

HMT surgical protocol

Equipment list

- General surgical kit
- General animal care kit
- Scalpel
- Bone scraper
- Vetbond
- Permanent marker (for marking where burrholes will go on contralateral - somatosensory/frontal)
- Drill - bit size 1mm? Or less if using silver wires - no screw
- Cannula holder (kopf)
- Relyx 3M opaque dental cement - standard tips, endo tips
- HMT
- Parafilm
- Kwik-cast
- Teflon tape, sellotape

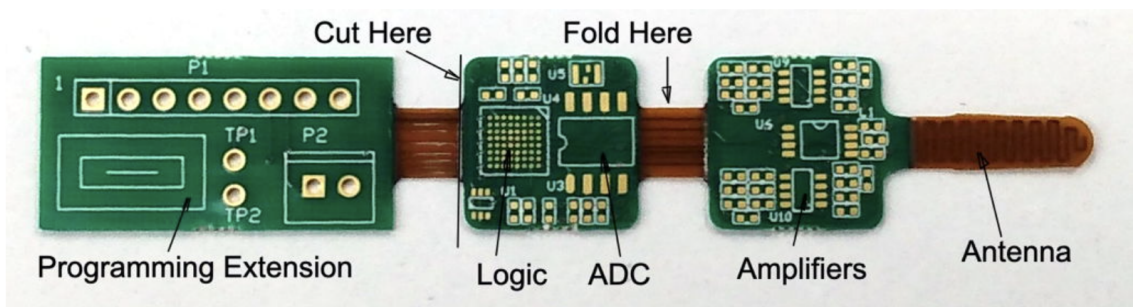
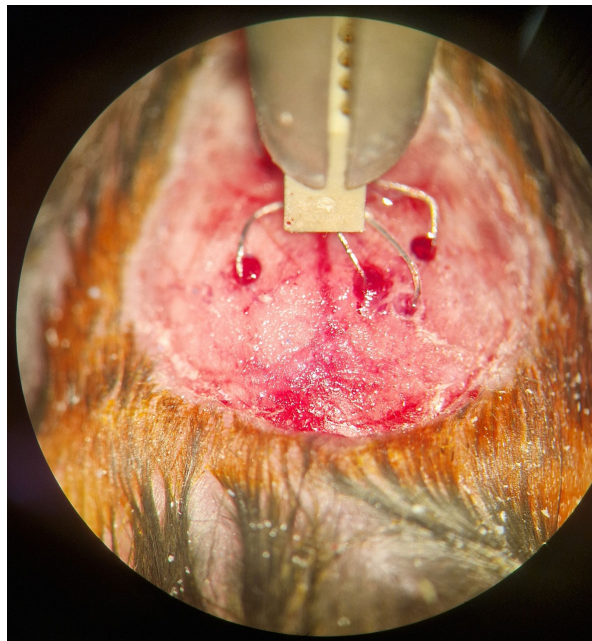


Figure: Rigid-Flex Printed Circuit Board for Prototype HMT, Top Side. Connector is on the bottom side.

· supports the CR1220, CR1225, and CR1025 coin cells.

Surgical Procedure

1. Cut away oval of skin over bregma/lambda
2. Scrap away connective tissue
3. Apply thin layer of vetbond all over skull - to harden skin at edges for ease of dental cement application once omnetics is in place
4. Mark additional burrholes and drill
 - a. 5 burrholes required - 3 on RH, 2 on LH (incl. reference)
5. Fix omnetics into cannula holder and lower onto skull in the middle of all burrholes - THIS IS PRIOR TO CUTTING WIRES
6. Determine appropriate length of wire, mark on silicone using scalpel whilst wires are on skull
7. Raise omnetics away from skull, place on table, and remove silicone from wires with scalpel at pre-determined point
8. Re-lower omnetics onto skull
9. Place wires into holes
 - a. In the case of bleeding, dab with twisted cotton bud in burrhole and apply vetbond over area (any clotting of blood will prevent this going directly onto brain - but there is potential to improve this approach)



10. Once all wires are fixed in place with vetbond, apply Relyx3 cement using the provided endo tip initially to place some cement under the omnetics and over the burrholes

NB: The top layer of dental cement (50um) will remain slightly sticky, this is due to oxidation and it is perfectly okay to apply more cement over the top - it will harden with the new layer of dental cement

a. If using surgical light on microscope, no need for UV - working time is ~1 minute once out the end of the tip

11. Apply a general layer of dental cement around the wires and omnetics

12. Once confirmed as solid, remove cannula holder from omnetics and apply another layer of dental cement up to the ledge of the pins



IF ATTACHING HEADSTAGE NOW:

13. Insert battery into HMT, fold and wrap in teflon + transparent tape

14. Connect omnetics

15. Apply thin layer of kwik-cast around the connection and allow to full dry



IF ATTACHING HMT LATER:

13. Place some parafilm over the omnetics connector
14. Place decent layer of kwik-cast over parafilm, wait to dry and apply another which merges onto dental cement to ensure the mouse can't pick it off

NB. in this case it is important to check the condition of the omnetics cap daily so the pins don't get damaged