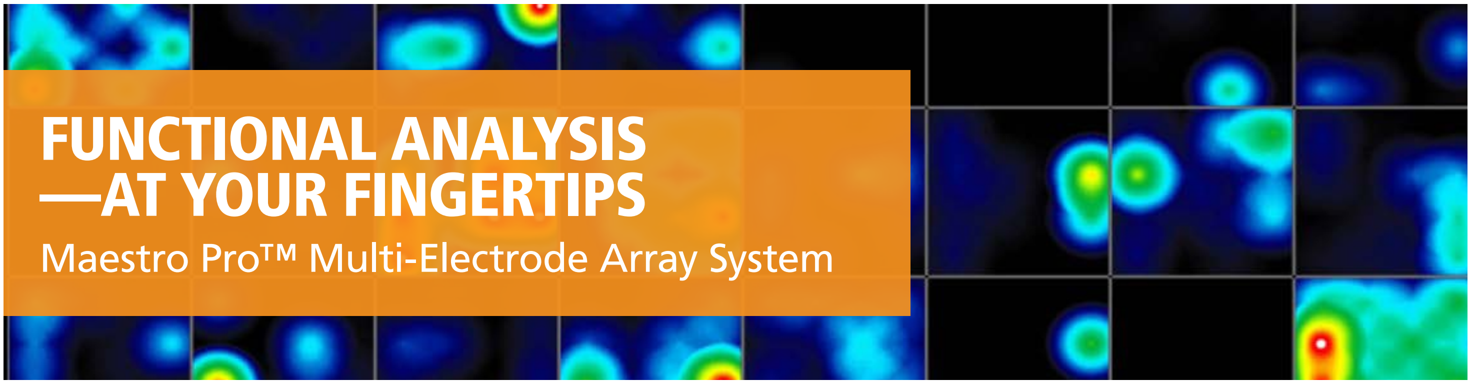


FUNCTIONAL ANALYSIS —AT YOUR FINGERTIPS

Maestro Pro™ Multi-Electrode Array System

Evaluating electrically active cells has never been easier. Conveniently capture dynamic activity patterns across an entire population of cells directly from a multi-well plate with the **Maestro Pro™ multi-electrode array (MEA) system**. Axion BioSystems' next-generation MEA technology lets you perform live, in vitro activity measurements that are non-invasive and require no labels, dyes, or complicated steps—so you can obtain quality electrophysiological data, faster.

Versatile and easy to use, the Maestro Pro™ is ideal for evaluating key indicators of neuronal and cardiomyocyte function, monitoring long-term electrophysiological maturation, as well as recording real-time responses to experimental stimuli.

Why Use the Maestro Pro™?

- Visualize and measure cellular activity in real-time, without labels or dyes, directly from a multi-well plate
- Record from up to 768 channels simultaneously using 6-, 24-, 48-, or 96-well plates with Axion BioSystems' most advanced, high-throughput MEA device
- Accelerate your research with powerful neural and cardiac analysis modules that transform complex data into clear results and publication-ready figures

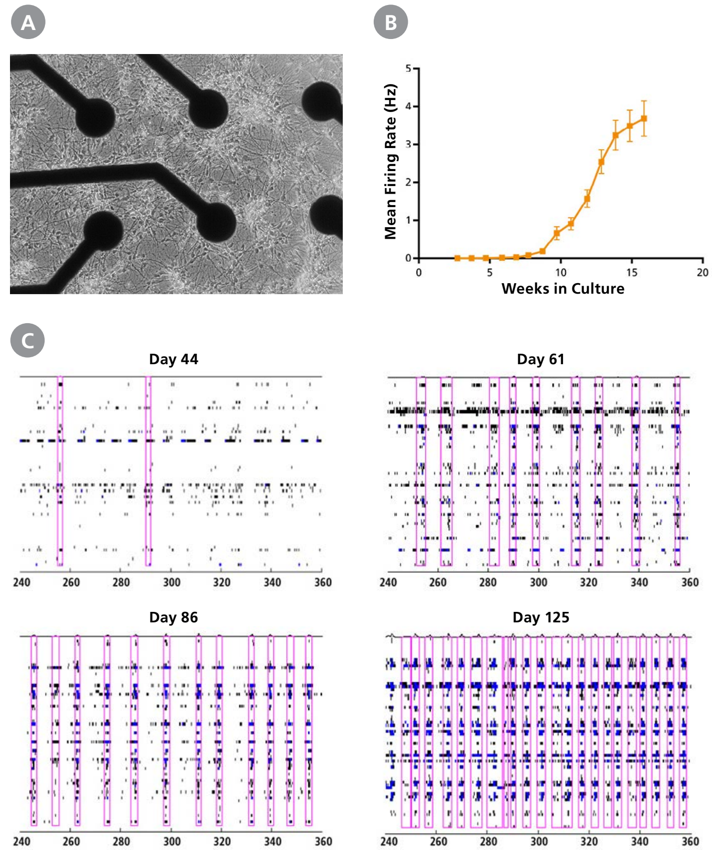


Figure 1. hPSC-Derived Neurons Demonstrate Measurable Network Activity Recorded on the Maestro MEA™ System

(A) hPSC-derived neurons cultured in BrainPhys™ Neuronal Medium (Catalog #05790) were plated on the Maestro MEA™ System. (B) The neurons become electrically active over a 15-week period, with a gradual increase in mean firing rate from Week 8 to Week 16. (C) Raster plots show the firing patterns of the neurons across 64 electrodes at different time points. Each black line represents a detected spike. Each blue line represents a single channel burst, a collection of at least 5 spikes, each separated by an ISI of ≤ 100 ms. Each pink box indicates a network burst, a collection of at least 10 spikes from a minimum of 25% participating electrodes across the entire well, each separated by an ISI of ≤ 100 ms. Neurons cultured in BrainPhys™ Neuronal Medium demonstrate electrical activity as shown by the increased number of spikes over time. In addition, there was an increase in network bursting frequency, which suggests that neuronal firing gradually organized into synchronized network bursts as the neurons matured. ISI = inter-spike interval

Request More Information

Have a question about the Maestro Pro™? We're here to help.

www.stemcell.com/info-maestro-pro

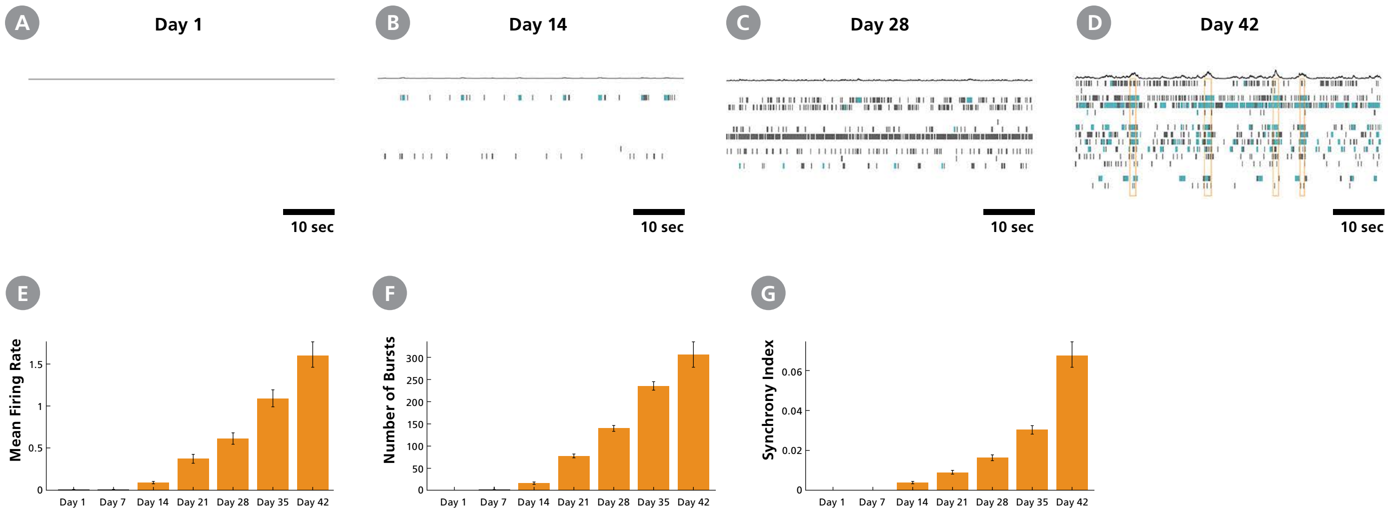
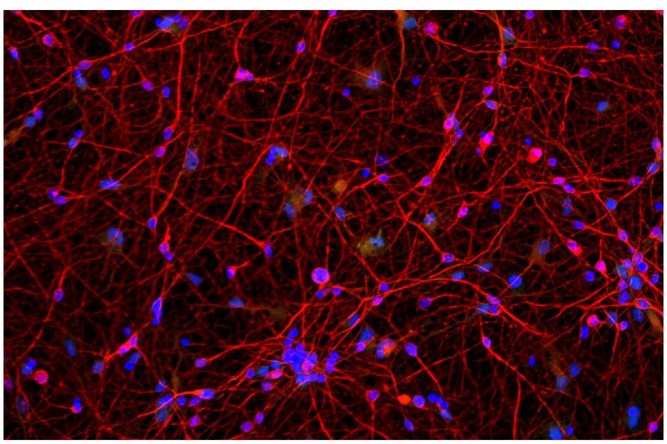
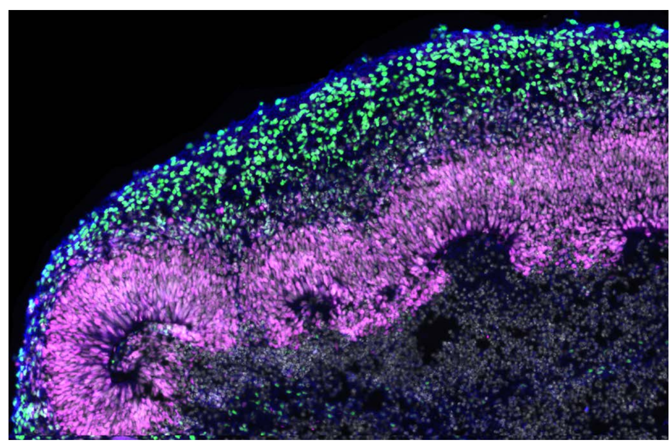


Figure 2. Human iPSC-Derived Forebrain Neuron Precursor Cells Increase Neuronal Activity over 42 Days in Culture

Human iPSC-Derived Forebrain Neuron Precursor Cells (Catalog #200-0770) were generated from the hiPSC line SCTi003-A (Catalog #200-0511). The neuron precursors were matured on a 48-well CytoView MEA™ Plate (Catalog #200-0872/200-0873) with STEMdiff™ Forebrain Neuron Maturation Kit (Catalog #08605). Electrical activity was measured from 16 electrodes over time using the Maestro MEA™ system. (A - D) Detected spikes (black lines), single channel bursts (blue lines; a collection of at least 5 spikes, each separated by an ISI of no more than 100 ms), and network bursts (orange boxes; a collection of at least 50 spikes from a minimum of 35% of participating electrodes, each separated by an ISI of no more than 100 ms) were recorded for each timepoint. Neuronal activity could be detected by Day 14 and increased throughout the 42-day culture period. (E) Mean firing rate, (F) number of bursts, and (G) synchrony index all increased over the 42-day culture period. hiPSC = human induced pluripotent stem cell

Featured Resources for Neural Research





Protocol

How to Culture hPSC-derived Forebrain Neurons for MEA Analysis Using the Maestro MEA™ System

www.stemcell.com/mea-for-forebrain-neurons

On-Demand Webinar

Using hPSC-Derived Neural Organoids for Disease Modeling and Drug Discovery

www.stemcell.com/activity-in-neural-organoids

Protocol

How to Culture Primary Rodent Neurons for MEA Analysis Using the Maestro MEA™ System

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Learning Center

Neurological Disease Modeling

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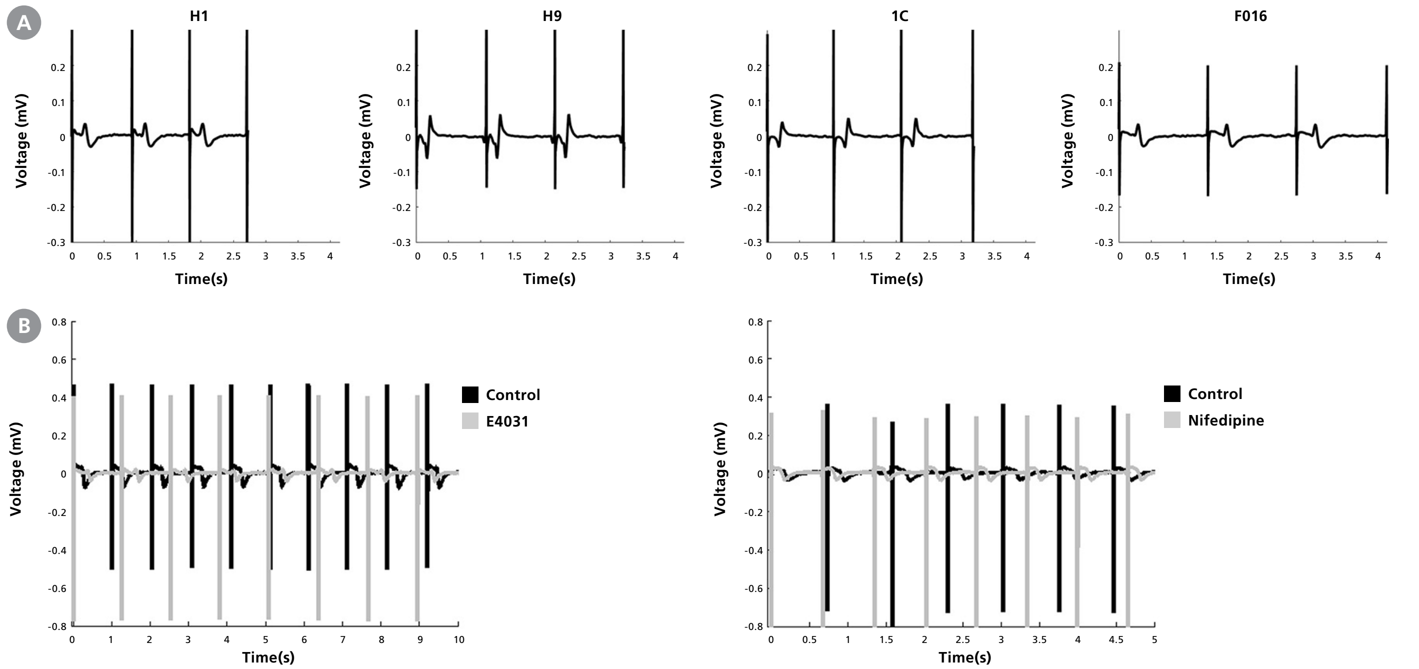
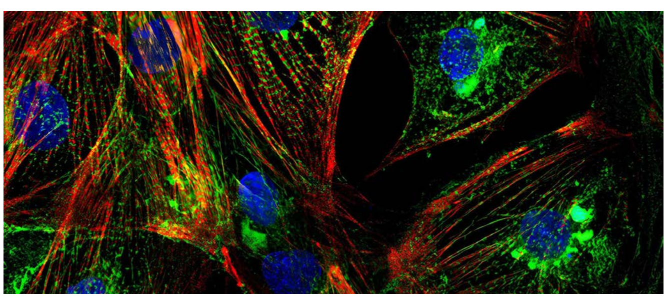


Figure 3. The Maestro MEA™ System Enables Functional Evaluation of hPSC-Derived Cardiomyocytes and Assessment of Electrophysiological Responses to Pharmacological Stimuli

(A) Ventricular cardiomyocytes were derived from four hPSC lines (H1, H9, 1C, F016) using the STEMdiff™ Ventricular Cardiomyocyte Differentiation Kit (Catalog #05010) and maintained using the STEMdiff™ Cardiomyocyte Maintenance Kit (Catalog #05020). At Day 25, ventricular cardiomyocytes demonstrate a characteristic MEA electrophysiology profile, including large spike amplitude, small repolarization waveform, and stable beating frequency. (B) MEA recordings of hPSC-derived cardiomyocytes (Day 27) show characteristic electrical profiles and drug response to E4031 and Nifedipine (10 nM and 300 nM, respectively; gray lines). E4031 prolonged and Nifedipine shortened the repolarization. For guidance on how to dissociate and plate hPSC-derived cardiomyocytes for MEA Assays, view our online protocol.

Featured Resources for Cardiac Research



Protocol

How to Dissociate and Plate hPSC-Derived Cardiomyocytes for MEA Assay

www.stemcell.com/mea-for-cardiomyocytes

On-Demand Webinar

Modeling Arrhythmias Using hPSC-Derived Cardiomyocytes and Tracking Their Excitability

www.stemcell.com/modeling-cardiac-arrhythmias

Noteworthy Publications Highlighting the Use of Maestro MEA™ Systems for Functional Analysis

16p11.2 deletion is associated with hyperactivation of human iPSC-derived dopaminergic neuron networks and is rescued by RHOA inhibition in vitro

Sundberg et al. (2021) Nat Commun 12: 2897

Multielectrode array characterization of human induced pluripotent stem cell derived neurons in co-culture with primary human astrocytes

Lemieux et al. (2024) PLOS One 19(6): e0303901

Phenotypic variability in iPSC-induced cardiomyocytes and cardiac fibroblasts carrying diverse LMNA mutations

Yang et al. (2021) Front Physiol 12:778982

The adipose-neural axis is involved in epicardial adipose tissue-related cardiac arrhythmias

Fan et al. (2024) Cell Rep Med 5(5): 101559

Maestro MEA™ System Components

Product	Description	Catalog #
Maestro Instruments		
Maestro Pro™	High-throughput multiwell MEA system with 768 channels	200-0887
Maestro Edge™	Multiwell MEA system with 384 channels	200-0888
Analysis Modules		
Neural Software Module	Neural data acquisition and analysis module for Maestro Edge™ or Pro™	200-0908/ 200-0910
Cardiac Software Module	Cardiac data acquisition and analysis module for Maestro Edge™ or Pro™	200-0909/ 200-0911
Multi-Electrode Array Plates		
CytoView MEA™ Plate	MEA plate, black or white polystyrene walls with transparent SU-8 bottom; 6-, 24-, 48-, 96-well formats	200-0870
BioCircuit MEA™ Plate	MEA plate, clear polystyrene walls with opaque bottom; 24-, 48-, 96-well formats	200-0877

From Cells to Analysis: Discover Our Complete Workflow for Excitable Cell Research

Confidently achieve robust and physiologically meaningful data by using the Maestro Pro™ MEA system with our specialty cell culture media, high-quality iPSCs and iPSC-derived cells, and accessory reagents that support functionally active cultures.

Product	Size	Catalog #
Customizable Neural Differentiation		
BrainPhys™ Neuronal Medium	500 mL	05790
NeuroCult™ SM1 Neuronal Supplement (50X)	10 mL 100 mL	05711 100-1281
BrainPhys™ Primary Neuron Kit	1 Kit	05794
Neural Differentiation Kits		
STEMdiff™ Forebrain Neuron Differentiation Kit	1 Kit	08600
STEMdiff™ Midbrain Neuron Differentiation Kit	1 Kit	100-0038
STEMdiff™ Motor Neuron Differentiation Kit	1 Kit	100-0871
STEMdiff™ Sensory Neuron Differentiation Kit	1 Kit	100-0341
Cardiac Differentiation Kits		
STEMdiff™ Atrial Cardiomyocyte Differentiation Kit	1 Kit	100-0215
STEMdiff™ Ventricular Cardiomyocyte Differentiation Kit	1 Kit	05010
Cells		
Healthy Control Human iPSC Line, Female, SCTi003-A	1 x 10^6 Cells	200-0511
Healthy Control Human iPSC Line, Male, SCTi004-A	1 x 10^6 Cells	200-0769
Human iPSC-Derived Neural Progenitor Cells	1 x 10^6 Cells 5 x 10^6 Cells	200-0620 200-0621
Human iPSC-Derived Forebrain Neuron Precursor Cells	1 x 10^6 Cells	200-0770
Human iPSC-Derived Midbrain Organoids, Differentiated	48 Organoids 96 Organoids	200-0790 200-0791
Human iPSC-Derived Midbrain Organoids, Mature	48 Organoids 96 Organoids	200-0792 200-0793