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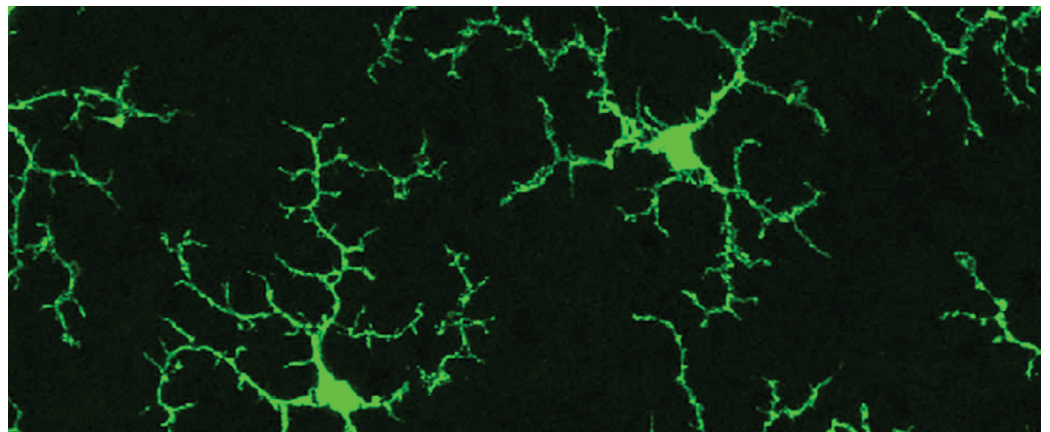
Blocking a “Master Switch” in the Eye to Treat Glaucoma

A study funded by National Glaucoma Research has shed light on a new way to block a “master switch” in the immune cells of the eye and brain that controls inflammation. This research introduces a potential new target for combatting glaucoma as well as other neurodegenerative diseases.

In a significant breakthrough, scientists uncovered a critical protein within the human body known as IGFBP1. When it’s functioning optimally, it protects one’s vision. In glaucoma, immune cells known as microglia become inflamed, causing damage that leads to vision impairment. IGFBP1 intervenes like a superhero, calming the inflammation and preventing further harm.

What makes this discovery particularly exciting is its broader implications. By targeting the inflammation that damages these cells, IGFBP1 not only offers hope for people living with glaucoma, but also holds the potential for treating other neurodegenerative diseases like Alzheimer’s and Parkinson’s. This innovative approach represents a significant leap forward in our understanding and management of these debilitating conditions.

Your generous support fuels groundbreaking research and enables critical progress. Together, we’re making a real difference in the lives of those affected by glaucoma, and we’re moving closer to preserving vision and enhancing quality of life.



Microglia (green branch-like structures) in a healthy adult mouse retina

Credit: Wai T. Wong, National Eye Institute, NIH.



President's Corner

Thank you for your steadfast support of National Glaucoma Research. Your compassionate giving makes breakthrough therapies possible and gives meaningful hope for those living with glaucoma.

In this issue of *National Glaucoma Research Report*, you'll find out how your contributions drive advances that have critical implications for not only glaucoma but other neurodegenerative diseases as well. You can also learn about potential treatment options.

I hope the discoveries highlighted here will be as inspiring to you as they are to me. Ultimately, it's your support that fuels our progress in the battle to treat and one day find a cure for glaucoma.

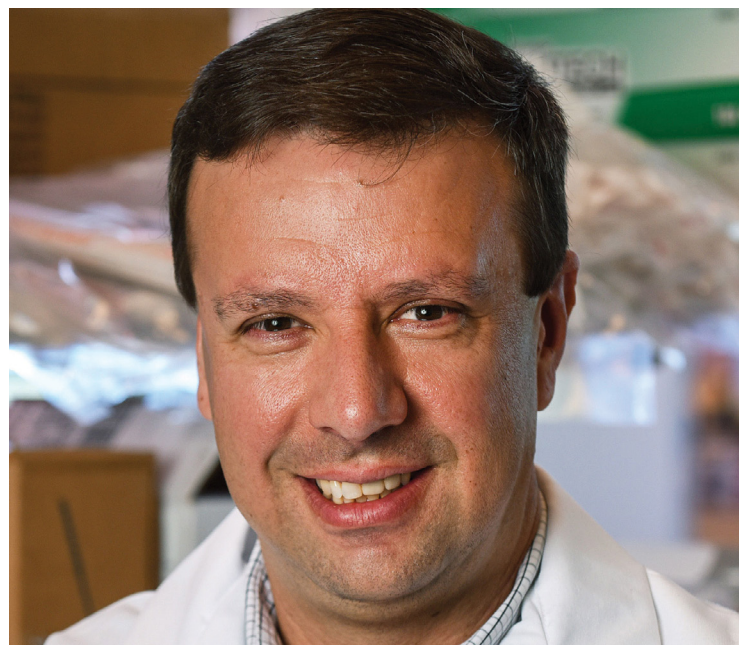
Stacy Pagos Haller
President

Growing Cells to Restore the Eye-Brain Connection

Jason Meyer, PhD, at Indiana University School of Medicine in Indianapolis, is a pioneer in glaucoma research and a National Glaucoma Research success story. He is making significant strides in regenerating eye tissue using induced pluripotent stem (iPS) cells. His work focuses on creating powerful disease models to understand early cellular changes in glaucoma and developing new treatments.

One of the most thrilling aspects of Dr. Meyer's research is that he and his team developed gene editing of iPS cells that will hopefully help maintain happy and healthy cells. Through CRISPR gene editing, they seek to correct genetic mutations in stem cells, paving the way for effective cellular therapies. Dr. Meyer collaborates with fellow researchers to tackle the complex challenge of repairing the eye-brain connection of the visual pathway that suffers damage in people living with glaucoma.

Support from National Glaucoma Research's donors has been instrumental throughout Dr. Meyer's career, enabling groundbreaking advancements in understanding and potentially curing glaucoma. His holistic approach, including the study of neuroinflammation, holds promise for faster and more effective treatments, and it offers hope to people with this sight-stealing disease.



Jason Meyer, PhD

RESEARCHER SPOTLIGHT: Mark Prausnitz, PhD

Optimizing an injectable gel for long-lasting treatment of eye pressure

Current glaucoma treatments focus on relieving the fluid buildup in the eye that is the hallmark of this disease. These treatments consist of either eye drops, which can be difficult to administer regularly, or laser or invasive surgery, which carries the risk of complications.

That's why Mark Prausnitz, PhD, at the Georgia Institute of Technology, and his colleagues are testing the safety and efficacy of a different intervention: an expanding gel. This treatment requires a single injection that can last for months, offering a potential nonsurgical intervention for glaucoma.



Mark Prausnitz, PhD

To optimize this hydrogel treatment, researchers will develop different formulations to test, including in-lab models of eye pressure. They will conduct studies to better understand how the gel works. They predict the hydrogel can enlarge a space where the built-up fluid can flow more easily from the eye, reducing eye pressure.

When the study is complete, Dr. Prausnitz and his colleagues expect to have a gel formulation and method that is safe and effective in lowering pressure in the eye. This can set the stage to move into clinical trials, where success could mean a new method of treating glaucoma that does not involve drugs or surgery.

TREATMENT OPTIONS: Which One Is Right for You?

Managing glaucoma is crucial to prevent permanent vision loss. Eye drops and surgery are two common ways to lower eye pressure and preserve vision.

Since the eye has a barrier protecting it from harmful substances, glaucoma medications are applied as eye drops or ointments rather than pills or injections. The type and severity of your glaucoma will determine the most suitable medication. Take your medications as prescribed. Also, tell your eye doctor about any other medicines and supplements you take.

When medications fail to reduce eye pressure or cause severe side effects, laser surgery or conventional surgery (also called incisional therapies) are options. Both can reshape tissue and clear blockages or open new drainage channels. Although it can be highly effective at reducing eye pressure and the need for medication, surgery is rarely the first treatment choice due to potential complications.

You and your doctor must weigh the benefits and risks of surgery to determine your best option. Factors to consider include:

- Glaucoma severity
- Presence of cataracts
- History of eye surgery
- Susceptibility to inflammation
- Age and health conditions
- Physical limitations
- Tolerance for eye drops
- Social support for post-op care and follow-ups

For more information, visit brightfocus.org/glaucoma-treatment.



Tasty Beef Stir-Fry



This savory stir-fry is sure to impress!

Ingredients

- 9 oz beef tenderloin steak, very lean
- 1 tbsp peanut oil
- 3 tbsp hoisin sauce
- 5 cups stir-fry vegetable blend
- ½ cup sliced almonds (optional)

Instructions

1. Thinly slice the beef across the grain.
2. In a bowl, mix half the peanut oil and half the hoisin sauce. Add beef and stir until well-coated.
3. In a nonstick frying pan, stir-fry the beef at high heat for 1 minute until it begins to brown. Remove and set aside.
4. Reduce heat to medium-high and add the rest of the peanut oil.
5. Add the stir-fry vegetables and cook for 2 minutes.
6. Add 1 tablespoon of water, cover pan, and wait 1 minute.
7. Return the beef to the pan along with any juices.
8. Add the rest of the hoisin sauce and stir-fry for 1 minute until vegetables are tender-crisp.
9. Remove from the heat. Garnish with almonds if desired. Serve hot.

Makes three servings.



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Harnessing AI to Improve Glaucoma Clinical Trials

Clinical trial participants often endure repeated vision testing over long periods—a process that usually yields inconsistent results. National Glaucoma Research–funded Jithin Yohannan, MD, MPH, and his team at Johns Hopkins University are pioneering a transformative approach using artificial intelligence (AI) tools. It will allow them to screen participants more quickly.

During the first exam, AI tools can help identify those who are best suited for repeated tests and at a higher risk for disease progression, thereby streamlining the process and enhancing accuracy.

The researchers plan to develop further AI tools to analyze the imaging data from eye exams and help predict the trajectory of vision changes over time. This will provide a deeper understanding of glaucoma progression, offering hope for more effective treatments.

Dr. Yohannan believes their findings will make clinical trials more efficient and less costly. It could mean faster assessment and approval of life-changing treatments for people living with glaucoma—a remarkable achievement in the quest for clearer vision and brighter tomorrows.

NEW! Register for

Glaucoma



Chats

Recently diagnosed with glaucoma? Know someone who has it? Receive helpful information from our FREE monthly phone call with doctors, researchers, or experts in the field on timely topics. You can submit questions before or during the event. Transcripts and audio recordings are available afterward on our website.

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

Help Fight Glaucoma While Gaining Tax Benefits

If you are 70½ or older and would like to make a significant impact in the fight against glaucoma, then an IRA charitable rollover may be right for you. It enables you to lower the income and taxes from your IRA withdrawals, while also supporting our sight-saving work.

Benefits of an IRA charitable rollover:

- You avoid taxes on transfers of up to \$100,000 from your IRA to National Glaucoma Research.
- It may satisfy your required minimum distribution (RMD) for the year.

- It can reduce your taxable income, even if you don't itemize deductions.
- You can make a gift that is not subject to the deduction limits on charitable gifts.
- It helps further our important work and mission.

To make an IRA charitable rollover, simply contact your IRA plan administrator and direct them to make a gift from your IRA to National Glaucoma Research. Your IRA funds will be transferred to us to help continue our vital work.

To learn more, please contact us at 301-556-9362 or plannedgiving@brightfocus.org.

Thank you for supporting National Glaucoma Research!

Please share this newsletter with someone who might be interested in learning more about some of the latest advancements in research to diagnose, prevent, treat, and cure glaucoma. This newsletter is published by National Glaucoma Research, a program of BrightFocus Foundation®, a nonprofit organization located at 22512 Gateway Center Drive, Clarksburg, Maryland 20871, 301-948-3244, brightfocus.org.

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