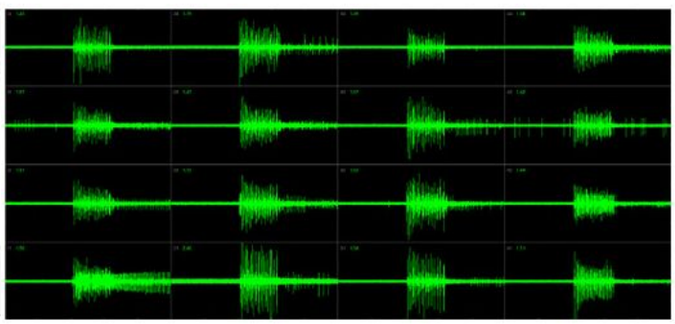
ELIXIRGEN SCIENTIFIC

RICOH

MEA (Multi-electrode Array) Assay Services

with hiPSC-derived Neurons & Astrocytes generated by Quick-Tissue™ Technology



Applications

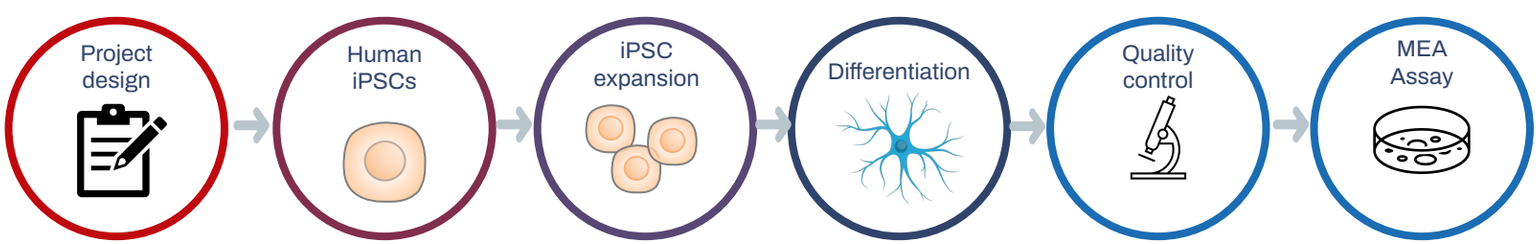
- Neuronal Characterization
- Disease Phenotyping
- Neurotoxicity Screening

Electrophysiological Assay with MEA

By recording extracellular field potentials, MEAs offer a powerful, scalable, and highly sensitive platform to investigate the functional networks of hiPSC-derived neurons in a high-throughput manner. They have been used to study neuronal functions and brain disorders as well as to evaluate the toxicity of chemical compounds. hiPSC-derived neurons generated by our Quick-Tissue Technology show strong and consistent firing/network activities, which is suitable for MEA assays.

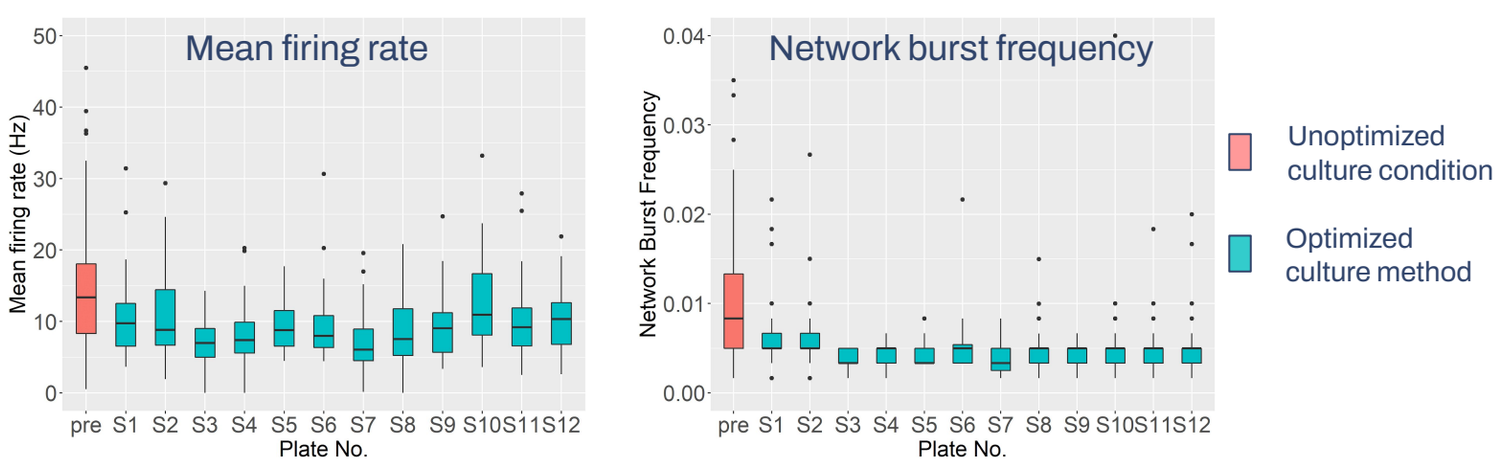
Advantages of Working with Elixirgen Scientific

1. One-Stop Services: We do more than just Assays



No need to work with multiple service providers! We offer differentiation services with assay services. Assays can be performed with neurons differentiated from customer iPSCs including disease state iPSCs.

2. Low plate-to-plate variances with standardized culture conditions



Quick-Neuron™ Excitatory Neurons were co-cultured with human primary astrocytes on CytoView MEA 48 (Axion Biosystems) for 6 weeks post-thaw. Spontaneous firing activities were similar among 12 different plates.

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MEA (Multi-electrode Array) Assay Services

Key Components of MEA Assay Services

Cells	**Our standard** hiPSC-derived excitatory neurons from standard control iPSC line (EX-SeV-CW50065) co-cultured with human iPSC-derived astrocytes (AS-SeV-CW50065) **Options** ● Other neuronal subtype: Cholinergic neurons (motor neurons) ● Other iPSC lines from the CIRM iPSC repository: Alzheimer's disease, Epilepsy, Autism, etc. ○ Starting from customer iPSC lines is also an option.
MEA Recording	**Our standard** Maestro Pro (Axion Biosystems) + CytoView48 (Axion Biosystems) 8 compounds, 4 doses per plate (cumulatively added) Record 20 min before and after test compound administration **Options** High density MEA (HD-MEA): MaxTwo (MaxWell Biosystem)
Analysis	**Our standard** Mean firing rate, Burst frequency, Burst duration, Network burst frequency, Number of active electrodes, etc. **Options** Statistical analysis, PCA analysis, and other secondary analyses

Effect of Various Compounds on Neural Firing Activities

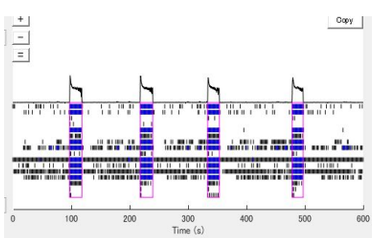
Human iPSC-derived neurons co-cultured with human primary astrocytes responded to various neurotransmitters, receptor antagonists, and ion channel blockers as expected.

Mechanism	Receptor/Channel	Drug	Conc. Range	Rel. # of spikes
Negative control	-	Acetaminophen	1, 10, 100 μM	
Agonist	Glutamate	Glutamate	1, 10, 100 μM	
	GABA	GABA	0.1, 1, 10 μM	
	Dopamine	Dopamine	0.1, 1, 10 μM	
	Muscarine	Pilocarpine (HCl)	0.1, 1, 10 μM	
	Histamine	Histamine	0.3, 3, 30 μM	
Antagonist	AMPA/Kainate	CNQX	0.5, 5, 50 μM	
	GABA(A)	Picrotoxin	0.1, 1, 10 μM	
	GABA(A)	Gabazine	0.3, 3, 30 μM	
	Dopamine D2	Chlorpromazine	0.1, 1, 10 μM	
	NMDA	D-AP5	0.5, 5, 50 μM	
	Histamine H1	Ketotifen	0.1, 1, 10 μM	
	Glycine, Acetylcholine	Strychnine	0.3, 3, 30 μM	
Ion Channel Blocker	Sodium	Carbamazepine	3, 30, 300 μM	
	Potassium	4-AP	0.3, 3, 30 μM	

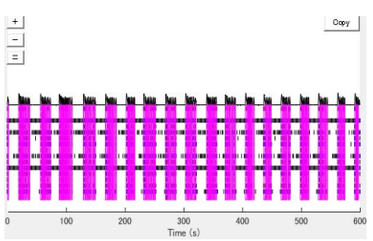
Comparison of Neural Firing Activities Between Healthy Control and ASD Patient

Neurons derived from iPSCs of an ASD patient exhibited aberrant firing. Network bursting exhibited significant differences between the Healthy and ASD line.

Healthy Control



ASD Patient



We offer multiple services that can be combined with MEA Assays. Contact us to request a quote or consultation.

Check out our website for more information!

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