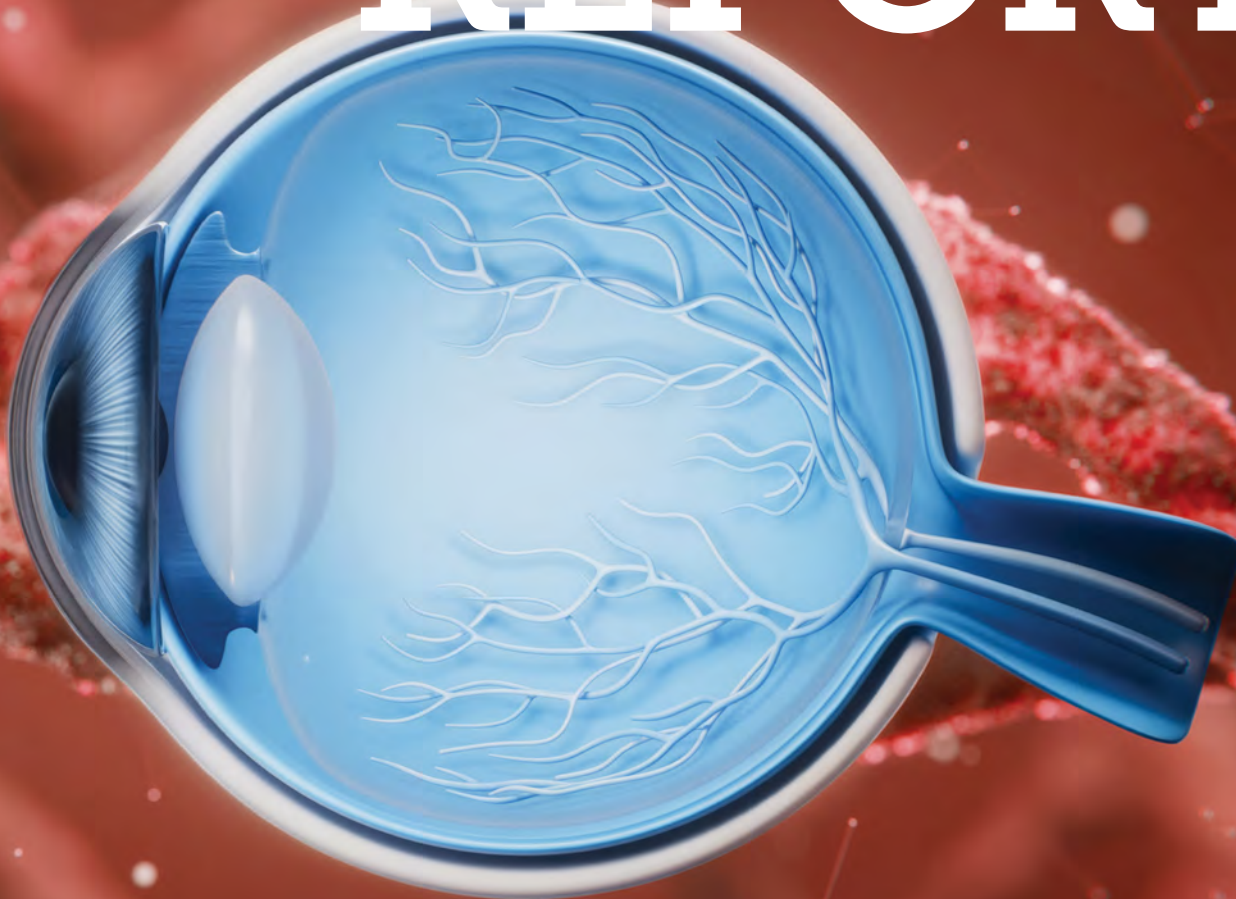


REPORT



Understanding the Hidden Link Between Steroids and Glaucoma

Corticosteroids are some of the most common medications in the world, used every day to treat conditions like joint pain, digestive issues, and eye inflammation. But for nearly one in three people who take them, these drugs can cause eye pressure to rise to dangerous levels, increasing the risk of glaucoma. And as newer, stronger steroids become available, this problem is growing.

With your support, National Glaucoma Research-funded scientists Daniel Stamer, PhD, and Guorong Li, MD, of Duke University, are working to find out why this happens. Their research centers on a

specific gene found in the part of the eye responsible for draining fluid. When this gene is “turned off,” the eye seems to be shielded from the harmful effects of steroids on eye pressure. But until now, no one has understood the reason behind this protection.

Using advanced technology that allows them to study individual cells one at a time, Drs. Stamer and Li are mapping exactly what happens inside the eye when pressure rises or steroids are introduced. Their discoveries could lead to new treatments that prevent glaucoma from developing as an unintended side effect of medications that millions of people rely on.

Thank you, because with your help, this important research brings us closer to protecting the vision of people who may not even realize they are at risk.



President's Corner

I continue to be inspired by the pioneering research made possible by your generosity. Thanks to you, scientists are accelerating discoveries that bring us closer to new treatments for glaucoma and a future without vision loss.

In this issue, you'll discover how a breakthrough finding about mitochondria may unlock new treatments for exfoliation glaucoma. You'll learn how stress accelerates retinal aging, leaving the eye increasingly vulnerable—and what that means for future prevention. Plus, you'll find out how a promising new compound could prevent scarring after glaucoma surgery, and how scientists are uncovering the hidden link between a common medication and rising eye pressure.

Your support fuels this progress. Together, we are advancing science, funding bold ideas, providing valuable information to the public, and creating hope for millions. Thank you for being part of this journey to preserve sight and transform lives.

Stacy Pagos Haller



Researcher Spotlight:

Dorota Skowronska-Krawczyk, PhD

From Resilience to Vulnerability: How Stress Accelerates Aging in Glaucoma

Age is one of the greatest risk factors for glaucoma—but why do aging eyes become increasingly vulnerable to the kind of pressure that destroys vision? That's the question at the heart of research being conducted by Dorota Skowronska-Krawczyk, PhD, of the University of California, Irvine, with support from National Glaucoma Research.

Dr. Skowronska-Krawczyk is investigating how repeated mild stress—the kind that builds gradually over time—alters gene activity and epigenetic patterns in the retina, effectively accelerating the aging process and leaving nerve cells less able to withstand rising eye pressure. Her work aims to map the changes that shift the retina from resilience to vulnerability, identifying the precise moments where intervention could make a difference.

This innovative approach could reveal new early diagnostic markers and open the door to treatments that preserve vision as we age—and may have broader implications for other neurodegenerative diseases as well.

This pioneering research is bringing us closer to understanding why aging eyes become more vulnerable to glaucoma—and to developing new ways to intervene early, protect vision, and extend independence for millions at risk.



A New Approach to Scar-Free Healing After Glaucoma Surgery

Jennifer Fan Gaskin, MD, (far right) with her research team (Manish Shah, PhD, and Elsa Chan, PhD). Photo courtesy Jennifer Fan Gaskin.

For people with advanced glaucoma, filtration surgery is often the last option for saving sight—but up to 50 percent of these surgeries fail within five years due to scarring. When the body tries to heal the surgical site, it can block the new drainage pathway, allowing dangerous eye pressure to build again.

National Glaucoma Research-funded scientist Jennifer Fan Gaskin, MD, is working to change that. Currently, the most common anti-scarring drugs used after glaucoma surgery are chemotherapy agents that can also damage healthy surrounding tissue—causing serious complications. “Our goal is to stop the scarring that can undermine glaucoma surgery and ultimately protect patients from blindness,” said Dr. Fan Gaskin.

Her team is studying DiOHF, a lab-made compound inspired by natural plant chemicals, which has shown strong antioxidant and anti-scarring properties in cardiac disease and cancer research. Early-stage lab data in glaucoma is already encouraging. “Our vision is to take this compound to a clinical trial in the next five years,” she said.

Groundbreaking research like this brings new hope to the millions of people who depend on glaucoma surgery to protect their sight—and moves us closer to a future where surgery succeeds the first time, every time.



Recently diagnosed with glaucoma? Know someone who has it? Join our FREE monthly phone call with doctors, researchers, and experts on glaucoma to receive valuable information. You can submit questions before or during the live event. Transcripts, audio recordings, and podcasts are available on our website.

To register, call **855-345-6647** or go to brightfocus.org/NGRchats.

Cellular “Powerhouses” May Hold the Key to Treating Exfoliation Glaucoma

Exfoliation glaucoma (XFG) is one of the most severe forms of glaucoma. It affects an estimated 25 percent of the 60 million people worldwide who’ve been diagnosed with open-angle glaucoma—and currently, there is no treatment. But thanks to your support, that may be changing.

National Glaucoma Research—funded scientists Arunkumar Venkatesan, PhD, and Audrey Bernstein, PhD, of SUNY Upstate Medical University, have made a critical discovery: XFG is driven by defects in the mitochondria—the tiny powerhouses that give eye cells the energy they need to function. When mitochondria break down, cells lose their ability to clear misfolded proteins, causing a white, flaky buildup that blocks fluid drainage, raises eye pressure, and ultimately leads to vision loss.

In a first-of-its-kind study, Drs. Venkatesan and Bernstein tested two drugs—a natural compound and a form of vitamin B3—and found both were able to reverse mitochondrial damage in a lab model of XFG, opening the door to healthy cell function.

While further confirmation in additional lab models is needed before the drugs can be tested in people, Dr. Venkatesan is optimistic: “This promising finding opens the door for more research into the possibility of restoring mitochondria to help address protein defects and clear away exfoliation material before it forms in the eye.”

Researchers are uncovering the biological roots of glaucoma and working toward treatments that could protect vision for millions.



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Thank you for supporting National Glaucoma Research

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