Reusable, Sterilizable Surgical Instruments for Deployment of Neuropixels Probes in the Operating Room

Tech ID: 34420 / UC Case 2026-417-0

ABSTRACT

Researchers at the University of California, Davis have developed a system of reusable, sterilizable 3D-printed surgical tools that enables safe, precise intraoperative deployment of Neuropixels probes within standard neurosurgical workflows.

FULL DESCRIPTION

This technology provides a suite of modular, biocompatible, and sterilizable 3D-printed surgical instruments designed specifically to overcome the limitations of existing stereotactic hardware for Neuropixels probe deployment. The system includes a centralized probe holder with anti-rotation features and depth-marked guides, compatible with leading neurosurgical platforms such as the ExcelsiusGPS® robotic navigation system and CRW stereotactic frame. Fabricated from Class I medical-grade Surgical Guide resin, these tools enable reproducible, high-precision placement of neural probes during surgery and translational neuroscience research, facilitating advanced intraoperative neurophysiology in large-brain species and paving the way for human clinical use.

APPLICATIONS

- Intraoperative deployment of Neuropixels neural probes during human neurosurgery.
- Translational neuroscience research in large-brain animal models such as non-human primates.
- Advanced neural recording studies requiring high-density, multi-regional brain data collection.
- Integration with robotic navigation systems and stereotactic frames for enhanced surgical precision.
- Development of next-generation clinical neurophysiology devices and surgical tools.

FEATURES/BENEFITS

- Enables repeated use and sterilization through autoclave or low-temperature processes.
- Ensures biocompatibility and compliance with international standards using Class I medical-grade 3D-printing resin.
- Solves limitations of aluminum components by offering sterilizability, axial alignment, anti-rotation, and precise depth control.
- Provides modular components optimized for diverse surgical environments and systems.
- Facilitates accurate and repeatable electrode placement in large-brain species and intraoperative human procedures.

CONTACT

Byron N. Roberts
bnroberts@ucdavis.edu
tel: 530-754-8689.

INVENTORS

- Brown, Daril E.

OTHER INFORMATION

KEYWORDS

3D-printed surgical tools, biocompatible materials, clinical neurosurgery, excelsiusGPS ®, neuropixels probes, precision neural recording, reusable sterilizable instruments, stereotactic frames, surgical guide resin, translational neuroscience

CATEGORIZED AS

- **Engineering**
  - Engineering
  - Robotics and Automation
- **Medical**

- Integrates with major robotic navigation and stereotactic frame technologies.
- Problems Solved Replaces non-sterilizable hardware, expanding clinical neurosurgical use of Neuropixels probes.
- Restores precise axial alignment and rotational control lacking in standard probe holders.
- Introduces fine depth markings for precise probe insertion.
- Ensures compatibility with widely used neurosurgical robotic and stereotactic platforms.
- Simplifies safe management of electrical cables within sterile surgical fields.

PATENT STATUS

Patent Pending

- Devices
- Disease: Central Nervous System
- Research Tools
- Therapeutics
- **Research Tools**
- Animal Models

RELATED CASES

2026-417-0

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:
530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax:
530.754.7620