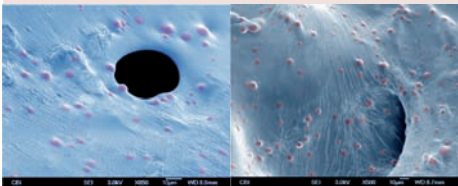


# 2015 SIGHT + SOUND

FALL EDITION



Morgan V. Fedorchak, PhD  
Assistant Professor of Ophthalmology,  
Chemical Engineering and Clinical &  
Translational Sciences



Microscopic view of drug-loaded microspheres suspended in hydrogel.

## Louis J. Fox CENTER FOR Vision Restoration

of UPMC and the University of Pittsburgh

### An End to Eye Drops

By Carrie Fogel

The Department of Ophthalmology’s Louis J. Fox Center for Vision Restoration is well known for engaging scientists of various backgrounds. Such collaborations help to ensure the success of vision restoration, which is the goal of the unique Ocular Tissue Engineering and Regenerative Ophthalmology (OTERO) Fellowship that is offered each year. Fellows, with backgrounds other than ophthalmology, are tasked with using a multi-disciplinary approach to pursue a ‘revolutionary’ idea that, if successful, will provide radical improvement in the treatment and prevention of vision impairment. One former OTERO fellow and current Assistant Professor of Ophthalmology, Dr. Morgan Fedorchak, who has a PhD in Bioengineering from the University of Pittsburgh, had one such revolutionary idea; one that is generating excitement and anticipation from scientists, physicians, and patients alike.

Glaucoma is the second leading cause of blindness worldwide and it can painlessly and irreversibly damage one’s optic nerve to the point of permanent loss of vision. Dr. Fedorchak decided to tackle one of the most frustrating problems that both doctors and patients experience with glaucoma treatment; the frequent use of topical eye drops. Teaming with Dr. Joel S. Schuman, Chairman of the Department of Ophthalmology, and Dr. Steven R. Little, Chairman of the Department of Chemical Engineering, Dr. Fedorchak found that the current method of applying drops several times per day is frustrating and creates a higher risk of not adhering to the treatment. Another concern Dr. Fedorchak noted, “was the matter of systemic absorption, meaning that once the drug was placed on the eye, it was absorbed by the bloodstream, and thus, there was a chance for complications or negative reactions.”

Dr. Fedorchak’s goal was to create a once-a-month controlled-release treatment of a glaucoma drug that is both convenient and comfortable. To accomplish this, Dr. Fedorchak used her engineering background to create a substance, which has two components: “You start with a liquid drop, which is administered just like an eye drop and then turns into a gel at body temperature. The gel then settles in the lower eyelid, allowing the eye to move around normally without seeing the gel. It stays in place, is non-degradable and extremely safe. Secondly, within the gel are polymer microspheres, which are the drug releasing component. The microspheres break down over time, releasing medication steadily at the ideal rate for drug delivery. By the end of one month, when the drug completes the delivery, the gel can be removed and a new drop can be instilled,” states Dr. Fedorchak.

Once the gel was developed, it was tested in an animal study. In the animal model, the drug-loaded drop was placed in one eye and tested against animal subjects that received the standard treatment of twice-daily drops in one eye. Dr. Fedorchak observed three important results that indicated how successful this new therapy could be. “The biggest thing is safety: we did not notice any infection, irritation, or anything on a cellular level that would indicate

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# Faculty Under the Microscope: Barry E. Hirsch, MD

by Heather Chronis

**B**arry E. Hirsch, MD is highly regarded by his patients as compassionate and knowledgeable, and is nationally recognized for excellence in ear surgery. He came to the University of Pittsburgh in 1979 for a residency in Otolaryngology (ENT), after graduating from the University of Pennsylvania Medical School. His interview with the Chairman of the Department of Otolaryngology, Eugene N. Myers, MD, sealed the deal for relocating to Pittsburgh. "Dr. Myers was making the program come alive," states Dr. Hirsch. Upon completing the residency, Dr. Hirsch joined the Georgetown Faculty in 1982 and stayed until 1984, when he was given the opportunity to return to the Eye and Ear Hospital for a fellowship with his mentor, Donald B. Kamerer, MD. This "golden opportunity" coincided nicely with his wife, Jean C. Harwick, MD beginning a cornea fellowship at Eye and Ear Hospital.

In 1987, Dr. Hirsch established the Temporal Bone Laboratory as a training area for residents. He recognized the need for the Residents and Fellows to obtain the necessary practice to develop their skills in ear surgery. The laboratory began with state of the art equipment, including the same microscopes that are used in the operating room. Following his fellowship with Dr. Ugo Fisch in Switzerland in 1996, Dr. Hirsch began to incorporate techniques of Skull Base Surgery into the training facility. Donor funding from many of Dr. Hirsch' patients, the Lions Clubs, and other organizations continues to provide updated equipment that maintains the status of the laboratory as one of the finest in the country. As a testament to its success, the dynamic space is now also used by Ophthalmology, Urology, and Plastic Surgery for training purposes.

Otolaryngology residents and neurotology fellows regard Dr. Hirsch as an outstanding instructor. As a resident recently commented, "Dr. Hirsch clearly loves working with residents and teaching, and is very trusting in surgical situations that require precision measured in millimeters. He is just as patient and thoughtful in the clinic setting, and is always ready to answer and discuss clinical questions. Dr. Hirsch is also one of the most personable attendings I have had the pleasure



**Barry E. Hirsch, MD, FACS**  
Director, Ear/Hearing Center and Otology/Neurotology Division, performing an exam at the Eye & Ear Institute, Oakland, Pennsylvania

of working with — he obviously cares a great deal for his patients, and they for him."

Dr. Hirsch takes a considerate and personalized approach to every one of his patients. "I first began treatment with Dr. Hirsch in 1989, when I had my first ear surgery. Quite frankly, I would be nearly deaf today, if it had not been for Dr. Hirsch's medical treatment. Dr. Hirsch takes the time to explain everything regarding the problem at hand and how to resolve the issue. He is always happy to see me and I am always astounded at how cordial he is even during the worst appointments," states Laura Underhill. Twenty six years later, she continues to be a patient of Dr. Hirsch. The admiration is not all one sided. Dr. Hirsch is often inspired by his patients. A teenage patient of Dr. Hirsch's has a metastatic tumor that has spread to his lungs and treatment, at this point, is directed toward controlling the primary tumor and those to his lungs. The patient has a "phenomenal outlook" and shares his love of music, including a self-produced CD with

Dr. Hirsch, all while receiving chemotherapy at Children's Hospital. Dr. Hirsch considers this patient a role model and source of inspiration showing strength and love of life.

Dr. Hirsch remains passionate about Otolaryngology more than thirty years after arriving at the Eye and Ear Institute. His excellence in treating patients, along with training residents and fellows, has helped the institution maintain its top national ranking. Dr. Hirsch is a prime example of the continued exceptional patient care and treatment that has been the hallmark of the Eye and Ear Institute since its inception. **S+S**

*Should you wish to support Dr. Hirsch's work, please indicate the Temporal Bone Laboratory fund on the attached envelope and mail to the Eye & Ear Foundation. Donations are also accepted online at [eyeandear.org](http://eyeandear.org).*

**To schedule an appointment with Dr. Hirsch, please call the ENT Clinic at 412-647-2100.**



# Retinal Regeneration is a Fishy Problem

By Carrie Fogel

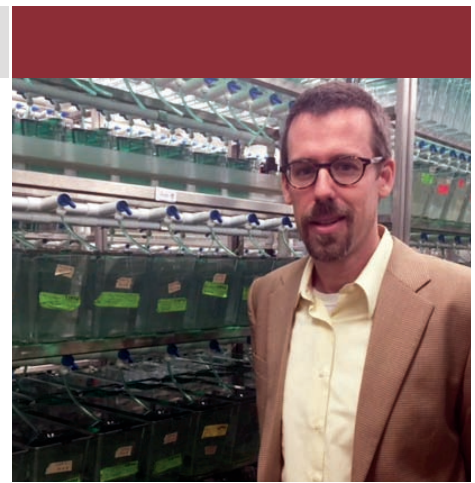
**W**hile most people anticipate the summer season as a time for vacations and time away from work, that was not the case for Jeffrey Gross, PhD, the new Director of the Louis J. Fox Center for Vision Restoration. Dr. Gross arrived in Pittsburgh in late July; a time when many were spending their days on sunny beaches, Dr. Gross was already hard at work setting up his new laboratory in the University of Pittsburgh's Biomedical Science Tower. Dr. Gross' research is now conducted at the Charles and Louella Snyder Laboratory for Retinal Regeneration and focuses on ocular development, disease, and regeneration.

"I had an initial phone conversation with Joel S. Schuman, MD, Chairman of the Department of Ophthalmology at the University of Pittsburgh, during which we discussed the Fox Center and the collaboration of the Department of Ophthalmology with the McGowan Institute for Regenerative Medicine, which I found interesting." After a few meetings with Dr. Schuman, Dr. Gross came away from each visit more enthusiastic. "I really liked that here, at Pitt, the clinicians and basic scientists can collaborate and the barrier in getting everyone to talk to each other does not exist, as it does at other institutions and it shows in the science that is being done here." The scientists, too, left a positive impression on Dr. Gross: "It feels

like the scientists and the physicians have this 'can-do attitude'. Everyone I talked to made me believe that if you had a research question, people are ready to jump in and work with you and it feels like the whole team wants everyone to be successful."

In addition to the positive reactions he received from the scientists, the unique partnership that exists among University of Pittsburgh scientists, McGowan Institute scientists, and UPMC physicians was attractive to Dr. Gross as well: "It's very collaborative here and, as someone who sees the great potential for collaboration in the direction my work is headed, I understood how beneficial it could be for my research. The science being done here is fantastic. People actively solve problems here and that helps find opportunities for collaboration as well as finding funding for projects. The hurdles that exist to doing innovative science are minimal at Pitt, and it seemed like we could really succeed here."

The laboratory, he explains, is a basic science laboratory that focuses on understanding the diseases of the eye, why certain people get them and developing regenerative therapies to cure them. We investigate genetics and molecular biology and use zebrafish models, because their genetic makeup is similar to that of humans and they have a remarkable ability



Jeffrey Gross, PhD among the 11,000 zebra fish tanks at the University of Pittsburgh School of Medicine

to regenerate their retina and Retinal Pigment Epithelial (RPE) cells. after injury. Additionally, any effects of the genetic changes that are made to the zebrafish model are easy to see, as larvae and embryos are transparent, meaning that ocular defects can be more easily tracked than in mammal models. As Dr. Gross explains, "We can create a mutation in a genome and identify fish that have eye diseases that resemble humans, like macular degeneration, cataracts, coloboma, and more. By understanding what proteins and compounds are present or not present, we can see how that creates a defect and thus how you create therapies to counteract that defect from occurring. You need to understand what went wrong so that you can fix it."

As the new director of the Fox Center, Dr. Gross is focused on supporting the research already happening and growing the support base for the center. One goal he does hope to accomplish is to strengthen our capacity to fund seed projects. "The way that federal funding works now is that it's hard to find support for really innovative new ideas. At the Fox Center, we want to foster this innovation and creativity because we believe that this is how really groundbreaking research comes about." Dr. Gross hopes that by using donor support, which has already contributed so much, that will leverage support from the National Eye Institute, as well as other large foundations. "The research here is fantastic," he says, "and I believe we're well on our way to establishing ourselves nationally and internationally as THE center for regenerative ophthalmology." 

*To support Dr. Gross' research in discovering ways to regenerate the human retina damaged by such diseases as macular degeneration, glaucoma, and retinitis pigmentosa, simply return the attached envelope or donate online at [eyeandear.org](http://eyeandear.org).*



Front row, left to right: Krista Angileri, Natalie Gath, and Pawat Serittrakul.  
Second row: Jeffrey Gross, PhD; Andrea Hartsock, PhD; and Nick Hanovice.  
Not pictured: Jiwoon Lee, PhD; and Lyndsay Leach, PhD.

# 30 years

## Celebrating 30 Years of Advancing Ophthalmology and Otolaryngology Research

by Heather Chronis


**T**his year, the Eye & Ear Foundation celebrates 30 years of supporting research in Ophthalmology and Otolaryngology at the University of Pittsburgh. Founded in 1985, following the sale of Eye and Ear Hospital, the Eye & Ear Foundation raises funds to ensure that the groundbreaking research opportunities, a cornerstone of the Eye & Ear Foundation since its inception, continues today and into the future.

For the past 12 years, under the leadership of Chairman, Joel S. Schuman, MD, and the Eye & Ear Foundation Endowed Chair at the University of Pittsburgh, the UPMC Department of Ophthalmology has amassed a very impressive team of researchers led by Dr. Robert Hendricks, the Joseph F. Novak Endowed Chair and Director of Research since the 1970s. Dr. Schuman founded the Louis J. Fox Center for Vision Restoration to specifically focus on, not just treating diseases and disorders of the eye, but restoring lost vision. Mr. Fox, an alumnus of the University of Pittsburgh made his naming gift for the Fox Center six years ago. Since this time, the Fox Center has added research laboratories focused on retinal regeneration, optic nerve regeneration, curing the high eye pressure that causes glaucoma, curing corneal blindness, artificial vision, and eye transplant among other

exciting new research. Jeffrey M. Gross, PhD, the new Director of the Fox Center and the E. Ronald Salvitti, MD Chair, recently arrived from the University of Texas and is moving forward with innovative research that has been the hallmark of the Center.

For more than 40 years, founding Chairman for the UPMC Department of Otolaryngology, Eugene N. Myers, MD, along with the current Chairman and The Dr. Eugene N. Myers Professor and Chair at the University of Pittsburgh, Jonas T. Johnson, MD, have led a skilled team of physicians using innovative techniques and treatments for ear, nose, and throat disorders, including skull base surgery, robotic surgery, and personalized medicine in head and neck cancer. With the leadership of Dr. Johnson, the Otolaryngology Department maintains its position as one of the top tier programs in the country due to historically recruiting the best surgeons who have established themselves as leaders in the field of Otolaryngology, along with a program that consistently carried out advanced research to improve patient care. Since the beginning, life changing research has abounded at Eye and Ear Institute. Thirty years ago, Charles D. Bluestone's, MD groundbreaking studies on otitis media led the nation in treatment modalities and this work continues today in

concert with innovative research in voice, balance disorders, auditory sciences, and tinnitus.

From the pioneers at Eye and Ear Hospital to today's practicing physicians, groundbreaking research and lifesaving treatments have been the guiding principles of the institution. George Fechter, Chairman of the Eye & Ear Foundation says, "It is the responsibility of the institution to distribute that knowledge for the greater good. The Eye & Ear Foundation provides support for research through donations and securing grants." Financially strong, the Eye & Ear Foundation must continue to grow its endowment to provide funding for both current and future projects. In honor of the Eye & Ear Foundation's 30th anniversary, please consider a gift that will truly make "sense," or rather give the gift of senses in the years to come. 

*The Eye & Ear Foundation is a non-profit 501 (C)(3) organization created solely to support the education and research efforts of the Departments of Ophthalmology and Otolaryngology at the University of Pittsburgh. Our Eye & Ear Foundation is the only foundation in the region which supports research and academic efforts to eradicate both hearing and vision loss. To support our research, please complete and return the enclosed envelope or donate online at [eyeandear.org](http://eyeandear.org).*





# HearCARE

by Catherine Palmer, PhD

Communication is an essential part of being human. A baby first communicates his/her needs and wants through sounds—crying when hungry and soon cooing and laughing at the world he has been born into. For an aging adult, communication is known to positively impact cognition, fight off social isolation, and keep depression in check. Older adults move to senior communities to maintain or increase their social engagement, receive care from qualified staff, and to ultimately enhance their quality of life. We know that the majority of individuals over 65 years of age have significant hearing loss. This leaves them with complex listening needs due to the low incidence of hearing aid use, group communication situations that are common for social activities, interactive dining environments, and the need for telephone use to connect with loved ones. Busy staff and family members may not be aware of the impact of decreased hearing on quality of life, as well as caregiver burden. With hearing loss being associated with increased depression, increased falls, and a decrease in cognitive function, residents with untreated hearing loss may be more prone to health status decline.

HearCARE is a quality improvement project developed by the Audiology Division of the Department of Otolaryngology at UPMC. This project is generously funded by the Hearst Foundation. HearCARE evaluates the efficacy of a new model for delivering audiology

services and communication assistance to residents at assisted living facilities, employing Communication Facilitators (CF) who are trained and supervised by an audiologist. The project is evaluating whether the implementation of a CF who delivers hearing healthcare and implements communication solutions tailored to the resident and the environment will enhance communication abilities of residents, thereby increasing social engagement, with improved quality of life, and reducing burden on staff and family members. Six months into the project, we have completed the CF training program and introduced the CF into the facility. We are measuring self-perceived communication success on residents, family, and staff at three facilities. One facility has the CF, one facility has an audiologist visit once per month (a model currently available), and one facility has no intervention. The CF has proven to be a full-time position with activities, including setting up assistive listening devices for TV, phone, and group listening; streamlining referrals for higher level audiological care when needed, hearing aid troubleshooting, hearing aid insertion, hearing aid cleaning and maintenance, battery changes, facilitating communication interactions in social activities including activity room, bingo, movies, dining. Comments from residents include, "I used Super Ears to watch TV, which I wasn't able to do for years," "The CF model is so helpful. I wonder why it took so long to develop it," and "I wasn't wearing my hearing aid for a



good six months prior to your arrival at the facility. Since you've been checking on me, this is the longest I have worn them." The CF model may be a cost-effective solution for enhancing hearing and communication in residential settings. We look forward to collecting data at the end of the year to see the impact of the program. **S+S**

The HearCARE Team: Catherine Palmer, PhD, Director of Audiology; Jennifer Fruit, AuD, Coordinator; Reem Mulla, AuD, Audiologist; Elizabeth Derwin, BA Communication Facilitator.

*Contributions to the HearCARE project can be directed to the Eye & Ear Foundation. Simply indicate Audiology Fund on the attached envelope when sending in your contribution. Online donations are accepted at [eyeandear.org](http://eyeandear.org)*

**To schedule a hearing assessment, please call the UPMC Center for Audiology at 412-647-2030.**

## An End to Eye Drops *continued from front page*

damage. We also saw that the actual efficacy of the treatment (judged by monitoring the intraocular pressure (IOP) in the subjects) saw comparable results to those subjects who received the regular drops twice each day." Third, and most interestingly, was that the eye that received treatment experienced a drop in pressure and the untreated eye was unaffected, whereas in the subjects who received standard drops, the untreated eye also had low pressure, which indicates that it was absorbed systemically and could potentially produce negative side effects. The gel importantly stays where it needs to be, with less access to systemic circulation and more access to the affected tissues than the standard drugs. The gel uses 100 times less drug over the course of a month, ultimately preventing patients from taking more medication than needed.

Clearly, this new drug delivery system has the potential to change the way ophthalmic drugs are administered to patients. Dr. Fedorchak and her team are on the cusp of submitting an Investigational New Drug (IND) application to begin a clinical trial and are also exploring other applications for the gel, such as post-operative treatment, which might prevent patients from needing to fill a prescription to manage their post-operative care. Dr. Fedorchak is also collaborating with Dr. Deepinder Dhaliwal, Professor of Ophthalmology, using drops to deliver antibiotics following cataract surgery. The team has also submitted a patent application for this new technology, which, if approved, will be a monumental success for the entire Ophthalmology Department at the University of Pittsburgh and its efforts to bring this technology to patients through commercialization. **S+S**

*Morgan Fedorchak, PhD, a product of the Ocular Tissue Engineering and Regenerative Ophthalmology (OTERO) Fellowship program, was recently promoted to a full-time Faculty position within the Department of Ophthalmology at the University of Pittsburgh. Her delivery platform for glaucoma drugs is currently awaiting Investigative New Drug (IND) approval for further clinical trial. The OTERO Fellowship through the Louis J. Fox Center for Vision Restoration recruits scientists with varying backgrounds into the field of regenerative ophthalmology. With this scholarship program, fellows are trained jointly by the McGowan Institute and by the Department of Ophthalmology at the University of Pittsburgh with the goal of providing radical improvement to the treatment of vision impairment.*

# Working in Collaboration to Prevent Blindness

by Heather Chronis

The Ophthalmology and Visual Sciences Research Center at the University of Pittsburgh, under the direction of Robert Hendricks, PhD, has been the recipient of multiple restricted and unrestricted grants from the Research to Prevent Blindness (RPB). Founded in 1960 by Dr. Jules Stein, RPB is a national leader in the effort to fund, coordinate, and promote vision research in the United States. From its infancy to today, RPB has advocated at all levels for vision research. RPB restricted and unrestricted grants have helped to launch the careers of countless vision scientists. Indeed, many leading vision scientists around the world credit the RPB with their early scientific development.

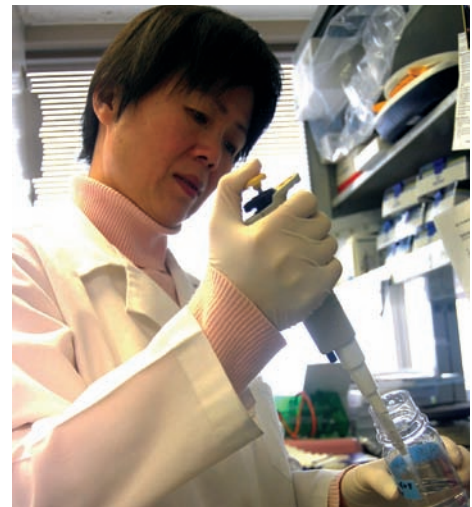
The unrestricted grants to the University of Pittsburgh have supported pilot projects including recent projects by Dr. James Funderburgh and Dr. Yiqin Du to study the use of corneal stromal stem cells to treat corneal scarring, by Dr. Du to study the use of trabecular meshwork stem cells to treat glaucoma, by Dr. Shiva Swamynathan to study the anti-inflammatory role of SLURP-1, and by Dr. Ian Sigal to study ocular biomechanics in glaucoma. All of these studies are now funded by National Institute of Health (NIH) R01 grants. Work by Dr. Kevin Chan and Dr. Ian Conner investigating the structural, metabolic, and functional relationships between the eye and the brain in glaucoma was also funded by an RPB unrestricted grant and currently has an NIH R01 application pending.

In addition to funding pilot projects, RPB unrestricted grants have also helped with physical improvements to the research labs. One of the most valuable uses of the RPB funding is the purchase of lab equipment for new faculty. Additionally, service contracts on core equipment have been funded, which has helped to preserve equipment obtained through other grants.

The research faculty of the University of Pittsburgh have also received many individual grants from RPB. Dr. Funderburgh received a Stein Professorship, a \$625,000 award for a researcher who is moving from a basic science department to an ophthalmology department. This grant helped Dr. Funderburgh move his laboratory from University of Kansas to the University of Pittsburgh. Dr. Xiangyun Wei, Dr. Robert Shanks and Dr. Matthew Smith have all received Career Development Awards, which include a \$200-250,000 award to promote their early vision research career development. Dr. Robert Hendricks and Michael Gorin were awarded the Senior Scientific Investigator Award designed to support high risk/high reward projects of senior investigators, Sherrie Divito, Jared Knickelbein and Daniel Roh all won the RPB Medical Student Award, Dr. Xiangyun Wei won the Wasserman Award, while Dr. George Stetten and Dr. Steven Little each won the Innovative Ophthalmic Research Award. Over the last twenty years, the total amount of RPB individual grants to the Ophthalmology Department have totaled




Robert L. Hendricks, PhD, Director, Ophthalmology & Visual Sciences Research Center, Joseph F. Novak Endowed Chair, University of Pittsburgh School of Medicine

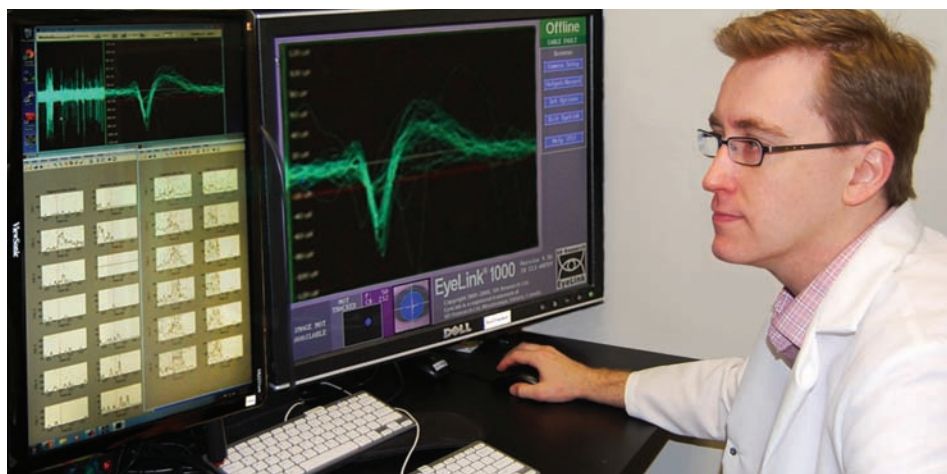


Yiqin Du, MD, PhD, Assistant Professor of Ophthalmology, Stem Cell Biology and Glaucoma Laboratory, has confirmed that the stem cells can differentiate into functional trabecular meshwork cells—essential to stem cell-based therapy for glaucoma.

\$1,690,000, providing the researchers with the opportunity to continue their study of unique and targeted approaches to prevent vision loss.

RPB support to the Ophthalmology Department has increased each year, which has allowed the institution to grow in stature in the ophthalmology research arena, since Dr. Hendricks' arrival in 1997. From this ground breaking work, has come NIH grants which are considered the most prestigious in the United States and are considered a predictor of great future successes. The funding by the RPB has provided the groundwork for international success for the Ophthalmology Department at the University of Pittsburgh. 

*To learn more about the Ophthalmology Department's research projects, please feel free to contact the Eye & Ear Foundation. Donations to the Ophthalmology Department can be sent in the attached envelope or online at [eyeandear.org](http://eyeandear.org).*



Matthew A. Smith, PhD, Assistant Professor of Ophthalmology, Visual Neuroscience Laboratory. His work is designed to lay the foundation for interfaces with the visual system, such as a cortical visual prosthetic device.



# UPMC Center for Balance Disorders Helps Steady Patients

by Patrick J. Sparto, PT, PhD

Common problems, such as dizziness, balance disorders, and falls can potentially result in debilitating effects and are often a leading sign of other medical conditions. Dizziness and balance disorders have many causes, including inner ear abnormalities, migraine headaches, anxiety, and even muscle weakness. The symptoms may include feeling unsteady, dizzy, woozy, a fear of falling, or having a sensation of movement, spinning, or floating. Balance is maintained by several body systems working together. The brain takes information from the eyes, inner ear, and sensation in the limbs to understand where we are and how we are moving. When one of these systems is damaged or the brain does not interpret the signals correctly, a balance disorder can occur.



Although dizziness and balance disorders are common in older adults, they can occur in anyone and at any age. The UPMC Center for Balance Disorders within the Department of Otolaryngology at the University of Pittsburgh focuses on finding the cause of dizziness and balance disorders and then develops a treatment plan with their comprehensive balance disorders care team. A key component in the success of the Center for Balance Disorders has been the Vestibular (Balance) Laboratory, a specialized facility designed to test the

**The Center for Balance Disorders combines their comprehensive testing facility and a team of experts to help identify and overcome balance problems at any age.**

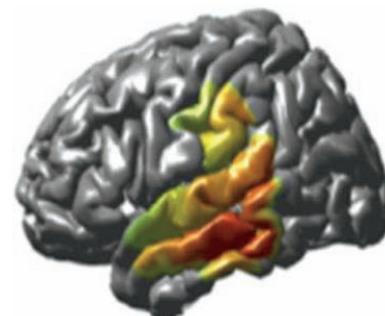
balance system. Several different types of tests are performed depending on the type of problem and symptoms, including a screening of eye movement; thermal testing of the inner ear; positional testing for inner ear abnormalities; rotational testing to determine how the brain processes information from the eyes and inner ear; computerized dynamic posturography to test balance while standing; and vestibular evoked myogenic potentials to test specific functions of the inner ear. All of these tests help to determine the cause of the dizziness and balance problems, as well as the most effective treatment plan for the patient. Treatment plans commonly involve a combination of therapies, including medications and physical therapy. Patients with dizziness and balance disorders are often referred to specialized physical therapy clinics around the region.

The Center for Balance Disorders is also actively researching how the brain helps to coordinate one's balance. This is accomplished by using an innovative brain imaging technique called Near Infrared Spectroscopy (NIRS). This non-invasive technique measures how much the activity in the different parts of the brain increases in response to changes in the challenge of the balance task. We are testing this technique in older adults, and in individuals with balance disorders. We have found that when people perform a challenging balance task, such as standing on an unstable surface with their eyes closed, there is increased activity in the part of the brain just above the ears. This activity is increased more as people age.

Sadly, many people live and suffer with debilitating dizziness, balance disorders, and fear of falling when help is often available. The Center for Balance Disorders combines their comprehensive testing facility and a team of experts to help identify and overcome balance problems at any age. **\$+\$**

*Private support from individuals and organizations sustains this research, leading to better care for patients at the Center for Balance Disorders. If you wish to support this work with a donation, please use the attached envelope or visit [eyeandear.org](http://eyeandear.org) for online donations.*

**For more information on balance disorders or to schedule an appointment, call the UPMC Center for Balance Disorders at 412-647-2125.**



While standing on an unstable surface with eyes closed, a person's brain activity increases in a part of the brain called the vestibular cortex, as shown by the red and yellow colors on the brain image.



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The official registration and financial information of the Eye & Ear Foundation may be obtained from the Pennsylvania Department of State by calling toll free, within Pennsylvania, **1-800-732-0999**. Registration does not imply endorsement.

To contribute to a story, ask questions, make comments, or obtain more information, please contact Katherine M. Troy, Managing Editor, at [Katherine@eyeandear.org](mailto:Katherine@eyeandear.org).



## The Next *30 years*

By Lawton Snyder

**W**e are fortunate to live in a time when medical procedures have advanced to today's standard. When the Eye & Ear Foundation was established thirty years ago, procedures were much different. Eye surgeries for cataracts and glaucoma were more invasive and often required an overnight stay. There were no options to image the back of the eye to determine the progression of retinal degeneration. If you were diagnosed with macular degeneration, you were told that nothing could be done. If you suddenly developed profound hearing loss, the cochlear implant was not an option, and hearing aid technology was not nearly as advanced as it is today. If you had to have surgery to remove a tumor in your throat or at the base of your skull, the operation would result in disfiguring scars.

Today, most eye procedures are completed in the office. Every ophthalmologist has a method to image the retina and optic nerve to determine if the patient is at risk for macular degeneration and/or glaucoma, which could lead to vision loss. We now have medical treatments for wet macular degeneration that have been effective for many patients. There are many technological solutions for hearing loss, which continue to improve. There are surgical instruments, including surgical robots, that allow tumors to be removed by going through the mouth or nose to avoid disfigurement.

Throughout all of these medical advances the Eye & Ear Foundation has been there to provide our scientists the resources to advance technologies, surgeries, and medical treatments in all areas of research in the eyes, ears, nose, and throat. Just imagine what the next 30 years will bring, thanks to your generous support.