IN FOCUS

FALL 2019

A Publication for Members of the FOUNDATION FIGHTING BLINDNESS

Foundation Fighting Blindness Investing Nearly $6.5 Million in New Grants

by Ben Shaberman

Thanks to our successful fiscal year of fundraising which ended on June 30, 2019, the Foundation has committed $6.5 million for 14 new research projects for inherited retinal diseases. The newly funded research efforts include development of a CRISPR/Cas9 therapy for retinitis pigmentosa, a retinal imaging technique using artificial intelligence, and several therapies that have strong potential to treat a wide range of inherited retinal diseases.

"We are delighted to expand our grants portfolio with several highly impressive projects that address many key research priorities and critical needs. Furthermore, the projects are being led by the world's top retinal scientists," says Brian Mansfield, PhD, executive vice president of research/interim chief scientific officer at the Foundation. "These grants wouldn't have been possible without the generosity of our donors over the last year — their support through major gifts, walks, dinners, mail, and personal initiatives. The hard work and commitment of our donors is incredible and continues to successfully drive our mission."

The Foundation currently funds a total of 80 research grants.

New grants for Fiscal 2020 (beginning July 1, 2020) include:

Next generation optogenetics for vision restoration
Deniz Dalkara, PhD
Institut de la Vision (France)
$2.5 million over 5 years

Optogenetic therapies hold promise for restoring vision in people with advanced retinal disease regardless of their underlying mutation. Dr. Dalkara and her team are developing an optogenetic therapy that can be administered to different retinal cell types depending on the condition (stage of disease) of the patient's retinal structure. Furthermore, the approach has the potential to bestow a higher degree of sensitivity (i.e., better vision) than current optogenetic approaches in clinical trials and translational studies.

Continued on page 11

WHAT'S INSIDE

HELP FIGHT BLINDNESS

Use the enclosed envelope to make a life-changing gift.

In Focus is published by:
Foundation Fighting Blindness, Inc.
7168 Columbia Gateway Drive
Suite 100
Columbia, MD 21046

BEACON STORY

The Show Must Go On Despite Vision Loss Due to Stargardts

*Emmy Award-Winning Writer and Performer Ellen Gould Weaves her Personal Experience with Stargardts Into Her New Musical, "**Seeing Stars**"*

by Ellen Gould

We inherit lots of things that affect our lives in unforeseen ways. Growing up, I was definitely the 'artist type' and a bit precocious. I sang before I spoke and recited Juliet's balcony speech to Romeo standing on the sofa at age 7. My parents said I always looked at things differently and was often ahead of my chronological years. But no one expected I would become legally blind from macular degeneration by age 16.

I have Stargardt disease, which is an inherited juvenile form of what most people are familiar with as age-related macular degeneration (AMD). It usually occurs in late childhood/ early adolescence, runs in families and causes varying degrees of central vision loss. It is often progressive and, in its most extreme form, can leave only the peripheral vision intact. I'm one of the lucky ones – my 20/200-vision has remained relatively stable for most of my life. But it did create many challenges for me as a budding singer and actress.

I moved to New York City after college to start my career over 30 years ago. There were no technologies

to instantly blow up the font of scripts and little concern for disability issues. If I didn't hide the fact that I was visually impaired I knew I would hear, "You have a problem? Okay… NEXT!" So, I decided to try writing shows that I could perform myself. That way, I figured, I wouldn't have to audition anymore and could create the kind of roles I wanted to play!

As luck would have it, I had an opportunity to perform my first original piece at an event sponsored by a charity I volunteered for. It took place at The Public Theater in NYC and a producer happened to be in the audience. He opened "Bubbe Meises, Bubbe Stories" Off-Broadway the following year. The show later aired on PBS and I received two Emmy Awards: one for acting, one for writing (the one for writing, strangely, made me the happiest).

Not every show I've written and performed has had that kind of happy ending. But I love the process and, thankfully, enough audiences have enjoyed the results that I've managed to make a career of it. And I never would have been motivated to expand my view of what was possible if I had not been visually impaired. Thank you, Stargardt!

Thank you, also, to Foundation Fighting Blindness! For the past 8 years this important organization has really broadened my horizons with regard to the blindness community. I am hoping my show can be of service to this and other organizations that are raising money and awareness of visual impairments. It's always the personal stories that help open people's hearts and dare them to see the world in a different kind of way.

After decades of writing and performing my own solo musicals, I am about to launch the most personal of them all. As I prepare for my first performances of "Seeing Stars" I feel a mix of trepidation and joy – like the character that introduces herself with, "Just call me THE WRITER because I'm finally writing about the thing I've tried so hard to hide…that I don't see the way most other people see."

Professional Headshot of Ellen Gould

WHAT DO I SEE?

WHAT DO I REALLY SEE?

In a constellation of reflecting stories, five women personally affected by Stargardt all ask that question. Their fierce and funny answers prove that whatever limits our sight can lift us to greater vision.

Ellen Gould

"Seeing Stars" debuts in New York City this October as part of The United Solo Theater Festival. To learn more, visit: http://unitedsolo.org/us/2019-seeingstars

BEACON STORY

Blind Miracle on Ice

by Shawn Hewson

My name is Shawn and I have Usher syndrome type 3, which means I have vision impairments combined with hearing impairments. My parents discovered my hearing loss at 4 years old, after realizing that I wasn't just ignoring them when called from behind. To this day, I wear a cochlear implant in my left ear and a behind-the-ear hearing aid in my right ear. At 7 years old, my vision loss (retinitis pigmentosa) was diagnosed soon after a T-ball game where I couldn't locate the baseball that was hit in my direction in the outfield.

In 1996 at the age of 28, a local retinal specialist told me that I would nearly go blind in two years. Although that did not come true, it did push me to get involved with the blind community in order to better prepare and guide me along my journey in life with Usher syndrome going forward. I was encouraged by my doctor, Dr. Eliot Berson at Mass. Eye and Ear, to get involved locally and that is what brought me to the Foundation Fighting Blindness chapter in Twin Cities. I participated in the inaugural Twin Cities VisionWalk in 2007 and just about every year since.

Today, my field of vision for each eye is roughly 12-15 degrees, 20/100 central vision, night blindness, some color blindness, and high sensitivity to bright lights. As things continue to become more difficult in all aspects of my life, my priorities change, and I've learned to adapt along the way. As a result, my family life as a husband and father has become more functional, I am highly engaged at my workplace, and I have a strong desire to be even more involved in the Usher syndrome community.

I recently became more involved by joining the local blind hockey team as a player.

Shawn putting on his hockey gear and ice skates giving a thumbs up.

The Minnesota Wild professional hockey organization launched Minnesota's first-ever blind hockey program in October 2018. In blind hockey, the puck is approximately three times the size of a standard puck and is made from metal with ball bearings inside that cause it to make noise upon impact. That design is what helps the players locate the puck, but it is more of a challenge for me because I do not hear the puck noise as well as others do.

In late December 2018, I was asked by my coaches if I wanted to go to Tampa, Florida for the Toyota-USA Hockey Disabled Hockey Festival. My first reaction was, "No way! I have never played real hockey games before and I will get slaughtered." Thankfully, my teammate Nick, who is an incredible player, and coaches, Chris and Lonny, were already committed to Tampa, and I received a ton of encouragement from family, friends, and my other teammates to attend.

Shawn and his daughters, Siena and Sadie, at the Foundation Fighting Blindness' Twin Cities VisionWalk.

Shawn wearing his gold medal from the 2019 Disabled Hockey Festival in Florida.

Shawn with his team members from the 2019 Disabled Hockey Festival as follows: Lonny, Shawn, Nick and Chris.

When I woke up the first morning of the festival in Florida, I was distraught with the jitters. I really felt like I didn't belong there, and this was way out of my comfort zone. I had never played an organized hockey game before, had no idea what the game would look like, how good these players were, or if I would be able to hear the whistles and my coaches in an actual game.

There were several U.S. Blind Hockey National Team players on each team, which was pretty cool. We had Kevin Shanley, who usually plays defense for the National Team, as one of our goalies. One of my fellow defensemen was Daniel Belding from the U.S. National Team, and I was eager to learn more about being a defensive player from him.

By the end of the festival, the realization sunk in that I was a part of something that was truly remarkable. Each game featured many hard-fought battles for the puck and a high level of effort from all the teams. And in the end, my team came out with a 6-0 triumph to capture the gold. Many great people came together to create this platform to allow us to play the game and embrace the passion of hockey with others who have the same kind of impairments, along with great coaches who understand our needs. New friendships were formed. Dreams were lived.

If you are to persevere in your struggles and overcome obstacles, it is essential to step out of your comfort zone. This allows you to grow in strength, confidence, and courage over time.

CLINICAL-TRIAL PIPELINE

Retinal-Disease Therapy

Inherited Retinal Diseases and Dry AMD: 36 trials (Select trials) | Updated August 2019

GENE THERAPIES	Progress
Achromatopsia (CNGB3) – AGTC	Phase 1/2
Achromatopsia (CNGB3) – MeiraGTx	Phase 1/2
Achromatopsia (CNGA3) – AGTC	Phase 1/2
Achromatopsia (CNGA3) – Tubingen Hosp	Phase 1/2
AMD (Dry) – Gyroscope	Phase 1/2
Choroideremia (REP1) – Nightstar	Phase 3
Choroideremia (REP1) – Spark	Phase 1/2
Choroideremia (REP1) – Tubingen Hosp	Phase 2
LCA and RP (RPE65) – MeiraGTx	Phase 1/2
LCA and RP (RPE65) – Spark	FDA Approved
RP (PDE6B) – Horama	Phase 1/2
RP, Usher, others (optogenetic) – Allergan	Phase 1/2
RP, Usher, others (optogenetic) – GenSight	Phase 1/2
RP (RLBP1) – Novartis	Phase 1/2
Retinoschisis (RS1) – AGTC	Phase 1/2
Retinoschisis (RS1) – NEI	Phase 1/2
Stargardt disease (ABCA4) – Sanofi	Phase 1/2
Usher syndrome 1B (MYO7A) – Sanofi	Phase 1/2
X-linked RP (RPGR) – AGTC	Phase 1/2
X-linked RP (RPGR) – MeiraGTx	Phase 1/2
X-linked RP (RPGR) – Nightstar	Phase 3 Pen.

CELL-BASED THERAPIES	Progress
AMD-dry (RPE) – Astellas	Phase 1/2
AMD-dry (RPE) – Cell Cure	Phase 1/2
AMD-dry (RPE on scaffold) – Regen Patch	Phase 1/2
RP, Usher (retinal progenitors) – jCyte	Phase 2b
RP, Usher (retinal progenitors) – ReNeuron	Phase 2
Stargardt (RPE) – Astellas	Phase 1/2

MOLECULES, PROTEINS, AONS	Progress
AMD-dry (C3 inhibitor) – Apellis	Phase 3
AMD-dry (C5 inhibitor) – Ophthotech	Phase 2
LCA (CEP290, AON) – ProQR	Phase 1/2
LCA (CEP290, CRISPR) – Editas	Phase 1/2
Stargardt disease (emixustat) – Acucela	Phase 3
Stargardt disease (deuterated vit A) – Alkeus	Phase 2
Stargardt disease (C5 inhibitor) – Ophthotech	Phase 2
Usher syndrome 2A (AON) – ProQR	Phase 1/2

Visit **ClinicalTrials.gov** for more details and trial contact information. This document is for informational purposes only. Information is subject to change, and its accuracy cannot be guaranteed.

MY RETINA TRACKER

My Retina Tracker, My Story

Susan, who was diagnosed at age 28 with retinitis pigmentosa (RP), was experiencing relatively rapid vision loss. Six months later, Susan had full renal failure from polycystic kidney disease and had an immediate kidney transplant. She has no family history of RP but her two younger brothers had both died young of kidney disease.

In search to learn more about her eye disease, Susan received genetic testing for her RP through a program that focused on analyzing only 32 genes – mainly involved in early onset RP. One pathogenic RPE65 variant was identified. Her local retinal specialist said she probably had RPE65-disease and would qualify for a new vision-restoring gene therapy called LUXTURNA. However, she was told that she did not qualify. RP due to RPE65 is a recessively inherited disease and she would need to have two mutations in her genes to qualify.

Susan had not received genetic counseling with the first genetic test and was then referred to a genetic counselor. This counselor informed Susan that her retinal disease was not typical of RPE65 disease and was probably due to a different genetic cause. The counselor helped her connect with a different retina specialist who worked with her to find and enroll in the My Retina Tracker® (MRT) testing program. MRT provides a comprehensive test of 266 retinal disease genes. This time, her test came back with a clear diagnosis – two mutated copies of the NPHP1 gene, which is the cause of her RP – and is also known to cause kidney disease.

About her experience, Susan said, "I was first told that genetic testing wasn't important for me. I found another doctor and found the Foundation's program. And now look, this genetic testing has answered questions for me and my family that I never would have had otherwise. I started out frustrated that I didn't qualify for gene therapy, but now I'm so grateful for everything I've learned about my disease. This has given me hope."

Top: Susan (left) with her daughter Amber and her grandson Luca

Bottom: Susan showing her muscles with her t-shirt that says, "Retinitis Pigmentosa Warrior. It's not for the weak."

To learn more about how you can join the My Retina Tracker® registry, visit MyRetinaTracker.org.

EVENT SPOTLIGHT

Join Us at an Upcoming Vision Seminar!

Looking to expand your knowledge of the clinical health landscape? Ready to open your mind to the possibilities of new research? Registration is now open for our 2019 fall Vision Seminar series!

The Foundation Fighting Blindness' Vision Seminar – a free half-day panel discussion on the current outlook of retinal health and science – is your opportunity to get up close and personal with some of the brightest minds in the field. Let engaging presenters from the Foundation Fighting Blindness and other renowned researchers from across the country share their expertise with you and your loved ones.

Seats are filling fast, so sign up today! Call **866-782-7330** or visit one of the following:

Montgomery County | 9/7/19
Give.FightingBlindness.org/
MontgomeryCountyVisionSeminar

Charlotte | 9/14/19
Give.FightingBlindness.org/
CharlotteCountyVisionSeminar

New York City | 10/6/19
Give.FightingBlindness.org/
NewYorkVisionSeminar

RESEARCH ROUNDUP

Allergan and Editas Begin Recruiting for CRISPR/Cas9 Clinical Trial for LCA10

Allergan, a global pharmaceutical company, and Editas Medicine, a developer of gene-editing therapies, have begun patient recruitment for a Phase 1/2 clinical trial for a CRISPR/Cas9 treatment for people with Leber congenital amaurosis 10 (LCA10). The treatment targets a specific mutation (c.2991+1655A>G in Intron 26) of the gene CEP290.

Known as the Brilliance clinical trial, the study is the first for a CRISPR/Cas9 treatment for an inherited retinal disease. It is also the first clinical trial for a CRISPR/Cas9 therapy administered inside the human body.

Brilliance is a dose escalation trial that will enroll adult and pediatric (3–17 years of age) patients at sites in the US.

Known as EDIT-101, the CRISPR/Cas9 gene-editing technology developed by Allergan and Editas is designed to locate and remove the mutation in LCA10. The treatment works like a pair of molecular scissors to cut out the mutation. The treatment is delivered to photoreceptors by a subretinal injection.

Gene editing is different from gene (replacement) therapy. In gene therapy, copies of an entirely new gene are delivered to the retina to replace the defective copies. In CRISPR/Cas9 gene editing, only the mutated region of the gene is corrected.

Save the Date for VISIONS 2020

The National Conference of the Foundation Fighting Blindness!

June 18-20, 2020

Hyatt Regency Minneapolis
Minneapolis, Minnesota

Jessie on stage speaking at the Los Angeles VisionWalk with a shirt that says, "Jessie's Sight Savers."

REGISTER AT VisionWalk.org

VISIONWALK SPOTLIGHT

Jessie's Sight Savers

Jessie Wolinsky grew up in Oak Park, California and was diagnosed with retinitis pigmentosa (RP) at the age of 7. Now 26 years old, Jessie is a preschool teacher who has overcome so much to be where and who she is today.

"Growing up with RP was incredibly difficult," says Jessie. "I used to be ashamed of my condition and tried to hide it. I felt that there was no way a blind person could ever have a happy life, but through the support of the Foundation Fighting Blindness, I realized that wasn't true at all."

Jessie and her parents, Marsha and Fred, discovered the Foundation when Jessie was first diagnosed and started participating in the Los Angeles VisionWalk when she was 14. They have participated in the VisionWalk as team "Jessie's Sight Savers" every year since.

"I love the VisionWalk because it makes me feel like my future is getting brighter," says Jessie. "I am so fortunate to have loyal friends and family who donate and participate each year. I've even had complete strangers make generous donations just because they've heard me share my story."

Jessie is also the Foundation's Los Angeles Chapter President and has recently started speaking at other events, like VISIONS 2018.

"The Foundation has taught me that there is power in your story and when you share it, you not only help yourself, but you have the opportunity to inspire others," says Jessie. "I want to show people that they may not be able to control what they're going through, but they can control their reaction to it."

Walk with Us at One of Our Upcoming Fall VisionWalks:

Indianapolis, IN	9/7/19
Pittsburgh, PA	9/8/19
Northern KY/Cincinnati, OH	9/21/19
Montgomery County, MD	9/22/19
Twin Cities, MN	9/22/19
St. Louis, MO	10/05/19
Seattle, WA	10/05/19
Philadelphia, PA	10/05/19
Denver, CO	10/12/19
Triad, NC	10/12/19
Westchester-Fairfield, NY	10/13/19
Houston, TX	10/19/19
Charlotte, NC	10/19/19
Los Angeles, CA	10/26/19
Boston, MA	10/26/19
San Diego, CA	11/03/19

Continued from front cover

Development of small molecule modulator for preserving vision in people with retinitis pigmentosa
Stephen Martin, PhD
University of Texas at Austin
$900,000 over 3 years

Dr. Martin and his colleagues are developing a small-molecule modulator known as TMEM97/σ2R that can be administered into the vitreous in a slow-release formulation to delay the progression of photoreceptor loss and to preserve vision in people with retinitis pigmentosa. The emerging therapy is designed to work independent of the underlying gene mutation causing the disease. The goal is to develop a drug that can be moved into toxicology studies in preparation for a clinical trial.

Gene editing to treat retinitis pigmentosa (RHO mutations)
Alberto Auricchio, MD
University "Federico II" (Italy)
$300,000 over 3 years

Mutations in the gene rhodopsin (RHO) are a frequent cause of autosomal dominant retinitis pigmentosa. Dr. Auricchio is developing a gene-editing therapy — homology-independent targeted integration (HITI) which uses CRISPR/Cas9 — to cut and replace both the normal and mutated copies of RHO. Though he will be testing the treatment in mice with a specific mutation, the therapy is being designed to work for all mutations in RHO.

Modulating microRNAs to prevent retinal cell death
Sandro Banfi, MD
Telethon Institute of Genetics and Medicine TIGEM
$300,000 over 3 years

Tiny pieces of RNA known as microRNAs are considered therapeutic targets, because they play a role in many cellular processes including programmed cell death. Previous research conducted by Dr. Banfi provided evidence that inhibition of certain microRNAs can prevent or slow degeneration of retinal cells. Dr. Banfi is evaluating inhibition of microRNAs 181a/b as a therapeutic approach (prevention of cell death) in several mouse models of inherited retinal disease. The approach may be beneficial to people with a broad range of retinal degenerative conditions.

Enhancing metabolism in photoreceptors to treat retinal degenerations
W. Clay Smith, PhD
University of Florida
$300,000 over 3 years

Glycolysis is the process that breaks down glucose to provide fuel for cells in the body. Dr. Smith's goal is to boost glycolysis in photoreceptors to slow degeneration. He is working to accomplish this by delivering a modified arrestin1 protein to photoreceptors in various animal models. This approach is designed to work independent of the disease-causing gene mutation, so it has the potential to help people with a broad range of inherited retinal diseases.

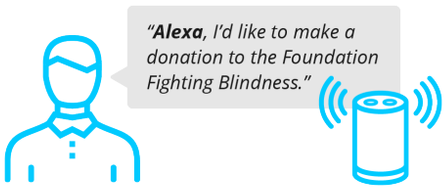
IN FOCUS
is published by:

FOUNDATION FIGHTING BLINDNESS

Foundation Fighting Blindness, Inc.
7168 Columbia Gateway Drive
Suite 100
Columbia, Maryland 21046

Foundation Fighting Blindness meets all of the standards of the BBB Wise Giving Alliance.

Giving is easy. With Amazon Pay, making the actual donation is, too. Amazon Alexa-enabled device owners and app users can make a donation to the Foundation Fighting Blindness simply by saying, "Alexa, I'd like to make a donation to the Foundation Fighting Blindness."



To learn more, visit **FightingBlindness.org/Shop-to-Support**.

IN FOCUS

This and previous issues of **In Focus** are available online, where you can get the latest retinal-research information, as well as updates on the Foundation's activities, on your PC and mobile devices.

For an online and accessible version of **In Focus**, visit **FightingBlindness.org/In-Focus-Newsletter**.

CONNECT WITH US

- *FoundationFightingBlindness*
- *FightBlindness*
- *FNDFightingBlindness*
- *FightBlindness*

WAYS TO MAKE A LASTING IMPACT

Please consider, as part of your lasting legacy, remembering the Foundation Fighting Blindess in your will, trust, or other estate planning. For more information, visit **MyPlanToFightBlindness.org**.