

STEERABLE THERMOABLATION PROBE FOR IMPROVED ACCESS TO BRAIN LESIONS

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Technology Description

An interdisciplinary team led by Professor Eric Leuthardt has developed a steerable device that can be integrated into existing thermoablation systems to treat abnormal brain lesions. Thermoablation is a more targeted and less disruptive method for treating lesions than chemotherapy, radiation therapy, and surgical excision. However, the straight probes used in existing thermoablation technologies can only move in one direction and consequently cannot treat approximately 25% of tumors because they are too large, irregularly shaped, or in multiple locations. To address this problem, this steerable device allows a surgeon to rotate, retract, and redeploy the laser probe along both a linear and a curved trajectory. Enabled by a pre-curved memory wire that extends in a predictable trajectory from a straight sheath, this device can carefully navigate delicate structures of the brain and deliver targeted thermal treatment to diseased tissue including tumors and epileptic foci.



Rendering of steerable thermoablation device, featuring a telescopically slidable laser extending from a pre-curved guide and straight, rigid sheath.

Stage of Research

- **Prototype** – The inventors have extensively validated the design using computer simulations and phantoms.

Applications

- **Interstitial Thermal Therapy (ITT) for brain lesions** including tumors and epileptic foci.

Key Advantages

- **Precise three-dimensional steering** – with predictable control over probe trajectory to within 0.5 mm, this device accesses diseased tissue better than straight-probe alternatives with only one-dimensional trajectories.

- **Careful navigation through delicate tissue** – pre-curved guide deploys and retracts the laser probe along a “follow the leader” trajectory that prevents “sweeping” and damaging delicate tissue.

- **Compatible with MRI and FDA-approved thermoablation systems.**

Patents

- [Thermoablation probe](#) (US Pat. App. Pub. # US2017/0119467A1)

Related Web Links

- [Leuthardt Lab](#)