

Engineering and Characterization of an Optogenetic Model of the Human Neuromuscular Junction

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Materials

Name	Company	Catalog Number	Comments
Cells			
SkMDC	Cook Myosite	P01059-14M	
Media and Supplements			
Advanced DMEM/F12	ThermoFisher Scientific	12634-020	
Bovine Serum Albumin solution	Millipore Sigma	A9576-50ML	
G-5 Supplement (100X)	ThermoFisher Scientific	17503-012	
Geneticin Selective Antibiotic (G418 Sulfate) (50 mg/mL)	ThermoFisher Scientific	10131-035	
Insulin, Recombinant Human	Millipore Sigma	91077C-100MG	
Matrigel	Corning	354277	
mTeSR Plus	Stem Cell Technologies	100-0276	
MyoTonic Growth Media Kit	Cook Myosite	MK-4444	
N-2 Supplement	ThermoFisher Scientific	17502-048	
NbActiv4 500 mL	BrainBits LLC	Nb4-500	
Neurobasal Medium	ThermoFisher Scientific	21103-049	
Neurobasal-A Medium	ThermoFisher Scientific	A13710-01	
Pluronic F-127	Sigma Aldrich	P2443	
ReLeSR	Stem Cell Technologies	5872	
Plasticware			
30 mm cage cube system	ThorLabs	CM1-DCH, CP33, ER1-P4 and ER2-P4	
37 µm Reversible Strainer, large	Stem Cell Technologies	27250	
546 nm short-pass excitation filter	Semrock	FF01-546/SP-25	
573 nm dichroic mirror	Semrock	FF573-DI01-25x36	
594 nm long-pass emission filter	Semrock	BLP01-594R-25	
594 nm long-pass excitation filter	Semrock	BLP01-594R-25	

Blue (470nm) Rebel LED on a SinkPAD-II 10mm Square Base - 65 lm @ 700mA	LuxeonStarLEDs	SP-05-B4	
Carclo 29.8° Frosted 10 mm Circular Beam Optic - Integrated Legs	LuxeonStarLEDs	10413	
Corning 60 mm Ultra-Low Attachment Culture Dish	Corning	3261	
Heat sink	LuxeonStarLEDs	LPD-19-10B	
Optics			
pluriStrainer 400 µm, 25 pack, sterile	PluriSelect	43-50400-03	
pluriStrainer 500 µm, 25 pack, sterile	PluriSelect	43-50500-03	
Red (627nm) Rebel LED on a SinkPAD-II 10mm Square Base - 65 lm @ 700mA	LuxeonStarLEDs	SP-05-R5	
ring-actuated iris diaphragm	ThorLabs	SM1D12D	
T-Cube LED drivers	ThorLabs	LEDD1B, KPS101	
Molds			
Female Threaded Hex Standoffs, 3 1/2" 10-32, Partially Threaded 1/2"	McMaster	91920A046	
Low-Profile C-Clamp	McMaster	1705A12	
Growth Factors			
Adenosine 3',5'-cyclic monophosphate	Millipore Sigma	A9501-1G	
CHIR 99021, 10 mg	Tocris	4423/10	
DAPT 10 mg	R&D Systems	2634/10	
Human CNTF, research grade, 5 µg	Miltenyl Biotec	130-096-336	
Human Vitronectin Protein, CF	R&D Systems	2349-VN-100	
Human Vitronectin Protein, CF	R&D Systems	2349-VN-100	
IGF1 Recombinant Human Protein	ThermoFisher Scientific	PHG0078	
Laminin mouse protein, natural	ThermoFisher Scientific	23017015	
Recombinant Human Agrin Protein	R&D Systems	6624-AG-050	
Recombinant Human GDNF Protein, CF 50ug	R&D Systems	212-GD-050/CF	
Recombinant Human Neurotrophin 3 100 ug	Cell Sciences	CRN500D	
Recombinant Human Neurotrophin-4	Cell Sciences	CRN501B	
Recombinant Human Sonic Hedgehog/Shh (C24II) N-Terminus	R&D Systems	1845-SH-100	
Recombinant Human/Murine/Rat BDNF 50 ug	Peprtech	450-02	
Retinoic Acid, 50 mg	Millipore Sigma	R2625-50	
SAG Smoothened Agonist	Millipore Sigma	566660	
SB431542 10 mg	Stem Cell Technologies	72234	
StemMACS LDN-193189	Miltenyl Biotec	130-103-925	
Vitronectin from human plasma	Millipore Sigma	V8379-50UG	
Y-27632 dihydrochloride	Tocris	1254	
Antibodies			
α-actinin mAb (Mouse IgG1)	Abcam	ab9465	
Choline Acetyltransferase (ChAT) (Goat)	Millipore	AB144P	
Desmin mAb (Mouse IgG1)	Dako	M076029-2	

Myosin Heavy Chain (MHC) (Mouse IgG2b)	DSHB	MF20	
Equipment			
Arduino Uno R3	Arduino	A000066	
Automated stage	Applied scientific instrumentation	MS- 2000 XYZ	
Expanded plasma cleaner	Harrick Plasma	PDC-001 (115V)	
Invitrogen Countess Automated Cell Counter	Marshal Scientific	I-CACC	
IX-81 Inverted fluorescence microscope	Olympus	IX-ILL100LH	
Series Stage Top Incubator System	Tokai Hit STX	TOKAI-HIT-STXG	
Zyla 4.2 sCOMS Camera	Andor Technology	ZYLA-4.2P-CL10	
Software			
Arduino Software (IDE)	Arduino	IDE 1.8.19	
Mastercam	Mastercam	Mastercam for Solidworks	
Matlab	Matlab	R2021b	
NIS elements	Nikon	Basic Research	
Solidworks 3D CAD	Solidworks	Solidworks Standard	