

# Gleams

Glaucoma  
Research Foundation

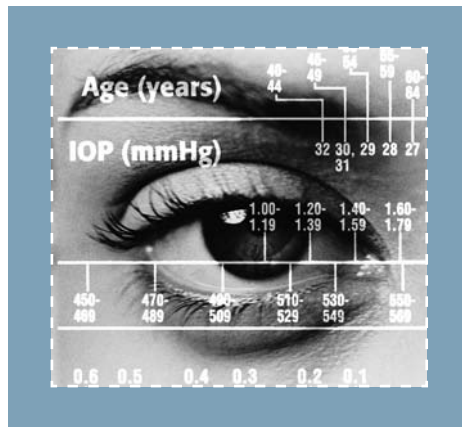
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## A New Tool To Predict Glaucoma

Glaucoma can be difficult to detect and diagnose. Measurement of eye pressure, examination of the optic nerve, and visual field testing, in particular, are simple, painless tests that help to determine if a patient has glaucoma. Recently, a new tool has become available to eye care specialists to help predict the development of glaucoma in one type of patient, namely one with ocular hypertension (high eye pressure).

Researchers at the Hamilton Glaucoma Center of the University of California San Diego (UCSD) have developed a “glaucoma risk calculator” that estimates the 5-year risk of a patient with ocular hypertension progressing to glaucoma.

The risk calculator was developed based on a comparison of data collected in the UCSD Diagnostics in Innovations in



Glaucoma Study (DIGS) from patients with ocular hypertension and compared with the data obtained independently in the national multi-center Ocular Hypertension Treatment Study (OHTS).

This recent study validated key patient risk factors that predict the progression from ocular hypertension to glaucoma – risk factors such as older age, high intraocular pressure, thin central cornea, larger vertical cup-to-disc ratio, and higher visual

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### Special Feature

How the CFC Researchers are working to preserve sight and prevent vision loss.

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## GRF Scientific Advisors

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## A New Tool To Predict Glaucoma

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field pattern standard deviation index. The risk calculator provides the eye specialist with a single number that estimates the risk for developing glaucoma within the next five years of an individual patient. To simplify the predictive model for clinical use, the UCSD team developed an easy-to-use slide rule-type device known as the STAR (Scoring Tool for Assessing Risk).

Use of a risk calculator may improve allocation of healthcare resources and provides information that helps an eye care specialist manage a patient with ocular hypertension. As an example, it may be recommended that a patient who is at low risk for developing glaucoma be withdrawn from treatment and examined at less frequent intervals. In contrast, treatment might be recommended to another patient who is at high risk for developing glaucoma.

Use of a risk calculator provides information that can help patients understand their condition, but is not meant to replace the experience and clinical judgment of an eye specialist. As new data become available, it is likely that new and improved risk calculators will emerge. These calculators may incorporate new risk factors or eliminate others to improve

their predictive abilities.

The Glaucoma Research Foundation and other national organizations dedicated to eye health encourage everyone at risk to have regular comprehensive eye examinations by an eye care specialist. This is particularly important for those at highest risk, such as those with ocular hypertension or a family member with glaucoma.



Robert N. Weinreb, MD is Distinguished Professor of Ophthalmology and Director of the

Hamilton Glaucoma Center at the University of California, San Diego. He and Felipe Medeiros, MD, his colleague at UCSD, are co-developers of the STAR glaucoma risk calculator.

## Our Scientific Advisors — Key To Finding The Cure

The GRF Scientific Advisory Committee is currently evaluating Pilot Project grant applications to determine which projects will be funded in 2007. Our Catalyst For a Cure (CFC) Advisory Board meets in December with the CFC principal investigators to evaluate progress and review results.

## Spotlight On Research:

# Protecting Retinal Ganglion Cells

## CFC Science Update

**How the Catalyst For a Cure (CFC) research consortium is working to preserve sight and prevent vision loss in glaucoma.**



By Rebecca M. Sappington, PhD.  
A summary of findings published in *Investigative Ophthalmology & Visual Science (IOVS)*: “Interleukin-6 protects retinal ganglion cells from pressure-induced death” by R. Sappington, M. Chan, and D. Calkins (July, 2006).

The retina is a thin tissue layer in the back of the eye containing photoreceptor nerve cells. These nerve cells, known as *retinal ganglion cells* (RGCs), change the light rays that enter the eye into electrical impulses and send them through the optic nerve to the brain where images are perceived.

The cells that comprise the retina and the brain can be divided into two main classes, *neurons* and *glial cells*. The Catalyst For a Cure research scientists have been studying glial cells because glial cells can influence the survival of the neurons in both health and disease through the release of proteins. These proteins act as signals between glial cells and neurons, and even between different types of glial cells.

*Cytokines* are one such family of signaling proteins that can act to both increase and decrease the survival of neurons. In glaucoma, glial cells in the retina and optic nerve are implicated as sources of cytokines that can alter the survival of retinal ganglion cells (RGCs).

The examination of other cell types in addition to RGCs is critical to understanding and treating glaucoma in a comprehensive manner. The essential

role of glial cells in supporting neurons in a healthy retina identifies these cells as potential key players in disease progression as well as in recovery.

Our work provides insight into the complex signals between the cells in the retina, and identifies the cytokine *interleukin-6* (IL-6) as a potential protector of retinal ganglion cells in glaucoma.

### Findings from the recent study

The CFC researchers examined how elevated pressure alters the release of IL-6 from two types of glial cells in the retina, *astrocyte glia* and *microglia*. We also determined how this pressure-induced release of IL-6 influences the survival of RGCs exposed to elevated pressure.

We found that microglia-derived signals inhibit RGC death induced by pressure and that a pressure-induced increase in microglia-derived IL-6 is the main contributor to the neuro-protective effect. In contrast, astrocyte-derived signals can override the protective benefits of IL-6 and actually increase RGC death induced by elevated pressure.

# Q&A

Andrew G. Iwach, M.D.

## More Eyedrop Techniques

Second in a series of tips for putting in glaucoma eyedrop medication.

**Q:** Is there a simple way of administering eye drops?

**A:** I offer this piece of advice to my patients. It is sometimes helpful to acknowledge that some patients have a strong reflex that makes them blink at even the thought of the drop hitting their eye. I suggest having them lay down flat, face up. Close the eye. Place the drop outside of the lid in the corner of the eye near the nose. As they open the eye, the drop will roll in. Then close the eye again. Don't blink. Keep the eye closed for a few minutes.

**Q:** Can eye drops really cause significant side effects?

**A:** The tears of the eye drain through a small canal into the



nose. The inside of the nose is lined with nasal mucosa, which is vascular — it has many blood vessels.

When you put drops in your eye, the drops can become “pumped” into the tear system if you blink. Once in contact with the vascular nasal mucosa, relatively rapid absorption of drugs into the bloodstream can occur. The drops can act as a systemic “bolus” — an infusion of the drug into the bloodstream. To minimize systemic effects and maximize local absorption into the eye, simply keep the eyelid gently closed for a few minutes after putting drops in.

So then, if your eye is closed, how do you know the time is up? You can use a cooking timer. Or,

consider that most popular songs are 2-3 minutes long. Have the radio on when you put in your drops. After two songs, you can open your eye. Many patients have found this a good alternative to punctual occlusion as described in the last issue of *Gleams*.



Dr. Iwach is an Associate Clinical Professor of Ophthalmology at the University of California at San

Francisco and a faculty instructor at the California Pacific Medical Center Department of Ophthalmology. He serves as GRF's Board Treasurer and is Executive Director of the Glaucoma Research and Education Group (GREG).

**Gleams** is published three times a year by the Glaucoma Research Foundation.

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## Challenge Grant For Wrap-up of Capital Campaign

A challenge grant matching new and increased contributions from individuals up to \$50,000 received by December 21, 2006, has been awarded GRF by the **Edward Joseph Daly Foundation**, GRF President and CEO **Thomas Brunner** announced. "We are very grateful to **June Behrendt**, Daly Foundation Executive Director, for this challenge which comes as we begin the third and final year of our capital campaign. The continuing vitality of our research and education programs depend on everyone getting involved. With this generous challenge, everyone's new and increased giving will be doubled." The challenge comes as GRF announced results of its just completed fiscal year, ending with a balanced budget and bringing GRF to 79% of its three-year goal of \$7.5 million.

Reminding us that gifts of every size make a difference, Brunner singled out the efforts of Vernon Hills, Illinois Sixth grader **Danielle Fiarito** who (with help from proud parents Maureen and Dan)

made glaucoma awareness her school project, raising funds through the sale of her handcrafted jewelry. What kind of difference can a 6th grader make? No item sold for over \$2 and she raised \$1,200 in the process!

Additionally, **Pfizer** reinforced its commitment to urging early testing as a way to preserve vision with a new \$50,000 partnership with GRF. **Delta Gamma Foundation (DG)** in Columbus, Ohio renewed its commitment to GRF's website with its gift of \$10,000, reinforced locally by a gift from GRF's good friends in the **Diablo Valley** chapter of DG. GRF's website, now attracting 50,000 unique visitors monthly, also won the continued support of the **Union Bank of California Foundation**. **San Francisco Rotary Foundation** endorsed GRF's Catalyst For a Cure research consortium with its recent first-time gift.

Additional major gifts came from the **Kate Obstgarten Foundation** through **Sandra Rubin** in Delray, FL;

**Sam and Denise Polakoff** in Forest Hill, MD; **Betsy Erdman** in Kula, HI; and **Christopher Morgan** in New York, NY. Major gifts from California include **The Clarence B. and Joan F. Coleman Foundation**, **Alvin T. Levitt** through his **Royce Philanthropic Fund**, **Robert Karp**, **Paul May**, **Frank Stein**, **Patricia and Michael Peyser**, **Joseph Bernstein**, and **Dorothy and Richard Annesser**, along with several other dearly appreciated gifts.



Danielle Fiarito raised \$1,200 for glaucoma research selling her handcrafted jewelry

## In Appreciation

Our deepest appreciation for the generosity of our donors, including members of THE CATALYST CIRCLE, THE BLANCHE MATTHIAS SOCIETY, and institutional donors. (Contributions from March 28 to July 15, 2006)

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## The President's Message



Dear Friends,

With the Fall season upon us, our thoughts turn to the upcoming holidays and family gatherings. What could be a better gift for your loved ones than to give them the gift of sight? If you have glaucoma, talk to your children and other family members about it. We know that glaucoma has a genetic component, and that early diagnosis and treatment is the best way to fight this blinding disease.

One way to keep your friends and family informed is to sign them up to receive *Gleams*, our free newsletter. Call us at 1-800-826-6693 or send an email to [gleams@glaucoma.org](mailto:gleams@glaucoma.org).

Our friends at EyeCare America suggest that you "take a family glaucoma snapshot" by *asking*: "Does anyone in our family have glaucoma?," *calling* their toll-free line 1-800-391-EYES to see if you qualify for a free exam, and *telling* your family if you have glaucoma.

It's also a pleasure to introduce GRF's new leadership team on the Board of Directors: **Deirdre Porter**, Executive Vice President at San Francisco's Wentworth, Hauser, and Violich is our new Board Chair, **Timothy J. Dwyer** of Woodside, CA is Vice Chair, **F.T. Barr** of Afex International in Houston is our new Board Secretary, and **Andrew G. Iwach, MD**, who contributes the Q&A article in this edition of *Gleams*, is our Board Treasurer. With the addition of new Board members **Fred Brinkmann** and **Bill Stewart**, we have a strong and involved Board of Directors leading the Foundation.

The Board, Staff, and Advisors at GRF wish all the best to you and your family this holiday season.

As always, we appreciate your support, your ideas, and your participation.

Thomas M. Brunner, President and CEO

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