

Materials List for:

Electrophysiological Method for Recording Intracellular Voltage Responses of *Drosophila* Photoreceptors and Interneurons to Light Stimuli *In Vivo*

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Materials

Name	Company	Catalog Number	Comments
Stereo Zoom Microscope for making the fly preparation	Olympus	SZX12 DFPLFL1.6x PF eyepieces: WHN30x-H/22	Capable of ~150X magnification with long working distance; bespoke heavy steel table mount stand
Stereomicroscope in the intracellular set-up	Olympus	Olympus SZX7; eyepieces: WHN30x-H/22	30X eyepieces are needed for seeing the electrode tip reflections well when driving it through the small corneal hole into the eye
Nikon microscope	Nikon SMZ645; eyepieces: C-W30x/7		
Anti-vibration Table	Melles Griot	With metric M6 holes on the breadboard	Our bespoke rigs have a large hole drilled through the thick breadboard that lets in the fly preparation platform pole (houses a copper heatsink with electronics) from below
Newport			
Micromanipulators	Narishige	Narishige NMN-21	In our intracellular set-ups, different micromanipulator systems are used for driving the sharp recording electrodes into the fly eye. All the listed manipulators are successfully providing long-lasting stable recordings from <i>Drosophila</i> photoreceptors and LMCs.
Huxley Bertram	Huxley xyz-axis with fine manual control		
Sensapex	Sensapex triple axis		
Märzhäuser	Märzhäuser DC-3K with additional x-axis piezo stepper and MS 314 controller		
Magnetic Stands	Any magnetic base with on/off switch will do		For example, to manage cables inside the Faraday cage
Electrode Holders	Harvard Apparatus	ESP/W-F10N	
Silver Wire	World Precision Instruments	AGW1510	0.3 - 0.5 mm diameter; needs to be chloridized for the electrode holders
Fiber Optic Light Source	Many different, including Olympus		
Fiber Optic Bundles	UltraFine Technology		To deliver the LED light stimulus to the Cardan arm system. We use both liquid and quartz light guides (range from UV to IR)
Thorn Labs			

Fly Cathing Tube		P80-50P 50ml Cent. Tube PP, Pack of 100 Pcs	Cut the conical bottom off from 50 ml Plastic Centrifuge Tube and glue a 1 ml pipette tip on it.
Digital Acquisition System	National Instruments		
Single-electrode current/voltage-clamp microelectrode amplifier	npi SEC-10LX	http://www.npielectronic.de/products/amplifiers/sec-single-electrode-clamp/sec-10lx.html	Outstanding performer!
Head-stage	Standard (+/- 150 nA)	For npi SEC-10LX	
LED light sources and drivers	2-channel OptoLED (Cairn Research Ltd., UK)		Many of our stimulus systems are in-house built
Self-designed and constructed			
Acquisition and Analyses Software	Many companies to choose from		Biosyst; custom written Matlab-based system for experimental and theoretical work in the Juusola laboratory
Personal Computer or Mac			Ensure that PC or Mac is compatible with data acquisition system and software
Cardan arm system	Self-designed and constructed		Providing accurate x,y,z-positioning of the light stimuli
Peltier temperature control system	Self-designed and constructed		
Faraday Cage	Self-constructed		Electromagnetic noise shielding
Filamented Borosilicate Glass Capillaries		Outer diameter: 1 mm	
Inner diameter: 0.5 - 0.7 mm			
Filamented Quartz Glass Capillaries		Outer diameter: 1 mm	
Inner diameter: 0.5 - 0.7 mm			
Pipette Puller	Sutter Instrument Company	Model P-2000 laser Flaming/Brown Micropipette Puller	For borosilicate reference electrodes, use the preset program #11 (patch electrodes): Heat = 350; Filament = 4; Velocity 36; Delay = 200).1.2.1). For borosilicate recording electrodes, use the preset program #12 (this typically pulls good conventional sharps for photoreceptor recordings): Heat = 355; Filament = 4; Velocity 50; Delay = 225; Pull = 150. For LMC recordings, which require electrodes with finer tips, these values need to be adjusted. For pulling quartz capillaries, P-2000 manual suggests programs for fine tipped microelectrodes. These programs' preset parameters serve as useful starting points for systematic modifications to generate electrodes with good penetration success and low recording noise.
Extracellular Ringer Solution for the reference electrode	Chemicals from Fisher Scientific	10326390, NaCl 10010310, KCl 10147753, TES 10161800, CaCl2 10159872, MgCl2 10000430, sucrose	See the recipe in the protocol section
3 M KCl solution for filling the filamented recording microelectrode	Salts from Fisher Scientific	10010310, KCl	
Petroleum jelly	Vaselin		

Non-stainless steel razor blades			
Blade holder/breaker	Fine Science Tools By Dumont	10053-09	9 cm
Blu-tack	Bostik		Alternatively, use molding clay
Forceps	Fine Science Tools By Dumont	11252-00	#5SF (super-fine tips)