

Materials List for

# Open-source Toolkit: Benchtop Carbon Fiber Microelectrode Array for Nerve Recording

Julianna M. Richie<sup>1</sup>, Paras R. Patel<sup>1</sup>, Elissa J. Welle<sup>1</sup>, Tianshu Dong<sup>2</sup>, Lei Chen<sup>3</sup>, Albert J. Shih<sup>2</sup>, Cynthia A. Chestek<sup>1,4,5,6</sup>

<sup>1</sup>Department of Biomedical Engineering, University of Michigan, Ann Arbor <sup>2</sup>Department of Mechanical Engineering, University of Michigan, Ann Arbor

<sup>3</sup>Department of Mechanical Engineering, University of Massachusetts Lowell <sup>4</sup>Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor <sup>5</sup>Neuroscience Graduate Program, University of Michigan, Ann Arbor <sup>6</sup>Robotics Graduate Program, University of Michigan, Ann Arbor

## Corresponding Author

Cynthia A. Chestek  
cchestek@umich.edu

## Citation

Richie, J.M., Patel, P.R., Welle, E.J., Dong, T., Chen, L., Shih, A.J., Chestek, C.A. Open-source Toolkit: Benchtop Carbon Fiber Microelectrode Array for Nerve Recording. *J. Vis. Exp.* (176), e63099, doi:10.3791/63099 (2021).

## Date Published

October 29, 2021

## DOI

10.3791/63099

## URL

jove.com/video/63099

## Materials

Name	Company	Catalog Number	Comments
3 prong clams	05-769-6Q	Fisher	Qty: 2 Unit Cost (USD): 20
3,4-ethylenedioxythiophene (25 g) (PEDOT)	96618	Sigma-Aldrich	Qty: 1 Unit Cost (USD): 102
353ND-T Epoxy (8oz)++ (ZIF and Wide Board Only)	353ND-T/8OZ	Epoxy Technology	Qty: 1 Unit Cost (USD): 48
Ag/AgCl (3M NaCl) Reference Electrode (pack of 3)	50-854-570	Fisher	Qty: 1 Unit Cost (USD): 100
Autolab	PGSTAT12	Metrohm	
Blowtorch	1WG61	Grainger	Qty: 1 Unit Cost (USD): 36
Carbon Fibers	T-650/35 3K	Cytec Thornel	Qty: 1 Unit Cost (USD): n/a
Carbon tape	NC1784521	Fisher	Qty: 1 Unit Cost (USD): 27
Cotton Tipped Applicator	WOD1002	MediChoice	Qty: 1 Unit Cost (USD): 0.57
Delayed Set Epoxy++	1FBG8	Grainger	Qty: 1 Unit Cost (USD): 3
DI Water	n/a	n/a	Qty: n/a Unit Cost (USD): n/a
Dumont Tweezers #5	50-822-409	Fisher	Qty: 1 Unit Cost (USD): 73
Flex Array**	n/a	MicroConnex	Qty: 1 Unit Cost (USD): 68
Flux	SMD291ST8CC	DigiKey	Qty: 1 Unit Cost (USD): 13
Glass Capillaries (pack of 350)	50-821-986	Fisher	Qty: 1 Unit Cost (USD): 60
Glass Dish	n/a	n/a	Qty: 1

			Unit Cost (USD): n/a
Hirose Connector (ZIF Only)	H3859CT-ND	DigiKey	Qty: 2 Unit Cost (USD): 2
Light-resistant Glass Bottle	n/a	Fisher	Qty: 1 Unit Cost (USD): n/a
Micropipette Heating Filament	FB315B	Sutter Instrument Co	Qty: 1 Unit Cost (USD): n/a
Micropipette Puller	P-97	Sutter Instrument Co	Qty: 1 Unit Cost (USD): n/a
Nitrile Gloves (pack of 200)	19-041-171C	Fisher	Qty: 1 Unit Cost (USD): 47
Offline Sorter software	n/a	Plexon	Qty: 1 Unit Cost (USD): n/a
Omnetics Connector* (Flex Array Only)	A79025-001	Omnetics Inc	Qty: 1 Unit Cost (USD): 35
Omnetics Connector* (Flex Array Only)	A79024-001	Omnetics Inc	Qty: 1 Unit Cost (USD): 35
Omnetics to ZIF connector	ZCA-OMN16	Tucker-Davis Technologies	Qty: 1 Unit Cost (USD): n/a
Pin Terminal Connector (Wide Board Only)	ED11523-ND	DigiKey	Qty: 16 Unit Cost (USD): 10
Probe storage box	G2085	Melmat	Qty: 1 Unit Cost (USD): 2
Razor Blade	4A807	Grainger	Qty: 1 Unit Cost (USD): 2
SEM post	16327	Inf	Qty: 1 Unit Cost (USD): 3
Silver Epoxy (1oz)++	H20E/1OZ	Epoxy Technology	Qty: 1 Unit Cost (USD): 125
Silver GND REF wires	50-822-122	Fisher	Qty: 1 Unit Cost (USD): 423.2
Sodium p-toulenesulphonate(pTS)-100g	152536	Sigma-Aldrich	Qty: 1 Unit Cost (USD): 59
Solder	24-6337-9703	DigiKey	Qty: 1 Unit Cost (USD): 60
Soldering Iron Tip	T0054449899N-ND	Digikey	Qty: 1 Unit Cost (USD): 13
Soldering Station	WD1002N-ND	Digikey	Qty: 1 Unit Cost (USD): 374
SpotCure-B UV LED Cure System	n/a	FusionNet LLC	Qty: 1 Unit Cost (USD): 895
Stainless steel rod	n/a	n/a	Qty: 1 Unit Cost (USD): n/a
Stir Plate	n/a	Fisher	Qty: 1 Unit Cost (USD): n/a
Surgical Scissors	08-953-1B	Fisher	Qty: 1 Unit Cost (USD): 100
TDT Shroud (ZIF Only)	Z3_ZC16SHRD_RSN	TDT	Qty: 1 Unit Cost (USD): 3.5
Teflon Tweezers	50-380-043	Fisher	Qty: 1 Unit Cost (USD): 47
UV & Visible Light Safety Glassees	92522	Loctite	Qty: 1 Unit Cost (USD): 45
UV Epoxy (8oz)++ (Flex Array Only)	OG142-87/8OZ	Epoxy Technology	Qty: 1 Unit Cost (USD): 83
UV Laser	n/a	WER	Qty: 1 Unit Cost (USD): 30

Weigh boat (pack of 500)	08-732-112	Fisher	Qty: 1 Unit Cost (USD): 58
Wide Board+	n/a	Advanced Circuits	Qty: 1 Unit Cost (USD): 3
ZIF Active Headstage	ZC16	Tucker-Davis Technologies	Qty: 1 Unit Cost (USD): 925
ZIF Passive Headstage	ZC16-P	Tucker-Davis Technologies	Qty: 1 Unit Cost (USD): 625
ZIF*	n/a	Coast to Coast Circuits	Qty: 1 Unit Cost (USD): 9