UNIVERSITY OF GEORGIA
Regenerative Bioscience Center

Brain glue, a substance that could one day serve as a treatment for traumatic brain injuries (TBIs)

A new study led by the University of Georgia Regenerative Bioscience Center (RBC) team showed that a patent-pending brain glue significantly protected brain tissue from severe TBI damage. The paper, published in Science Advances, presented the first video evidence that the gel protects against the loss of brain tissue after a severe injury and may also aid in functional neural repair.

At a cost of $38 billion a year, an estimated 5.3 million people are living with a permanent disability related to TBI in the U.S. today, according to the Centers for Disease Control and Prevention. The Brain and Spinal Injury Trust Fund Commission reports that TBIs cost Georgians over $1.5 billion annually in lost wages and medical costs.

UGA RBC (lead), UGA Complex Carbohydrate Research Center, UGA Biomedical and Health Sciences Institute, Duke University and Georgia Tech College of Engineering

Initially funded by the Center for Regenerative Engineering & Medicine, known as REM, a collaborative initiative launched in 2011 between UGA, Emory University and Georgia Tech

"This study has been four to five years in the making. Our collaborative research is so painstakingly documented that, after you read about it, you have to believe there is new hope for severe victims of brain injury."

— RBC research team

Exosomes promote remarkable recovery in stroke

In the journal Translational Stroke Research, the RBC team presented brain-imaging data for a new stroke treatment that supported full recovery in swine, modeled with the same pattern of neurodegeneration as seen in humans with severe stroke.

It's been almost a quarter century since the first drug was approved for stroke. But what's even more striking is that only a single drug remains approved today. Studies say risk factors in the "stroke belt," which includes Georgia, is 34% higher for the general population than elsewhere in the U.S.

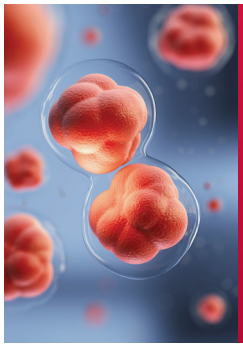
UGA RBC (lead), UGA Veterinary Teaching Hospital and Aruna Biomedical

"It was eye opening and unexpected that you would see such a benefit after having had such a severe stroke. Perhaps the most formidable discovery was that one could recover and do so well after the exosome treatment."

— RBC research team

Medical research teams are using our own cells to cure disease

To combat the cost of chronic disease, a multidisciplinary consortium called the Center for Cell Manufacturing Technologies, or CMaT, backed by the National Science Foundation, is producing cell-based therapies — products designed to cure and promote self-healing — with more consistent quality in much larger quantities. The CMaT



"By bonding together around a common goal and CMaT's cross-institutional investments, we will have a greater impact on the development and the prosperity of each other's local economies, as well as that of the state of Georgia."

— RBC research team

partnership offers hope of new therapy and cures — and provides Georgia the opportunity to become the next big biotech hub for jobs.

Healthcare spending is projected to accelerate over the next decade, and a RAND study found that 60% of American adults now live with at least one chronic condition. Chronic diseases, such as asthma, cancer, diabetes and heart disease, cost Georgia approximately $40 billion each year, according to the Georgia Department of Public Health.

UGA RBC (campus lead), UGA College of Engineering and UGA Institute of Bioinformatics

The CMaT research consortium, consisting of more than 100 members working in universities, industry and government agencies, is headquartered in Atlanta at Georgia Tech as part of the Marcus Center for Therapeutic Cell Characterization and Manufacturing.

Growing back the lymph system

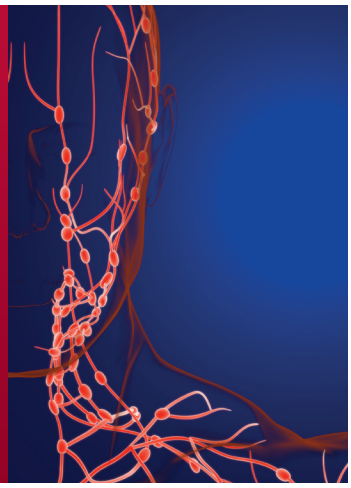
Published in Nature Biomedical Engineering, the findings lay the foundation for a new class of treatment options for lymph-related disorders, such as chronic wound complications, and could even help prevent the spread of cancer.

Lymphatic dysfunction is connected to a variety of diseases, including both cardiovascular disease and cancer. For example, breast cancer cells break away from the primary tumor and travel through the lymphatic system. If left alone, they can spread throughout the body.

UGA RBC (lead), UGA College of Veterinary Medicine, Georgia Tech George W. Woodruff School of Mechanical Engineering and the Albert Einstein College of Medicine

"We're excited because there is now an animal model that we can use to put the lymphatic vessel under this state of prolonged stress that wasn't a result of the initial injury, but a result of the vessel's adaptation to the surgery. It's a good model for what happens to a human."

— RBC research team



This study was funded by the Regenerative Engineering and Medicine (REM) seed grant program.

Building upon transformative success, the RBC proposes to develop the Translational Biomedical Center of Excellence (TBCE) to promote faster development and transition early-phase therapeutics into clinical treatments.

An investment in the TBCE is expected to significantly enhance UGA's translational research capabilities in this rapidly growing field by expanding our expertise in strategic areas and providing access to core research technologies. This investment will help UGA translational research successfully compete for multimillion-dollar National Institutes of Health and Department of Defense center and program grants. The TBCE will be an academic center of excellence that will train tomorrow's leading researchers and develop cures of the future.

To learn more, visit rbc.uga.edu.

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