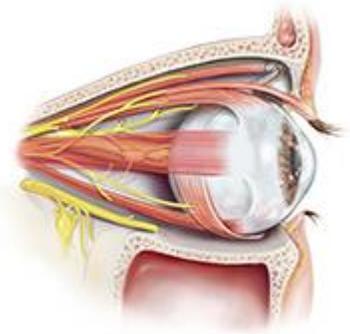




## **\$1.25 Million Received from Defense Department to Make Whole-Eye Transplantation a Reality**

University of Pittsburgh School of Medicine researchers co-lead by McGowan Institute for Regenerative Medicine faculty members [Vijay Gorantla, M.D., Ph.D.](#), associate professor of surgery in the Department of Plastic Surgery at the University of Pittsburgh and the administrative medical director of the Pittsburgh Reconstructive Transplant Program at UPMC, and [Joel Schuman, M.D.](#), chair of the Department of Ophthalmology, Pitt School of Medicine, and director of the UPMC Eye Center, have been awarded \$1.25 million from the U.S. Department of Defense (DOD) to fund two projects that aim to establish the groundwork for the nation's first whole-eye transplantation program.



Offered through the DOD's Vision Research Program, the grants support conceptually innovative research that ultimately could lead to critical discoveries or major advancements. The Pitt researchers will lead a multidisciplinary consortium that includes clinicians and scientists from Harvard University and the University of California, San Diego.

Although corneal transplants are routinely performed today, whole-eye transplantation has remained an unrealized goal in vision restoration because of challenges related to immune rejection and reestablishing the connectivity of the optic nerve to the visual centers in the brain.

The Audacious Restorative Goals in Ocular Sciences (ARGOS) Consortium established at Pitt will be the first cross-disciplinary, systematic attempt to explore strategies to enable corneal regeneration, retinal cell survival, long-distance optic nerve regeneration with cortical integration, and whole-eyeball transplantation.

“Recent advances in our understanding of retinal ganglion cell survival and successes with optic nerve regeneration in experimental studies strengthen our hope that whole-eye transplantation is an audacious yet achievable goal,” said Dr. Gorantla. “Our experience with transplanting complex immunogenic tissues, such as the hand, will help us optimize treatments for rejection in eye transplants.”

According to the DOD, blast injuries are the most common for soldiers wounded in action, with up to 40 percent of blast injuries affecting the eyes. Approaches to minimize worsening of injury to the eye after trauma, preserve and protect residual retinal and optic nerve function, and restore vision are all goals that will be investigated.



“This is an aggressive program with very high-risk and high-reward scenarios. We’re excited to be leading the project and honored to be collaborating with global leaders in optic nerve regeneration,” said Dr. Schuman. “By solving one facet of the problem at a time, the long dreamed-of goal of whole-eye transplantation may be possible with the promise of a better life for millions of patients worldwide.”

Sub-awardees of the current award include Jeffrey Goldberg, M.D., of the University of California, San Diego; and Larry Benowitz, Ph.D., of Harvard University.

In a related project led by principal investigator Kia Washington, M.D., assistant professor of plastic surgery, University of Pittsburgh School of Medicine, the research team will focus on establishing baseline viability and structural integrity in an animal model of whole-eye transplantation. The researchers will examine immune rejection and evaluate the usage of extracellular matrix therapy for improvement of optic nerve function after whole-eye transplantation.

“We have successfully performed an eye transplant in a small animal model,” said Dr. Washington. “This ongoing project may eventually lead to restoration of vision after trauma or degenerative disease.”

The Louis J. Fox Center for Vision Restoration will provide additional key funding for the whole-eye transplantation effort.

Illustration: Randall Mackenzie Illustrations.

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