

Vision *for the* Future

UNIVERSITY OF ROCHESTER FLAUM EYE INSTITUTE WINTER 2012 / 2013 NEWSLETTER

A Portrait in Perseverance

“When I first met **Daniel Krenzer** in 2004 he had failed his vision screening at school,” FEI Pediatric Ophthalmologist **Matthew Gearing, M.D.**, said. “I had been seeing his older sisters routinely, so I expected him to be near-sighted or maybe have amblyopia (lazy eye). What I saw was a surprise. Dan had inflammation inside the front of the eye with scarring of the pupil to the underlying lens. I diagnosed uveitis and let his parents know that in many cases treatment is a ‘one and done’ process. But for Dan, it has been a more difficult, chronic

“We just love Dr. Gearing... It is so nice to have an ophthalmologist who is dedicated to kids and who is so calm and understanding of their problems.”

condition. Fortunately, for me and him, his parents are on a very even keel — his mom is a nurse who is a great advocate for Dan’s health.”

“I also thought that Dan was just another kid who needed glasses,” Denise Krenzer, Dan’s mom, said. “A lot of things changed for us when he was diagnosed. Since then his uveitis has become part of our daily lives. Thanks to the Flaum Eye Institute, we’ve had a great friend and resource along every step of a sometimes difficult journey.”

Krenzer’s uveitis is the anterior type, which is the most common form of this inflammatory disease and occurs in approximately 9 out of 10 cases. Sometimes called iritis, it affects the front part of the eye and can specifically attack the iris. Uveitis can be caused by autoimmune disorders such as rheumatoid arthritis or ankylosing spondylitis, infection, or exposure to toxins. However, in many cases the cause is unknown. Complications from uveitis can be as severe as

temporary or permanent blindness and can include cataract, glaucoma, pain, blurred vision and light sensitivity.

“At its worst it was quite a challenge,” Krenzer said. “Dan’s eyes were so terrible that he was exhausted from trying to keep up at school. His vision fluctuated a great deal. During these times, I would be his eyes, reading his assignments to him and then acting as scribe while we completed his homework. It got so bad one time that Dan was



DANIEL KRENZER, A SELF PORTRAIT — EXHIBITED THIS PAST SPRING AT THE RUSH HENRIETTA DISTRICT-WIDE ART SHOW

receiving cane training and learning Braille.” *At certain points in his treatment, Dan’s vision worsened to 20/200.* “We didn’t know what the future held in store for him.”

Getting Dan’s uveitis under control presented many challenges to Gearing. During the course of treatment, he has had to rely upon the expertise of other

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Making the Move to Improve Eye Research

Any scientist will explain that moving a laboratory is no easy undertaking. In many instances, expensive and delicate instrumentation must be taken apart and reassembled. In addition, the work of researchers, fellows, graduate students and support personnel must be interrupted while equipment, offices and people get relocated. In short, when you move an entire research organization — let alone one laboratory — there had better be a good reason. The University of Rochester’s world-renowned Center for Visual Science recently expanded its presence in the Medical Center where they now occupy 6,000 square feet of new space adjacent to FEI. The reason for the short journey was the best of all: increasing the speed and development of vision saving diagnostics and therapies.

“This extends the scope of FEI enormously,” CVS Director and Dean for Research in Arts, Science, and Engineering, **David Williams, Ph.D.**, said. “It allows us to consolidate all of the core vision research that we’ve been doing using adaptive optics imaging and bring it into one place. In addition to the labs, we’ve moved CVS administrative offices to the Medical Center and will be running operations from here. The University of Rochester is home to many brilliant scientists from myriad disciplines like optics, brain and cognitive sciences, engineering, neurology, neurobiology and anatomy, and ophthalmology,” Williams continued. “We now have a flexible

(CONTINUED ON PAGE 3)

It is hard to believe that we flipped the calendar to 2013. It was an extremely busy summer and fall at the Flaum Eye Institute (FEI) as we have grown in size and accomplishments. In July we welcomed four new residents and a new cornea fellow who have settled in and are showing great potential to be future leaders in ophthalmology.

Along with the new residents, we have welcomed three additional faculty members (page 9) since our last issue of Vision for the Future. Two of them were former residents and the other a former medical student at the University of Rochester. It gives me great satisfaction to know that we are building a world class institution for vision care, research and education that provides a place for those with connections to this great community to return and pursue their ambitions without compromise.

I am delighted to announce that **Krystal Huxlin, Ph.D.**, has received tenure from the University of Rochester and has been promoted to full professor (page 9). In academia, a "double jump" is rare and is testament to her abilities as a teacher and a researcher. I am equally pleased to announce that Dr. Huxlin has been appointed as Director of Research at FEI and thank **Lin Gan, Ph.D.**, for his recent service in this position. We continue to anticipate groundbreaking work from the two of them.

I would also like to reflect on our translational research enterprise. As many of you know, facilitating bench-side to bed-side science was one the main reasons I came to Rochester 11 years ago. Of course, this endeavor takes time to bear fruit. The road from the moment an inventor has an idea to a working, useful product — especially in the field of medicine — is filled with dead ends and obstacles. Most ideas never come to fruition as products. I am pleased to announce that U.S. patent 8,273,077 has been issued to **Scott MacRae, M.D.**, and his colleague **Manoj Venkiteshwar, Ph.D.**, (page 3). The technology that they developed helps provide tens of thousands of patients each year with the best possible results achievable with laser refractive surgery (LASIK). Licensed by **Bausch + Lomb**, the invention is already providing Dr. MacRae and FEI with royalty revenue.

I am also pleased that a technology invented here for a portable retina camera has entered its next phase in the march toward commercialization (page 8). Through the efforts of local optics company **Lumetrics** and FEI, the National Institutes for Health has awarded nearly \$1 million to Lumetrics to deliver a working prototype of a product that could have a massive impact on eye care delivery in developed nations and the third world.

Our pipeline of new technologies combined by our ability to leverage the knowledge and manufacturing capital in the region could someday be the hallmark of FEI. It takes the effort of many, and I thank everyone who supports this effort including the FEI researchers, the companies with which we work, philanthropists who provide seed capital, investors in the FEI Excubator, and our patients who participate in necessary human-based research through clinical trials.

As always, I offer my sincere thanks to our Advisory Board for their guidance and support as we look forward. We are also extremely grateful to everyone who supports FEI through their generosity, like the late Barbara and Richard Keldorf (page 5). Their thoughtful gift in recognition of **David DiLoreto, M.D., Ph.D.**, will help us advance our missions as we care for those who put their trust in us.

Sincerely,



Steven E. Feldon, M.D., M.B.A.
 Director, David and Ilene Flaum
 Eye Institute
 Chair, Department of Ophthalmology
 University of Rochester
 School of Medicine & Dentistry



V I S I O N

The Flaum Eye Institute is a world leader in preserving and restoring vision, providing the most advanced research, education, and technology development, coupled with compassionate, expert, patient care.



Patent Issued for Nomogram

A U.S. patent has been issued to the Flaum Eye Institute's **Scott MacRae, M.D.**, for technology that has improved the eyesight of tens of thousands of people around the world. The Rochester Nomogram is a complex formula that helps physicians determine how to optimize vision during refractive surgery, such as LASIK. The data derived from the Nomogram adjust the way the laser interacts with a person's eye tissue, thereby substantially reducing the chances that the patient's eyes will be near-sighted or far-sighted after the procedure.

Thanks to the Nomogram, MacRae's team has reduced the number of patients who need additional procedures to achieve the best vision possible by two-thirds. Currently, a remarkable 99.3 percent of MacRae's patients see 20/20 or better after refractive surgery when the Nomogram is employed. He presented the data at a September meeting of the European Society of Cataract and Refractive Surgeons.

"Eyesight is crucial to everyone's quality of life," MacRae said. "As a physician, I am required to do everything in my power to make sure each of my patients has the very best vision possible. There's nothing like the feeling of having a patient sit up after surgery, look at the clock on the wall, and exclaim that it's the first time in decades they've been able to tell the time without wearing glasses."

The technology has been licensed to **Technolas Perfect Vision**, a cataract and refractive laser company that is a product of a joint venture between **Bausch + Lomb** and **20/10 Perfect Vision AG**. MacRae, the University of Rochester and FEI will receive revenue in the form of royalties from the invention. This patent represents yet another step forward in FEI's efforts to become a world leader in translational research, where new technologies are transformed into real products that improve the quality of life for patients everywhere.

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Making the Move

workspace that fosters collaborative investigations so that scientists, engineers, clinician/scientists and our industrial partners have a place to work together. I'm really excited by the discoveries that we'll make here during the coming years."

At the center of the new laboratories is the world's largest concentration of adaptive optics scanning laser ophthalmoscopes (AOSLO). They are the heart of FEI and CVS's Advanced Retina Imaging Alliance (ARIA). Each of the six instruments represents nearly a \$1 million dollar investment and can image individual retinal cells and the tiniest structures of the living eye in unprecedented detail. Scientists and clinicians from a variety of perspectives are using this technology to answer some of the most basic questions about the origin of certain eye diseases, to detect and track the progression of eye diseases, and to image the effects of therapeutic agents on sick and healthy cells. Current investigations include better differentiation of the cells that make up the retina, imaging the retinal ganglion cells (RGCs) that die in glaucoma, imaging the retinal pigment epithelium (RPE) in relation to diseases like age-related macular degeneration and looking at minute changes to retinal vasculature. In the future, there is an opportunity to collaborate with industry to commercialize this technology to develop

table-top instruments that can be used to screen for disease in doctors' offices. Indeed, engineers from Canon® will soon be joining the ARIA group to make this hope a reality. There is also potential for using AOSLO to track the effectiveness of exciting new therapies such as implanting retinal stem cells into diseased eyes.

"This ushers in a whole new era for eye research at the University of Rochester. The strength of the CVS program was a major factor in my decision to come to Rochester," **Steven Feldon, M.D., M.B.A.**, said. "Research has become more complex and collaborative. Proximity of the CVS labs to the FEI labs helps enormously in producing world-class science that will lead to the successful treatment and prevention of blinding eye diseases. I think that this proximity will result in more research output for the same level of funding as a result of shared equipment, supplies, and personnel. This is especially important during times such as these when federal, foundation, and industry dollars are very limited."

The construction and move were funded in part by a \$1.5 million investment by the University of Rochester School of Medicine and Dentistry.

ADVANCING THE VISION

A MOST GRATEFUL THANK YOU TO OUR DONORS FOR THEIR GENEROUS GIFTS AND ONGOING SUPPORT.

The David and Ilene Flaum Eye Institute is most grateful to its donors for their generous gifts and ongoing support. We are especially appreciative to the friends, patients, alumni and faculty who contributed to our Annual Fund. The Annual Fund is an essential source of funding that will help continue our groundbreaking work in vision care and research. This year, your donations had a direct impact on patient care, helping us recruit new faculty and purchase new equipment for our clinic and research laboratories.

The following donors have contributed in various ways to FEI between March 1, 2012, and November 31, 2012. Gifts can be designated to the Annual Fund and mailed to: **Jennifer Richardson**, Director of Advancement, FEI, 210 Crittenden Blvd., Box 659, Rochester, NY 14642.

Or make a gift online by going to eyeinstitute.urmc.edu and clicking on **"Ways to Help"**.

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*We offer special thanks to
Bausch + Lomb, Research
to Prevent Blindness,
Glover-Crask Charitable Trust,
David & Ilene Flaum, and
the late Lynn & Walter Lutz
for their sustaining
support.*

* deceased

A Gift from the Heart

When **David DiLoreto, Jr., M.D., Ph.D.**, received a call from the estate of **Barbara and Richard Keldorf**, he was taken by surprise. Barbara, a patient since 2007, and her devoted husband Richard had left Flaum Eye Institute more than \$275,000 in recognition of the care that DiLoreto and his team had provided. Barbara, who suffered from Age Related Macular Degeneration (AMD) had recently died and Richard passed away just five days after her death.

“When my mom died, Dr. DiLoreto was the only one of my parents’ many doctors who called my house to express sympathy,” said **Candice Moreland**, the Keldorf’s daughter who frequently drove Barbara to her appointments at FEI. “You could hear the emotion in his voice and understand how much he cared for them. My parents were so grateful for all that Dr. DiLoreto provided. This gift that they made to support AMD research is a fitting remembrance of that.”

For DiLoreto and Moreland, the gift came as a complete surprise. “My Dad would sometimes complain about the cost of the yellow caution tape that they used to keep the deer out of their gardens,” Moreland said. “But my stepfather was a saver. He owned a Texaco station and worked all the time. Dr. DiLoreto and his staff, especially **Yvonne Yu** and **Terry Meacham, N.P.**, were like family to them. I can remember going to appointments with them and my mother was always quizzing Dr. DiLoreto about his family as if he were one of us. And he was always so nice and patient. My stepfather would bring

in articles about the latest research on AMD and Dr. DiLoreto would always answer his questions about mom’s disease and offer his own opinions of what new therapies were coming along.”

“What I remember is how kind and grateful the Keldorf’s were,” DiLoreto said. They visited me monthly for several years after being referred by another ophthalmologist. Barbara always wore a smile when she came in — even though she knew that she was probably going to get an injection in one or both of her eyes.” Keldorf received intravitreal injections of anti-VEGF drugs to prevent leaky blood vessels from growing in the back of her eye. “She loved to hold my hand as we started our conversation during each visit. They put their total trust in me and with that responsibility I grew close to them not only as patients but as friends. I’m touched by their generosity and inspired by their devotion to seeking a cure for AMD.”

FEI extends its sincere thanks to the Keldorf’s and their family. Age-related macular degeneration is one of the leading causes of blindness among American adults over the age of 55. DiLoreto and the FEI retina service provide patients with relief from this disease through the use of pharmaceutical agents, but there is no cure for it. FEI clinicians and researchers are working diligently to better prevent, diagnose and treat AMD.

Patient Care: (585) 273-3937 LASIK: (585) 273-2020
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FEI in the Community

FEI continues extending a friendly hand into the region to bring healthcare and education through community based lectures and screenings. FEI would like to thank all the faculty, staff, students and volunteers who helped out at the following events:

SEPT. 8: FEI third-year resident, **Seth Pantenelli, M.D.**, led a troop of medical students to the Rochester Public Market to conduct Glaucoma Screenings. Despite high winds and drenching rains the team was able to provide nearly 50 people — many of them uninsured or underinsured — with a risk assessment for glaucoma as well as other potentially blinding diseases

OCT. 20: FEI attended the annual Rochester Diabetes Walk where it passed out literature and educated people about the link between diabetes and eye disease. The crew was led by FEI clinical research coordinator **Vanessa Desmore**.

NOV. 13: **Regina Smolyak, M.D.**, provided another eye health lecture to the Jewish Family Service. It was standing room only and the first presentation delivered in Russian by an FEI faculty member.



IF YOU ARE INTERESTED IN...

inviting one of our faculty members to speak about eye health topics, starting a support group related to eye disease or scheduling a glaucoma (or other type of) screening, please contact Steve Kofron at 585-275-3977. We’ll do our very best to accommodate your request.

CELEBRATING THE VISION

Faculty / Board Dinner Reflects on Achievements and Highlights Growth

In early October, the FEI Board, faculty and friends gathered to welcome new faces, celebrate achievements and give a sneak preview of exciting new expansion plans. More than 100 gathered at the Genesee Valley Club and enjoyed the lively party graciously hosted by **David and Ilene Flaum** and their family. Highlighting the program was the introduction of five new faculty, **Krystal Huxlin's Ph.D.**, promotion to tenured, full professor and Director of Research at FEI, **David Williams' Ph.D., Champalimaud Award**, the promotion of **Richard Libby, Ph.D.**, the announcement of **Geunyoung Yoon, Ph.D.**, receiving tenure, and the announcement of **Scott MacRae's, M.D.**, patent.

After receiving a heartfelt introduction by his daughter **Sara**, David Flaum thanked the faculty, staff, and board members for their dedication to FEI and urged them on to create an even brighter future for vision research, patient care and education.



JOLIE SPEARS, MITHRA GONZALEZ, M.D., ANN MULLIGAN, AND STEVEN FELDON, M.D., M.B.A.



THE FLAUM FAMILY (L TO R): ASHER FLAUM, MONICA FLAUM, ILENE FLAUM, DAVID FLAUM, DARREN RESSLER, SARA FLAUM-RESSLER, JAMIE FLAUM AND LOREN FLAUM



DIANE FELDON AND BARRY FLORESCUE



RINA AND DANNY CHESSIN



JENNETTA HAMMOND, BENJAMIN HAMMOND, M.D., MATTHEW GEARINGER, M.D., AND JOE HANNA

A Tradition Grows

Each year FEI Board Member **Ron and Jessica Billitier** host a special event to raise funds dedicated to improving patient care at FEI. *The Billitier Vision Dinner* continues to grow in popularity, informing community leaders about FEI's clinical and research missions. In September more than 100 people attended and celebrated with a five-star meal expertly paired with a variety of wines at Tournedos Restaurant.

During the festivities, FEI's **Scott MacRae, M.D.**, explained the need for funding to purchase specialized equipment to enhance FEI's position as a national leader in treating the corneal disease keratoconus (see page 8). Through corporate and table sponsorships, donations and a silent auction, a record \$34,000 was raised. A live auction of a wine dinner at Tournedos highlighted the evening.

Plans are already in the making for this year's event and anyone interested in becoming a sponsor is invited to contact **Jennifer Richardson** at 585-273-5472. FEI gratefully acknowledges all those who came in support of eye care and research and especially recognizes Tournedos and the Billitiers for their hard work and generosity that makes this such a special event on the FEI calendar.



JESSICA AND RON BILLITIER

A Portrait in Perseverance

FEI sub-specialists to manage his patient. “Dan has had nearly every complication that one sees in uveitis,” Gearinger said. “This included cataracts, glaucoma, vitritis, swelling of the retina and calcium build up in his cornea.” Some of these complications were a result of the uveitis and some were the result of treatments used to reduce inflammation in his eyes to help him see better.”

“He’s had two types of glaucoma,” Gearinger said. “The first kind was acute angle closure glaucoma which can be an immediate threat to vision. It happened after surgery I performed to remove cataracts in both his eyes that were caused by the uveitis. A laser was used to make a hole in his iris and break up the attack. Later he developed open angle glaucoma as a result of his uveitis and the steroids used to treat it. He required daily eye drops to keep the glaucoma in check, but eventually we had to implant a tube device in one eye to relieve the pressure on his optic nerve caused by fluid building up.”

In addition to the cataract and glaucoma surgeries, Dan also had a vitrectomy by FEI retina specialist **Mina Chung, M.D.** The procedure was needed because the uveitis had spread to the back of one eye. This resulted in inflammation of the retina and the vitreous fluid that helps the eye keep its shape.

During the course of treatment, Gearinger also referred Dan to the University of Rochester Medical Center’s rheumatology group. Since then, Dan has been receiving infusions of immunosuppression drugs aimed at reducing the inflammatory response in his eyes. Depending on the severity of the flare-ups, the treatments can be as frequent as monthly. Throughout this process Denise has been grateful that the majority of Dan’s care has been under one roof and that Gearinger has been Dan’s quarterback.

“We just love Dr. Gearinger,” Denise said. “When Dan was young he could be an especially difficult patient. It is so nice to have an ophthalmologist who is dedicated to kids and who is so calm and understanding of their problems. The other doctors we’ve seen and all of the staff have been so friendly to us, too. It’s like an extended family; even the technicians say hello to Dan when we’re in for an appointment. We were especially pleased when the Flaum Eye Institute added **Dr. Khalifa.** It’s important to have a uveitis specialist in town. Before he came, we were traveling to Boston or Philadelphia when the flare-ups became especially severe. It’s great that we can get all of his treatments here.”

With glasses, Dan now sees 20/30 and is enjoying the transition to high school where he is an honor student. “He’s pretty much your typical high school kid,” his mother said. “He is involved in all sorts of activities, like being a part of the theater group’s back stage crew, and he is involved in Masterminds — a quiz competition between area schools. He also likes creating digital art, some of which was featured at the annual district-wide art show. As a 15 year old, I think he’s also looking forward to driving and is already talking about college. He’s interested in studying astronomy or geography or something science-related that might require an advanced degree.”

“We’re just so happy to have things at a point where they’re under control,” Krenzer continued. “We don’t want Dan’s future to be limited by anything. Our goal is to make sure he is independent, which I think we’re achieving. He administers drops on his own to keep his eye pressures in check. He goes to camp every summer, and next year he’s going to Europe as part of an art appreciation trip. He’s come a long way. We’re also keeping our fingers crossed that we can wean Dan off the immunosuppressant therapy. That would be terrific because every time we come in for an infusion, he has to make up a day of school.”

“Dan has been through a lot,” Gearinger said. “I tell families with kids who have uveitis and glaucoma that we will get to know each other very well and to expect the course of disease to be like a roller coaster with ups and downs. When things are looking good, I try to remind them that we still need to be vigilant, and when things are tough that we can improve the outlook with medications or surgery. It’s a pleasure treating Dan, and I am grateful to have had the opportunity to get to know his parents. Hopefully, the worst is behind us and Dan will continue to do great things as we keep an eye on his vision.”



About Uveitis

The National Eye Institute describes uveitis as a group of inflammatory diseases that causes swelling and/or destroys eye tissues. It occurs primarily in the iris, ciliary body and choroid, but can affect other parts of the eye. Uveitis can target anyone but is primarily diagnosed in persons between 20 and 60 years old. Although fairly rare, some estimates say that up to 280,000 people in the United States are affected by the disease each year and up to 30,000 new cases of blindness result annually.

Eye infections, injury, systemic inflammatory diseases (such as sarcoidosis or rheumatoid arthritis) and toxic exposure have all been known to cause uveitis. However, in many cases the condition presents without a clearly defined cause. There are several forms of uveitis and each is related to the part of the eye where the inflammation occurs. Symptoms of uveitis in the front of the eye can include light sensitivity, decreased visual acuity and pain. When it occurs in the middle or the back of the eye, there is usually no pain, but blurred vision and floaters in both eyes are common.

Uveitis is readily diagnosed by general ophthalmologists even though the underlying cause may not be understood. In mild cases, dark glasses and dilating drops (used to reduce pain in the iris) may be prescribed. Depending on the level and location of the inflammation, steroidal anti-inflammatory medication may be used. This can be taken as eye drops, swallowed as a pill, injected around or into the eye, infused into the blood intravenously, or released by a capsule that is surgically implanted inside the eye. Because long-term steroid use can have negative side effects such as cataract or glaucoma, other methods are used if treatment lasts longer than three months.

In the case of chronic uveitis, patients are generally sent to an ophthalmologist who is fellowship trained in managing the condition. Uveitis specialists may rely on other experts such as retina and glaucoma specialists to manage complications related to the disease. In some instances, the uveitis specialist will consult with a rheumatologist and begin systemic infusions of immunosuppressive drugs aimed at arresting the inflammation. Properly diagnosed and treated, the prognosis for good vision is excellent.

FEI Receives \$1.5 Million NIH Grant to Study Process of Geographic Atrophy

Geographic atrophy (GA) is a severe type of age-related macular degeneration (AMD) commonly associated with the dry form of the disease. Geographic atrophy related to AMD is a major cause of vision loss for those over 55 and no effective treatment exists. Even the cause and the primary cell type responsible for progression of GA remain poorly understood. This gap in understanding represents a critical barrier in developing new treatments. The National Eye Institute recently awarded **Mina Chung, M.D.**, a \$1.5 million grant to use FEI's advanced retinal imaging laboratories to identify the primary site of cell damage in GA.

Using high-resolution fluorescence adaptive optics scanning laser ophthalmoscopy (FAOSLO) Dr. Chung aims to establish the sequence of cellular loss in the progression of GA. She believes cell loss begins in the photoreceptors — first in the rods and then in the cones — and is eventually followed by damage to retinal pigment epithelial (RPE) cells, which nourish and maintain the photoreceptors as well as other retinal cells. FAOSLO will allow Chung's team to study this in great detail because it is the first high-resolution optical technology that can simultaneously image the photoreceptors and RPE in patients. Validation of Dr. Chung's hypothesis could prove useful in evaluating potential new treatments for dry AMD and by providing early end points for defining success in clinical trials.



MINA CHUNG, M.D.

Cornea Service Adds New Equipment

FEI's six cornea specialists help make Rochester a world renowned center for research and patient care. Keratoconus is a condition where the cornea thins and can cause blinding optical distortion or lead to corneal failure requiring a transplant. Recently FEI purchased a piece of equipment on the leading edge of keratoconus diagnosis and treatment that will establish Rochester as a regional center for therapy and research into this debilitating disease.

The Ziemer Galilei G4 corneal tomographer/topographer represents the latest advance in clinical imaging. Just the third installation in the United States, it provides the highest sensitivity in screening patients for keratoconus. The Galilei uses a special kind of dual camera system to construct a three-dimensional image of the cornea. Software employed by the instrument corrects for artifacts and motion, which is especially helpful in imaging children. The resulting corneal map provides ophthalmologists with unprecedented detail that can be used to diagnose keratoconus or better predict which patients might have complications from LASIK surgery.

The Galilei will not only give FEI a better screening tool for corneal disease, it could be potentially used to establish a corneal cross-linking center in Rochester. In cross-linking, physicians apply a solution containing the vitamin riboflavin to the eye. As the vitamin is absorbed into the cornea it is exposed to a special beam of ultra violet light. When this occurs, changes happen to corneal tissue; strong bonds of collagen form which stabilize the cornea and can even reverse some of the optical distortions caused by keratoconus. Although not yet approved in the United States, cross-linking is being successfully used elsewhere in the world. When approved in the U.S., having the Galilei is the first step in establishing FEI as a regional center for this novel treatment.



Lumetrics / FEI Partnership Awarded Nearly \$1 Million in NIH Start-up Funding

Congresswoman **Louise Slaughter** visited Rochester-based medical technology firm **Lumetrics** to announce a \$973,000 Small Business Innovation Research (SBIR) grant from the National Institutes of Health. The highly competitive grant will fund development of a digital hand-held diagnostic ophthalmic instrument that will dramatically improve access to vision related healthcare both in the U.S. and across the globe. The promising pen-sized device will provide an effective clinical tool for inspecting the retina and documenting the findings.

"We are extremely pleased that the National Institutes of Health found our idea worthy of such a large and prestigious grant," **John Hart**, CEO of Lumetrics, said. "The collaboration with the University of Rochester and its Flaum Eye Institute is an incredible opportunity for Lumetrics and will lead to new jobs at our company and expanded purchasing for our local supplier community."

The development of the new camera has been led by **Phillip Ignatovich, Ph.D.**, Chief Technology Officer for Lumetrics and **David Kleinman, M.D., M.B.A.**, a retinal specialist at the Flaum Eye Institute. The camera is made possible through a key invention patented by FEI's **Steven Feldon, M.D., M.B.A.**, and **Geunyoung Yoon, Ph.D.** Both will be assisting on many aspects of the project.

"When we applied for this grant we told a great story," Kleinman said. "There is no group better suited for this project than our team here in Rochester. We have world-renowned expertise in optical engineering, medical device development and manufacturing, and cutting edge research in ophthalmology and the visual sciences. As we advance this novel technology, we hope it further establishes our community as a leader in bringing great imaging products to the global stage."

Lumetrics is one of nearly 140 technology firms in the Rochester area focusing on the field of photonics and optics. Organized as the Rochester Regional Photonics Cluster, these firms represent the largest manufacturing cluster in New York State.

FEI Welcomes Three New Faculty with Rochester Roots

In the last *Vision for the Future*, we welcomed **Christian Klein, M.D.** and **Sarah Klein, O.D.** Christian grew up in Rochester and the young family returned from practice in Chicago, deciding that the Finger Lakes was a great place to raise children. Keeping in tradition with the Rochester connection, we are delight to announce the addition of three more clinicians just in time to occupy our expanding clinical space.



REGINA SMOLYAK, M.D.

Regina Smolyak, M.D., joins **Shakeel Shareef, M.D.**, in our glaucoma service. Born in Russia, Smolyak and her family relocated to Rochester when she was in her teens. She completed her undergraduate and medical degrees at the University of Rochester and her residency in ophthalmology at Albert Einstein College of Medicine in Bronx, NY. She completed a subsequent glaucoma fellowship at Washington University in St. Louis, Mo., and returned to New York City where she established

a thriving ophthalmology practice in Brooklyn. Smolyak is excited to return to Rochester to be close to family and friends. She is skilled in all phases of glaucoma management, including surgery and laser therapy as well as cataract surgery. She speaks fluent Russian and looks forward to re-establishing her roots in the area.



BENJAMIN HAMMOND, M.D.

In 2011 we bade farewell to third-year resident **Benjamin Hammond, M.D.** He and his young family traveled to Southern California where he entered a pediatric ophthalmology fellowship at Doheny Eye Institute/Children's Hospital of Los Angeles. As he began to search for cities in which to start his practice, Rochester was front and center. We are delighted to announce Hammond's return to FEI where he joins

Matthew Gearinger, M.D., managing a busy and growing pediatric ophthalmology practice. Before he came to Rochester for his residency, Hammond attended Brigham Young University where he was an honors graduate. He then completed Medical School at the University of Michigan where he excelled in research. He diagnoses and treats all pediatric eye conditions, including those requiring surgical management such as cataract, strabismus, glaucoma and tear duct obstruction. He will be splitting time between FEI's main campus and satellite locations.



MITHRA GONZALEZ, M.D.

In 2010, **Mithra Gonzalez, M.D.**, completed his ophthalmology residency at FEI. His ambition was to complete a prestigious American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) fellowship at the University of Colorado School of Medicine. When Gonzalez left Rochester, he went with the strong feeling that he would return, even though he was being recruited to join the faculties of other prestigious institutions.

We are thrilled to have him back where he will join FEI's **Steven Feldon, M.D., M.B.A.**, in the oculofacial plastic and orbital services. Gonzalez medically and surgically treats a variety of conditions related to orbital and facial problems, including trauma, tumors, inflammations, and congenital anomalies. He also provides aesthetic services at the main campus and FEI's Brighton location to help patients recapture a sense of youth and self confidence. His research interests include developing a better understanding of the biological markers of thyroid related eye disease and the genetics of congenital ptosis. Before completing his residency in Rochester, he received a bachelor's degree from Virginia Commonwealth University and a medical degree from the University of Iowa.

We welcome all three and are proud that Rochester is now a center for academic ophthalmology that can draw accomplished clinicians and scientists back to the region. FEI looks forward to their contributions to the advancement of research, education, and patient care..

New Research Director Twice Recognized by University

The march to tenure and full-professorship at a university can be a painstaking process. Each of these goals can be separately dependent on other criteria set forth by the faculty. This can include teaching or having an extensive record of publications and research productivity. To receive either tenure or be appointed professor are laudable. To simultaneously achieve both is rare and recognizes a special individual.

FEI's **Krystel Huxlin, Ph.D.**, recently accomplished this feat when the University of Rochester promoted her from Associate to Full Professor and granted her tenure at the same time. Huxlin has continuously distinguished herself as one of the University's finest teachers, training numerous



KRYSTEL HUXLIN, Ph.D.

students and post doctoral fellows while maintaining an outstanding record of publications. Her research includes maintaining two NIH funded laboratories that are each unique in their aim. One focuses on visual optics and corneal wound healing while the other has made great strides in how the injured brain can re-learn how to process visual signals. This has resulted in patented technology for restoring sight to persons who have suffered strokes. Added to this honor, Huxlin has been recently named Director of FEI's Basic Research enterprise. She will replace **Lin Gan, Ph.D.**, in this role. Gan is currently pursuing new collaborative research opportunities between FEI and Chinese institutions.

New Clinical Operations Managers Named



BRENDA HOUTENBRINK,
C.O.T., C.O.E.

FEI Refractive Surgery Center Practice Administrator **Brenda Houtenbrink, C.O.T., C.O.E.**, has been named the chief of clinical operations at the Flaum Eye Institute. She will provide leadership and oversight for all FEI clinical operations, including the faculty practice, hospital clinic, and off-site activities. Houtenbrink completed an undergraduate degree in business administration and brings strong strategic, customer service, management, and process improvement skills that have served to create a “best-in-class” refractive surgery practice. She looks forward to joining the FEI administrative leadership team helping the transformation of the clinical operation into a group practice focused on physician as well as patient satisfaction.

Dorothea Castillo has been named the director of technical and diagnostic operations. Castillo has been with the FEI since 1994, primarily as the lead diagnostic technician and photographer. As director she will be working very closely with Houtenbrink and collaborating on recruitment and staffing, workflows, and process improvement initiatives.

FEI Photographers Win in Chicago

The annual Ophthalmic Photographers’ Society’s conference took place in November in conjunction with the annual meeting of the American Academy of Ophthalmology. FEI’s diagnostic services talent were well represented. The following awards were earned:

Brandi Deats, CRA, O.C.T.-C.:

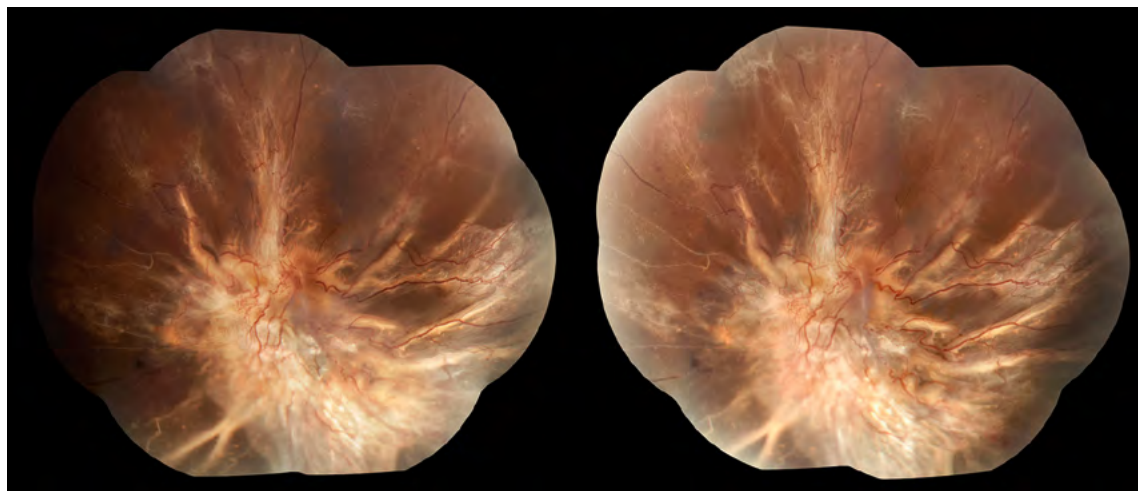
1st Place, scientific exhibition photograph – Composite “Tractional Detachment OU”

3rd Place, scientific exhibition photograph – ICG Angiogram “Birdshot Retinochoroidopathy”

Honorable Mention, scientific exhibition photograph – Cross Categories “RPE Atrophy and Bone Spicule: Color, Red-free, Green-free”

Rachel Hollar, C.R.A.:

Honorable Mention, scientific exhibition photograph – Instrumentation Photography “Dry Eye Glasses”



1ST PLACE AWARD — TRACTIONAL DETACHMENT OU

CLINICAL TRIALS

Clinical Trials currently enrolling at FEI include:

- ⊙ A Phase 3 Study to Determine the Efficacy and Safety of Rebamipide in Subjects with Dry Eye Syndrome (*J. Aquavella, M.D.*)
- ⊙ Multicenter, Double-Blind, Randomized, Placebo-controlled Study of Weight-Reduction and/or Low Sodium Diet plus Acetazolamide vs. Diet plus Placebo in Subjects with Idiopathic Intracranial Hypertension with mild Visual Loss Comparing Glatiramer Acetate (Copaxone®) with Placebo in Patients with a First Episode of Optic Neuritis (*Z. Williams, M.D.*)
- ⊙ Prospective Randomized Investigation to Evaluate Incidence of Headache Reduction in Subjects with Migraine and PFO Using the AMPLATZER PFO Occluder Compared to Medical Management (*C. Benesch, M.D. / S. Feldon, M.D.*)
- ⊙ Effect of Diabetes Education During Retinal Ophthalmology Visits on Diabetes (*D. DiLoreto, M.D., Ph.D.*)
- ⊙ Prompt Panretinal Photocoagulation Versus Intravitreal Ranibizumab with Deferred Panretinal Photocoagulation for Proliferative Diabetic Retinopathy (*D. DiLoreto, M.D., Ph.D.*)
- ⊙ A Comparative Effectiveness Study of Intravitreal Aflibercept, Bevacizumab and Ranibizumab for Diabetic Macular Edema (*D. DiLoreto, M.D., Ph.D.*)
- ⊙ A Randomized Trial of Bilateral Lateral Rectus Recession Versus Unilateral Lateral Rectus Recession with Medial Rectus Resection for Intermittent Exotropia (*M. Gearinger, M.D.*)
- ⊙ A Randomized Clinical Trial of Observation Versus Occlusion Therapy for Intermittent Exotropia (*M. Gearinger, M.D.*)
- ⊙ A Randomized Trial of Levodopa as Treatment for Residual Amblyopia (*M. Gearinger, M.D.*)

For more information please contact us at: **585-276-8734**



YOUSUF KHALIFA, M.D.,
F.A.C.S.

Khalifa Wins Academic Mentoring Award

For his efforts teaching medical students and residents, assistant professor of ophthalmology, **Yousuf Khalifa, M.D., F.A.C.S.**, was recognized by the University of Rochester School Of Medicine and Dentistry. He recently received the *2012 Trainee Academic Mentoring Award in Clinical Science*. This award recognizes outstanding devotion to the mentoring of trainees.

New Residents Arrive

FEI rang in the academic New Year at the annual "Meet the Residents Breakfast". For the first time in its history, the Flaum Eye Institute welcomed a class of four first year residents. This change in the number of trainees reflects the program's overall growth and is a great source of pride for faculty and alumni.

FEI Alumni Council President **Donald Grover, M.D.**, welcomed **Katharine Liegel, M.D.**, **Angela Pugliese, M.D.**, **Morgan Renner, M.D.**, and **Anushree Sharma, M.D.** Each were presented the AAO Basic Science Course in Ophthalmology textbooks which are made possible through the Alumni Resident Endowed Fund. We are very grateful to the Alumni Council who also underwrote the breakfast. We extend our sincere thanks to all our graduates, some of whom were in attendance, whose generosity in support of the program is reflected in its growth.



KATHERINE
LIEGEL, M.D.



MORGAN
RENNER, M.D.



ANGELA
PUGLIESE, M.D.



SHARMA
ANUSHREE, M.D.

2013 Flaum Eye Institute Visiting Professor Series

Ophthalmologists, physicians from other medical specialties, optometrists and allied health professionals are invited to attend. There are no fees to attend — except for the annual conference — and each Saturday lecture carries 4.0 hours of ACGME Category I credit. These CME credits may be applicable toward other professional certifications to maintain licensure in New York State or anywhere in the U.S.A. Please check with your corresponding accreditation council to determine how many credits transfer.

Grand Rounds begin at 8 a.m. in the FEI clinic area, located on the third floor. Free event parking in the Eye Institute lot at 210 Crittenden Blvd. is available.

FEB. 16

Dimitri Azar, M.D., M.B.A.

Professor of Ophthalmology
UIC College of Medicine

CORNEA/REFRACTIVE SURGERY

MARCH 15 & 16

58TH ROCHESTER OPHTHALMOLOGY CONFERENCE *(fee required)*

Joel Schuman, M.D.

Chairman, Department of Ophthalmology
Director of UPMC Eye Center
University of Pittsburgh School of Medicine

GLAUCOMA

Timothy Olsen, M.D.

Chairman, Department of Ophthalmology
Director of Emory Eye Center
Emory University

RETINA

APRIL 20

Robert Goldberg, M.D.

Karen and Frank Dabby Professor of
Ophthalmology
UCLA Jules Stein Eye Institute

OCULOFACIAL PLASTICS

MAY 11

Ken Nischal, M.D.

Professor of Ophthalmology
University of Pittsburgh School of Medicine

PEDIATRIC OPHTHALMOLOGY

JUNE 15

Marco Zarbin, M.D., Ph.D.

Professor and Chair of Ophthalmology
and Visual Science
University of New Jersey School of Medicine
and Dentistry

RETINA



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ROCHESTER
MEDICAL CENTER

Flaum Eye Institute

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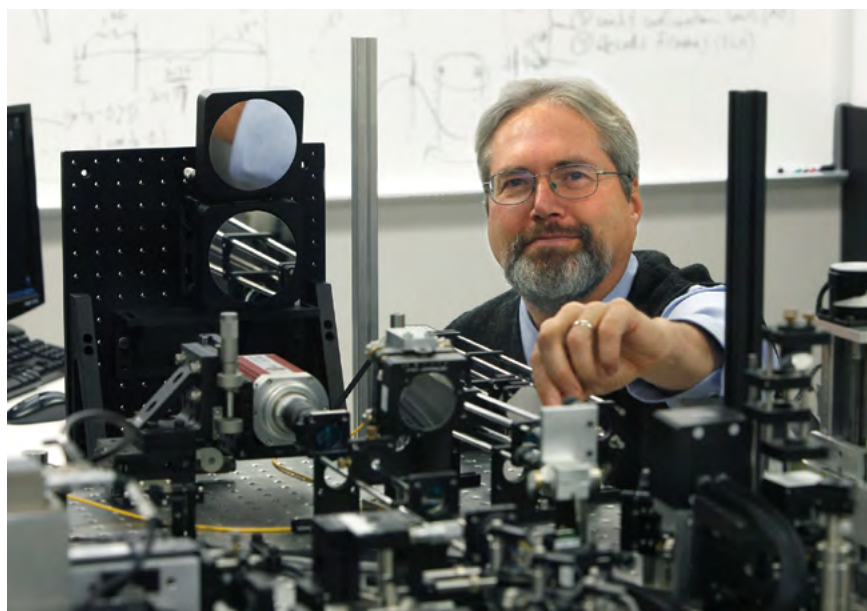
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Researcher Honored for 'Major Breakthrough' in Vision Science

David Williams, a faculty member of the University of Rochester's Flaum Eye Institute received the *António Champalimaud Vision Award* in Lisbon, Portugal. The ceremony, chaired by the president of Portugal, recognized Williams' work on adaptive optics technologies as a "major breakthrough in the understanding and/or the preservation of vision." In awarding the prize, the jury stated that Williams and his research group have "revitalized the field of physiological optics, producing technically brilliant and groundbreaking work."

The prize is shared with the developers of optical coherence tomography, another method of imaging the retina that has improved the diagnosis and clinical management of retinal disease. Williams said he was delighted to share the award as "together these two technologies make it possible for us to image the retina with unsurpassed resolution and move us further down the path to understanding of retinal disease." Williams, called the discoveries in adaptive optics "the work of many graduate students, postdoctoral fellows, and collaborators over two decades. It is great for our whole community that the achievements and potential of adaptive optics for vision is showcased with this award," he said.



COURTESY DEMOCRAT AND CHRONICLE MEDIA GROUP AND PHOTOGRAPHER CARLOS ORTIZ

The jury added that the discoveries of Williams and his colleagues have "demonstrated the potential of optical methods, for both the investigation and the improvement of normal and pathological visual function. They have set the stage for current approaches to vision correction and have opened up new possibilities for imaging retinal structures in the living eye."

Williams is a faculty member of the Institute of Optics, director of the Center for Visual Science, and Dean for Research in Arts, Science, and Engineering.

FACULTY PRACTICE Comprehensive Eye Care

Shobha Boghani, M.D.
Christian Klein, M.D.
Sarah Klein, O.D.
Rebecca Nally, O.D.
Jill Schafer, O.D.

Contact Lens Services

Rebecca Nally, O.D.
Jill Schafer, O.D.

Cornea and External Disease

James Aquavella, M.D.
Steven Ching, M.D.
Holly Hindman, M.D.
Yousuf Khalifa, M.D.
Ronald Plotnik, M.D., M.B.A.

Glaucoma

Shakeel Shareef, M.D.
Regina Smolyak, M.D.

Neuro-Ophthalmology and Orbit

Steven Feldon, M.D., M.B.A.
Zoë Williams, M.D.

Oculofacial Plastics

Mithra Gonzalez, M.D.
Steven Feldon, M.D., M.B.A.

Pediatric Ophthalmology

Matthew Gearinger, M.D.
Benjamin Hammond, M.D.

Refractive Surgery

Scott MacRae, M.D.
Holly Hindman, M.D.

Retina and Vitreous

Mina Chung, M.D.
David DiLoreto, M.D., Ph.D.
David Kleinman, M.D., M.B.A.
Rajeev Ramchandran, M.D.

Uveitis

Yousuf Khalifa, M.D.

Veterans Services

Shobha Boghani, M.D.
Sarah Klein, O.D.
Fred Schamu, O.D.
Shakeel Shareef, M.D.

RESEARCH FACULTY

Charles Duffy, M.D., Ph.D.
William Fischer, M.S.
Lin Gan, Ph.D.
Jennifer Hunter, Ph.D.
Krystal Huxlin, Ph.D.
Amy Kiernan, Ph.D.
Richard Libby, Ph.D.
William Merigan, Ph.D.
Gary Paige, M.D., Ph.D.
Richard Phipps, Ph.D.
Duje Tadin, Ph.D.
David Williams, Ph.D.
Geunyoung Yoon, Ph.D.
Jim Zavislan, Ph.D.

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