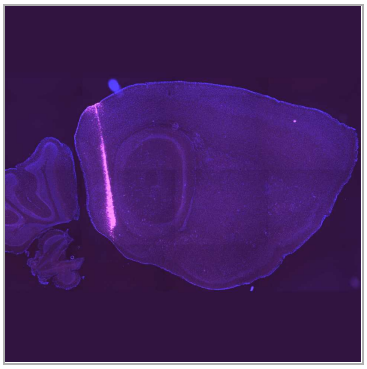

VERSION 3

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We use this protocol and it's working

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Explant Surgery: Chronic recoverable Neuropixels in mice V.3

In 1 collection

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ABSTRACT

This protocol collection explains how to build a low-cost, lightweight system to implant 1 Neuropixels 1.0 probe or 2 Neuropixels 2.0 probes into mice, record during freely moving behavior, then recover the probes for future use. This protocol explains how to recover a previously implanted Neuropixel probe and clean for future use. See full collection for more details.

MATERIALS

Tools:

- Dovetail holder & stereotax adapter (Sensapex uMp-NH & uMp-NPR-200)
- Tiny flathead screwdriver (Wiha, 0.8 x 40)
- Scissors
- Headbar stereotactic adapters (see *Implant surgery* protocol)

Consumables:

- Isoflurane
- Tergazyme (1g per 100mL, Alconox 1325, made within 8h of surgery)
- dH20

Keywords: electrophysiology, silicon probe, electrode, Neuropixels

Prepare mouse

5m

1 Set O2 flow rate to 1-1.5L/min and isoflurane to 3%. Place mouse in anesthetic chamber.

Safety information

Use vacuum systems connected to isoflurane lines and work on a downdraft table to move uninhaled isoflurane away from the surgeon.

2 When breathing has slowed to 1Hz, move animal to the toothbar. Switch isoflurane from chamber to nosecone. Wait until unresponsive to pedal reflex test, then lower to 1.5% isoflurane.

Note

Monitor and record anesthetic depth throughout procedure. Ears and toes should be pink, respiration should be once per 1-2 seconds, and pedal reflex should be lost. If respiration slows or extremities start to lose color, lower isoflurane levels. If respiration speeds up or reflex is present, increase isoflurane levels and halt the procedure until animal is fully anesthetized again.

3 Set the nosecone to the position you recorded from the implant surgery. Attach mouse to headbar stereotactic adapters.

Remove probe

25m

4 Remove all the tape to expose the screws and probe.

5 Cut the ground wire above the pin.

6 Attach the Sensapex holder and set the stereotax to the angle used in the implant surgery. Tax to the dovetail cap. A fully open Sensapex holder can be taxed in from anterior or dorsal to the dovetail holder.

7 Adjust the screws so the holder grips the dovetail cap.

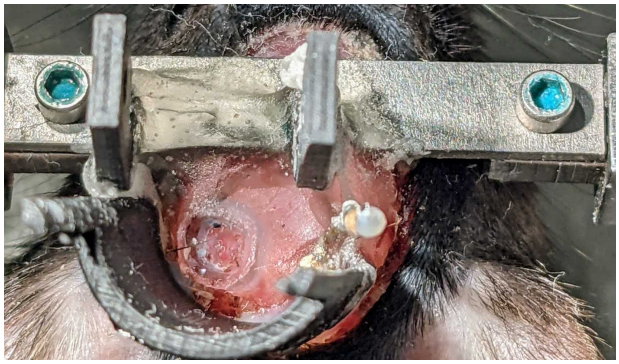
8 Unscrew the wings from the body. Screws can be saved for future surgeries.

9 Slowly tax up to bring the probe & body piece away from the animal. Set back to 0 degrees and adjust the arm so the probe is away from the surgical field.

10 Lower the probe into tergazyme and let sit for 30 minutes, then rinse with dH2O.

Perfuse

11 Remove the mouse from the stereotax and prepare for perfusion.



Remaining implant after single 1.0 probe is explanted. After perfusion, the assembly can be removed from the skull in 1 piece by grasping the headbar and rotating it away from the skull.

Re-use probe

12 Assemble following the *Assembly* protocol, skipping the steps that modify the probe (sharpening, soldering wire to the PCB, attaching the body piece). Extend the ground wire back to full length and attach a new pin.