

Materials List for:

Whole Cell Patch Clamp for Investigating the Mechanisms of Infrared Neural Stimulation

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Materials

Name	Company	Catalog Number	Comments
Cell culture materials and equipment			
Glass coverslips	Lomb Scientific	CSC 10 1 GP	
4-ring cell culture dish	VWR International	82050-542	
Poly-L-ornithine solution	Sigma-Aldrich	P4957	
Laminin	Invitrogen	23017-015	
Curved forceps	WPI	14101	Dumont #5 tweezers (45° angle tip)
CO ₂ Incubator	ThermoScientific	Heracell 150i	
Table 1. Cell culture materials and equipment.			
Neurobasal media			
Neurobasal A	Gibco	10888-022	
N-2 supplement	Invitrogen	17502-048	
B27 serum-free supplement	Invitrogen	17504-044	
Penicillin-Streptomycin	Invitrogen	15140-148	
L-Glutamine	Invitrogen	25030-149	
Intracellular solution			
Potassium chloride	Sigma-Aldrich	P4504	
HEPES	Sigma-Aldrich	H4034	
Potassium D-gluconate	Sigma-Aldrich	G4500	
EGTA	Sigma-Aldrich	E3889	
Na ₂ ATP	Sigma-Aldrich	A2383	
MgATP	Sigma-Aldrich	A9187	
NaGTP	Sigma-Aldrich	G8877	
Potassium hydroxide	LabServ	BSPPL738.500	
Sucrose	Sigma-Aldrich	S8501	
Extracellular solution			
Sodium chloride	Sigma-Aldrich	310166	
Potassium chloride	Sigma-Aldrich	P4504	
HEPES	Sigma-Aldrich	H4034	
Calcium chloride	Sigma-Aldrich	383147	
Magnesium chloride	Sigma-Aldrich	M8266	
D-Glucose	Sigma-Aldrich	G8270	
Sodium hydroxide	LabServ	BSPSL740.500	
Sucrose	Sigma-Aldrich	S8501	

Table 2. Solutions for cell culture and patch clamp. a) Neurobasal media. b) Intracellular solution. c) Extracellular solution.

Upright microscope	Zeiss	AxioExaminerD1	Equipped with Dodt contrast
Water-immersion objective	Zeiss	W Plan-APOCHROMAT 40x/0.75	
Platform and X-Y stage	ThorLabs	Burleigh Gibraltar	
Recording chamber	Warner Instruments	RC-26G	
Vibration isolation table	TMC	Micro-g 63-532	
CCD Camera	Diagnostic Instruments	RT1200	
Camera software	Diagnostic Instruments	SPOT Basic	
In-line solution heater	Warner	SH-27B	
Temperature controller	Warner	TC-324B	
Patch clamp amplifier	Molecular Devices	Multiclamp 700B	
Patch clamp data acquisition system	Molecular Devices	Digidata 1440A	
Micromanipulator	Sutter Instruments	MPC-325	
Micropipette glass	Sutter Instruments	GBF100-58-15	Borosilicate glass with filament
Micropipette Puller	Sutter Instruments	P2000	
Recording Software	AxoGraph		Lab pack and electrophysiology tools
Aspirator bottle	Sigma-Aldrich	CLS12201L	1 L Pyrex aspirator bottle, with outlet for tubing
PE Tubing	Harvard	PolyE #340	
Masterflex peristaltic pump	Cole-Parmer	HV-07554-85	

Table 3. Patch clamp equipment.

1,870 nm laser diode	Optotech		
200/220 μm diameter multimode optical fiber patch cord (FC/PC)	AFW Technologies	MM1-FC2-200/220-5-C-0.22	Light delivery optical fiber, silica core and cladding, 0.22 NA
Optical fiber through connector (FC/PC)	Thorlabs	ADAF2	
Optical fiber cleaver	EREM	FO1	
Optical fiber stripping tool (0.25 - 0.6 mm)	Siemens		For removing optical fiber jacket
Optical fiber stripping tool (0.6 - 1.0 mm)	Siemens		For removing outer coating of patch cord
Signal generator			Any signal generator that can output the necessary pulse shapes and is capable of being externally triggered
Optical fiber positioner			Custom made positioner. Could substitute with standard micropositioner used for patch clamp experiments
Optical fiber chuck	Newport	FPH-DJ	
Laser power meter and detector head	Coherent	FieldMate (power meter) with LM-3 (detector head)	

Table 4. Laser equipment.