

Focused Ultrasound Neuromodulation of Human *In Vitro* Neural Cultures in Multi-Well Microelectrode Arrays

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Materials

Name	Company	Catalog Number	Comments
MEA System	Axion Biosystem Inc.	Maestro Edge	Sampling Rate: 11500 Hz
MEA Plate	Axion Biosystem Inc.	CytoView MEA	Electrode and Well: 16 electrodes in 24 wells
Well plate Interface	Amcor Inc.	Parafilm PM996; P7793	Thickness: 127 μ m
CO ₂ Tank and Regulator for culture	AirGas Inc./ Harris Inc.	9296NC	Concentration: 5%
Culture Media	ThermoFisher Inc.	Laminin; 23017-015	Concentration: 1 μ g/mL
HiPSC Neurons	Peprtech	CIPS and GM01582 Derived; 450-10	Concentration: 10 ng/mL (Refer Taga et al [2021] ¹³)
Transducer	Sonic Concepts Inc.	CTX250; 008	Center Frequency: 250 kHz
Matching Network	Sonic Concepts Inc.	CTX250; NFS102v2	Impedance: 50 Ω
Transducer Power Output (TPO)	Sonic Concepts Inc.	Version 4.1; 020	Frequency: From 250 kHz to 2.5 MHz
Membrane	McMaster Inc.	Silicone Rubber; 5542N115	Thickness: 0.0127 cm
Coupling Gel	Parker Laboratory Inc.	Aquasonic 100; B08DDWG GXB	Viscosity: 130,000–185,000 cPs
Connection to Probe holder	McMaster Inc.	Steel Threaded Rod; 90322A661	Length: 1–1/2" Long
Centrifuge	ThermoFisher Inc.	Sorvall Legend X1R; 75004261	Max acceleration: 10–25,830 x g
Hydrophone	Sonic Concepts Inc.	Y-104; 009	Range: 50 kHz–1.9 MHz
Water Tank	Sonic Concepts Inc.	WT	Size: 30 cm x 30 cm x 30 cm
Water Conditioning Unit	Sonic Concepts Inc.	WCU; SN006	Flow Velocity: 50 mL/s maximum
Oscilloscope	Rohde-Schwarz Inc.	RTC1002	Sampling rate: Up to 50 MHz
Stage	Sonic Concepts Inc.	MicroStage; 2	Accuracy: 1 μ m
Thermochromic sheet	TIPTEMP Inc.	Liquid Crystal Sheet; TLCSEN337	Range: 22–24 $^{\circ}$ C
Computer	Microsoft Surface	Surface Pro	CPU i5 1035G4: 3.7 GHz
Data Transfer Software	Mathworks Inc.	MATLAB	Version 2021b

Processing Software	Python Software Foundation	Python	Version 3.7.10
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