

**Emory Researchers Awarded \$1.6 Million to Study Common Type of Pituitary Tumor**  
30 March 2005

Researchers at Emory University have received a \$1.6 million grant from the National Institutes of Health (NIH) to study what makes the most common type of pituitary tumors grow and if there's a better method of diagnosing and treating these tumors. Pituitary tumors occur in 20 percent of the population and make up 10 percent of all types of brain tumors.

Because there is limited medical treatment and no specific imaging tests for this common tumor, known as a non-functional pituitary tumor, the scientists hope this research will provide them with answers to better help treat affected patients.

Tumors in the pituitary gland can cause a variety of complications. The pituitary gland is located just below the brain and secretes hormones including growth hormones, thyroid stimulating hormones and sexual hormones in males and females. Tumors found in the pituitary gland can be functional or non-functional. Functional pituitary tumors, which produce specific hormones, can result in life-threatening diseases, infertility and impotence. Non-functional pituitary tumors, which do not secrete hormones, are the most common pituitary tumors and are not life threatening. However, non-functional pituitary tumors can cause low levels of pituitary hormones, a condition known as hypopituitarism, and blindness.

This four-year study will focus on non functional pituitary tumors because they are so common. While most non-functional tumors are benign and can be treated with surgery, up to 35 percent need additional treatment with surgery and radiation. Approximately 20 percent of treated patients have serious side effects, suggesting the need for better therapy.

"One part of our research study will look at folate receptor alpha (FRa) overexpression in non-functional tumors and the mechanisms that cause these tumors to grow," says Nelson Oyesiku, MD, PhD, FACS, professor of neurosurgery and director of the Laboratory of Molecular & Biotechnology at Emory. Dr. Oyesiku is also principal investigator of the NIH research award.

Folate receptors are receptors that allow an essential vitamin -- folic acid -- to enter into the cells. When the receptors are overexpressed, the cells have too many receptors on the surface of the cells. These cells act as markers, and to expert scientists, they look almost as if they have been red-flagged.

"The goal is to determine the molecular factors controlling the proliferation of the tumors. We believe that FRa holds significant promise for medical treatment of non-functional tumors by enabling molecular imaging and targeting of these tumors to identify and select tumors that may respond to folate-targeted therapy," says Dr. Oyesiku.

Dr. Oyesiku and colleagues will first look at FRa overexpression and why the mechanism encourages tumors to grow. The team will also test certain cytotoxic agents (chemicals that destroy cells or prevent cell division to prevent tumors from growing) in cell culture. These findings could later lead to animal models for testing agents. For the third prong, the researchers will take their work out of the laboratory and into the hospital to look for better ways to image and diagnose the tumors. Now, the standard diagnosis is by MRI.

The researchers hope to enroll 100 participants in this study to undergo an imaging test that allows doctors to visualize functional information about specific areas of the body, such as how much blood flow is getting to a particular organ or tissue. In this case, the pituitary gland and the tumor will be imaged by a SPECT (Single Photon Emission Computed Tomography) scan.

Doctors hope the SPECT scan, also known as a "Folatescan", will help easily identify patients that have folate receptors, or markers, on their tumors.