

Materials List for:

Assembly And Characterization Of Biomolecular Memristors Consisting Of Ion Channel-doped Lipid Membranes

Joseph S Najem^{1,2}, Graham J Taylor^{2,3}, Nick Armendarez⁴, Ryan J Weiss⁵, Md Sakib Hasan⁵, Garrett S Rose⁵, Catherine D Schuman⁶, Alex Belianinov⁷, Stephen A Sarles², C Patrick Collier^{3,7}

¹Joint Institute for Biological Sciences, Oak Ridge National Laboratory

²Department of Mechanical, Aerospace and Biomedical Engineering, University of Tennessee

³Bredesen Center for Interdisciplinary Research, University of Tennessee

⁴Department of Biosystems and Agriculture Engineering, University of Kentucky

⁵Department of Electrical Engineering and Computer Science, University of Tennessee

⁶Computer Science and Mathematics Division, Oak Ridge National Laboratory

⁷Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

Correspondence to: Joseph S Najem at najemjs@ornl.gov, Stephen A Sarles at ssarles@utk.edu, C Patrick Collier at colliercp@ornl.gov

URL: <https://www.jove.com/video/58998>

DOI: [doi:10.3791/58998](https://doi.org/10.3791/58998)

Materials

Name	Company	Catalog Number	Comments
1,2-diphytanoy- <i>sn</i> -glycero-3-phosphocholine (DPhPC)	Avanti Polar Lipids	850356P/850356C	Purchased as lyophilized powder (P) or in chloroform (C)
Agarose	Sigma-Aldrich	A9539	
Agarose (0.5g Agarose Tablets)	Benchmark	A2501	You can either use the powder form or the tablets
Alamethicin	AG Scientific	A-1286	
Analytical balance	Mettler Toledo	ME204TE/00	
Axopatch 200B Amplifier	Molecular Devices	-	
BK Precision 4017B 10 MHz DDs Sweep/Function Generator	Digi-Key	BK4017B-ND	
Borosilicate Glass Capillaries	World Precision Instruments	1B100F-4	
Brain Total Lipid Extracts (Porcine)	Avanti Polar Lipids	131101	
DigiData 1440A system	Molecular Devices	-	
Extruder Set With Holder/Heating Block	Avanti Polar Lipids	610000	This includes a mini-extruder, 2 syringes, 100 PC membranes, 100 filter supports, and 1 holder/heating block
Freezer (-20 °C)	VWR International	SCUCBI0420AD	
Glassware	VWR International	-	
Hexadecane, 99%	Sigma-Aldrich	544-76-3	
Isopropyl Alcohol	VWR International	BDH1133-4LP	
Microelectrode Holder	World Precision Instruments	MEH1S	
MOPS	Sigma-Aldrich	M1254	
Nitrogen (N ₂) Gas	Airgas	UN1066	
Parafilm M All-Purpose Laboratory Film	Parafilm	PM999	
Powder Free Soft Nitrile Examination Gloves	VWR International	CA89-38-272	
Precleaned Microscope Sildes	Fisher Scientific	22-267-013	
Refrigerator (4 °C)	VWR International	SCUCFS-0504G	

Silver wire	GoodFellow	147-346-94	Different diameters could be used depending on the application
Sodium Chloride (KCl)	Sigma-Aldrich	P3911	
Stirring Hot Plate	Thermo Scientific	SP131325	
VWR Light-Duty Tissue Wipers	VWR International	82003-820	
VWR Scientific 50D Ultrasonic Cleaner	VWR International	13089	