

Materials List for:

# Examining Monosynaptic Connections in *Drosophila* Using Tetrodotoxin Resistant Sodium Channels

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URL: <https://www.jove.com/video/57052>

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## Materials

Name	Company	Catalog Number	Comments
UAS-csChrimson	Bloomington Drosophila Stock Center	55135	Used as a neural activator
UAS-NaChBac	Bloomington Drosophila Stock Center	9466	Restores excitability in cells in TTX
Tetrodotoxin	Tochris	1078	Special permission may be needed to purchase TTX as it is a controlled substance
all trans-Retinal	Sigma-Aldrichall trans-Retinal	R2500	Require co-factor for channelrhodopsin
Weldable 321 Stainless Steel Sheet, 0.002" Thick, 10" Wide	McMaster Carr	3254K7	Used to make custom fly holder. Custom foil can be laser cut at <a href="http://pololu.com">pololu.com</a> from the provided PDF file
Dissection Microscope	Zeiss	Stemi 2000-C	Used for dissection of preparation
Waxer	Almore	Eectra Waxer 66000	Used during dissection to secure fly in foil
Paraffin Wax	Joann	4917217	Used with waxer
Number 5 forceps	Fine Science Tools	#5CO	Used for dissection and desheathing
Dissection Scissors	Fine Science Tools	15001-08	Used to remove parts of the cuticle during dissection
Tungsten wire	A-M Systems	797500	Use with electrolysis to make sharpened needles for dissection
Recirculating Peristaltic Pump	Simply Pumps (Amazon)	PM200S	for recirculating TTX
Speed Controller for peristaltic pump	Zitrades (Amazon)	N/A	PWM Dimming Controller For LED Lights or Ribbon, 12 Volt 8 Amp,Adjustable Brightness Light Switch Dimmer Controller DC12V 8A 96W for Led Strip Light B
Versa-Mount Precision Compressed Air Regulator	McMaster Carr	1804T1	For applying positive pressure during patching
Glass capillaries	World Precision Instruments	TW150F-3	For patch pipettes
Multipurpose Gauge	McMaster Carr	3846K431	Gauge for pressure regulator
Electrophysiology Camera	Dage MTI	IR-1000	Any camera that works in the IR range (850 nm) will work. You do not want to use red illumination as this can activate csChrimson
IR LED	Thorlabs	M850F2	For oblique illumination
fiber optic for IR LED	Thorlabs	M89L01	Couples to IR LED

Objective lens	Olympus 40X	LUMPlanFLN	This can be used on most microscopes and works well for visualizing fly neurons.
Amber LED	Thorlabs	M590L3d	For visualizing RFP and mCherry
Blue LED	Thorlabs	<b>M470L3<sup>d</sup></b>	For visualizing GFP
GFP filter set	Chroma	<b>49011</b>	For visualizing GFP or stimulating channel2rhodopsin
Custom mCherry Filter Set	Chroma	et580/25x and t600lpxr (from the 49306 set) but with an et610lp barrier/emission optic	Use only if you wish to patch identified neurons with channel2rhodopsin
Dichroic to combine Amber and blue LED	Thorlabs	DMLP550R	Use only patch under mCherry and excite channel2rhodopsin with blue light.
Red LED	LEDSupply	Cree XPE 620 - 630 nm	Used to drive csChrimson
LED Driver	LEDSupply	3021-D-E-1000	Used to drive LEDs for optogenetic stimulation
Manipulator	Sutter Instruments	MP-225	Used to position pipette during recordings
Patchclamp Amplifier	A-M Systems	Model 2400	An equivalent amplifier is suitable
Bessel Filter	Warner Instruments	LPF 202A	Auxillary filter used to filter current trace to oscilloscope during patching.
Data Acquisition System	National Instruments	NI PCIe-6321 781044-01	Used to record data from amplifier to computer
Connector Block - BNC Terminal BNC-2090A	National Instruments	779556-01	Used to connect amplifier to DAQ card.
Steel Foil	McMaster Carr	3254K7	Steel foil for custom recording chamber
Magnets	K&J Magnetics	D42	To secure recording chamber to ring stand
1/16" Cell Cast Acrylic Clear	Pololu		Used to make custom recording chamber. Acrylic can be laser cut at pololu.com from the provided PDF file