

# Barrow researchers prove utility of imaging tool in surgeon's hand

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Scientists at Barrow Neurological Institute have recently made discoveries about use of a new technology for imaging brain tumors in the operating room—a finding that could have important implications for identifying and locating invading cells at the edge of a brain tumor. The research, led by neurosurgeons, Drs. Mark Preul, Nikolay Martirosyan, Peter Nakaji, and Jennifer Eschbacher, was published in the April issue of *Neurosurgical Focus*.

Dr. Preul directs the Neurosurgery Research Laboratory of the Barrow Neurosurgical Institute, which has carried out the pioneer work in applying and developing confocal laser endomicroscopy for [brain tumors](#). His research largely focuses on new means to incorporate imaging methods to view cells of brain tumors with a hand held instrument that a neurosurgeon can use to visualize the individual cells during the progress of the operation. On the fly, neurosurgeons can use the pen-sized instrument on the brain to view the [tumor cells](#) with unique fluorescent characteristics that outline the tumor cells. Images of the tumor cells are immediately created on an LCD screen observed as the surgeon scans the instrument across the tumor or brain surface. In the first study to compare use of the confocal laser endomicroscope to frozen section biopsy, the endomicroscope images could identify and characterize the tumor tissue as well as sampling the tissue, or, frozen section biopsy.

"For the first time we have an instrument that can visualize the cells of the tumor as we are operating on the brain. We can immediately detect a region that harbors tumor, and see the border of the brain tumor. This is

especially beneficial for malignant tumors where the amount of tumor removed may play a huge part in the survival time of the patient. This is personalized medicine on the surgical front with a new imaging tool in the surgeon's hand," says Dr. Preul.

The research was conducted in the neurosurgery department of the Barrow Neurological Institute. Preul and the team came to their results by using the confocal laser endomicroscope on 74 brain tumor patients. The research was funded by the Barrow Neurological Foundation.

The eventual goal of this research is to develop the instrument to a degree that it is FDA approved and can speed up the process of pathology interpretation of brain tumor tissue. Hopefully this technology will improve [brain tumor surgery](#) by allowing for a more tailored removal of the tissue and allowing for more aggressive management at the tumor border.

Next steps for this research will see new refinements in the endomicroscope [instrument](#) and development of new tumor cell stains and probes that light up the [tumor](#) cells to an even greater degree.

Provided by St. Joseph's Hospital and Medical Center

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