Three years ago TGF made a decision to devote its efforts to curing exfoliation syndrome, an age-related systemic disease characterized by the production and accumulation of a whitish material in many ocular as well as non-ocular tissues. Worldwide, XFS is the most common identifiable cause of open-angle glaucoma, comprising the majority of glaucoma in some countries.

Last September, more than 40 scientists and glaucoma clinicians from research institutions throughout the US and from Canada, Japan and Singapore gathered in New York to participate in TGF’s 21st Scientific Think Tank, the third consecutive annual Think Tank to focus on exfoliation syndrome.

“As a result of this new focus we have greatly increased the number of researchers who are working on this disease and related areas,” said Robert Ritch, MD, The Glaucoma Foundation’s Medical Director, Chairman of the Scientific Advisory Board, and Think Tank organizer. “We have achieved more professional awareness and in the last three years have probably tripled the number of researchers in this field. The tide is turning.”

Several working groups have been formed to continue the discussions initiated at the Think Tanks, develop collaborative research, and stimulate new advances, focusing on four different facets of exfoliation syndrome. The first is investigating genetics, genomics, and gene-environment interactions. A second group is working on biomarkers — looking for specific molecules that may be elevated or decreased in the eye or blood. Another group is attempting to develop better animal models of the disease, while a fourth group is further exploring molecular and cellular mechanisms involved in the production of exfoliation material by the cells in the eye. Growing patient-derived XFS cells in cell culture has revealed that similar to other age-related diseases such as age-related macular degeneration and Alzheimer’s, the cellular machinery that degrades protein aggregates is not working properly. In the case of XFS, the theory is that exfoliation material cannot be degraded leading to an accumulation of “cellular trash” both inside and outside the cell that becomes toxic.

TGF’s research grants program is also now funding only projects aimed at furthering these efforts. In the past year, TGF has funded seven projects related to exfoliation. “The Glaucoma Foundation is unique in letting us work on one aspect of the whole,” says Professor Terete Borrás of the University of North Carolina School of Medicine, a Think Tank participant and recent grantee. “These are special projects to test things that haven’t been tested — it’s a very good way to go.” Says another grantee, Michael G. Anderson;

(Continued on page 9)
Let us begin with a letter from the President:

Dear Friends,

It’s been three years since The Glaucoma Foundation sharpened its focus on exfoliation syndrome, the leading identifiable cause of open-angle glaucoma worldwide. We believe a cure for exfoliation syndrome is within reach in the near future.

On these pages you will read about our most recent International Scientific Think Tank, which explored "Exfoliation Syndrome: Tying it all Together" with presentations on new developments and concepts relating to the pathophysiology of exfoliation syndrome. "As a result of this new focus we have greatly increased the number of researchers who are working on this disease and related areas," says Think Tank organizer Dr. Robert Ritch. "...The tide is turning."

The initiative to find a cure for exfoliation syndrome is the most ambitious project in the Foundation’s history. Your continued support is essential to the progress of this major undertaking.

I write this letter after the conclusion of World Glaucoma Week 2015. This global initiative, spearheaded by the World Glaucoma Association and World Glaucoma Patient Association, was a great success, with governments, eye care professionals and patient groups from Argentina to Uzbekistan participating in close to 500 activities all aiming at raising awareness and encouraging earlier detection of glaucoma.

That is a good reminder for all – early detection and ongoing treatment are key to preserving sight. Glaucoma communities can play an important role in helping glaucoma patients understand their disease and learn how to manage it over their lifetime. The Glaucoma Foundation’s three free online support groups for young patients, caregivers of young children with glaucoma, and adult patients provide information and mutual support to some 1000 members.

These are exciting times for The Glaucoma Foundation. We are most grateful for your support and we value the role that our long-time friends play in all that we do.

Sincerely,

[Signature]

Scott R. Christensen
President
Chief Executive Officer
Reduced-Cost Eye Care Resources

Reduced-Cost Eye Examinations

The Glaucoma Foundation receives many queries asking where individuals can go for free or low-cost eye exams. Here are some suggestions.

www.eyecareamerica.org

EyeCare America, a public service foundation of the American Academy of Ophthalmology, provides eye care to eligible uninsured at-risk individuals through volunteer ophthalmologists at no cost to those who qualify. Go online for eligibility requirements and referrals to an ophthalmologist.

www.Medicare.gov 1-800-Medicare

Medicare provides for an annual dilated eye exam for individuals at high risk for glaucoma. You’re at high risk if you have diabetes, a family history of glaucoma, are African-American and 50 or older, or are Hispanic and 65 or older.

www.preventblindness.org 1-800-331-2020

Prevent Blindness America provides vision screenings through local affiliates. Go online to locate the affiliation in your area.

www.glaucomacongress.org 1-877-611-4232

The Friends of the Congressional Glaucoma Caucus Foundation provide screenings for high-risk populations. A calendar of screenings nationwide is on the website or available by phone.

www.aoafoundation.org/vision-USA 1-800-766-4466

Provides free basic eye health services to uninsured low-income families. Eligibility varies. Vision USA is a project of the American Optometric Assn.; volunteer doctors of optometry provide eye exams.

www.lionsclubs.org

Local Lions Clubs provide varying services, including financial assistance for eye care and free vision screenings.

Throughout the year, many organizations, community centers, hospitals and eye organizations join together to offer free glaucoma screenings across the country. Check your local listings.

Reduced-Cost Prescription Medications

The Glaucoma Foundation receives many calls and messages from readers wanting to know if TGF provides free or low-cost prescription medications for glaucoma patients unable to pay the full cost. While TGF does not provide financial assistance for programs like these, some manufacturers of glaucoma medications do provide free or low cost drugs to patients who can not afford them. Eligibility varies, and in many cases you will need to go through your doctor’s office. To research sources for help, you can begin online.

www.needymeds.org 1-800-503-6897

Lists assistance programs by medication brand name and manufacturer. The site provides eligibility requirements, information about the application process and requirements, and links to each drug company’s website from which application forms can be downloaded. Also lists free or low-cost sliding scale medical clinics by zip code.

www.rxassist.org

Offers lists of patient assistance programs (drug assistance programs, free clinic associations, etc.) with contact information and answers to Frequently Asked Questions about programs nationwide.

www.themedicineprogram.com 1-866-694-3893

This is a free volunteer patient advocacy organization which helps people enroll in the many prescription medication patient assistance programs sponsored by the major pharmaceutical companies.

In addition to these websites, your doctor or pharmacist and local hospital may know other resources for free or discounted medications. Social service agencies or religious groups may have emergency funds.
What is the relationship between diabetes and glaucoma?

The relationship between diabetes and glaucoma can be controversial and confusing. First we must understand that there are two types of diabetes. In type 1 diabetes (T1D), there is a complete loss of the pancreatic beta cells that make insulin. The profound inability to make insulin in T1D necessitates that nearly all patients with this condition be treated with insulin replacement therapy. In type 2 diabetes (T2D), the cells that make insulin are not destroyed. In fact, T2D patients can typically make more insulin than patients without diabetes. When blood sugar levels are high, the secreted insulin is ineffective at lowering blood glucose levels, producing a state of insulin resistance. The treatment of T2D is often directed at lifestyle measures that reduce insulin resistance like diet and exercise, although some of these patients also require medications to lower blood sugar.

Second, we must understand that there are many different types of glaucoma so we must both specify the type of diabetes (T1D or T2D) and the type of glaucoma we are referring to when we examine the relation between diabetes and glaucoma.

One thing is clear: uncontrolled T1D or T2D for a long enough period will lead to the development of diabetic retinopathy, consisting of leaking blood vessels and poor retinal blood supply that disrupts retinal function. Left unchecked the retina becomes starved for oxygen and develops new blood vessels and the stimulus for new blood vessel formation can travel to the anterior segment of the eye. This triggers new blood vessel formation in the ocular anterior segment and interferes with the normal internal drainage system of the eye leading to elevated intraocular pressure, a condition referred to as neovascular glaucoma.

The real question is does T1D or T2D lead to other forms of glaucoma, particularly primary open-angle glaucoma (POAG), the most common form of glaucoma in the Western world? The relation between T1D and POAG has not been thoroughly studied but it does not appear that T1D is a risk factor for POAG.

On the other hand there is considerable evidence that T2D is a risk factor for POAG. A recent summary of the results of 47 studies that collectively included nearly 3 million people concluded, "diabetes, diabetes duration, and fasting glucose levels were associated with a significantly increased risk of glaucoma, and diabetes and fasting glucose levels were
associated with slightly higher IOP." Most, but perhaps not all, the diabetes included in this summary analysis was T2D and most of the glaucoma was POAG.

Despite the rather convincing results distilled from these 47 studies, there is some controversy. First, there is a concern that some of these studies are subject to detection bias. Simply stated, patients with diabetes are more likely to be under closer ophthalmic observation and patients under closer observation are more likely to have glaucoma detected. It is difficult to find the "ideal study" of T2D and risk of POAG that followed patients over a long time period and that is free of this detection bias. Also basic science literature suggests that retinal ganglion cells (the cells whose axons make up the optic nerve) might function better when blood sugar levels are higher. To the former concern, I would say the relation between T2D and elevated IOP is fairly strong, reproducible and not subject to detection bias. To the latter concern, I would state that one has to differentiate hyperglycemia (elevated blood sugar) from insulin resistance (an inability of secreted insulin to produce a lower blood sugar). While hyperglycemia might make retinal ganglion cells function better in the short term, an insulin resistant state could ultimately contribute to glaucoma. The relation between insulin resistance and POAG requires further study.

The bottom line is this. If I had T2D, I would work hard to reduce my insulin resistance. The health benefits of achieving reduced insulin resistance are myriad and could include a more favorable IOP and reduced risk of POAG.

New Scientific Advisory Board Members

The Glaucoma Foundation has named five new members to its Scientific Advisory Board. SAB members include many of the most respected glaucoma clinicians and researchers. The SAB is a critical component of the overall operation of The Glaucoma Foundation. Its prominent members monitor, assess and analyze the scientific and research undertakings around the world and bring this information to bear on the workings of The Foundation. Many serve on the committee that reviews research applications and makes recommendations to The Foundation’s Board of Directors.

The new members are:

Michael Anderson, PhD, Associate Professor in the Departments of Molecular Physiology & Biophysics and Ophthalmology & Visual Sciences, University of Iowa.

Tin Aung, MMed, FRCS, FRCOphth, FAMS, PhD, Head and Senior Consultant, Glaucoma Service, Singapore National Eye Center.

Steven Bassnett, PhD, Professor, Ophthalmology and Visual Sciences, Washington University School of Medicine, St. Louis.

Miguel Coca-Prados, PhD, Professor (Adjunct), Department of Ophthalmology and Visual Sciences, Yale University School of Medicine, New Haven.

Dieter Reinhardt, PhD, Professor and Canada Research Chair in Cell-Matrix Biology, Department of Anatomy and Cell Biology, McGill University, Quebec, Montreal.
What's the role of Optical Coherence Tomography in diagnosing glaucoma?

The imaging technology known as Optical Coherence Tomography (OCT) measures the reflection of laser light similar to how an ultrasound measures the reflection of sound. It provides a cross-section analysis of the retina and optic nerve, measuring the thickness of the retinal nerve fiber layer and other portions of the retina such as macula thickness. It also creates a contour representation of the optic nerve as well as providing measurements of the optic disc size and neuroretinal rim area. OCT provides a three-dimensional image of the back of the eye, allowing ocular disease to be more readily recognized. OCT technology has improved over the last few years, in large part due to the increased computer processing speed.

The ultra-high resolution enables clinicians to see and analyze layers of the retina with respect to subtle changes in structure and function associated with glaucoma and other blinding eye diseases. Clinicians will often observe changes to the retinal nerve fiber layer and neuroretinal rim before visual field changes are seen in early glaucoma. OCT is becoming increasingly valuable as a means to monitor and evaluate these changes. Each OCT comes with a normative (reference) database which allows a person's measurements to be compared to a group of individuals with a similar age who are free of eye disease. OCTs also come with software that allows images to be analyzed over time. By documenting the appearance of the optic nerve and retinal nerve fiber layer at a particular moment, such images can establish an initial baseline for future evaluation and can provide the doctor with important findings about progressive damage.
Create a Lasting Legacy

Bequests have always played an important role in the support received by The Glaucoma Foundation. "Year in and year out, bequests comprise a meaningful portion of the income that funds our programs," says TGF President Scott Christensen. TGF values the support of all its donors, which number in the thousands. But a gift in your will or trust, or another planned gift of any size, helps carry our work forward in a special way.

TGF receives such income from friends old and new. William Vaughn had been making annual donations through TGF's Direct Mail Program, but The Foundation never knew that he had made plans for a more significant major gift. So it was a very happy surprise indeed to learn that Mr. Vaughn, who passed away at the age of 93, had remembered The Glaucoma Foundation with a provision of $400,000 in his Revocable Trust.

Receiving this distribution is a major milestone for The Foundation. We hope other friends of The Glaucoma Foundation will consider extending their own commitment with a lasting gift.

WE NEED YOUR SUPPORT

YES, I support The Glaucoma Foundation's work in pursuit of new treatments and cures for glaucoma. Enclosed is my tax-deductible gift of:

☐ $25  ☐ $50  ☐ $100  ☐ $250  ☐ $500
☐ $1,000  ☐ Other $ __________________

Please make checks payable to: The Glaucoma Foundation

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Gifts may be made with Visa, MasterCard, or American Express.

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*In order to locate additional supporters, The Foundation occasionally trades mailing lists with other non-profit organizations. Checking this box will ensure that The Glaucoma Foundation never trades your address. [52-2014]
New TGF Board Member

Kumar Mahadeva

Wijeyaraj (Kumar) Mahadeva, founder of Cognizant Technology Solutions in 1994, and Chairman and CEO until 2004, was the driving force behind one of the fastest-growing technology services companies in the world. Cognizant is a Nasdaq 100 and Fortune 500 company with a market cap of $30 billion.

Following Cognizant, Kumar founded Kubera Partners, a publicly traded private equity fund investing in businesses that operate in the US-India corridor and is a managing partner with the fund.

Prior to establishing Cognizant, Mr. Mahadeva was Chairman of Dun & Bradstreet India and China, responsible for business development in the region. He also worked at AT&T, where he was Director of Strategy and Corporate Development, and at McKinsey and Company, where he was a consultant to CEOs of information technology companies on issues related to corporate development, strategy and operations. He started his career in research and development at the British Broadcasting Corporation in London.

Mr. Mahadeva was born in Columbo (Sri Lanka) and has lived and worked in Europe, Asia and the US. He has a Master's degree in Electrical Engineering with first class honors from Cambridge University, England, and an MBA from the Harvard Business School.

TGF BALL CELEBRATES 28 YEARS
Two Renowned Figures in the Ophthalmic Community Honored

Bruce E. Spivey, MD, MS, MEd, a most distinguished member of the world ophthalmic community, received The Glaucoma Foundation’s Kitty Carlisle Hart Award of Merit for Lifetime Achievement at the organization’s 28th Annual Ball held at the Crowne Plaza Hotel in New York City on December 3rd.

The award was created in 1999 in recognition of Ms. Hart’s contributions to the battle against glaucoma and was presented to Dr. Spivey by the late Ms. Hart’s daughter, New York physician Dr. Catherine Hart, and son, Chris Hart.

Income generated from the Ball supports cutting edge research that will lead to a cure for glaucoma, with a focus on exfoliation syndrome. Proceeds also sustain Foundation efforts to educate the public about the disease and the need to detect the disease in its earliest stages.

Dr. Spivey served as a departmental chairman for 16 years, a hospital CEO for 16 years, the CEO of a national specialty society for his specialty for 17 years and the CEO of multi-hospital systems for over 14 years. From 1976 to 1992, he was Founding Executive Vice President and Chief Executive Officer of the American Academy of Ophthalmology. He is also the Immediate Past President of the International Council of Ophthalmology, which he headed for eight years.

Also honored at the 2014 Ball was M. Bruce Shields, MD, who was presented with the 2014 Robert Ritch Award for Excellence and Innovation in Glaucoma for his dedicated and exemplary career and contributions as a renowned glaucoma specialist. This award, named in honor of Dr. Robert Ritch, Founder of TGF and its Medical Director, recognizes the contributions of individuals who have played a significant and unique role in promoting the medicine and science of glaucoma.

Dr. Shields most recently held the Marvin L. Sears Professorship and was Chairman Emeritus of Ophthalmology and Visual Science at the Yale School of Medicine. Before coming to Yale, he spent 22 years at Duke University — as Director of the Glaucoma Service beginning in 1974 and Professor of Ophthalmology beginning in 1984.
THE CURE GLAUCOMA NOW! CAMPAIGN  

(Continued from Cover)

PhD, of the University of Iowa, “A small grant can feed a big idea. I think The Foundation’s new focus is playing a huge role in bringing us closer to finding a cure for exfoliation syndrome.”

Since 2013, The Glaucoma Foundation has raised well in excess of $2 million for the Cure Glaucoma Now! effort. “We are encouraged by the significant financial support we have already received for this bold initiative to find a cure for exfoliation syndrome,” says TGF CEO and President Scott R. Christensen. “The Glaucoma Foundation is uniquely positioned for this most ambitious project and welcomes underwriting support from the public and the medical community. We are very excited about this journey to a cure.”

Dr. Theodore Krupin  
1942-2015

The Glaucoma Foundation is deeply saddened by the death on March 25 of Dr. Theodore Krupin, a world renowned leader in the research and treatment of glaucoma. Dr. Krupin was a longtime member of the Glaucoma Foundation’s Board of Directors, Medical Advisory Board and Scientific Advisory Board. In 2010 he received the Glaucoma Foundation’s Robert Ritch Award for Innovation and Excellence in Glaucoma.

His career spanned three major academic institutions: Washington University, The University of Pennsylvania, and Northwestern University in Chicago, where he had been Professor of Ophthalmology at Northwestern University’s Feinberg School of Medicine in Chicago.

Dr. Krupin authored more than 160 original scientific papers and is the author / coauthor / editor of nine ophthalmology textbooks. Among his many contributions and innovations that are a critical part of the management of patients with glaucoma, over the last decade he was the initiator, lead investigator and coordinator of the first multicenter study considering treatment options for low-pressure glaucoma.