

REPORT

Better Health Through Research

October 2007

New Treatment Holds Promise for Treating Glaucoma

Technique may soon be tested on human patients

By harvesting adult stem cells from bone marrow tissue, Iowa State University researchers have developed a new technique for treating the blindness caused by glaucoma — a technique that has proven so effective on rats it may eventually be tested on human patients.

“Four years ago, I was very skeptical that this would work,” said Dr. Sinisa Grozdanic, one of the project leaders, a veterinary ophthalmologist and assistant professor of veterinary clinical sciences. “Now I see positive results. Hopefully, in a few years, we’ll be able to say it’s working in humans.”

After determining that animals with glaucoma boost their production of neuron-protecting proteins to shield themselves from blindness, the Iowa State researchers used stem cells derived from rats’ bone marrow to mimic that process in the laboratory. They then transplanted the modified cells to the rats’ eyes and created a dramatic improvement in the animals’ visual functions.

“One of the really unique aspects of this approach is that we can isolate these stem cells from the same individual being treated,” said Donald Sakaguchi, neuroscientist and associate professor of genetics, development and cell biology. “It eliminates the ethical issues associated with embryonic stem cells and the immunological problems of graft rejection.”

INSIDE THIS ISSUE

New Treatment Holds Promise for Treating Glaucoma

Technique may soon be tested on human patients..... p. 1

President’s Corner

The aging of America p. 2

Fish May Hold Key to Curing Human Blindness

Breakthrough holds major potential for treating glaucoma..... p. 2

’Tis the Season

Memorial gifts are an ideal way to honor loved ones over holidays p. 3

Healthy Living p. 4

President's Corner

The aging of America

The recently released Health and Retirement Study by the National Institute on Aging confirms what many experts have long warned. The aging of America will have profound impacts on the fabric of our society — and on the health challenges faced by our senior population.

Already, an estimated 2.2 million people in the United States are affected by glaucoma. That number is expected to reach well over 3 million as people live longer. And because many different genetic factors, including race, affect a person's risk of developing glaucoma, the importance of raising awareness and promoting scientific research grows more and more critical with each passing year.

Fortunately, National Glaucoma Research is ready to do whatever it takes to translate today's laboratory discoveries into tomorrow's therapeutic breakthroughs. America may be aging, but our sense of mission is as fresh as when we began in 1978. We know that we must succeed — because the costs of failure are too high.

Brian K. Regan, Ph.D.
President

Fish May Hold Key to Curing Human Blindness

Breakthrough holds major potential for treating glaucoma

A tiny tropical fish could give scientists an unexpected new tool for restoring vision impaired by glaucoma and other ailments, according to recent findings by British scientists.

The zebra fish, so called because of its distinctive stripes, has long been a curiosity in the scientific world because of its special stem cells, which repair damage to its eyes by stimulating the growth of retinal cells.

British scientists have now found that these same cells — called Müller's glial cells — are present in the human eye. Although it is not clear if the cells are capable of repairing the retina, researchers were able to turn them into retinal cells in the laboratory and grow them in large quantities. The cells were then successfully transplanted into rats.

While tests on humans are still several years away, the technique could open the door to a range of new treatments.

continued on page 3

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Simply click on the National Glaucoma Research link to learn more about what's new in the world of glaucoma research, as well as important information about risk factors for glaucoma and healthy choices that may help you minimize the risk of glaucoma.

continued from Fish May Hold Key

“Our findings have enormous potential,” said Dr. Astrid Limb, of University College London’s Institute of Ophthalmology, in an interview with the Daily Mail. “They could help in all diseases where the neurons are damaged, which is basically nearly every disease of the eye.”

Dr. Limb said the Müller’s glial cells could be harvested directly from the patient’s eye, modified into retinal cells and then injected back in the eye. “Because they are so easy to grow,” the researcher added, “we could make cell banks and have cell lines available to the general population, subject to typing as with blood transfusions.”

Scientists might also find a way to activate dormant Müller’s glial cells in the human eye, Dr. Limb said, and eliminate the need for surgery.

“Our next step is to identify which factor is responsible for blocking the regeneration,” said Dr. Limb. “Once we know how this mechanism works, we will be much closer to developing a treatment.”

National Glaucoma Research has embraced this powerful new tool of researchers and is proud to support, with your help, researchers like Dr. Brian Link of the Medical College of Wisconsin who are using this tiny fish to understand the molecular code behind glaucoma.

‘Tis the Season

Memorial gifts are an ideal way to honor loved ones over holidays

With the holidays approaching, this is a wonderful time to honor loved ones with a special gift!

Memorial and Honor Gifts to National Glaucoma Research can be given at any time of year, for any special occasion – birthdays, anniversaries, graduations, weddings and especially, Christmas and Hanukkah – to show appreciation for someone’s kindness or to recognize a friend’s impact on your life. When you make a gift in memory or honor of someone special, we will send a card notifying the honoree or their family of your generous gift in their name.

To make a Memorial or Honor Gift donation or for more information, please call Sierra Saligumba, Memorial Coordinator, at 800-437-2423, or visit our website www.ahaf.org.

In Memoriam

Douglas H. Johnson, M.D.
1951-2007

National Glaucoma Research and the glaucoma scientific research community lost a dedicated and devoted leader when Douglas H. Johnson, M.D. passed away in July 2007. Dr. Johnson of the Mayo Clinic in Rochester, Minnesota and a true pioneer in glaucoma research served as a member of the National Glaucoma Research Scientific Review Committee since 1993 and chaired the committee from 1998 until his death.

He diligently led the Scientific Review Committee in carefully reviewing countless grant applications to identify the best investigators worldwide to receive funding. Under his leadership, National Glaucoma Research awarded close to 100 grants totaling \$8.2 million. His contributions of time, professional expertise and leadership have been immeasurable.

In appreciation of his long-term commitment, National Glaucoma Research established the *Dr. Douglas H. Johnson Award for Glaucoma Research*. The special grant will be awarded to a deserving scientist of the highest caliber in pursuit of research.

Healthy Living

National Glaucoma Research is dedicated to eradicating glaucoma through research and public education. As part of our efforts, we encourage everyone — regardless of whether they have been diagnosed with glaucoma — to take steps to improve their eye health.

Get with the program

To protect vision and enhance your overall health, scientists recommend the following:

- Eat a varied and nutritious diet that includes leafy green vegetables, fruit, fish and foods containing vitamins D, E and C, beta carotene and omega-3 fatty acids
- Get regular exercise such as walking
- Maintain a healthy weight
- Keep blood pressure at a normal level
- Schedule a full annual eye exam
- Prevent overexposure to sunlight by wearing sunglasses and hats

Get examined

Glaucoma progresses slowly over a period of years, and often there are no symptoms or pain until damage has occurred. Once the optic nerve is damaged, however, it can never be repaired. As a result, millions of people with glaucoma may not know they have the disease until they have irreversible vision loss. For this reason, regular and comprehensive eye examinations are critical.



Get treated

Although glaucoma is not curable, it is treatable, provided it is diagnosed early and is consistently managed. However, in a recent study, nearly one-third of respondents with primary open angle glaucoma said they did not take medication and did not undergo surgery. This lack of medical treatment is particularly troubling because proper and regular use of medication and regular follow-up with a physician are essential to controlling eye pressure and preventing optic nerve damage.

Get educated

Everyone benefits from learning about the risk of glaucoma and the importance of scheduling regular eye exams for themselves and their loved ones. To learn more about glaucoma you can order a copy of our free brochure, *The Essential Facts on Glaucoma*, in English or Spanish. More extensive information is available in our recently updated booklet, *Living with Glaucoma*, at a cost of \$5.

All publications are in large print. Print copies can be ordered by calling 1-800-437-2423 or online at www.ahaf.org.

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