

Materials List for

# Development of a Low-cost Epimysial Electromyography Electrode: A Simplified Workflow for Fabrication and Testing

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## Materials

| Name  | Company   | Catalog Number         | Comments   |
|---|---|------------------------|--|
| <b>Electrode Materials</b>  |   |                        | <b>Quantity &amp; price per electrode</b>  |
| Contact surface   | Prince and Izant PT90/IR10 1.25 mm x 5 mm foil  | Catalog #1040055       | 2 per electrode<br>\$7.50 per foil<br>\$15.00 per electrode  |
| PFA coated stainless-steel electrode lead wire  | A-M Systems Multi-Stranded PFA-Coated Stainless Steel Wire 50.8 μm strand diameter            | Catalog #793500        | Dependent on desired lead length (e.g., 9 inch lead wires x2)<br>\$128 per 25 ft spool<br>\$5.12 per foot<br>\$0.42 per inch (x18)<br>\$7.68 per electrode |
| Folding jig   | 3D printed (see .gcode file)  | NA                     | NA   |
| Sealant for electrode body  | Nusil Med-1137 liquid silicone  | Catalog #MED-1137      | 1 gram<br>\$344.66 per 2 oz. (59.15 mL)<br>\$5.83 per electrode  |
| Silicone base   | Implantech Alliedsil Silicone Sheeting-Reinforced, Long Term Implantable (8" x 6") .007 thick | Catalog #701-07        | 10mm x 5mm sheet<br>\$225.00 per 8 x 6 inch<br>\$0.36 per electrode (10 mm x 5 mm)   |
| Thinner for sealant mixture   | Toluene 99.5% ACS Reagent 500mL or Xylene ACS 99.5%   | Catalog #179418-500 ML | 0.75 mL<br>\$25.53 per 500 mL<br>\$0.38 per electrode  |
| Template for perforating silicone base  | Cutting jig – 3D printed (see CAD file)   | NA                     | NA   |
| Custom-fabricated electrode: <b>\$29.25</b>   |   |                        |  |
| Industry standard electrode (EP105 EMG Patch Electrode, 2 contacts, single-sided, 7mm x 4mm, MicroProbe for Life Science): \$305.00 |   |                        |  |
| <b>Additional Fabrication Materials</b>   |   |                        |  |

|  |  |              | Quantity & price per electrode        |
|--|--|--------------|---------------------------------------|
| 3D printing software                   | Solidworks (Solidworks, 2022)  |              |                                       |
| Micro-Tig welder                       | Micro-Tig Welder (CD1000SPM, Single Pulse Research and Light Production Resistance Spot Welder, Sunstone)                                  | SKU 301010   | \$3,500                               |
| Ultrasonic bath                        | Ultrasonic bath (CPX Series Ultrasonic Bath, Fisherbrand).   | 15-337-403   | NA                                    |
| <b>Ex Vivo Testing Materials</b>       |  |              |                                       |
|  |  |              | Quantity & price per electrode        |
| Data acquisition platform and software | DigitalLynx 4sX Base Cheetah version 6.0 (Neuralynx Inc.)  | NA           | EMG acquisition hardware and software |
| Electrode interface board (EIB)        | EIB, EIB16-QC, Neuralynx Inc.  | 31-0603-0007 | NA                                    |
| Signal generator                       | 5 MHz Function Generator, B&K Precision  | 4005DDS220V  | \$387.46                              |
| Potentiostat                           | PGSTAT1 potentiostat (EcoChemie, Utrecht, Netherlands)   | NA           | NA                                    |
| Stainless steel screw                  | Fine Science Tools   | 19010-00     | \$98                                  |
| <b>Ex Vivo Testing Materials</b>       |  |              |                                       |
|  |  |              | Quantity & price per electrode        |
| Rodent treadmill                       | Exer 3/6 Open Treadmill, Columbus Instruments  | NA           | NA                                    |
| Dental cement                          | Excel Formula® Pourable Dental Material, St. George Technology Inc.  | #24211       | \$125.60                              |
| Light microscope                       | Keyence BZ-X800, Keyence Corporation, Osaka, Japan   | NA           | NA                                    |
| Motion capture system                  | Optitrack Color Camera, Optitrack, NaturalPoint Inc.   | NA           | NA                                    |
| Peak detection algorithm               | "SciPy.signal.find_peaks - SciPy v1.8.1 Manual", 2022  | NA           | NA                                    |
| Python software                        | Python Software Foundation. Python Language Reference, version 3.9. Available at <a href="http://www.python.org">http://www.python.org</a> | NA           | NA                                    |
| Rat                                    | HsdBlu: LE, Envigo   | 140          | NA                                    |
| Statistical software                   | GraphPad Prism version 10.0.0 (GraphPad Software, Boston, Massachusetts USA)   | NA           | NA                                    |