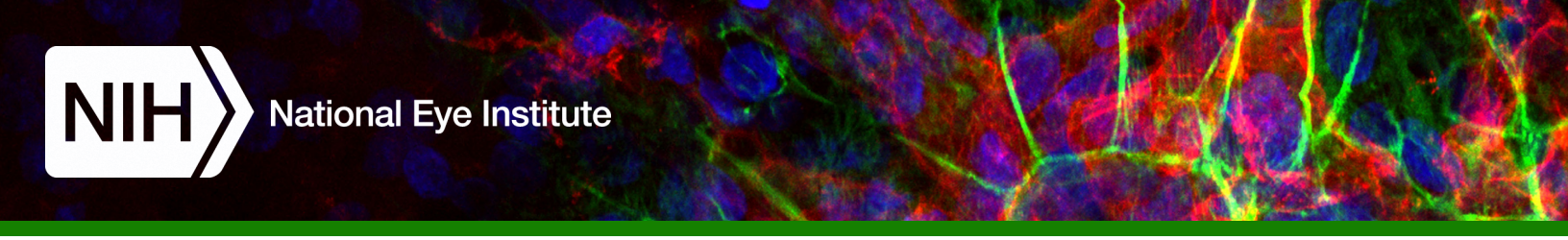

NIH National Eye Institute

Our Accomplishments

The National Eye Institute (NEI) was established by Congress in 1968 to protect and prolong the vision of the American people. NEI research leads to sight-saving treatments, reduces visual impairment and blindness, and improves the quality of life for people of all ages. NEI-supported research has also advanced our knowledge of how the visual system—from the eyes to the brain—works in health and disease.

NEI supports vision research through approximately 1600 research grants and training awards made to scientists at more than 250 medical centers, universities, and other institutions across the country and around the world. NEI also conducts laboratory and patient-oriented research at its own facilities located on the NIH campus in Bethesda, Maryland.

Because of continued Congressional and public support, our national investment in vision research has led to major advances in the prevention and treatment of eye diseases and visual disorders:

- **Diabetic retinopathy.** NEI-funded research has established many treatments for this potentially blinding form of diabetic eye disease. For example, clinical trials showed that laser surgery on the eye, intensive blood sugar control, and lipid-lowering therapies can slow vision loss from the disease.
- **Age-related macular degeneration (AMD).** Clinical trials at NEI have shown that for patients with AMD, taking supplements with high levels of antioxidants and zinc can reduce the risk of vision loss from advanced AMD.
- **Anti-VEGF drugs.** NEI-funded research helped show that a protein called VEGF stimulates abnormal blood vessel growth that occurs in advanced stages of diabetic retinopathy and AMD. NEI has funded comparison trials of anti-VEGF drugs to provide doctors and patients with the information they need to choose the best treatment options.
- **Glaucoma.** NEI has supported research on effective drugs that reduce elevated eye pressure, a significant risk factor for this blinding disease.
- **Laser treatments.** NEI has contributed to the development of medical lasers to treat the wet form of AMD, to diagnose and treat patients with glaucoma, and to correct myopia and other refractive errors.
- **Retinopathy of prematurity (ROP).** NEI-funded research led to a treatment called cryotherapy for this eye disease, which can affect premature infants. Cryotherapy involves briefly freezing the outer parts of the retina, and can prevent blindness from ROP.
- **Amblyopia.** NEI-funded trials have shown that amblyopia—a common childhood condition in which one eye becomes weaker than the other—can be treated by temporarily preventing use of the stronger eye with an eye patch or eye drops. These treatments strengthen the weaker eye by keeping it active and enhancing its connections to the brain.
- **Corneal stromal keratitis.** NEI research discovered that an oral antiviral drug significantly decreases the recurrence of herpes of the eye and reduces the recurrence of corneal stromal keratitis, a severe form of the disease.
- **Uveitis.** Safe and effective drugs have been introduced against certain forms of this potentially blinding inflammation inside the eye. With reports that survivors of Ebola virus infection may be at risk for uveitis, efforts are underway to understand this risk and treat the condition.
- **Retinitis pigmentosa.** NEI-funded researchers have isolated genes and gene mutations at the root of retinitis pigmentosa (RP), a group of inherited diseases that affect more than 100,000 Americans. These researchers have moved on to develop gene therapy approaches that are showing promise for preventing vision loss from RP.

- **Leber congenital amaurosis.** NEI-supported scientists have used gene therapy to partially restore vision to people with this blinding disease that begins in childhood. The gene responsible for LCA was isolated at NEI.
- **Bionic vision.** NEI supported development of the Argus II retinal prosthesis—which consists of video goggles that send visual information to a computerized artificial retina. In 2013, the device received FDA approval for use in people blinded by retinitis pigmentosa. Argus II has yielded modest but life-changing visual improvements for these patients, and has laid the groundwork for more advanced approaches.
- **Noninvasive imaging.** With support from NEI, scientists have developed a technology called optical coherence tomography to see tissues deep inside the eye, noninvasively and in real time. Doctors are using this technology to look for early signs of disease, and to monitor disease progression and treatment response.

Part of the NEI mission is to disseminate information to improve visual health. To meet this objective, NEI established the National Eye Health Education Program (NEHEP), which promotes the importance of early detection and timely treatment of eye disease, and the use of vision rehabilitation services. NEHEP partners with more than 60 professional, civic, and voluntary organizations and government agencies concerned with eye health. The program builds upon and extends NEI-supported research, by bringing evidence-based information to health professionals, patients, and the public.

The Future

NEI continues to pioneer new advances in the prevention and treatment of vision loss:

- **NEI Audacious Goals Initiative (AGI).** Many eye diseases irreversibly damage nerve cells in the retina, which detects light and sends signals to the brain. Often, this damage causes permanent vision loss or blindness. The NEI AGI is coordinating the development of therapeutic approaches for regeneration of the retina and its connections to the brain.
- **Stem cells.** Scientists at NEI are working toward a trial of stem cell therapy for AMD. The trial will investigate whether replacing damaged tissues in the retina with cells derived from patients' own cells can prevent or restore lost vision.
- **Gene therapy.** Researchers are continuing to develop gene-based treatments for a variety of inherited eye diseases. While some therapies to replace defective genes have moved into clinical trials, researchers are also exploring approaches in gene repair.
- **Genetics of complex diseases.** The causes of glaucoma and AMD remain mysterious. Most cases are not inherited, but genetics does play a role. NEI-funded researchers have identified many genetic risk factors for AMD and glaucoma. Further study of these genes is helping to unravel the biology of these diseases and holds promise for improved therapies.

National Eye Institute

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