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VTA and PnO Viral Injections With Optrode Implantation

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We use this protocol and it's working



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Abstract

This protocol describes stereotaxic viral injections into VTA and PnO followed by implantation of a chronic optrode in the same surgical session. The optrode headcap is fixed using RelyX Unicem 2 (3M). A single skull screw is placed for grounding purposes.

Materials

- All materials listed in the injections-only protocol.
- Chronic optrode with integrated optical fiber (e.g., Cambridge Neurotech H8b or H10b, integrated 200 μ m fiber, NA 0.39).
- Optional nano-drive (if used).
- RelyX Unicem 2 (3M) for implant fixation.
- One skull screw for electrical ground connection.
- Headstage interface and protective cap.

Step-by-Step Procedure

- 1 Induce and maintain isoflurane anesthesia (3–4% induction; 1.0–1.5% maintenance) and mount the mouse in the stereotaxic frame on a 37 C heating pad.
- 2 Expose and level the skull. Drill craniotomies for VTA and PnO injections and for the optrode implantation site.
- 3 Place one skull screw for electrical grounding at a suitable location on the skull, avoiding planned craniotomies.
- 4 Inject virus into PnO and VTA as required for the experiment using slow infusion and a brief dwell time before injector withdrawal.
- 5 Prepare the optrode for implantation (confirm integrity of the integrated fiber and connector).
- 6 Lower the optrode to the planned VTA depth and confirm stable placement.
- 7 Fix the optrode (and nano-drive if used) using RelyX Unicem 2 (3M) to build a stable headcap. Allow cement to fully cure before moving the animal.
- 8 Administer perioperative analgesia as in the study (carprofen 5 mg kg⁻¹, subcutaneous).
- 9 Close any remaining exposed scalp margins around the headcap as appropriate.
- 10 Monitor the animal until fully recovered and perform daily checks during recovery.