

# Miniature Optical Coherence Tomography Probe for Real-time Monitoring of Surgery

## Summary

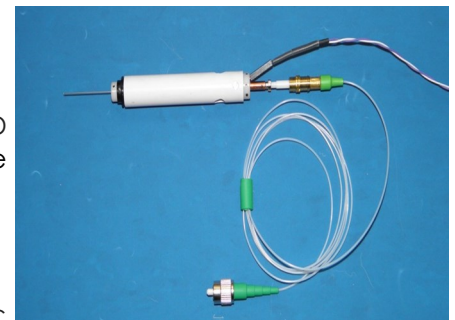
Vanderbilt researchers have designed a forward scanning miniature intraoperative Optical Coherence Tomography (OCT) probe that can be used for diagnostic purposes and real-time monitoring of surgery within small spaces, such as endoscopic surgery, intraocular surgery, and other microsurgery.

## Purpose

This OCT probe can be used to guide surgeries, including guiding an incising laser, in very small spaces. OCT technology has had a profound effect on imaging and diagnosis in many medical fields, including ophthalmology, gastroenterology, urology, and oncology. However, there exists a need for a forward scanning miniature OCT probe capable of passing through the 1.2mm diameter size of the smallest endoscopic working channel. This is especially true in ophthalmic surgery, where such a miniature OCT probe could be used to monitor laser ablation procedures in the eye in real-time, rather than merely examining the results of the procedure after the fact.

## Technology Description

The OCT probe presented here is a forward-imaging OCT microprobe for 2D and 3D diagnosis and monitoring of surgical depth, including incisions made with a laser, in relatively small spaces, such as intraocular surgery.

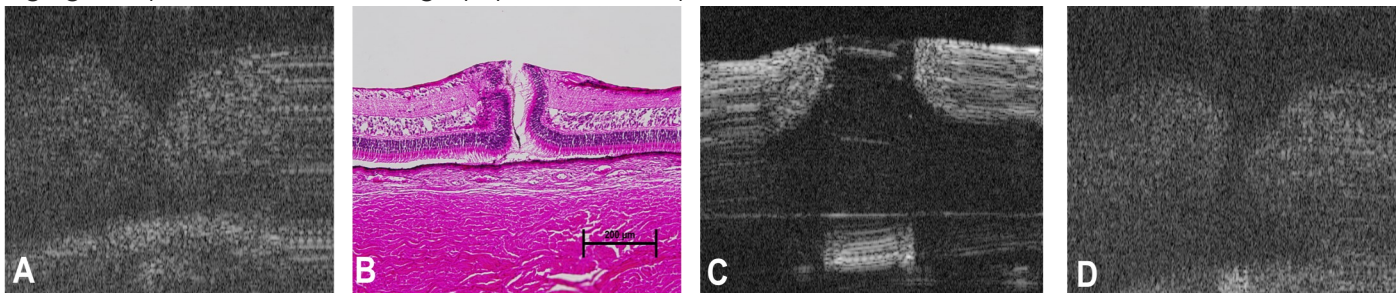


## Technology Features

- Miniature 25-gauge probe can fit within 1.2mm diameter endoscopic working channel.
- Forward scanning.
- Provides a means of real-time monitoring and guidance of surgical procedures.
- Optimized to use with commercially available 850 nm spectral domain OCT Systems.

## Technology Development Status

Working prototypes have been developed and used in a porcine model to demonstrate that the OCT probe can monitor and guide retinal procedures in real time. This OCT probe has also been successfully used as an imaging component of robotic surgery systems developed at Vanderbilt.



A. Partial retinal laser incision (OCT) B. Complete retinal laser incision (H&E), C. Complete retinal scissors incision (OCT), D. Complete retinal laser incision (OCT) .

## Intellectual Property Status

Issued US Patents [8,655,431](#) and [9,014,788](#); [PCT/US11/38593](#), nationalized in US, EU, and CA

### CTTC Contact:

Taylor Jordan, JD  
615.936.505  
Taylor.Jordan@Vanderbilt.edu

### Vanderbilt Lead Inventors:

Karen Joos, MD.  
Jin Shen, Ph.D.  
Vanderbilt Eye Institute  
<https://medschool.vanderbilt.edu/ophthalmology/joos-laboratory-glaucoma-and-laser-research>

VU Reference Number: VU0940

