BrightFocus® Foundation | National Glaucoma Research



Powering Progress
Through Bold Science

2026 National Glaucoma Research Projects

National Glaucoma Research

Driving Breakthroughs to Save Sight

National Glaucoma Research is currently investing



$5 million in

32 research projects across **4** countries.

National Glaucoma Research, a BrightFocus Foundation program, supports groundbreaking research and shares trusted information about this sight-stealing disease impacting more than 4 million Americans.

We believe that by providing initial funding for highly innovative, bold research and creative ideas, we can spark revolutionary approaches and vision-saving breakthroughs for this “sneak thief of sight.”

Explore our grants & trusted glaucoma resources:

brightfocus.org/NGR



You Make Bold Science Possible

Thanks to your generosity, National Glaucoma Research is advancing cutting-edge science on every front—from exploring new ways to regulate eye pressure and understand the root causes of glaucoma to protecting and regenerating the optic nerve.

Because of you, researchers are empowered to test novel hypotheses, challenge conventional thinking, and pursue discoveries that could lead to earlier detection, more effective treatments, and better outcomes for people living with glaucoma.

This research portfolio showcases the work you make possible. Grants are vetted through a rigorous evaluation process by the world's top scientists and clinicians who serve on our Scientific Review Committee.

Together, we are moving closer to a future without glaucoma. Thank you for your support and commitment to a brighter tomorrow.

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This portfolio reflects awarded grants as of July 20, 2026. All grants will be awarded pending conclusion of contract negotiations.

Controlling Eye Pressure in New Ways

Elevated intraocular pressure (IOP) is common in glaucoma when the aqueous humor cannot drain properly. Normally, this fluid drains through the trabecular meshwork into Schlemm's canal and into the bloodstream. Blockages, increased fluid volume, and trabecular meshwork stiffness can raise eye pressure. Grantees are investigating ways to regulate eye pressure, reduce stiffness, and control IOP.



Maldevelopment of Schlemm's Canal in Children with Glaucoma

Revathi Balasubramanian, PhD | Columbia University

The Schlemm's canal and the trabecular meshwork are aqueous humor outflow tissues in the eye that are critical for the regulation of intraocular pressure—a key determinant of glaucoma. Development of the Schlemm's canal is affected in several early-onset forms of glaucoma. This project will elucidate the role of Apelin receptor in Schlemm's canal development and pediatric glaucoma types.



How the Microenvironment Affects Schlemm's Canal Cell Behavior

Samuel Herberg, PhD | SUNY Upstate Medical University

Glaucoma is a leading cause of blindness worldwide, but exactly what causes the disease is unclear. Using a first-of-its-kind 3D fluid drainage tissue model system, the researchers seek to investigate the contributions of glaucomatous biomechanical cues in driving Schlemm's canal cell mechano-dysfunction. This work will set the stage for the identification of future glaucoma therapies targeting cellular biomechanics.



IOP-Related Gene Responses in the Optic Nerve Head and Trabecular Meshwork

Diana C. Lozano, PhD | Oregon Health & Science University
Co-Principal Investigator: Kate Keller, PhD

Elevated intraocular pressure (IOP) is a leading risk factor for primary open-angle glaucoma. Yet, the cellular events that comprise protective homeostatic IOP responses, or damaging events leading to tissue injury, are poorly understood. Researchers will investigate how mild and repeat IOP elevations modify the molecular mechanisms in ocular tissues implicated in glaucoma pathogenesis. This study will advance the understanding of how subtle IOP exposures can cumulatively develop into chronic glaucoma.



Novel Mechanisms to Regulate Eye Pressure

Colleen McDowell, PhD | University of Wisconsin-Madison

Elevated pressure in the eye is a major risk factor for glaucoma and is due to fluid buildup and improper drainage in the eye. It is known that fluid drainage from the eye is not uniform circumferentially, and this study aims to study how these segmental differences in fluid flow are developed and regulated. This data will help identify novel mechanisms to lower pressure in the eye.



Developing a New Glaucoma Treatment That Avoids Daily Drops

Gavin Roddy, MD, PhD | Mayo Clinic Rochester

Glaucoma is a leading cause of irreversible blindness worldwide. Current treatments that require daily instillation of eyedrops to lower pressure cause side effects and fail to adequately treat many patients. Dr. Roddy's lab developed a pressure-lowering drug that acts for 6 months with a single injection. They now seek to test this drug in a large animal model in hopes of bringing a new therapy to patients.



Developing New Drugs for Glaucoma

Pete Williams, PhD | Centre for Eye Research Australia Limited (Australia)

Current treatment strategies for glaucoma only focus on the management of intraocular (eye) pressure. There are no available therapies that target the degenerative processes in the retina and optic nerve themselves. The Williams lab is developing a first-in-class injectable formulation for glaucoma to prevent blindness at its root cause—neurodegeneration in the retina and optic nerve.

Imaging & Exploring the Eye-Brain Connection

Glaucoma causes tiny blind spots, or visual field defects, that can lead to vision loss and blindness, with progression varying among individuals. Early diagnosis is key, and advances in eye imaging now detect the tiniest changes preceding glaucoma. National Glaucoma Research grantees are developing new technologies to image retinal ganglion cells and are investigating cellular communication disruptions, aiming for earlier detection of the disease and new treatments.



Novel Visualization of Aqueous Outflow: Uncovering Glaucoma Mechanisms and Therapeutic Targets

Tyson Kim, MD, PhD | University of California, San Francisco

Recipient, 2026 Thomas R. Lee Award for Glaucoma Research

Glaucoma is strongly influenced by elevated pressure and impaired fluid drainage from the eye. Dr. Kim's team developed a new imaging method that visualizes and quantifies this drainage with microscopic precision. This study will establish a first-of-its-kind framework for directly visualizing and quantifying aqueous drainage dynamics in the eye, fundamentally advancing our ability to understand how outflow is regulated and how it may fail in glaucoma, opening new avenues for more targeted and personalized glaucoma therapies.



The Impact of Glaucoma on Light-Mediated Mood and Sleep Disorders

Xiaorong Liu, PhD | University of Virginia

Co-Principal Investigator: Ignacio Provencio, PhD

A subset of retinal ganglion cells (RGCs), known as ipRGCs, transmit light information from the eyes to the brain for purposes beyond vision, such as regulating sleep and mood. Because people with glaucoma often suffer from light-induced sleep and mood disturbances, researchers aim to understand how ipRGCs control light's effects on mood and sleep.

Predicting Outcomes & Other Treatment Innovations

Approved glaucoma treatments mainly focus on lowering eye pressure through eyedrops or surgery, but these require consistency and carry risks. More reliable treatments addressing the underlying causes beyond eye pressure are needed. Grantees are developing drugs to lower eye pressure and protect nerve cells. They are also exploring genome-editing approaches to restore trabecular meshwork function, stem cell transplantation, lifestyle interventions, and strategies to communicate genetic testing with at-risk individuals.



Foot-Based Monitoring and Feedback to Improve Mobility and Reduce Falls in Glaucoma

Navid Amini, PhD | California State University, Los Angeles

Nearly half of people with glaucoma fall each year. This study uses smart insoles (shoe inserts with motion and pressure sensors) to track how glaucoma patients lift their feet while walking and deliver real-time vibrations on the soles to correct unsafe patterns. Through continuous monitoring and personalized feedback, the research team aims to reduce falls and improve mobility, confidence, and quality of life.



Improving Glaucoma Care with Agentic AI

Mark Christopher, PhD | University of California, San Diego

This project will develop advanced artificial intelligence (AI) tools that combine imaging, functional testing, and clinical measurements over time to understand glaucoma progression. By providing clear, automated summaries for doctors, these tools aim to improve diagnosis and staging, guide treatment decisions, and reduce the documentation burden in glaucoma care.



Saving Sight: A Journey to Healing Without Scars

Jennifer Fan Gaskin, MBChB, MD, FRANZCO | Centre for Eye Research Australia (Australia)
Co-Principal Investigators: Elsa Chan, PhD & Roy Kong, PhD
Mentor: Keith Martin, DM, FRANZCO

Minimally invasive glaucoma surgery is an increasingly popular treatment to prevent ongoing vision loss from glaucoma. However, its success is limited by scarring, and the current use of anti-scarring cancer drugs carry serious long-term risks. This project aims to develop a more effective and safer alternative to improve long-term success of glaucoma surgery and to improve the quality of life for people with glaucoma worldwide.



Retinal Ganglion Cell Axon Degeneration in a 3D Microfluidic Hydrogel Model

Shruti Patil, PhD | Indiana University School of Medicine
Mentor: Jason Meyer, PhD

Retinal ganglion cell (RGC) axons traversing the optic nerve head are highly susceptible to glaucomatous damage, yet the link between optic nerve head biomechanics and RGC axonal degeneration remains poorly understood. To address this, researchers will implement 3D platforms integrating microfluidics and hydrogels with tunable stiffness to model biomechanical aspects affecting RGC axons in the optic nerve head. This offers hope for more effective glaucoma treatments.



Activating the Eye's Own Nitric Oxide to Fight Glaucoma

Myoungsup Sim, PhD | Duke University

In this project, researchers aim to develop safer, longer-lasting glaucoma treatments by restoring the eye's own nitric oxide production. By targeting tiny sensory organelles called primary cilia with a selective enzyme inhibitor, the team seeks to enhance fluid drainage and lower eye pressure naturally. This approach could lead to safer, longer-lasting treatments that better preserve vision in people with glaucoma.



Investigating the Role of Impaired Mitochondrial Dynamics in Exfoliation Glaucoma

Arunkumar Venkatesan, PhD | SUNY Upstate Medical University
Co-Principal Investigator: Audrey Bernstein, PhD

Exfoliation glaucoma is a severe form of open-angle glaucoma that can lead to blindness when flaky material builds up in the eye and blocks normal fluid drainage. This research will investigate how damage to the cell's "power plants," called mitochondria, contributes to the disease and accelerates harmful aging processes in eye cells. The findings could help identify new treatments that protect vision by improving mitochondrial health and slowing disease progression.



Harnessing Artificial Intelligence to Enhance Glaucoma Care

Benjamin Xu, MD, PhD | University of Southern California

Glaucoma is among the most common causes of irreversible vision loss worldwide. A public health crisis is emerging due to the rapid rise in glaucoma prevalence, shortage of eye care providers, and glaring access and equity issues. Researchers will integrate teleophthalmology and artificial intelligence (AI) to enhance the delivery of high-quality, reproducible, equitable, resource-efficient glaucoma care.

Protecting & Regenerating the Optic Nerve

Unlike most cells, the nerve cells providing vision don't regrow once damaged. National Glaucoma Research supports efforts to protect and regenerate retinal ganglion cells (RGCs), which carry visual signals from the eye to the brain. Researchers are also developing neuroprotective drugs to nourish and support fragile RGCs for long-term viability.



Understanding Optic Nerve Head Astrocyte Contributions to Glaucoma

Evan Cameron, PhD | Cleveland Clinic – Lerner Research Institute

This project aims to define the signaling pathways in optic nerve head astrocytes that regulate immune cell-mediated neurodegeneration in glaucoma. This work will serve as the foundation for future astrocyte-targeted therapeutics designed to mitigate or reverse the effects of glaucoma, significantly improving patient vision and quality of life.



Exploring Glucagon-Like Peptide-1 Receptor Agonists for the Treatment of Glaucoma

Qi Cui, MD, PhD | University of Pennsylvania, Perelman School of Medicine

In glaucoma, pro-inflammatory myeloid cells induce retinal ganglion cell death. In this project, researchers will examine monocyte infiltration and microglia activation in experimental glaucoma and the modulatory influence of glucagon-like peptide-1 receptor agonists (GLP1RA). Results will enhance understanding of neuroinflammatory processes in glaucoma and clarify mechanisms behind GLP1RA-induced retinal ganglion cell rescue, helping to guide the development of novel glaucoma therapies.



Using AI to Detect Loss of Connections Between Neural Cells in Glaucoma

Luca Della Santina, PhD, PharmD | University of Houston

Death of retinal ganglion cell in glaucoma is not equal across the retina, with neurons in some regions able to survive longer than others. The reason behind this is still largely unknown. In this project, researchers will create new artificial intelligence (AI) tools to investigate large portions of the retina and use them to assess structure and function of synapses early after ocular pressure elevation in lab models of glaucoma.



Reducing Inflammation to Protect Vision in Glaucoma

Cátia Gomes, PhD | Indiana University

Glaucoma is characterized by retinal ganglion cells (RGCs) degeneration. Inflammatory astrocytes and microglia closely associate with RGC axons at the optic nerve head, the primary site of injury. To investigate how this inflammatory crosstalk contributes to axonal degeneration in glaucoma, human stem cell-derived models and microfluidic devices will be employed to specifically study RGC axons. The results will serve as a strong foundation for future translational studies focused on preventing RGC axonal loss.



Interleukin-10 as a Neuroprotective Factor in Glaucoma

Tatjana Jakobs, MD | Schepens Eye Research Institute of Massachusetts Eye and Ear

Visual impairment in glaucoma is caused by the degeneration and eventual death of retinal ganglion cells through mechanisms that are not fully understood. Retinal microglia can play neuroprotective and neurotoxic roles in glaucoma. Researchers have identified IL10 as a microglia-derived factor with potential neuroprotective effects on retinal ganglion cells. The team will test this with assays of visual function and microscopic analysis of ganglion cell morphology.



Using Nature's Hibernation Strategies to Protect Vision in Glaucoma

Kiyoharu Miyagishima, PhD | National Eye Institute
Co-Principal Investigator: Francisco Manuel Nadal-Nicolas, PhD

Glaucoma, a leading cause of blindness, results from the loss of nerve cells that carry vision signals. Current treatments focus on lowering eye pressure but don't work for all patients. The hibernating ground squirrel naturally protects its eyes under extreme stress. Researchers will investigate the protective exosomes they release, aiming to develop new therapies that directly preserve vision.



How Neural Activity Shapes Vision Recovery in Glaucoma

Yvonne Ou, MD | University of California, San Francisco

This project explores how light and neural activity help the retina protect itself from damage in glaucoma. By studying how retinal cells maintain and rebuild their connections after injury, researchers aim to uncover ways to preserve vision and stimulate repair processes that could benefit people with glaucoma and related neurodegenerative diseases.



Spatial Responses to Elevated Pressure in the Human Optic Nerve Head

Jeremy Sivak, PhD | University Health Network (Canada)

Recipient, 2026 Dr. Douglas H. Johnson Award for Glaucoma Research

Glaucoma irreversibly damages retinal and optic nerve tissue, often in association with high eye pressure. Yet, how pressure affects this tissue in human eyes is unclear. Using a new human tissue model, the research team profiled acute neuroinflammatory responses to pressure. They will compare this data to long-term changes present in glaucoma samples to uncover critical links between pressure and disease—ultimately identifying key early responses in the human optic nerve head that, in time, contribute to adaptive or damaging degenerative cascades.



Role of IOP Elevation in Increasing Vulnerability of Retina to Stress

Dorota Skowronska-Krawczyk, PhD | University of California, Irvine
Co-Principal Investigator: Qing Nie, PhD

Aging, a process where damage accumulates in our cells over time, makes tissues more sensitive to elevated intraocular pressure (IOP). However, it is unknown how cells become more vulnerable as they age. Our experiments will explore how retinas respond to IOP-related stress and the mechanisms behind this vulnerability, aiming to find new ways to protect retinal neurons from glaucomatous changes.



The Immune Landscape of the Human Optic Nerve Head

Monica Vetter, PhD | University of Utah
Co-Principal Investigator: Navita Lopez, PhD

In this project, researchers will study the properties of resident myeloid cells in the human optic nerve head and optic nerve, assess how they change in glaucoma, and define the responses of other immune cell populations. By mapping these cells and defining their molecular signatures, they aim to uncover how neuroimmune responses may have protective or detrimental effects and identify new therapeutic targets to protect vision.



Human Retinal Regeneration to Cure Glaucoma

Karl Wahlin, PhD | University of California, San Diego

Retinal ganglion cell neurons connect the eye to the brain, and when they die, whether through glaucoma or through acute trauma, this leads to permanent vision loss and blindness. Similar to how this occurs throughout the animal kingdom, researchers propose to develop the capability to do this in human retinal tissues through the conversion of existing Müller cells in the eye.

Understanding What Causes Glaucoma

Glaucoma threatens sight by damaging the optic nerve, primarily due to chronic elevated intraocular pressure (IOP) from improper fluid drainage. National Glaucoma Research funds studies on the genetics of glaucoma, including racial and ethnic disparities in its incidence, and more sensitive methods for detecting its onset. Scientists are also developing new research models to better understand glaucoma and create new therapies.



Assessment of Vascular Resistance in Glaucoma

Brad Fortune, OD, PhD | Good Samaritan Foundation (Legacy Health)

Abnormal blood flow within the eye is thought to be one factor contributing to the development and progression of glaucoma. However, questions remain about how and when this occurs. In this project, researchers aim to determine whether vascular resistance is elevated during early stages of glaucoma. Results will contribute important knowledge and useful diagnostic tools to the glaucoma research community.



Measuring the Effects of Visual Stimuli on Retinal Blood Vessels and Flow

Stuart Gardiner, PhD | Good Samaritan Foundation (Legacy Health)

This project will optimize and compare two different methods to quantify the response of the eye to a visual stimulus. Researchers will quantify the effect of stimulation on retinal arterial diameter and blood flow. The ultimate goal is to use the optimized technique to uncover important new information about disease mechanisms and potentially provide new diagnostic biomarkers for disease progression.



Mitochondria in Retinal Ganglion Cells

Rob Nickells, PhD | University of Wisconsin-Madison

Retinal ganglion cells receive input from a tree-like dendritic arbor that exhibits pathology after optic nerve damage. This study examines the biology of energy producing organelles called mitochondria in arbor pathology, including how specialized cells called microglia participate in this process.



Role of a Key Gene, *ANGPTL7*, in Steroid-Induced Glaucoma

Dan Stamer, PhD | Duke University School of Medicine
Co-Principal Investigator: Guorong Li, MD

Glucocorticoids are widely used anti-inflammatory drugs that treat a variety of diseases, but long-term use often results in elevated eye pressure that can lead to glaucoma. Using the most advanced research technologies, researchers aim to understand how ANGPTL7, a glaucoma risk gene, is involved in elevating eye pressure after glucocorticoid treatment.



Understanding How Variants in LOXL1 Affect Pseudoexfoliation Glaucoma Risk

Hannah Youngblood, PhD | Georgia Institute of Technology
Mentor: Raquel Lieberman, PhD

Genetic variants in the LOXL1 gene can alter risk for pseudoexfoliation glaucoma (XFG), a blinding disease that affects more than 10 million people. This project seeks to determine how these variants alter the structure and function of the LOXL1 protein. Successful completion of this project will provide a better understanding of how LOXL1 variants contribute to XFG and provide the groundwork for therapeutic development.



Using Artificial Intelligence to Discover Genetic Risk Factors for Glaucoma Worsening

Nazlee Zebardast, MD, PhD | Massachusetts Eye and Ear Infirmary
Co-Principal Investigator: Mohammad Eslami, PhD

Glaucoma is a leading cause of blindness worldwide, yet physicians cannot predict who will lose vision quickly. This project studies the role of genetics in glaucoma progression using clinical data and machine learning methods. Discoveries may allow earlier detection of high-risk patients, more personalized treatments, and new targets to slow or prevent vision loss.

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