Materials List for:

Modeling Biological Membranes with Circuit Boards and Measuring Electrical Signals in Axons: Student Laboratory Exercises

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Materials

Circuit board

1. Electronics listed below for the breadboard experiments can be obtained at an local electronics store such as Radio Shack.
2. Bread board, resistors, capacitors, batteries and wires that can serve as junctions for the breadboard as outlined in the experiments.
3. A common voltmeter (Wavetek Meterman voltmeter)
4. A/D board for on line recording to a computer. Electrical signals are recorded on line to a PowerLab/4s interface (ADInstruments, Colorado Springs, CO, USA). We use standard software from ADInstruments named Chart or Scope.

Physiology experiments

1. Crayfish (*Procambarus clarkii*). Atchafalaya Biological Supply Co., Raceland, LA., USA.
2. Standard crayfish saline: Modified from Van Harreveld's solution (1936). (in mM) 205 NaCl; 5.3 KCl; 13.5 $CaCl_2 2H_2O$; 2.45 $MgCl_2 6H_2O$; 5 HEPES and adjusted to pH 7.4. All saline chemicals were obtained from Sigma chemical company (St. Louis, MO).
3. Dissection tools: Fine #5 tweezers, fine scissors, knife blade holder, #26002-20 insect pins (all obtained from Fine Science Tools (USA), Inc., 373-G Vintage Park Drive, Foster City, CA 94404-1139)
4. A nerve chamber dish (ADInstruments, Colorado Springs, CO, USA) to hold the nerve. The wires that come with the nerve chamber dish can be used to stimulate the nerve.
5. A suction electrode is used to record the signals.
6. The manipulator or a clamp on a ring stand will also serve as a holder for the suction electrode.
7. Faraday Cage
8. Dissecting Microscope
9. High Intensity Illuminator (light source)
10. Microscope Platform
11. AC/DC Differential Amplifier (A-M Systems Inc. Model 3000)
12. PowerLab 26T (AD Instruments)
13. Extracellular amplifier (AD Instruments)
14. LabChart 7 (ADI Instruments)
15. Dissecting tools
16. A ring stand and clamp to serve as a holder for the recording suction electrode