

A New Online Portal Will Match Eye Banks With Researchers Seeking Human Ocular Tissues

Christine A. Curcio

Department of Ophthalmology and Visual Sciences, School of Medicine, University of Alabama at Birmingham, Birmingham, Alabama, United States

Correspondence: Christine A. Curcio, Department of Ophthalmology, EyeSight Foundation of Alabama Vision Research Laboratories, 1670 University Boulevard Room 360, University of Alabama School of Medicine, Birmingham, AL 35294-0019, USA; curcio@uab.edu.

Citation: Curcio CA. A new online portal will match eye banks with researchers seeking human ocular tissues. *Invest Ophthalmol Vis Sci*. 2018;59:4796–4797. <https://doi.org/10.1167/iavs.18-25632>

Modern investigative ophthalmology and vision science uses human ocular tissues for laboratory studies of anatomy, physiology, biochemistry, pathology, genomics, and proteomics, as well as for ophthalmic device research and development. Population aging increasingly focuses attention on chronic diseases, such as age-related macular degeneration (AMD), glaucoma, and diabetic retinopathy. Seminal discoveries in human eyes can set a course for an entire research field to follow. Furthermore, the need to revisit well-characterized human tissues in light of new information arising from clinical observations and research using model systems is ongoing. Because the macula, aqueous outflow tract, and lamina cribrosa have unique biology, human tissue will be a mainstay of AMD and glaucoma research for the foreseeable future. To address AMD specifically, recent editorialists have called for new and compelling molecular pathology data from human donor eyes.^{1,2}

In 2005, vision researchers and representatives of eye banks convened to discuss the declining availability of human eye tissue recovered for research purposes, resulting in a 2006 editorial in *Investigative Ophthalmology & Visual Science (IOVS)*.³ This article documented the decline, described how changes in the eye banking industry in prior decades contributed, and called for renewed communication between scientific and eye bank communities to meet tissue needs for research.

Thirteen years later, vision researchers and representatives of eye banks, under the auspices of The Association for Research in Vision and Ophthalmology (ARVO) and the Eye Bank Association of America, again convened with much the same mission. The outcome of a survey of ARVO members regarding human tissue used in their research is now reported.⁴ Salient points of the survey, which included ARVO members from 34 countries, as well as multiple research areas and career stages, include: (1) a widespread consensus among researchers that human tissues are needed for individual programs, (2) an expressed difficulty in obtaining tissues within a preferred death-to-preservation interval (typically 6 hours) and accompanied by adequate clinical documentation, and (3) interest in a new online portal, set to launch in the fall of 2018. At the portal, United States eye banks will register answers to standardized questions about tissue availability and services, allowing researchers to seek a tissue source that best fits their needs. Although many researchers will continue to use local eye banks, the portal holds promise to link tissue providers and interested users, wherever they are.

It is time to consider a next step in the overall goal of well-informed, transparent, and reproducible use of human ocular tissues for impactful research—the development of guidelines for publishing data obtained from human tissues. Ideally a checklist can be developed that can guide authors and reviewers alike. This goal also is consistent with the National Institutes of Health (NIH, Bethesda, MD, USA) Rigor and Reproducibility movement.

Specific points to consider for guidelines include these, and others:

1. Manuscripts using human tissues should have a Methods section describing all procedures.
2. What organization provided tissue? Naming the eye bank demonstrates to governing boards that research donations make a difference and to readers that eye banks are partners in the enterprise.
3. What were the criteria for recovery given to the eye bank?
4. What was the time interval between death and preservation, and death and utilization? Eyes may be recovered right after death, but overnight shipping inserts a delay that obviates the value of rapid recovery. RNA starts degrading quickly after death in eyes under typical eye bank conditions.⁵ For example, brain (analogous to retina) has much better RNA quality with rapid versus delayed recovery.^{6,7}
5. If diseased and comparison tissues are used in a study, how was a diagnosis made, by whom, and by what criteria? Are these diagnostic criteria also used by others, and are they consistent with available clinical guidelines?
6. What specialized dissection techniques and tools are needed to prepare tissues for assays?
7. Were tissues subdivided for regional analysis?

The ARVO-sponsored task force of researchers and eye bank representatives has taken the lead in developing a mechanism for certifying eye banks as research resources, culminating in this web-based portal. Accordingly, it is fitting that *IOVS*, ARVO's flagship journal, will take the lead on developing publication guidelines, as a collaboration among stakeholders, including authors, editors, and eye bank representatives. A committee of editorial board members and designated interested parties will convene with the goal of presenting materials to the full editorial board at the 2019 Annual Meeting in Vancouver, British Columbia, Canada.

Acknowledgments

Supported by NIH Grants 1R01EY027948-01 and R01EY015520, unrestricted funds to the Department of Ophthalmology and Visual Sciences from Research to Prevent Blindness, Inc., and EyeSight Foundation of Alabama.

Disclosure: C.A. Curcio, None

References

1. Dryja TP. Early insight into neovascular age-related macular degeneration. *JAMA Ophthalmol*. 2016;134:1281-1282.
2. Bird AC, Bok D. Why the macula? *Eye (Lond)*. 2017;32:858-862.
3. Curcio CA; Research Tissue Acquisition Working Group. Declining availability of human eye tissues for research. *Invest Ophthalmol Vis Sci*. 2006;47:2747-2749.
4. Stamer WD, Williams AM, Pflugfelder S, Coupland SE. Accessibility to and quality of human eye tissue for research: a cross-sectional survey of ARVO members. *Invest Ophthalmol Vis Sci*. 2018;59:4783-4792.
5. Malik KJ, Chen CD, Olsen TW. Stability of RNA from the retina and retinal pigment epithelium in a porcine model simulating human eye bank conditions. *Invest Ophthalmol Vis Sci*. 2003;44:2730-2735.
6. Trabzuni D, Ryten M, Walker R, et al. Quality control parameters on a large dataset of regionally dissected human control brains for whole genome expression studies. *J Neurochem*. 2011;119:275-282.
7. Beach TG, Sue LI, Walker DG, et al. The Sun Health Research Institute Brain Donation Program: description and experience, 1987-2007. *Cell Tissue Bank*. 2008;9:229-245.