National Glaucoma Research

National Glaucoma Research Report

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In This Issue

New Ways to Diagnose and Monitor Glaucoma

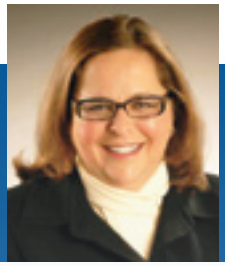
A new implantable device made by National Glaucoma Research–funded scientists could change the way glaucoma is diagnosed.

High intraocular pressure (IOP), which refers to the fluid pressure in the eye, is used as a parameter to diagnose and track glaucoma. Until recently, reducing IOP has been the main focus of glaucoma treatment. However, for many people, glaucoma continues to progress despite treatment aimed at lowering IOP. And for people who have glaucoma with normal IOP, lowering IOP is not a treatment option. Therefore, new parameters and treatments are needed.

J. Crawford Downs, PhD, at the University of Alabama at Birmingham, received support from National Glaucoma Research to develop possible solutions. Together, Downs and his team have developed an implantable, wireless device that measures IOP and a variety of pressure parameters in the eye.

For example, their device measures pressure from cerebrospinal fluid surrounding the optic nerve head, which is the main site of damage in glaucoma. Previous studies have suggested that measuring this pressure within the site of damage might provide a useful way to diagnose and monitor glaucoma.

Downs and his colleagues have already conducted several studies with their device in animal models. They have found that new ways of measuring pressure may be more important than measuring IOP alone. This discovery could have profound implications for diagnosing and treating glaucoma, especially for people whose glaucoma is not caused by high IOP.



President's Corner

I'm pleased to share this latest issue of National Glaucoma Research Report. As you may know, we fund grants to the best scientific minds in their respective fields—something that has not gone unnoticed by other groups who share our passion for defeating glaucoma.

Through its National Eye Institute, the National Institutes of Health (NIH) recently awarded one of its "Audacious Goals" grants to a team comprised entirely of current and former NGR grantees.

This "dream team" of scientists received key funding from NGR during the beginning stages of their work, which enabled them to receive this additional funding from NIH.

This is a powerful affirmation of our commitment to supporting the most promising scientists and their bold ideas early on. Thanks to your ongoing support, critical research will continue to be performed, and the lives of people with glaucoma will continue to improve.

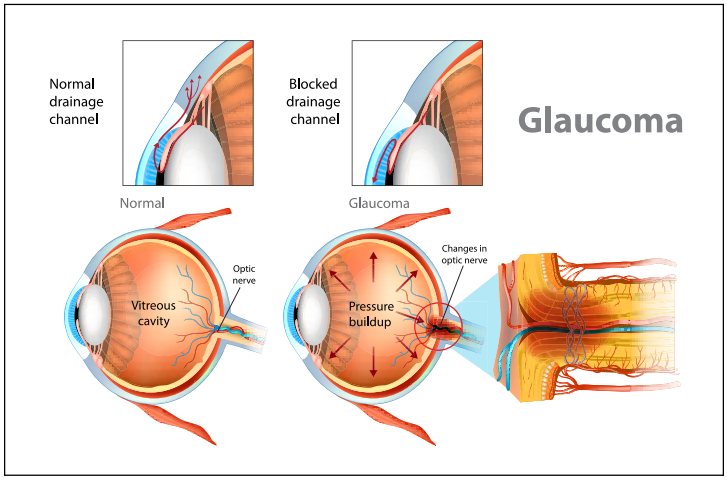
Stacy Pagos Haller
President

Gene for Repairing Retinal Cells Identified

Glaucoma is characterized by damage to and the eventual death of retinal neurons that process visual information, or retinal ganglion cells (RGCs). One of the risk factors for vision loss from glaucoma is a chronic rise in fluid pressure inside the eye (a.k.a. intraocular pressure or IOP), which can damage the optic nerve. RGCs and other nerve cells in the adult retina typically do not regenerate following damage, so vision loss from glaucoma is considered permanent.

Most glaucoma therapies are designed to lower IOP; however, strategies to directly protect and/or save RGCs may also help preserve a person's vision. With this goal in mind, Ephraim F. Trakhtenberg, PhD, at the University of Connecticut Medical School, and his colleagues are working to identify genes within RGCs that regulate the process of regeneration—genes whose function shuts down not long after birth. They believe it may be possible to modulate this pathway in order to restore the regenerative capacity of the eye.

If successful, they could develop an innovative approach to rescuing injured nerve cells in the early stages of the disease, while the cells are still alive, by down-regulating genes that inhibit regeneration. This would be revolutionary for glaucoma treatment and could potentially be used for treating other physical ailments such as spinal cord injuries and strokes.



A potential treatment could be the first step in restoring vision loss from glaucoma.

SPOTLIGHT ON ... Philip Williams, PhD

Why Some Retinal Ganglion Cells Live or Die

As you read in the previous article, glaucoma causes vision loss by damaging and killing retinal ganglion cells (RGCs). Although many RGCs die during the course of vision loss due to glaucoma, there is a sizable population that survives despite the disease.

Philip Williams, PhD, at Washington University in St. Louis, has focused his research on understanding what makes surviving RGCs so resilient. He hopes those traits can be transferred to other RGCs.

"These cells rely on a constant intake of fuel to provide energy for normal function and survival," Williams says. "We believe that knowing how surviving RGCs maintain their energy requirements, in contrast to RGCs that die, will allow us to formulate new therapeutic strategies to treat glaucoma."

Williams and his team, through a grant from National Glaucoma Research, have developed a powerful combination of techniques that are helping them better understand why some RGCs cope with glaucoma while others die. Their goal is to develop new ways to preserve RGCs and, in turn, new ways to prevent and stop glaucoma.

Philip Williams, PhD

The research conducted by Dr. Williams will create a better understanding of how glaucoma affects cells in the eye that could lead to new prevention and mitigation techniques.

Glaucoma Eye Drops: 4 Tips

Using eye drops isn't easy for many glaucoma patients. Here are some helpful suggestions for managing the challenges:

- **Set up a reminder system.**
  The reminder could involve putting in your eye drops at the same time that you perform another routine activity each day, such as brushing your teeth. Or you can set phone alarms to remind you to take your eye drops.
- **Close your eyes after instilling the eye drop.**
  Blinking after you apply eye drops causes them to be "pumped" away into the tear system, diluting their effect. The best thing to do is to close your eyes like you are sleeping.
- **Wait 5 to 10 minutes between eye drops.**
  If you rapidly instill one eye drop after another, you will dilute the effects of the first eye drop.
- **Ask for help.**
  If you live with a family member or friend, or have friendly neighbors, consider asking for help with your eye drops. Even if they cannot put in the eye drops for you, setting up a "buddy system" can increase accountability for taking your eye drops.

Cilantro Lime Lentils

This high-fiber food is delicious and simple to make!

Ingredients

1 cup red lentils

1 tbsp extra-virgin olive oil

2 tbsp fresh lime juice

1/4 cup chopped cilantro

1/8 tsp salt

Ground black pepper to taste

Instructions

1. Place lentils in a pot and cover them with water. Bring water to a boil, then immediately reduce heat to simmer. Stir lentils to ensure even cooking.
2. Cook until soft, about 4 minutes.
3. Drain lentils and rinse with cold water.
4. Place in a large mixing bowl and gently toss lentils with olive oil, lime juice, cilantro, salt, and pepper.
5. Serve chilled or at room temperature. Season with a dash of salt to taste just before serving.

Makes four servings.

Fighting XFS Glaucoma with Big Data

In people with exfoliation syndrome (XFS), abnormal protein material builds up in the drainage system and other parts of the eye, which can impede drainage and raise intraocular pressure, eventually leading to glaucoma and, potentially, blindness. An estimated 25 percent of people with open-angle glaucoma suffer from XFS. It tends to cluster in families and has been associated with small gene anomalies.

That's why, with funding help from National Glaucoma Research, Karen Curtin, PhD, and Barbara Wirostko, MD, at the University of Utah, are utilizing Big Data analysis to better understand the comorbidities and risk factors that XFS shares with other medical conditions.

By using the medical histories and records of more than 11 million people dating back to the 1700s, they intend to identify clinical conditions that people with XFS tend to develop.

The goal is to prevent blindness by not only predicting and treating XFS earlier in patients, but also predicting which XFS patients are most likely to develop glaucoma. In addition, the results of this project may impact other diseases by identifying risk factors, environmental factors, and demographics that XFS shares.

Begin Your Legacy

National Glaucoma Research is fortunate to have dedicated benefactors who support its mission, including many who've chosen to secure its future through planned gifts. These generous visionaries have turned their compassion into action. To express our appreciation for this committed group of donors who have remembered National Glaucoma Research in their estate plans, we established the **de la Cuesta Legacy Society**.

Members of this special group share the common bond of philanthropy and a vision to provide for the needs of future generations. We invite you to join with other compassionate philanthropists who share your passion.

If you have already designated National Glaucoma Research as a beneficiary of your estate plan, please let us know. Contact Charlie Thomas at 301-556-9362 or plannedgiving@brightfocus.org so we can thank you for your foresight, welcome you into our de la Cuesta Legacy Society, and ensure that your gift is used as you intend. For more information regarding all the ways you can leave a legacy of support, go to brightfocus.org/plannedgiving.

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.