The Lions Eye Institute for Transplant & Research

The only combined eye bank and ocular research center in the world.

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Hundreds of thousands of people worldwide experience the onset of corneal blindness each year, but sight restoration is possible in many cases through corneal transplantation. Corneal tissue for these procedures is largely provided by eye banks, which retrieve and store eyes for transplant and research purposes. With most eye banks, however, the only tissue that is donated for research is that which did not meet transplant criteria.

The Lions Eye Institute for Transplant & Research (LEITR) is a nonprofit organization that was founded by Lions Club members in 1973. Unlike traditional eye banks, LEITR, located in Tampa, FL, is a combined eye bank and ocular research center. Each year, LEITR distributes approximately 6500 eyes for corneal transplantation and research. With both eye banking and research objectives, LEITR has provided sight to more than 55 000 individuals around the world and has hosted a number of studies to advance the understanding and treatment of blinding eye diseases.

EYE BANK

As one of the largest recovery agencies in the world, LEITR recovers tissue from thousands of donors each year. In recent years, the institute has provided roughly $1 million in ocular tissue to individuals who could otherwise not afford corneal transplant surgery. Like most eye banks, LEITR initially devoted the majority of its tissue to transplantation; however, several years ago, the organization began contemplating donating more toward research.

"In 2004, about 70% of the tissue that we were using was for corneal transplants only, so only about 20% or 25% was being used for research" Jason K. Woody, President and CEO of LEITR, said in an interview with *Retina Today*. "The [LEITR] board asked, what if we could work with different research, academic, and pharmaceutical groups and build something much larger? What if we were involved in diseases such as glaucoma, age-related macular degeneration, and diabetes? We could help millions of people."

Figure 1. Lab sleep suite for researchers conducting research at LEITR.

According to Mr. Woody, LEITR then began putting more effort into research tissue. "Last year, we provided more than 3200 corneas for transplantation and 3300 globes for research" he said. "So in that 5- or 6-year period, we transitioned to a 50/50 focus on transplantation and research."

OCULAR RESEARCH CENTER

The process of testing a new ophthalmic drug or

Figure 2. A donor cornea is precut for a surgical transplant using the DSAEK technique.

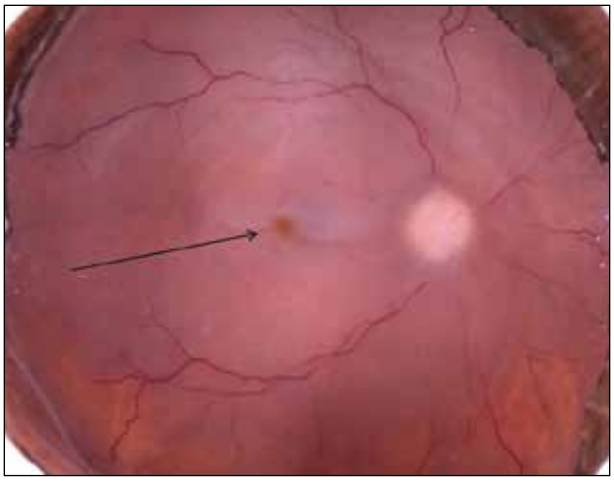

Figure 3. A human retina donated to LEITR for research purposes.

device typically begins in animal models; however, research on human tissue is of far greater relevance and offers researchers greater insight into eye diseases and potential treatments. Unfortunately, a great deal of research has been conducted in animal models simply because researchers believe that human tissue is not available, Mr. Woody explained.

LEITR has dedicated significant resources to provide healthy and diseased human ocular tissue for research. Further, the institute's 12 000-square-foot facility (4000 square feet of which has so far been built) features state-of-the-art laboratories and hotel-style sleep suites (Figure 1), enabling researchers to conduct on-site studies around the clock. Investigators may obtain whole globes, corneas (Figure 2), lenses, sclera, retinas (Figure 3) or retinal pigment epithelium, trabecular meshwork, optic nerves, and endothelial cells. A processing fee for the tissue and another fee for use of the facilities is applied. Researchers are assigned to their own lab for the duration of their stay and are able to bring any special equipment that they may need.

On-site capabilities greatly reduce the post-mortem time interval, providing researchers the opportunity to work with extremely fresh tissue, often within 4-6 hours of the patient's death. Additionally, the ability to reside in the building in such close proximity to the lab condenses study time. "When Duke University came down, they had 4 sets of tissue waiting for them when they hit the ground at the airport," Mr. Woody said. "They worked for 32 hours straight because we had so much tissue for them. Studies that would normally take 2 or 3 months are being done here in less than 1 week."

In addition to those from Duke University, researchers from the Karolinska Institute/St. Eriks Eye Hospital, Singapore National Eye Centre, Emory University, University of Arizona, and Georgia Tech have used the LEITR facilities.

Despite its value for corneal transplantation, donor tissue plays a key role in research efforts geared toward understanding, treating, and preventing eye diseases. However, many older patients may not be aware of the research value of their ocular tissue. To further enable the efforts at LEITR, it is important that medical professionals educate patients and their family members about organ donation.

"A corneal transplant can help 1 person, but for researchers, that could be the final set of research tissue needed to find the gene to help millions of people," Mr. Woody said. "Older patients are starting to feel that they can contribute, they can give something back. I think a lot of patients find comfort in the fact that they can be donors."

CONCLUSION

Human ocular tissue provides an innovative avenue of research for academia and industry. A new model and opportunity to utilize LEITR's new facilities for preclinical studies is being realized. In addition, the ability to demonstrate early proof of concept for ophthalmic drugs, drug delivery and medical devices is an exciting prospect for the future.

To learn more, contact LEITR at info@LionsEyeInstitute.org or visit www.LionsEyeInstitute.org. ■

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