Ochsner-Tulane Collaboration Reveals Potential Blood Biomarker for Stroke Diagnosis

Research study featured in prestigious medical journal

NEW ORLEANS—A collaboration between Ochsner Medical Center Vascular and Endovascular surgeon, Dr. Hernan Bazan and Tulane University School of Medicine Assistant Professor, Dr. Cooper Woods is developing new understandings on carotid plaque rupture and stroke. The research, which builds upon a previous study shows changes occurring in the carotid plaques of patients who have had a stroke are also present in the circulation, in the blood. As such, this could be developed as biomarkers of carotid plaque rupture and risk of future carotid-related stroke. The new research, which is featured in the August issue of Circulation: Cardiovascular Genetics, demonstrates that specific changes in certain non-coding RNA molecules responsible for maintaining a carotid plaque stable by allowing vascular smooth muscle cells to maintain a healthy mass are also occurring in the blood.

The goal of the research study is to develop a test that would minimize the time between a stroke and accurate diagnosis, ultimately leading to earlier treatment, and to be able to identify which patients with asymptomatic carotid disease are at greatest risk of future carotid plaque rupture and stroke.

Using a carotid biobank established at Ochsner in 2010 by Dr. Bazan, he and Dr. Woods examined blood samples of 112 patients to identify differences in the blood. Earlier work by this team of researchers identified specific non-coding RNA changes occurring in carotid plaques shortly after a patient sustained a stroke and published in the journal Stroke in December 2015. This latest work demonstrates that these changes can also be observed in the blood allowing for the development of future diagnostic tests aimed at improving treatment of patients at risk for stroke.

The samples were collected from patients undergoing carotid endarterectomy (CEA) at Ochsner Medical Center – Jefferson Highway and were divided into three groups:

- Those without a stroke in the previous six months (asymptomatic)
- Patients with acute stroke or transient ischemic attack, or “mini-stroke,” within five days of CEA (urgent)
- Patients with reduced blood flow to the brain within five to 180 days of the CEA (symptomatic)

The levels of specific non-coding RNA were then measured by Dr. Woods’ laboratory in the Departments of Physiology and Medicine. Analysis of the data identified that the ratio of two non-coding RNA was highly predictive of those patients in urgent group.

In an accompanying editorial by Professor Lars Maegdefessel, in the Karolinska Institute in Sweden, they call this work “a novel tool to monitor aggravation of advanced atherosclerotic lesions” because “there is a great need for biomarkers that can support clinicians to follow and predict the progression of carotid artery disease toward an unstable, rupture-prone lesion. Capturing high-risk individuals who could benefit from an intensified therapy (including a surgical intervention such as carotid endarterectomies) is of eminent importance.”

“This work represents an important step towards understanding and predicting carotid-related strokes,” said Hernan Bazan, MD FACS, Associate Professor and Program Director of the Vascular Surgery Fellowship at Ochsner Health System. “As a full-time vascular surgeon, I have a passion for not only treating patients, but understanding their conditions. Through ongoing translational research such as this, we are aiming to develop better treatments and work towards preventing these episodes.”
“Studying the processes that lead up to a stroke or heart attack is technically challenging, stated Cooper Woods, PhD, Assistant Professor in the Departments of Physiology and Medicine at Tulane University School of Medicine. “This collaboration between Tulane and Ochsner uses state of the art of methodology to examine the changes that occur in the artery very close to the time of a stroke. This paper is an example of how this approach can lead to important findings that have the potential to greatly enhance future patient care.”

This research study hopes to find indicators of stroke with the aim of early detection and prevention. Someone in the United States has a stroke every 40 seconds and every four minutes, someone dies from a stroke. Early detection of strokes could potentially improve recovery and reduce morbidity. Ochsner Neuroscience Institute’s Comprehensive Stroke Center has become a destination center for stroke patients across the Gulf South. Through the Telestroke System, Ochsner can provide rapid treatment of stroke through connecting physicians via telemedicine so that they are virtually “at the bedside” within minutes in over 30 emergency departments in the region.

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**About Ochsner Health System**
Ochsner Health System is Louisiana’s largest non-profit, academic, healthcare system. Driven by a mission to Serve, Heal, Lead, Educate and Innovate, coordinated clinical and hospital patient care is provided across the region by Ochsner’s 29 owned, managed and affiliated hospitals and more than 80 health centers and urgent care centers. Ochsner is the only Louisiana hospital recognized by U.S. News & World Report as a “Best Hospital” across three specialty categories caring for patients from all 50 states and more than 80 countries worldwide each year. Ochsner employs more than 18,000 employees and over 1,100 physicians in over 90 medical specialties and subspecialties, and conducts more than 600 clinical research studies. Ochsner Health System is proud to be a tobacco-free environment. For more information, please visit ochsner.org and follow us on Twitter and Facebook.

**About Tulane University School of Medicine**
One of the nation’s most recognized centers for medical education, Tulane University School of Medicine is a vibrant center for education, research and public service. Tulane School of Medicine is the second-oldest medical school in the Deep South and the 15th oldest medical school in the United States. Tulane School of Medicine recruits top faculty, researchers and students from around the world, and pushes the boundaries of medicine with groundbreaking medical research and surgical advances. Tulane remains in the forefront of modern medical innovation and is equipping the next generation of medical professionals with the tools to succeed in the rapidly changing future of health care.