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Simultaneous Recording of Neuropixels and EEG in Head-Fixed Mice

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Lydia Marks[1], Irene Rembado[1], Leslie Claar[1]

[1]Allen Institute

Lydia C. Marks
Allen Institute

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We are still developing and optimizing this collection.

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Abstract

This protocol collection details the surgical procedures necessary to record Electroencephalography (EEG) and Neuropixels data simultaneously in a head-fixed mouse. The first step is to perform the "EEG Array and Headframe Implant Surgery". After allowing the mouse to recover for at least 1 week, the next step is to perform the "Burr Hole Craniotomies Through EEG" surgery. Finally, the "External Ground and Reference Strategy for Simultaneous EEG and Neuropixels Recordings" provides information on how to set up and run a recording session.

Image Attribution

Gabriel Rodriguez, Allen Institute

Guidelines

Only perform these procedures in accordance with IACUC and veterinary requirements.

Safety warnings

- Personal Protective Equipment (PPE) should be used at all times while operating this protocol.
- Isoflurane Warning: Acute over-exposure to waste anesthetic gases (WAG) may cause eye irritation, headache, nausea, drowsiness or dizziness. Repeated exposure may cause damage to cardiovascular system and central nervous system. Refer to MSDS for additional information.

Ethics statement

Research-focused rodent behavior must be conducted according to internationally accepted standards and should always have prior approval from an Institutional Animal Care and Use Committee (IACUC) or equivalent ethics committee(s).

This protocol has been approved by the Allen Institute Animal Care and Use Committee (IACUC).
PHS Assurance: D16-00781
AAALAC: Unit 1854

Files

SEARCH

Protocol

NAME

EEG Array and Headframe Implant Surgery

VERSION 1

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Allen Institute

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Protocol

NAME

Burr Hole Craniotomies Through EEG

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Protocol

NAME

External Ground and Reference Strategy for Simultaneous EEG and Neuropixels Recordings

VERSION 1

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Allen Institute

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Protocol references

Claar L.D., Rembado I., Kuyat J.R., Russo S., Marks L.C., Olsen S.R., Koch C. (2023). Cortico-thalamo-cortical interactions modulate electrically evoked EEG responses in mice. *eLife*. https://doi.org/10.7554/eLife.84630

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Russo S., Claar L., Marks L., Krishnan G., Furregoni G., Zauli F.M., Hassan G., Solbiati M., d'Orio P., Mikulan E., Sarasso S., Rosanova M., Sartori I., Bazhenov M., Pigorini A., Massimini M., Koch C., Rembado I. (2024). Thalamic feedback shapes brain responses evoked by cortical stimulation in mice and humans. https://doi.org/10.1101/2024.01.31.578243