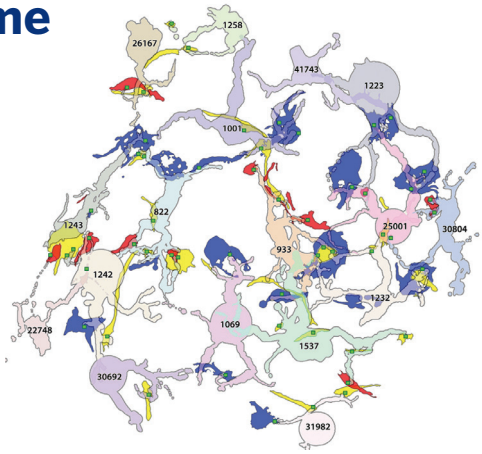
NEWS
60 YEARS
Research to Prevent Blindness
FALL 2020

Researchers Create World's First Pathoconnectome

RPB-supported researchers at the University of Utah Health Sciences Center's John A. Moran Eye Center completed the first map of the neuronal connections of the retina, or a connectome, in 2011. This September, they announced the completion of a pathoconnectome, which shows how eye disease alters retinal circuitry. The pathoconnectome is based on a model of retinitis pigmentosa, for which they constructed an immense data set that took years to compile.

Notably, the implications of the published research reveal abnormalities not only in eye diseases, but suggest applications in Alzheimer's disease, Parkinson's disease, epilepsy and Lou Gehrig's disease. "The components of neurodegeneration we see in the eye seem to mimic those we see in the brain," explained researcher Rebecca L. Pfeiffer, PhD. "So this pathoconnectome is allowing us to learn fundamental rules of how neurodegenerative diseases alter neural networks in general."



A pathoconnectome image showing rod bipolar cell dendrites and their synapse locations with rod (red), cone (blue) and indeterminate (yellow) photoreceptors.

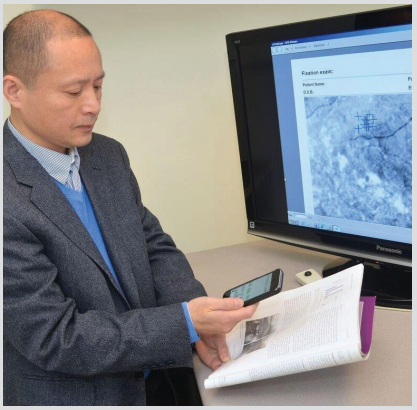
Dr. Pfeiffer indicated that the ultimate goal of this work is to develop new therapies that prevent or interrupt disease-based network rewiring. Next, the researchers will construct new pathoconnectomes that will show how the retina rewires itself in later stages of retinitis pigmentosa.

RPB CDA to Lead NEI

Congratulations to Michael Chiang, MD, of Oregon Health and Science University Dept. of Ophthalmology, who has been named the new director of the National Eye Institute. Dr. Chiang received a four-year RPB Career Development Award in 2005. RPB is proud to have recognized and nurtured his tremendous potential early in his career.

Apps for People with Low Vision

Researchers at Harvard Medical School created a suite of innovative vision assistance smartphone apps called SuperVision apps, with support from RPB. These apps provide advanced navigation services to people with visual impairment to increase independence and improve quality of life. SuperVision apps are free to the public and are routinely upgraded to improve functionality and performance. Learn more and download the apps at bit.ly/SuperVisionApps.



SuperVision creator Gang Luo, PhD, of Harvard Medical School, received an RPB/Reader's Digest Partners for Sight Foundation/ Consumer Technology Association Foundation "Innovations in Technology Low Vision Award" to support app development.

AI Lends Consistency to ROP Diagnosis

RPB-supported researchers at the Oregon Health & Science University, along with national and international colleagues, evaluated the use of artificial intelligence for providing severity scores for retinopathy of prematurity (ROP), a disorder that causes vision loss in babies. A study assessed the correlation between these severity scores and diagnoses by clinicians. The results showed that a deep learning-derived vascular severity scale is feasible for clinical adoption and could improve consistency of ROP diagnosis.

A GIFT TO RPB CAN SAVE SIGHT

Research to Prevent Blindness, Inc. (RPB) is the only public foundation supporting research aimed at treating, preventing or curing all diseases that damage and destroy vision. Your support is critical to the success of our efforts. Contributions totaling up to $1 million within a calendar year are matched through a fund established by RPB's founder, Dr. Jules C. Stein. Additionally, thanks to anonymous donors, donations made from now until the end of 2020 will be matched *again* (up to $50,000), tripling your impact on vision research!
ALL GIFTS AND BEQUESTS ARE TAX DEDUCTIBLE.

RPB is recognized by the U.S. Internal Revenue Service as a publicly supported tax exempt organization under section 501(c)(3) of the Internal Revenue Code.

Stay in Touch

1-800-621-0026 • www.rpbusa.org
@ResearchtoPreventBlindness
@RPB_org

Healthy Vision Tips from ScEYEnce

This fall, RPB and nine other organizations launched the ScEYEnce campaign to shine a spotlight on the powerful benefits of vision research. Stay up to date with ScEYEnce healthy vision tips and breaking research by following @ScEYEnceNow on Twitter or visiting www.sceyence.org.

Eat Your Vitamins

A study found that pharmacological-level doses of zinc, vitamins C and E, and beta-carotene along with copper may help slow the progression of AMD. Eat carrots, red peppers, spinach, broccoli and strawberries.

Avoid Excessive Caffeine

Too much caffeine can increase your risk for high blood sugar levels. A study has shown individuals who drink 3+ cups of coffee a day can have an increased risk of glaucoma.

Wear Sunglasses

UV-blocking sunglasses delay the development of cataracts. Sunglasses prevent retinal damage, wrinkles and skin cancer around the eye. Check that your sunglasses offer you 100 percent UV protection.

Rest Your Eyes

Try adding the 20-20-20 rule to your routine. For every 20 minutes that you spend staring at a screen, look at something that is about 20 feet in front of you for 20 seconds to reduce eye strain.

Exercise Your Endurance

A new study shows, in mice, voluntary running reduced harmful overgrowth of blood vessels in eyes by up to 45 percent. This overgrowth drives macular degeneration and contributes to other eye disorders that jeopardize vision.

Go Outside

Studies found that children who spend time outdoors have a lower risk of developing myopia. This is because UVB rays cause individuals to release dopamine in the retina, disseminate vitamin D and slow the axial growth of the eye.

More Effective Glaucoma Models

Creating effective and realistic disease models is an important step in developing and testing potential therapies for eye diseases. With this in mind, RPB-supported researchers at SUNY Upstate Medical University developed a new model for primary open-angle glaucoma.

According to the researchers, most current models of the disease do not sufficiently replicate the complex 3D interface between human trabecular meshwork (HTM) cells and the extracelluar matrix. The researchers created a novel HTM hydrogel to fill this gap; early research indicates promise for its use in advanced glaucoma treatment screening.