## THE GLAUCOMA FOUNDATION NEWSLETTER

SUMMER 2007

# 2007 Think Tank Spotlights Advances in Hi-Tech Imaging

On September 28-29, 2007 scientists from numerous countries will gather in New York City to participate in The Glaucoma Foundation's 14th International Think Tank, the annual conference at which experts from many different scientific disciplines share their research and apply their expertise to the challenges of glaucoma.

The Think Tank initiative was launched in 1994, when Dr. Robert Ritch, TGF's Founder and Medical Director, convened a gathering of 12 scientists and researchers from the U.S. and Canada for a day-long meeting to discuss the latest scientific research in the emerging field of

nerve regeneration. Two years later, the Think Tank sharpened its focus on optic nerve rescue and restoration, which at the same time became the core of TGF's research grant program.

"We have really been a major catalyst for setting the course to find new treatments and cures for

glaucoma, advancing the field of glaucoma research by at least 10 years," says Dr. Ritch. The Think Tank was instrumental in shifting the research focus to the optic nerve, and to the importance of understanding and protecting retinal ganglion cells and other types of cells in the retina that may be a source of glaucomatous damage.

In 2002, the meeting began considering new technologies that could play a role in restoring damage from glaucoma – stem cell therapy, gene therapy and, at the 10th Think Tank in 2004, tissue engineering.

Since 2005, the Think Tank has spotlighted innovational applications of micro-and nanotechnology to major unsolved problems in glaucoma. It first considered advanced drug delivery systems that can improve effectiveness and patient compliance. At last year's gathering, participating clinicians challenged nanoscientists at the meeting to apply their engineering and biomedical expertise to finding better ways to measure intraocular pressure, the most important known risk factor for glaucoma.



Clinicians, scientists and researchers attending the 2007 Think Tank will continue to consider the newest uses of nanotechnology with a discussion of advanced ultra-highresolution diagnostic imaging techniques for the eye.

TGF Founder & Medical Director

"Technological advances in our capability to image

patients and assess their disease have an enormous impact on

our clinical approach and the

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# **Blogging for TGF Dollars**

TGF has advocated many ways to support its vital work. But Tish McQueen of Knoxville, Tennessee, has introduced a new fundraising technique and in the process has raised \$310 for The Glaucoma Foundation.

A vibrant 35-year-old, Tish was diagnosed with glaucoma at age 27 and is in ongoing treatment with two medications. Her passion is blogging -- a way of collecting links to webpages and sharing thoughts and ideas with people online. "It's such a neat way to get my thoughts out there, to talk about movies I like, my personal life, whatever is on my mind. It's like a diary." With 200-300 hits a day on her blog, she's made a lot of new friends.

"I get home at night from my job as a human resources manager, and I go online and talk to lots of people. If I could make a living through blogging, I'd be in heaven," she says. Last year Tish met her blog partner online. He's Mike Wheeler, from central New York, a cartoonist and free lance graphic artist. Together, they launched a new site called BlogsWeLuv where they write about other blogs that catch their fancy.

They created this site because they needed a place to blog as partners during the 2007 Blogathon, an event for bloggers to rally together and raise money for their favorite charities. Tish selected TGF and enlisted Mike to join her for the July 28th event. On that day, participants are required to blog for 24 straight hours, making a new entry every 30 minutes. All pledges made on their behalf would directly benefit The Glaucoma Foundation. And every \$5 donated earned one entry to win a \$25 gift card from Amazon.com, donated by Tish and Mike.

On the appointed day, with a supply of Red Bull to help keep them awake, the Blogathon began, with postings on many subjects, including glaucoma. In one posting, titled "It's Not Just For Old People," Tish talked about celebrities who lost vision from glaucoma at a young age, urged bloggers to schedule an eye exam this year and every year thereafter, and asked them to support TGF by making a pledge.

Among responses to that posting, one woman wrote "I had no idea...Thank you for enlightening me (and everyone) on this subject!"

When it was over, Tish posted the following: "On behalf of The Glaucoma Foundation, Mike and I thank you for your pledges. With your donations, The Glaucoma Foundation will work to ensure a better quality of life for current and future generations of glaucoma patients."

The Glaucoma Foundation extends its sincere thanks to Tish and Mike for all their efforts.

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#### honoring Christopher Gardner Author, The Pursuit of Happyness

For further information or to add someone to our invitation list, please call Clara Cullen 212.651.2508 or email ccullen@glaucomafoundation.org.

# **Doctor I Have a Question?**



Questions answered by:

Dr. James Tsai

Robert R. Young Professor and Chair Department of Ophthalmology and Visual Science at Yale University School of Medicine

Since this new issue of Eye to Eye has a focus on research, we think it's important for you to know how glaucoma research is shaped. Nearly all treatments – including drugs and medical devices – require clinical trials and approval by the government's Food and Drug Administration (FDA). We hope the following column provides you with insight into this process.

## What are clinical trials?

Clinical trials are research studies conducted with people to find better ways to diagnose, prevent and treat disease. These studies are done on human patients to evaluate whether the new treatment, procedure or device is safe and effective.

## What is the FDA's role in glaucomarelated clinical trails?

The FDA's 2100 scientists review test results submitted by the developers of all medications and medical devices to determine whether clinical trials are warranted. Additionally, the administration approves the protocol and the team of researchers selected to conduct the research. Final approval by the FDA post-trials, determines whether the product can be made available to the public.

# How long does it take a new medication to receive FDA approval?

Taking into account early lab testing, completion of all clinical trial phases and review of the application, the average time to get a new product approved is eight years.

# Where can I get more information about clinical trials?

DHA

If you or someone you know is interested in learning more, communicate with your doctor. Because small groups and select doctors are involved with trials, don't expect your doctor to have specific details on each study. Be sure to understand that expressing trial interest does not guarantee involvement nor does it guarantee that you will be included in the treatment group. If you are still interested, try these resources:

## The FDA

www.fda.gov 888.463.6332

## The National Eye Institute

www.nei.nih.gov 301.496.5248

### Pharmaceutical Research and Manufacturers of America

www.phrma.org 202.835.3400

### www.clinicaltrials.gov

A service of the National Institutes of Health

**Please note:** The information contained in this column is meant to help you be a knowledgeable patient, not to endorse nor encourage involvement in clinical trails. Please discuss all of your options with your doctor(s) before making any decisions.

#### Dear Friends,

Since our last newsletter, we have been active in several areas that should interest our readers. For friends in the New York area, we are happy to announce that our patient network continues to grow. As you will read, the Glaucoma Support and Education Group of New York City, in existence for 25 years, will become more closely allied with TGF as our New York Chapter. Our New England and Chicago Chapters have also made significant strides in reaching out to educate the community of glaucoma patients and to also gain support for the work of The Foundation.

Our research activities are extremely newsworthy. In just a few weeks, we will host our 14th Annual Scientific Think Tank. At this international gathering, unique with its interdisciplinary format, participants will continue to examine how the newest technologies can help preserve and restore sight, focusing this year on new advances in high-tech diagnostic imaging techniques for the eye. In addition, we have recently awarded a new cycle of four grants to researchers studying the complex mechanisms of glaucoma in the ongoing pursuit of novel strategies and improved therapeutics to reduce the risk of glaucoma and prevent blindness.

There is also news on the funding front that we hope will positively impact the dollars we have available to apply to new research initiatives. The Glaucoma Foundation is creating The Maurice Luntz Endowment Fund for Glaucoma Research, which will supplement our existing giving program and will be used to support innovative research through earmarked grants. The Endowment Fund honors our good friend, Dr. Maurice Luntz, an internationally-renowned glaucoma specialist and a longtime and valued Board Member of The Glaucoma Foundation.

What we do touches the lives of many people. One of them is Tish McQueen, a resident of Knoxville, Tennessee, who has been blogging online – her favorite hobby, she calls it her passion – to raise funds for TGF. Read about her efforts in this issue.

Please continue your valuable support. There is no question that the support of friends makes it possible for The Glaucoma Foundation to carry out its vital programs and be a leader in the quest for finding new treatments and a cure for glaucoma. It is crucial to what we can do. Without it, we cannot continue our meaningful work.

Sincerely,

Scott R. Christensen/President and CEO

# African Americans and Glaucoma – An Update



It is known that glaucoma is four to five times more likely to develop in persons of African ancestry than in the white population, that blindness from glaucoma is about six times more common among African Americans, and that the disease occurs earlier and progresses more quickly in this population group. While the reasons for this high incidence and other statistical differences are not yet fully understood, recent findings and ongoing research are beginning to point to certain influencing factors.

In 2001, a study found a statistically significant difference between the central corneal thickness of all African Americans (with and without glaucoma) and all white subjects in the study. African Americans were found to have thinner corneal thickness measurements, which can lead to falsely low measurements of eye pressure that potentially result in an underestimation of the actual level of intraocular eye pressure.

Another investigation, completed in 2004, found that pressure-reducing eye drops can delay or prevent the onset of glaucoma in African Americans at high risk for developing the disease. In this study, part of a follow-up analysis of initial results from the major Ocular Hypertension Treatment Study (OHTS), researchers at the University of Maryland Medical Center in Baltimore and Washington University School of Medicine in St. Louis looked in detail at the outcomes for the 408 African Americans who participated in the original study. While their findings confirmed the importance of prompt medical treatment, the study suggested that even when the treatment is identical, the risk for African Americans remains higher.

Why is this so? Researchers are now looking at

whether certain anatomical variants -- for example, thinner corneas and slightly different anatomical appearances to the optic nerve -could explain some of the increased intraocular pressure (IOP) and other differences. They are suggesting that these factors need further investigation.

Several studies are doing just that. One, conducted by a team at Washington University, is studying gene-based differences in the optic nerves of African Americans and age-matched white individuals. The researchers are also comparing differences in growth factors, nerve cell proliferation and cell migration in optic nerve tissues, paying particular attention to the optic nerve head, the likely target of stress generated by high IOP.

The five-year African Ancestry and Glaucoma Evaluation Study, federally funded by the National Eye Institute, is also furthering research into the physiology of the optic nerve. Dr. Christopher Girkin of the University of Alabama at Birmingham, one of three sites involved in this investigation, explains that this study builds on previous research on racial differences in the optic nerve and cornea by developing detection techniques that are more sensitive to these physiological differences and other potential changes over time. "Structural differences have implications in designing treatments," says Dr. Girkin. "Improved detection techniques will impact current and future screening programs and subsequent treatment strategies," he adds.

Until there is more definitive information, early detection and treatment of glaucoma remain key to a good outcome. Comprehensive dilated eye exams are recommended at least once every two years for African Americans over age 40. African Americans ages 20-39 with no glaucoma symptoms should be examined every three to five years.

Medicare covers an annual dilated eye examination for people at higher risk for glaucoma. Because of the high incidence of glaucoma among African Americans, this important preventive benefit defines higher risk as people with diabetes, those with a family history of glaucoma, and African Americans aged 50 and older.

# **CHAPTER**CORNER

# New York TGF Chapter Formed

The Glaucoma Support and Education Group (GSEG) of New York City is a well-established, speaker-driven support community in the New York area that has been a partner of The Glaucoma Foundation for several years. Now, as the New York Chapter of The Glaucoma Foundation, the group will become a more integral link in the growing Foundation network.

In existence for over 25 years, with Edith Marks as its coordinator since 1992, GSEG has grown from a membership of 40 to over 300. What has set the group apart from other support groups has been the ongoing series of talks on such topics as: medication, surgery, visual fields, new diagnostic tools, the latest research, as well as complementary treatments and related lifestyle issues. All members receive the group's informative newsletter, "Living with Glaucoma," that contains summaries of the presentations made at the meetings with a readership beyond New York.

Ms. Marks, who is the author of "Coping with Glaucoma," looks forward to the closer affiliation with TGF. "We hope to expand geographically to encompass the entire Greater New York area, and also to increase attendance at our meetings," she says. Meetings are held nine times a year at the New York Eye & Ear Infirmary on 14th Street in Manhattan, on the third Saturday of each month from September to June.

"We really want to reach the baby boomer population, individuals who are now being diagnosed with glaucoma and could benefit from our group," she says. "Glaucoma is a problem that needs the full involvement of the patient. The psychological component is extremely important and not always addressed in the doctor's office. At our meetings members can both interact with other glaucoma patients and discuss similar problems, and can ask questions of the presenting doctors. Says TGF President Scott Christensen, "This collaboration will help us to better serve the community of glaucoma patients and gain broader support for the work of our Foundation."

Those interested in joining the new Chapter should contact Edith Marks at edithmarks@nyc.rr.com.

## BOSTON/CHICAGO

On Saturday, June 23, the Boston Chapter held its second meeting. "Pediatric Glaucoma: Big Problems for Little Kids." Teresa Chen, MD, an Assistant Professor of Ophthalmology at Harvard Medical School gave attendees information about congenital and aphakic glaucoma. Dr. David Walton, a world-renowned pediatric glaucoma specialist in Boston, was also on hand to answer questions. He is also a member of TGF's Medical Advisory Board.

Congenital glaucoma occurs at birth and may be present because of a malformation of the eye's drainage system. This disease affects boys more than girls and in most cases in both eyes. Aphakic glaucoma develops in the eye after the lens has been removed due to cataracts.

A few days later, on Tuesday, June 26, the Chicago Chapter held its first meeting. "Glaucoma Update - 2007", a talk given jointly by Sriram Sonty, MD, a Clinical Associate Professor of Ophthalmology at the University of Illinois, Chicago and Liane Seyk, Chicago Chapter President and glaucoma patient.

Dr. Sonty gave a talk regarding what is glaucoma, the different types of glaucoma, who is a prime candidate for glaucoma, and medications currently available for glaucoma treatment.

Liane Seyk presented the group with the patient's perspective. Mrs. Seyk is a glaucoma patient and advocates that timing her drops throughout the day (and night) is crucial Liane's main focus is medication compliance and self-education. Liane is never afraid of asking questions of her physician or his office staff about her concerns or changes she may have noticed with her eye health.

# **Research Grants**

## Spring 2007

#### Gareth R. Howell, PhD Research Scientist

The Jackson Laboratory, Bar Harbor, ME

## Assessing Glial Activation in a Mouse Model of Glaucoma

Glaucoma is characterized by the degeneration of the optic nerve, which disrupts neurotransmission between the eye and the brain, leading to blindness. Glial cells are thought to play an important role in glaucoma. In a resting state, glial cells are supportive to neurons, but in response to stress, can become activated and damaging. It has been shown that glial cells in the optic nerve become activated in early stages of glaucoma. However, it is not known whether this is a primary cause of the disease, or occurs later as the disease progresses. Due to the experimental limitations imposed with human studies, mice are valuable complementary organisms both to study the complex mechanisms of glaucoma and to develop improved therapeutics. Utilizing a mouse model that reproduces important aspects of human glaucomas, we propose to determine the timing and extent of glial activation in relation to glaucomatous damage using a combination of gene and protein expression analyses. This will be one of the most wide-ranging investigations of the role of glial cells in glaucoma to date.

## **Derek Murphy, PhD**

Associate Director, Centre for Human Proteomics Royal College of Surgeons in Ireland, Dublin

Evaluation of PEX Glaucoma-Associated Autoantigens as Disease Biomarkers and the Role of their Antigenic Targets in Retinal Neurodegeneration Exploitation of the immune response of glaucoma patients has identified molecules that are of importance for diagnosis, disease development and potentially new therapies for the disease. We have established a unique collaboration between ophthalmologists and molecular biologists to develop protein arrays for the discovery of novel disease markers in glaucoma, and so contribute to the fields of diagnosis and molecular characterization of this disease. To this end, we have profiled the humoral immune responses in pseudoexfoliation syndrome (PEX) glaucoma patients, identifying disease associated autoantibodies in patients' sera. This project can contribute enormously to providing panels of unique markers for the development of a biochip assay to help in the correct diagnosis of this disease. These markers may also provide novel therapeutic targets for the specific prevention of retinal neural degeneration in glaucoma patients.

## Deepak Shukla, PhD

Assistant Professor, Dept. of Ophthalmology & Visual Sciences University of Illinois at Chicago

#### Novel Peptides to Understand Herpetic Damage to Human Trabecular Meshwork via Actin Rich Nanotubular Structures

The infection of human trabecular meshwork (TM) cells with herpes simplex virus leads to elevated intraocular pressure (IOP) and may contribute to the development of glaucoma, which is the second most common cause of permanent blindness in the United States. HSV-1 infection into TM is mediated by HVEM receptor in which long actin rich nanotubular structures (LARS) plays a major role during viral spread from one cell to another. Here, we plan to isolate peptides against HVEM to prevent the virus from using HVEM receptors to invade cells and to understand virus interaction with LARS during viral spread. Our study will allow us to develop novel strategies to reduce the risk of glaucoma and prevent blindness

## Michael Walter, PhD

Professor and Chair, Department of Medical Genetics University of Alberta, CANADA

# Development of a Functional Assay for WDR36

The WD40 repeat 36 (WDR36) gene has recently been identified as a new primary open angle glaucoma locus. However, the function of WDR36 and its role in glaucoma pathogenesis are unknown. One of the important challenges presented by an adult-onset disease such as glaucoma is deciding if a DNA change seen in a patient causes the disease or is instead a normal variation that is not associated with the disease. We plan on developing a test that will determine if changes of the WDR36 gene found in glaucoma patients have a functional consequence. This will allow us to determine if WDR36 causes glaucoma. Understanding the actual function of WDR36 could also provide insight into a new cellular pathway to which novel glaucoma therapies can be targeted.

## Landmark Canadian Glaucoma Study



Canadian researchers have made a series of important findings in a just concluded long-term and broad study that has positively identified, for the first time, several risk factors predicting the progression of open-angle glaucoma.

"The results provide a gold mine of data and open the door for much more targeted research that will help us understand the disease," said Dr. Balwantray Chauhan, the study's principal investigator. Dr. Chauhan, chair of vision research at Dalhousie University's Faculty of Medicine, in Halifax, Nova Scotia, is a member of The Glaucoma Foundation's Medical Advisory Board.

The Canadian Glaucoma Study, funded principally by CNIB, the Canadian National Institute for the Blind, followed 258 glaucoma patients (130 men and 128 women) in five Canadian cities from 1994 to 2005. A large majority of participants were of European ancestry; their average age at the onset was 65. The study looked primarily at the role of non-IOP related factors, and found several of particular significance. Until now, scientists knew little about why some patients develop the disease faster than others after IOP is taken into account.

A most important finding was that women were twice as likely as men to progress in the disease. "We don't know whether this relates to hormonal factors, as our subjects were postmenopausal," said Dr. Chauhan, adding that further research is called for.

Very significant was the finding that patients who had an anticardiolipin antibody, associated with thrombosis or autoimmune disease, were four times more likely to progress in the disease. While only a small number of patients in the study had this antibody, all but two in this group showed positive progression. "This had never been considered as a possible risk factor," says Dr. Chauhan, "and we must find out if this antibody is a cause for the progression or rather happens after the fact."

The Canadian Glaucoma Study also confirmed other known risk factors, for example that open-angle glaucoma is primarily agerelated. It found that for every year of aging, the likelihood of the disease progressing increases by 4 percent. And while the study controlled for IOP, elevated ocular pressure still emerged as a major factor in the progression of glaucoma, making it even more significant than previously imagined.

The study also ruled out several factors previously thought to be

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# Exfoliation Glaucoma Gene Identified

Icelandic researchers have identified the gene that causes the disorder called exfoliation syndrome, the most common recognizable cause of open-angle glaucoma worldwide, according to a study released in August, 2007.

Exfoliative glaucoma is caused by the accumulation of microfibullar deposits that line the aqueous bathed surfaces of the eye's anterior chamber and block the drainage channels through which the fluid leaves the eye, causing elevated intraocular pressure, which in turn results in damage to the optic nerve.

The findings suggest that two mutations in the LOXL1 gene are the exclusive cause of this difficult-to-treat glaucoma.

Investigators are hopeful that the gene will provide a promising target for future therapies. "If we can neutralize the impact of these variants we might eliminate the disease," said Dr. Kari Stefansson, CEO of DeCODE Genetics, an Iceland-based company involved with the study.

# **GSEG Meeting**

October 20, 2007

## Topic: Medication and It's Side Effects

Speaker: Ilya Rozenbaum, MD

Location: New York Eye and Ear Infirmary 310 East 14th Street, NYC

Time: 11:00 АМ

For more information call TGF 212.285.0080



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# 2007 Think Tank

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management of glaucoma," says Dr. Ritch. The Think Tank will look at these cutting-edge diagnostic tools, for example, atomic force microscopes that can scan with resolution of fractions of a nanometer and high-speed, ultrahigh resolution optical tomography that can provide much improved image quality of tissue microstructure. A summary of the 2007 Think Tank will appear in the next issue of *Eye to Eye*.

## Canadian Glaucoma Study

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important, concluding that people with diabetes, hypertension and a history of cardiovascular disease were not more likely than others to progress if they had glaucoma.

Additional funding for the study came from the Glaucoma Research Society of Canada, Pfizer, Allergan and Merck.

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A copy of The Glaucoma Foundation's annual manical report may be obtained upon request by writing to The Foundation at 80 Maden Lane, Sure 1206, New York, NY 10038 or by residents of the states listed below from the appropriate state agency. Lorida: A copy of the official resistration and financial information may be obtained from the Division of Consumer Services by calling to Lifee within the State. Registration Number - CH7263. Registration does not imply endorsement, approval, or recommendation by the State. Maryland: Information filed under the Maryland Charitable Organizations Laws can be obtained from the Division of Consumer Services by calling to Lifee within the State. Registration Number - CH7263. Registration does not imply endorsement, approval, or recommendation by the State's Office, Charities registration, PO Box 136, Jackson, MS 39205-0136, 601-359-1633. New Jersey: Information filed with the Attorney General concerning this charitable solicitation may be obtained from the Attorney General concerning this charitable organization of Law, Charities Bureau, 120 Broadwar, New York, NY 10271. North Carolina: A copy of the Life and the Attorney General does not imply endorsement. New York: A copy of the Life and the Attorney General does not imply endorsement approach or the Office of the Attorney General does not imply endorsement, approval, or recommendation by the State. Pennsylvania: The Official registration or Fue Ganization and financial information may be obtained from the Department of Human Resources, Soliditation Licensing Branch, by calling 919-733-4510. Registration does not imply endorsement. Approval, or recommendation by the State. Pennsylvania: The Official registration of Fue Ganization or Fie Ganization of The Giaucoma Foundation may be obtained from the Constituent of Aspeculture & Consumer State or Washington; Registration and financial information may be obtained from the State Division, Office of the State