

ARVO News

Evidence-based model improves eye care in Africa
9

Tips on making the most of ARVO's online education
16

Meeting unmet needs in treating corneal wounds
17

ARVO 2016 special session: Spotlighting traumatic brain injuries and vision 19



2015 – 2016 Officers

John I. Clark, PhD, FARVO
President

Dimitri T. Azar, MD, MBA, FARVO
Vice President

Linda K. McLoon, PhD, FARVO
Vice President

Emily Y. Chew, MD, FARVO
President-elect

Paul S. Bernstein, MD, PhD, FARVO
Vice President-elect

Peter D. Lukasiewicz, PhD
Vice President-elect

William F. Mieler, MD, FARVO
Immediate Past President

Craig E. Crosson, PhD, FARVO
Executive Vice President

ARVONews team

Joanne Olson
Deputy Executive Director

Katrina Norfleet
ARVONews Editor
Director of Communications

John Saville
Senior Graphic Designer

Contributors

Debbie Chin
Gayle Claman, CAE
Molly Fujimoto
Claire Johns
Matt Windsor, PhD

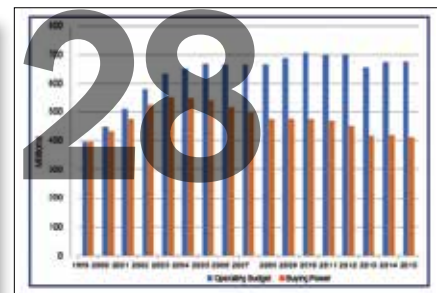
Advertising

Katherine Madison
National Trade Productions
kmadison@ntpshow.com

ARVO office

Iris M. Rush, CAE
Executive Director

1801 Rockville Pike, Suite 400
Rockville, MD 20852-5622
Phone: +1.240.221.2900
Fax: +1.240.221.0370
arvo.org



- 3 President's message**
Sharing the promise and the potential
- 5 Leaders and volunteers**
Getting to know our incoming president
Meet the EIC, EVP candidates
Our new MIT board member
- 8 Women in research**
Gisele Soubrane, FEBO, MD, PhD, FARVO
- 9 Around the globe**
Improving eye care in Africa
HARVO reaches Hungarian ophthalmologists
- 13 Advocacy and outreach**
Advocates help secure NIH budget increase
- 14 Spotlight on members**
West to receive Angle Award

- More about Beckman-Argyros Award recipient Williams
Five members in five minutes
SBIR grant helps company meet unmet needs
- 19 Trending topics**
TBI and vision: The outlook for therapeutics
Keynotes focus on biotech, genetics and vision
- 24 ARVO Foundation**
Message from the chair
WEAVR Luncheon: Networking with Geeta K. Vemuganti
Collaborative research fellows advance treatment of ROP
- 28 NEI director's message**
New year, new developments at NIH
- 26 Journals**
Exceeding expectations

Sharing the promise and the potential

by John I. Clark, PhD, FARVO

ARVO is a unique scientific organization committed to both basic and clinical research. The success of both depends on innovation and dedication in the leadership of our experimental laboratories where critical links are made between the fundamentals of the visual system and novel therapies for visual disorders. This year, a number of special presentations at the ARVO Annual Meeting in Seattle emphasizes this commitment.

Saturday, April 30, 10am – 1pm

Vision and traumatic brain injury: The outlook for therapeutics

Please plan your travel to arrive early for this third session in our series on traumatic brain injury (TBI) and vision. The session will emphasize the importance of vision research and the visual system in both the early detection of TBI and the potential for novel therapies through clinical and basic research. The session will include prominent ARVO researchers and neuroscientists, as well as patients, in an interactive discussion that I believe

will provide hope for innovative treatments for all patient populations including our veterans, athletes in impact sports and victims of trauma-related accidents. This session is open to members and the public free of charge.

Sunday, May 1, 12 noon – 1:15pm

ARVO/Alcon Opening Keynote: Components, computation, cognition

Allan Jones, PhD, CEO of the Allen Institute for Brain Science, will discuss how the institute is investigating brain connectivity. The group is using novel approaches to analyze enormous data sets generated by the collective experimental research of scientific teams working on several aspects of the fundamental function of the brain. Many of the researchers at the institute use the visual system for their research on brain connectivity, with heavy reliance on the extensive background knowledge produced by ARVO researchers.



John I. Clark, PhD, FARVO

See **President's message**, continued on page 4

The poster features a large graphic on the left side consisting of several overlapping, semi-circular segments in shades of blue, green, and yellow, resembling a stylized eye or a fan. The top left corner contains the EVER logo, which is a globe with the word 'EVER' above it. The main text is in a clean, sans-serif font. The text reads: 'EUROPEAN ASSOCIATION FOR VISION AND EYE RESEARCH' in a dark teal color. Below this, 'OCTOBER 5-8' is written in a larger, bold, dark teal font, followed by 'www.ever.be' in a smaller, dark teal font. To the right of this, a vertical line separates the text from 'EVER' and '2016', which are written in a very large, bold, dark teal font. Below '2016', the word 'NICE' is written in a large, bold, yellow-green font, and 'in France' is written in a smaller, dark teal font below it.

President's message, continued from page 3

Tuesday, May 3, 5:45 – 7pm

**ARVO/Champalimaud Award Lecture:
Generating evidence to inform practices,
programs and policies on what works to
reduce vision loss in sub-Saharan Africa**

The 2015 Champalimaud Vision Award laureates from the Kilimanjaro Centre for Community Ophthalmology, Seva Foundation and Seva Canada will discuss how improved understanding of the epidemiology of vision loss and evidence-based improvements to service delivery has increased their effectiveness. Much of their work has focused on cataract, which has the greatest medical, social and economic impact of any treatable health problem. But more advances are needed to defeat the problem of lens opacification, considered by some to be the low hanging fruit in the global offensive against world blindness.

Basic and clinical research by ARVO members contributed to advances in surgical procedures that support the success of this and other programs recognized by the Champalimaud Foundation. The Champalimaud Foundation is a relatively new organization in the fight against low vision and blindness and ARVO welcomes their strong partnership to optimize our collective efforts to improve vision internationally.

Thursday, May 5, 1 – 2pm

**Beckman-Argyros Award in Vision Research
session**

One of ARVO's newest partners, the Arnold and Mabel Beckman Foundation, is recognizing David R. Williams, PhD, FARVO, for his research on adaptive optics, a remarkable advance in imaging that is revolutionizing both clinical and basic science approaches to the structure and function of the eye. It is a model for the technological advances supported by NEI that helps vision research make the advances necessary to reduce low vision and blindness globally.

Thursday, May 5, 2 – 3:15pm

**ARVO/Alcon Closing Keynote:
Panel discussion — Genetics of vision:
Problems and solutions**

Book yourself a late flight on Thursday so you don't miss this compelling session featuring

prominent ARVO researchers Anneke den Hollander, PhD, and Janey Wiggs, MD, PhD, FARVO, who will be joined by Debbie Nickerson, PhD, and Jay Shendure, MD, PhD, both of the University of Washington's Department of Genome Sciences. Nickerson and Shendure are international leaders in basic science innovations in human genetics and high throughput screening. This session on the future directions of phenotype-genotype relationships in human vision will be interactive; look out for an invitation to submit advance questions to the panelists in early April.

The meeting in Seattle will emphasize how ARVO scientists are leading the global effort to advance basic and clinical research in visual function and prevention of poor vision and blindness. Our research is meeting the challenges of the leading causes of blindness worldwide and related diseases including cancer, diabetes, dementia and neurodegeneration. It is obvious that we have the advantage because the eye is so accessible and sensitive to systemic disease.

When we image the cornea, the lens and the retina, we are looking at specialized phenotypes resulting from the vasculature, metabolism, homeostasis, innervation and genetics of an individual and their environment over their lifetime. (The eye is the window to the vasculature/nervous/lymphatics systems and genetics during aging.) We are in a remarkable position to bring new fundamental knowledge to the efforts to improve patient health, not just in developed nations, but globally.

Lastly, we cannot conduct the research necessary to provide new knowledge and innovation without the support of the public and the individuals suffering from low vision and blindness. Sharing the promise and potential of our findings is as important as conducting the research. If you have suggestions on how to involve the general public in learning about and contributing to our progress in basic and clinical research and helping improve the collective approaches underway by ARVO and ARVO partners worldwide, please write to me today at clarkji@washingtton.edu.

Leading in an era of team science

Get to know ARVO's incoming president, Emily Chew

President-elect Emily Y. Chew, MD, FARVO, is the deputy director of the Division of Epidemiology and Clinical Applications, deputy clinical director and the chief of the clinical trials branch at the National Eye Institute/National Institutes of Health (NEI/NIH). Chew recently shared some of her background and vision for ARVO's future with ARVONews.

ARVONews: What projects are you currently working on?

Chew: The focus of my research is on randomized clinical trials, mostly in retinovascular diseases, from rare to common conditions. We have completed a large randomized clinical trial, the Age-Related Eye Disease Study 2 (AREDS2), and reported the main findings, on the effects of oral supplements on age-related macular degeneration and cataract, at the ARVO 2013 Annual Meeting. Many other analyses are currently ongoing. For example, we partnered with our internal medical colleagues here at NEI and conducted ancillary studies on the effects of oral supplements on cognitive function and cardiovascular disease. These studies leveraged the precious and now scarce research dollar while evaluating the importance of the association of eye diseases with other medical conditions.

We are completing the analyses on the study of medical therapies for persons with type 2 diabetes in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) Eye Study. With the help of the Lowy Medical Research Institute, we are collaborating with four basic science laboratories and conducting a large natural history of the more rare condition known as macular telangiectasia type 2. This has led to randomized clinical trials, both phase 1 and 2, designed to evaluate the intraocular delivery of ciliary neurotrophic factor (CNTF) using an encapsulated cell implant for the treatment of this rare ocular condition.

In the randomized clinical trials of common eye diseases of significant public health importance, we also provide data on the natural history of the disease. These data will help other investigators to design future studies. For rarer diseases, we hope to learn a great deal about processes that may be applicable to more common eye conditions.

ARVONews: What have been some of the highlights of your career to date?

Chew: I have had many, and all of them consisted of establishing terrific collaborations both within and outside of ophthalmology to give me a perspective that has been crucial to our research. We are in an era of team science and none of my research efforts would have been possible without the large teams of experts who truly contribute a great deal. Every person on the team, no matter their role, is essential to the success of our clinical research. I have learned a great deal

working with bright and energetic people who give so much of their time and effort to the projects.

ARVONews: Tell us about your involvement with ARVO through the years.

Chew: I presented at my first ARVO Annual Meeting as an ophthalmology resident. I have been attending and presenting to the program or in symposia since, and have only missed one meeting due to the birth of our youngest daughter. I was elected to the Annual Meeting Program Committee and served as chair for the Clinical/Epidemiologic Research (CL) Section.

I served on the editorial board of *IOVS* for four editors. I have participated on and recently chaired the ARVO Awards Committee. One of the most meaningful experiences associated with ARVO is serving as the CL Trustee on the Board.

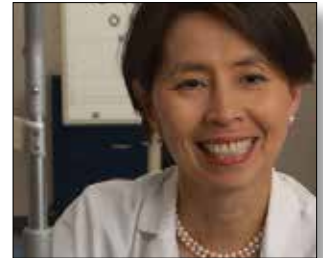
ARVONews: What are you looking forward to as ARVO president? What is your vision or hope for 2016-17?

Chew: I am very much looking forward to serving as the ARVO president to help ARVO advance its mission. I am excited by the global nature of research and to know that ARVO plays a vital role in this. Our international members are key players in several exciting initiatives, as are the international organizations that we partner with. Together, we're working to develop educational materials, for both clinical and basic science researchers, as well as improve the quality and rigor of the vision research enterprise around the world.

One area I particularly hope to support is our travel grant program for young researchers. In this climate of declining research funding, one of my hopes is to minimize the potential loss of these and future investigators to other fields and ensure young scientists stay engaged and have plenty of new opportunities in vision research.

On a broader scale, I hope ARVO can be influential in this big data era of innovative technologies that have resulted from research. So much has been discovered in recent years about biological pathways; much more research is needed. Thanks to OCT and other advances, data is also exploding in many areas of vision research, such as imaging, genetics, metabolism, proteomics, population-science and many others. Again, team science is crucial in integrating the current knowledge that we have with what we will be acquiring, thanks to these advances.

I am looking forward to ARVO leading the way in helping us unite our scientific communities and translate technical advances for meaningful and impactful clinical applications.



Emily Y. Chew, MD, FARVO

Who's who? Meet your candidates for the EIC and EVP positions

Editor in chief (EIC) candidates *Investigative Ophthalmology & Visual Science (IOVS)*

Jayakrishna Ambati, MD, FARVO,

is professor and vice chair of ophthalmology and visual sciences, professor of physiology at the University of Kentucky, where he holds the Dr. E. Vernon & Eloise C. Smith Endowed Chair and runs the Ambati Lab.

His group has provided insights into the role soluble VEGF receptors play in the creation of vascular boundaries in the cornea and retina and has identified inflammatory signatures that also drive angiogenesis in the eye. They also discovered target-independent actions of siRNAs in regulating angiogenesis, as well as cell death via immune modula-



tion in the eye as well as in other organs. Recently, his team revealed how the non-canonical actions of the microRNA pathway in regulating mobile elements could trigger inflammasome signaling, which is involved in multiple aging-associated disorders.

Ambati is the recipient of many honors, including ARVO's Cogan Award and Pfizer Ophthalmics Carl Camras Translational Research Award. He currently serves on the editorial boards of *IOVS* and *Ophthalmic Research*, and he is an associate editor of *TVST* and *Ophthalmology*.

Donald Hood, PhD, FARVO, the James F. Bender Professor of Psychology and professor of ophthalmic science (in ophthalmology), has been a member of the Columbia



University faculty since 1969. From 1982 to 1987, he served as vice president for the Arts and Sciences at Columbia University.

Hood has been a member of ARVO since 1970. His was one of the first ARVO Gold Fellows (2009) and an ARVO Distinguished Service Awardee. He served on the ARVO Board of Trustees and was chair of its Budget and Finance Committee (2006 – 2009). In addition, he was secretary and treasurer of the ARVO Foundation for Eye Research (2009 – 2015) and on the editorial boards of all three ARVO journals. He also served on the board of *Vision Research*.

His honors include being named a Fellow of ARVO, the American Academy of Arts and Sciences and the Optical Society of America. He is also the recipient of the Alcon Research Institute Award and the Research Excellence Award from the Optometric Glaucoma Society.

A conversation with the new MIT Trustee

Jaclyn Bermudez was recently selected as the new At-large Member-in-Training (MIT) ARVO Trustee. Here, she talks about her research, goals and preparation for her new role.

Tell us a little bit about yourself.



Bermudez: I did my undergraduate work at St. Mary's University in San Antonio, Texas and graduated with a BS in biology. I'm now at the University of North Texas Health Science Center and part of the North Texas Eye Research Institute. I'm in my fourth year and am

being co-mentored by Abbott Clark, PhD, FARVO, and Dr. Weiming Mao, PhD. My research focuses on the molecular mechanisms that lead to damage to the trabecular meshwork found in glaucoma.

How have you been involved with ARVO since joining?

Bermudez: This is my third year as an ARVO member and Orlando was my first Annual Meeting. At both the Orlando and Denver meetings, I enjoyed attending sessions on diversity and the WEAVR luncheon. I've been involved with — and founded — diversity initiatives at my university, and when I saw the posting about the MIT Board position, I thought I could bring a voice of diversity, women and students to the Board.

How have you been preparing for your responsibilities as the MIT Trustee?

Bermudez: I attended my first Board meeting in October and had a chance to talk with Megan Capozzi, the outgoing MIT Trustee. She gave me great advice and encouraged me to sit in on a lot of meetings. Being in all those meetings will give me a sense of where I can make a difference for MITs.

My primary responsibility is to be a liaison between the MITs and the Board. I look forward to serving on the MIT Committee and other ARVO activities where MITs can contribute and benefit. I'm really excited and honored to have been appointed and I hope to represent the MITs well.

Journal of Vision (JOV)

Andrew B. Watson, PhD, FARVO, is the senior scientist for vision research at NASA Ames Research Center in California. He held postdoctoral positions at the University of Cambridge in England and at Stanford University in California.



His research focuses on computational models of early vision, including spatial, temporal and motion processing, as well as models of neural processing and visual pattern classification.

In 2001, Watson founded *Journal of Vision*, where he served as editor-in-chief until 2013. Watson is a Gold Fellow of ARVO, a Fellow of the Optical Society of America and a Fellow of the Society for Information Display. Among his honors are Ames Associate Fellow for exceptional scientific achievement, the ARVO Special Recognition Award and the Presidential Rank Award from the President of the United States.

Translational Vision Science & Technology (TVST)

Carlo Montemagno, PhD, is the former and founding dean of the College of Engineering and Applied Science at the University of Cincinnati. Immediately before, he was the chair of the Department of Bioengineering and associate director of the California NanoSystems Institute, as well as the Roy & Carol Doumani Professor of Biomedical Engineering at UCLA. Prior to Montemagno's tenure with UCLA, he served as associate professor in the Department of Biological and Environmental Engineering at Cornell University — where he was one of the pioneers in the field of nanobiotechnology.



Montemagno then joined the U. S. Navy where he served as a Civil Engineering Corps Officer for 10 years. He then joined

Argonne National Laboratory where he led laboratory and field investigations, developing bioremediation technology for the treatment of hazardous waste.

Marco Zarbin, MD, PhD, FACS, FARVO, is chair of the Institute of Ophthalmology and Visual Science, Rutgers-New Jersey Medical School (R-NJMS) and chief of ophthalmology at University Hospital in Newark, N.J. He is a professor of ophthalmology and neuroscience at R-NJMS and holds the Alfonse A. Cinotti, MD/Lions Eye Research Chair. He is also co-director of the Ocular Cell Transplantation Laboratory at R-NJMS.



His clinical practice is focused on medical and surgical diseases of the retina and vitreous. He has published 198 peer-reviewed papers (both basic and clinical research) and editorials, 96 book chapters, 184 abstracts, one book on age-related macular degeneration, one book on stem cell therapy for degenerative retinal disease and one book on the management of diabetic retinopathy.

In addition to serving as the founding editor-in-chief of *TVST*, Zarbin serves on the editorial board for *Ophthalmology*, Retina Section Editor for the *Asia Pacific Journal of Ophthalmology* and is a vice chair of the Scientific Advisory Board of Foundation Fighting Blindness.

Executive Vice President (EVP) Candidates

Justine Smith, MD, PhD, FRANZCO, FARVO, is professor of eye and vision health at Flinders University and principal research fellow at the South Australian Health & Medical Research Institute. Prior to joining Flinders, Smith served 10 years at the Casey Eye Institute Faculty at Oregon Health & Science University. She also holds a professorial-level Future Fellow-



ship of the Australian Research Council. In 2015, Smith was elected to fellowship of the Australian Academy of Health and Medical Sciences and to Chair XIII of *Academia Ophthalmologica Internationalis*.

Well published, Smith runs a weekly uveitis clinic and participates in multiple international initiatives aimed at improving clinical outcomes for patients with this condition.

A past president of ARVO, she holds a number of prominent international positions within the eye and vision research and ophthalmology communities, including international councilor and chair of the Executive Committee Board of the International Ocular Inflammation Society, president of the Executive Committee of the American Uveitis Society, and is serving a six-year term on the Council of the American Academy of Ophthalmology.

Laura J. Frishman, PhD, FAAO, FARVO, is a professor of optometry, vision science and biology at Moores University and associate dean for research and graduate studies for the College of Optometry at University of Houston.



In recent years, her research has focused on refining noninvasive electrophysiological approaches for evaluating retinal and anterior visual pathway function and collaborative studies on structure function relations in glaucoma, multiple sclerosis and other optic neuro-pathologies.

Frishman has served on the ARVO Annual Meeting Program Committee, and she is currently serving a second term on the Awards Committee. She also is on the editorial board of *TVST*.

Frishman is an academic editor for the journal, *PLOS ONE*, and was former editor-in-chief of the *Visual Neuroscience* and of *Documenta Ophthalmologica*.

Frishman has served on federal grant review panels, including as a regular member of the former NEI study section, VISC, and she is currently a member of the National Advisory Eye Council.

Soubrane tells young scientists, “Believe in your possibility to progress”



Gisele Sourbrane, FEBO, MD, PhD, FARVO

Gisele Soubrane, FEBO, MD, PhD, FARVO, serves as professor of ophthalmology, Hôtel-Dieu Hospital in Paris, France. As a clinician-scientist, her research focuses on improvements in the diagnosis of AMD, pathogenesis and experimental models of AMD.

Soubrane has been an active member of ARVO for 35 years, which includes serving on the Annual Meeting Program Committee from 1997 to 2000. Soubrane also has been highly active in the international ophthalmic community, serving on the boards of the French Society of Ophthalmology, the European Board of Ophthalmology and the European Association for Vision and Eye Research.

ARVONews: What was your inspiration for becoming a researcher in the field of ophthalmology?

Soubrane: I am an ophthalmologist and I became focused on occult neovascularization, especially in age-related macular degeneration. Thirty years ago in 1984, nobody really knew how the machinery worked to produce new vessels on the retina or under the retina from the choroid and that triggered my curiosity. In order to understand I needed to first know what the basis is and how I could get more insight into the pathogenesis of these diseases and mechanisms. That was the reason I became a researcher — just curiosity. Saying, “I want to understand.”

ARVONews: What have been some of the highlights of your work?

Soubrane: In 1982, we began to implant small pumps underneath the retina and tried to modulate the choroidal vessels. This was done in guinea pigs. It became one of the approaches to gene therapy. The injection of manufactured epithelial cells to express specific parts of the genomes is exactly the same approach, in order to block the new vessel growth. It’s amazing to see within 30 years, that you come back to the same way of thinking and the same way of proceeding.

Also, I am particularly proud of two things: describing the occult subretinal new vessels

and identifying the reticular pseudodrusen that I first described a long time ago. Reticular pseudodrusen are cited in a paper nearly every month. It was mainly by chance I identified them. As for the occult vessels, everyone has now accepted that they are part of AMD, and that it’s the most frequent way of presenting the neovascular aspect of the disease.

ARVONews: What can you tell us about the research project you are working on now?

Soubrane: Presently, I am working on Müller cell trafficking. Until now, very little interest has been paid to these cells located in between all neural cells of the retina. They have a mechanical role of supporting the neighboring cells but also providing them the necessary nutrients, as well as taking away the waste products. In addition, it recently has been shown that Müller cells are the main site of alteration in macular telangiectasia type 2 (MacTel). So they have some implications in clinical ophthalmology.

We know a great deal about photoreceptors, bipolar cells and ganglion cells, but as for Müller cells we know very little.

ARVONews: Based on your years of professional experience, would you please share your best advice for young women scientists about moving ahead in the field?

Soubrane: I’ve learned that you do not need to work as much as a man, but twice or even four times as much. Too often people have it in their mind that women are looking after their children, that children will cause women to stop working for a time or that women are going to be pregnant soon. So to overcome that, women have to do more and be more brilliant.

The other great thing I’ve learned from life is to never give up. Always believe in what you are doing. Always believe in your possibility to progress. Always believe in the way you choose to go. There is doubt, but we should never give up. Always remain steady, and even more importantly, do it with a smile.

Revolutionizing eye care in Africa

Epidemiologist Paul Courtright, PhD, and his wife, Susan Lewallen, MD, an ophthalmologist, established the Kilimanjaro Centre for Community Ophthalmology (KCCO) 15 years ago with early support from the Seva Foundation and Seva Canada. The success of this long-term partnership to fight blindness in over 20 countries in Africa was recognized with the 2015 Antonio Champalimaud Vision Award.

According to Courtright, who serves as KCCO's international director, much of the project's effectiveness is due to their approach in determining what evidence was needed to guide eye care service delivery in some of the most poverty-stricken districts in Africa.

"After working in Africa for five years in the early 1990s, we recognized that in order to make changes, we would have to address some of our biggest challenges — really poor systems and lack of good evidence toward decision making," says Courtright.

From the beginning, the Seva Foundation, Seva Canada and KCCO priority was to develop an evidence base to guide this work. "It has taken the form of studies to better understand underlying dynamics of eye care-seeking behavior, patients' willingness and ability to pay for service, methods of engaging with the community and systematic efforts to make the best use



Champalimaud Vision Award recipients from the Kilimanjaro Centre for Community Ophthalmology (KCCO), the Seva Foundation (SF) and Seva Canada (SC). From left: Penny Lyons (SC), Paul Courtright (KCCO), Ken Bassett (SC), Susan Lewallen (KCCO), Edson Elish (KCCO), Suzanne Gilbert (SF), John Minde (KCCO) and Jack Blanks (SF).

of all levels of eye care personnel," says Suzanne Gilbert, senior director of Seva's Innovation and Sight Program.

Courtright further explains, "Community ophthalmology requires a team approach. It's identifying an ophthalmologist who has good potential leadership skills and training other individuals to take on the job of helping to manage the eye care program."

Seva Canada's program director, Ken Bassett, MD, PhD, remarked that the greatest challenge — human resources — is also the partnership's greatest success. "Finding, training and supporting the staff to take over and provide services has been incredibly difficult, and it took almost a decade longer than we thought," he says. "But there has been huge success in the transfer of knowledge, roles and skills to the African staff, including areas such as research study design and report writing."

The organizations are also working to identify the gender gap in service delivery and strategies to reduce it, as well as reduce disparities in the systematic life-long care of children with disabling eye conditions. Courtright reported that their programs have reached a level where they are not only providing better quality service but more equitable ones. "People who live in more urban areas of a district or region have better access,



Women in Tanzania struggle to get around with blindness simulating glasses. Photo: Kilimanjaro Centre for Community Ophthalmology

ARVO/ Champalimaud Lecture

Tuesday, May 3, 5:45pm
Seattle, Wash.

ARVO
2016

RESEARCH: A VISION FOR HOPE
MAY 1 - 5 | SEATTLE, WASH.

See **Revolutionizing eye care**, continued on page 10

Revolutionizing eye care, continued from page 9

but working with this program that now achieves equity throughout the district has been quite successful. That equity also makes sure that we address the needs of women — because as we know, women generally account for two out of three blind people in the world.”

Penny Lyons, MBA, Seva Canada executive director, acknowledges that being presented with the €1 million Champalimaud Award for its sustainable programmatic approach is significant. “It’s confirmation that what both Seva organizations have done for more than 30 years

is effective and that our methods are innovative,” says Lyons. “We plan to use the Champalimaud funds to create a social enterprise in Africa that will enable investors to invest in one or more standalone clinics — known as community eye centers — in rural communities. These community eye centers deliver primary eye care to a population of 50,000 to 100,000 people.”

This type of entrepreneur model will be highlighted by Gerald Msukwa, MMed, Ophth, at the ARVO Champalimaud Lecture being held during the 2016 ARVO Annual Meeting. Seva Canada funds a community eye center in Malawi in collaboration with Msukwa, who was successful in providing quality eye care to thousands of people within months of opening.

KCCO will use the award to continue to build capacity within Africa to ensure that the problems of Africa are addressed by those within the continent rather than those outside of it. For example, KCCO recently did a course in Cape Town and used some of the funds to bring in key participants, as well as a trainer who lives and works in Rwanda. “We are trying to create a whole series of links of individuals from throughout Africa so we’re not as dependent on the internal organization but more so on external partnerships to build capacity,” Courtright says.

Courtright will also present at the ARVO Champalimaud Lecture. “Our discussion will focus on how we use evidence to increase service delivery within Africa. The fact is that a lot of the research that is needed is not limited to Africa. We are looking forward to bringing topics to the ARVO research audience that will help them look at how they can become engaged — whether it be operational research or supporting capacity-building research.”

“What we are talking about is the business of trying a new model of providing high quality eye care to the world corps in a way that is effective and self-financed,” adds Bassett. “For example, there is a flurry of these eye care centers in Burundi, one of the poorest countries in the world. It’s counterintuitive that it will work, but it does work.”

A child takes a vision test in Tororo, Uganda.
Photo: Kilimanjaro Centre for Community Ophthalmology



Vision cards are used to administer tests in Madagascar.
Photo: Kilimanjaro Centre for Community Ophthalmology



Trachoma grader training takes place in Egypt.
Photo: Kilimanjaro Centre for Community Ophthalmology



International Chapter Affiliate news

HARVO expands research horizons of Hungarian ophthalmologists

This is the first in a series of articles that will highlight members and activities of ARVO's 13 International Chapter Affiliates (ICAs)

In the years since the Hungarian Association for Research in Vision and Ophthalmology (HARVO) became one of ARVO's first ICAs in 2007, its leaders have made supporting young researchers a priority.

According to HARVO's Janos Nemeth, PhD, DSc, (Semmelweis University), young scientists can apply for a grant to attend the ARVO Annual Meeting. The application deadline is in October, so HARVO can inform successful candidates in plenty of time to submit an abstract for the Meeting. HARVO grantees attend the Meeting, present and write up a report, which is published in the *Hungarian Journal of Ophthalmology*. They are invited to give a lecture on their ARVO topic at the following year's HARVO plenary session during the annual meeting of the Hungarian Ophthalmology Society.

"Each year, we support two to five young scientists to attend the ARVO Meeting," explains Nemeth. "The program is a great success, and the feedback from the grantees is excellent. The grant and the ARVO Meeting experience gives them intensive and positive research motivation."

Below, meet four of the nearly 30 young researchers supported by HARVO in recent years.



Gabor Mark Somfai, MD, PhD

I am a senior consultant at the Retinology Unit of the Pallas Clinics in Olten, Switzerland, and I have an affiliation

as an assistant professor at the Department of Ophthalmology at Semmelweis University in Budapest. Also, I am currently serving my second term as the Secretary of the Hungarian

Ophthalmological Society.

My main clinical and research area is retinal imaging. We are currently working on multiple projects investigating the relationship between changes in retinal microcirculation and retinal structure in diabetes and vascular occlusive diseases (mainly BRVO and CRVO). This work is carried out with the Quantitative Ophthalmic Imaging Lab of Dr. Delia DeBuc at the Bascom Palmer Eye Institute in close collaboration with Dr. William Smiddy. With Dr. DeBuc we are also exploring the neuroretinal changes in neurodegenerative diseases and the retinal changes observed after physical exercise. I also have an exciting collaboration with the lab of Dr. Agoston Szel at the Institute of Anatomy at my alma mater, Semmelweis University, where we are exploring the retinal changes in animal models of diabetes and their correlation with our clinical findings.

The 2008 HARVO grant gave me the chance to immerse myself in the world of ARVO Meetings for the fourth time. It was also my only chance to meet my collaborator and friend Dr. DeBuc in person and make plans for the upcoming year instead of needing long email conversations. (Let me note here that our collaboration with Dr. DeBuc began with a poster pin-up message at the 2005 ARVO Meeting.) Finally, it gave me the thrill of personal networking at the poster sessions, including my own poster presentation, where I spent about half a day meeting the passers-by.

My first ARVO Meeting in 2004 was love at first sight, and I am proud to say that I have attended all Annual Meetings since then, regardless of the costs (which were and still are very high for an Eastern European resident). HARVO's support made it easier to achieve my dream and firm goal to attend the Annual Meeting in 2008, for which I am very grateful both to ARVO and its Hungarian Chapter Affiliate. The Meeting in 2008 represents one vibrant snapshot among the many unforgettable moments that I am keeping among my fondest memories of my professional development.

See **ICA news**, continued on page 12

ICA news, continued from page 11

Arnold Szabo, MD

I've been working at the Department of Human Morphology and Developmental Biology at Semmelweis University in Budapest since I



finished my degree at the medical university. My current position is assistant professor. Besides research, I spend a significant part of my time teaching gross and microscopic anatomy, cell biology and embryology in Hungarian and German language for medical students.

I recently started my own laboratory. Our main projects focus on the developmental and functional aspects of the human retina. With our recently developed *in vitro* method we are able to keep the post mortem human retina alive for more than 10 weeks, which allows us the long-term modulation of this precious tissue. We already have a strong morphological background, and now we are trying to adopt and improve current electrophysiological techniques.

The 2008 HARVO travel grant made it possible for me to participate in the ARVO Meeting for the first time. The most important experience was meeting with researchers in person whom I had previously known only from their articles.

HARVO's support was a huge motivation to me. It showed me that I can be a part of the international scientific community. I consider myself lucky because I strongly collaborate with clinical ophthalmologists. From the continuous dialogue between clinicians and researchers both parties can benefit, and ARVO is probably the most important organization that brings clinical ophthalmologists and researchers together.

Mariann Fodor, MD, PhD

I am an assistant professor at the University of Debrecen's Department of Ophthalmology. My work centers on tear mediators and the



pathophysiology of keratoconus. My 2010 grant from HARVO to attend the ARVO Annual Meeting helped me to get new ideas for later research work. Due to HARVO's support, I managed to establish successful relationships with other researchers, who have helped me to widen the spectrum of my scientific interest.

Kinga Kranitz, MD

I am a clinical ophthalmologist in the Ophthalmology Department of Semmelweis University, Budapest.



I am interested in the diagnostic and therapeutic possibilities of keratoconus and the long-term effects of cross-linking therapy. In addition, I also do keratoconus femtosecond laser-assisted cataract surgery and premium IOL implantation.

The 2012 HARVO grant gave me a great opportunity to attend a remarkable conference as a young ophthalmologist. Getting insights into the possibilities and potential of clinical ophthalmic research encouraged me to continue my scientific work, along with patient care.

At the ARVO Annual Meeting, I presented a paper on the corneal changes in keratoconus after cross-linking therapy, and I had the opportunity to consult with significant representatives of the research area who helped me with useful advice. I continued my work, heeding their advice, and published an article in the *Journal of Refractive Surgery*.

I've continued my research work and in the last few years I have published several other articles in international and national peer-reviewed journals. As a result of this active scientific work, I am preparing for my PhD Thesis Defense (IF: 68) this spring.

In the meantime, I continued patient care activities and I passed the exams of the International Council of Ophthalmology and the specialist examination by the Hungarian national committee.

For new inspiration, I hope to have the opportunity to take part in future ARVO Annual Meetings.

Largest NIH budget increase since 2003: Secured with help from advocates

After years of tireless effort, advocates from across the U.S. biomedical community have convinced Congress to provide the largest increase to the National Institutes of Health (NIH) budget in 12 years. The 2016 NIH budget will be \$32 billion — \$2 billion (6.6%) more than 2015.

The National Eye Institute (NEI) will see a \$31.7 million increase in its funding to finally surpass its previous largest budget of \$704 million in 2012. Meanwhile, funding for the BRAIN Initiative — where vision researchers have seen significant success — will increase by \$85 million.

To encourage Congress to supply additional research funding, ARVO organized several events throughout the year for members to communicate directly with their representatives. Last February, in conjunction with the Annual Meeting Program Committee (AMPC) Meeting in Bethesda, Md., several AMPC members arrived a day early to visit their legislators on Capitol Hill.

Thomas Norton, PhD, FARVO, was one of the Advocacy Day participants who got to deliver his message for increased support for NIH directly to Alabama Senator Richard Shelby.

“The efforts of ARVO and the entire biomedical community are critically important because many groups are constantly competing with each other for federal dollars,” said Norton, professor of vision sciences at the University of Alabama, Birmingham. “We must continually present our case in order to have a chance of success. I don’t feel I can take much credit toward the increase in NIH funding, but my participation may have had a slight positive effect.”

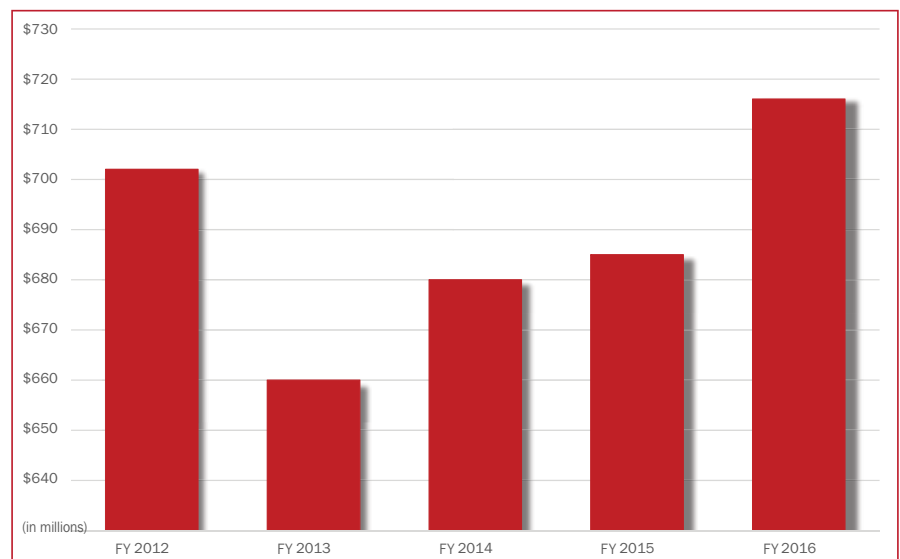
Days before the ARVO 2015 Annual Meeting, Daniel Carr, PhD, and Robert Anderson, MD, PhD, testified as two of only 23 public witnesses chosen to speak directly to members of the House Labor, Health and Human Services, and Education (LHHS) Appropriations Subcommittee. Carr and Anderson discussed the impact government funding for vision research has had on “people and products, patient outcomes and private industries.”

“If enough individuals voice their opinion to our Congress women and men, they will and do listen,” said Carr, professor of microbiology and immunology at the Dean McGee Eye Institute in Oklahoma City, Okla. “I found individuals on the Hill to be very responsive to our mission and goals. It was not simply lip service but a true and sincere appreciation for our cause from both sides of the aisle.”

To coordinate its messaging with that of other professional societies and advocacy groups, ARVO works with the National Alliance for Eye and Vision Research (NAEVR), an umbrella organization representing the larger vision community. “Working with NAEVR, ARVO joined with its fellow vision community organizations to maintain constant messaging about the need for a robust, sustained and predictable increase for the NIH in FY2016 — and beyond,” said James Jorkasky, executive director of NAEVR.

And while the new NIH budget is a significant improvement over years past, more work remains to be done to get the agency back to its inflation-adjusted peak in 2003. ARVO members can look forward to opportunities to contact their policymakers and have their voice heard in 2016.

National Eye Institute appropriations since FY 2012



Removing barriers, growing the next generation

Sheila West to receive the 2016 Joanne G. Angle Award

Sheila West, PhD, FARVO, the first female president of ARVO, will be presented with the 2016 Joanne G. Angle Award at the ARVO Annual Meeting in May. The Angle Award, ARVO's highest service honor, acknowledges outstanding volunteers and leaders who have made significant, continuous contributions to ARVO in support of its mission.



Sheila K. West, PhD, FARVO, Wilmer Eye Institute, Johns Hopkins Medical Institute

Being named the Angle awardee holds particular “honor and privilege” to West as she and Angle worked together in advancing women within this

organization.

“I still remember when I realized I had been elected as the first female president in 2000. I looked at Joanne Angle, the executive director, and Janet Blanks, the executive vice president, and I realized for the first time in ARVO's history that the organization was going to be run by women,” says West. “This was a significant moment for the organization in that going forward the faces the members were going to see were strong women leaders.”

An ARVO member since 1984, West's interest in volunteering at ARVO began in her early years. She believed that ARVO had a compelling mission, and she was willing to devote her time to help move it forward. “Everyone is incredibly busy writing grants and doing research. That can take up your entire time. So to say that you're also going to give up your time, it has to be for something you feel passionate about,” says West. “For me it is the recognition that ARVO stands for the integration of science across the vision sciences.

“For example, ARVO is not just a meeting about neuroscience or just a meeting about clinical drug development. It is a meeting in which you can hear the whole panoply of science within vision science.”

Currently, West is the El Maghraby Professor and vice chair for Research at Wilmer Eye Institute. She is a staunch supporter in aligning ARVO's key objectives with helping young investigators getting a leg up in their field — providing them an opportunity to present their research, meet “giants

in the field” and move forward. She also encourages the younger generation to get involved in ARVO in the early stages of their career. “It's ARVO's responsibility to provide opportunities for them to be involved,” she says. She adds that younger members have a responsibility as well, to “seek out a mentor who is currently or has been in a leadership position to help pick a committee and understand what it takes to be part of one.”

She recalls that the first time she responded to the call for committee volunteers and mistakenly applied for committees she wasn't suited for at that time. “But the response from ARVO leadership was very positive, and I was encouraged to re-apply,” says West. “I ended up going to the General Business Meeting and CL Section Meeting and speaking out. I got involved at that level.” She wound up talking to Barbara Klein, MPH, MD, FARVO, the section trustee who influenced the younger West.

“Here was a woman who was involved, and I could see the face of someone who looked and acted like me. It removed the barrier of believing that every leader has to be a male and come from a big section.” West ran for a seat on the Annual Meeting Program Committee, which was the path to her being elected to the Board of Trustees and ARVO president.

During her tenure as president, West was integral in establishing the ARVO Foundation for Eye Research, which remains a personal highlight of her many service activities. “That whole new initiative was so risky for us. To try to champion and be a pioneer for starting a foundation was kind of out there.”

She was instrumental in making sure the framework of the ARVO Foundation involved a leading figure in vision science — John Dowling, PhD, FARVO. “I consider it a personal triumph to have been able to recruit such a giant in the field and have him lend his name and credibility to what was obviously an important new initiative for ARVO.” Moreover, West is thrilled at having had the opportunity to fulfill her passion by creating a more stable component of ARVO — through the Foundation — that focuses on young investigators.

“Sometimes as we grow, it becomes a challenge to remember that a mission of any organization is about the growth of the next generation of scientists and the nurturing of the young,” adds West. “As long as we keep that message in the forefront, we won't lose the focus of what we are about.”

2015 Beckman-Argyros Awardee will explore retinal circuitry

In harsh budget climates, great science is often labeled “too risky” to fund. Fortunately, private organizations like the Arnold and Mabel Beckman Foundation are supporting cutting-edge research that would otherwise not occur. Now in its second year, the Foundation’s Beckman-Argyros Award in Vision Research has been awarded to David R. Williams, PhD, FARVO, to assist his group in identifying the function of the 17-plus different classes of ganglion cells in the retina.

“We develop advanced optical technology using adaptive optics to image the retina at resolutions that reach the cellular level,” says Williams, dean of research for Arts, Science and Engineering, director of the Center for Visual Science and the William G. Allan Professor of Medical Optics at University of Rochester. “This technology allows us to develop an understanding of normal retinal function as well as disease.”

The \$500,000 award from the Foundation will enable Williams’ group to explore the physiology of the normal retina. “What’s really nice about the award is that it’s so timely. With this technology in hand, we’re able to monitor the activity of hundreds of cells at any one time, increasing the probability that we’ll be able to identify the functional role each of these ganglion cell classes have for vision,” explains Williams.

Williams gives all the credit for his group’s success to his team members. “I have the luxury to have a crew of about 24 different people here at Rochester. We’ve got optical engineers, basic scientists, clinical researchers, biologists and neuroscientists all working together in one cohesive team. It’s really only through that cooperation that we’ve been able to have the successes we’ve had.”

To be counted among the researchers the Arnold and Mabel Beckman Foundation supports is one of the greatest honors for the Beckman-Argyros Award recipient. “When I received the award, I got to hear presentations by all the junior investigators the Arnold and Mabel Beckman Foundation supports. I heard some spectacular young people; I thought I was listening to an array of Nobel Laurates!” says Williams. “That reminded me of just how privileged I am to be awarded a prize from an organization that has such high standards.”

To learn more about the Beckman-Argyros Award in Vision Research, visit beckman-foundation.org/beckman-argyros.



Beckman-Argyros Award recipient David Williams, PhD, FARVO. Photo: J. Adam Fenster/University of Rochester.

Beckman-Argyros Award in Vision Research Session
 Thurs., May 5, 1–2pm
 Seattle, Wash.
Seeing through the retina
 — David Williams, PhD, FARVO

touch OPTHALMOLOGY.com®

Access and download for FREE our
**CONCISE, PEER-REVIEWED, OPEN ACCESS,
 OPINION based ARTICLES & VIDEOS** from
KEY OPINION LEADERS

Connect with us and
 join the debate

www.touchOPHTHALMOLOGY.com

Five members in five minutes

Getting the most out of ARVO's Online Education:
Members offer tips and lessons learned



Jeffrey H. Boatright, PhD,
FARVO

Jeffrey H. Boatright, PhD, FARVO
Professor of Ophthalmology
Emory University School of Medicine

“While a variety of information exists online about scientific publishing, the most valuable aspect of ARVO's Guide to Scientific Publishing online module is that it provides members with a succinct but comprehensive tutorial for all aspects of writing a scientific paper. This includes early, more philosophical thinking about scientific communication right through to the nuts-and-bolts of creating and submitting the manuscript and approaches to the review process. As a contributor to this module, I think it is most useful to scientists who are writing their first few papers, but mentors also may find it useful in guiding their trainees.”



Livia Mello Brandao, MD

Livia Mello Brandao, MD
Associate Researcher
Basel University Eye Clinic

“Since first attending the ARVO Annual Meeting it became very clear to me that the ARVO community focuses all possible resources not only on exchanging knowledge between its members, but also on providing means for continuous learning. I feel that accessing ARVO Online Education is a perfect opportunity not only to learn and get enough time to digest information, but also to have new insights from watching again sessions that I attended in person.”



Brittany J. Carr, PhD

Brittany J. Carr, PhD
Candidate, Neuroscience
Cumming School of Medicine, University of
Calgary

“The valuable lesson I learned from ARVO Online Education is to set aside time for exploring and utilizing the resources provided to members by organizations such as ARVO. Even when I feel that I am knowledgeable in the subject matter, I'm likely to discover extra tidbits of information that might give me an edge when networking at a conference or submitting a manuscript for publication.”



Linda D Hazlett, PhD, FARVO

Linda D. Hazlett, PhD, FARVO
Professor and Chair of Anatomy and
Cell Biology
Wayne State University School of Medicine

“As a contributor to ARVO's Strategies for Effective Grant Writing online module, the most valuable component is the collective viewpoints of the faculty represented in this resource, including the perspectives of reviewers of grant proposals. There is something for everyone to learn in this module — from novice grant writer, to those who have written, secured funding and managed grants for years.”

Lihteh Wu, MD
Medical Director
Asociados de Macula Vitreo y Retina
de Costa Rica

“For the past several years, ARVO has been recording selected sessions from the Annual Meeting that are available as a member benefit at arvo.org. Last year, I missed the Annual Meeting for the first time in 16 years. Fortunately, the recorded sessions allowed me to at least view some of the highlights of the Meeting. The 2015 Champalimaud Vision Award lectures are classics and everyone involved in ophthalmology should view them at least once. Napoleone Ferrara, MD, and Joan Miller, MD, FARVO, recount the discovery of VEGF and the development of anti-VEGF drugs that have significantly impacted the blindness rates of common retinal diseases, such as exudative age-related macular degeneration and diabetic macular edema — a true translational success story! Even for those who do attend the Annual Meeting, these recordings enhance the overall ARVO experience. As we are all aware, it is impossible to attend all the sessions. Invariably, we will miss some sessions because of scheduling conflicts. So having these recordings allows us to access them in our free time. I congratulate ARVO on making these recordings available.”



Lihteh Wu, MD

Visit ARVO Online Education at
<http://arvoconnect.arvo.org/arvoeducation>.

Meeting the unmet need: Treating corneal wounds

SBIR grants support entrepreneurs with novel drug delivery research

While many ARVO members make the transition to start-up entrepreneur from academia, Barbara Wirostko, MD, and MaryJane Rafii, MBA, PhD, co-founded Jade Therapeutics after meeting at Pfizer. Below, they talk about how the Small Business Innovative Research (SBIR) grants from the Department of Defense (DoD) and National Science Foundation (NSF) have supported their company's work in corneal wound healing and what's in store for the future.

ARVONews: How did Jade Therapeutics come about?

Wirostko: We first met at Pfizer in 2009. I was a senior medical director at the time and the team lead for primarily glaucoma products, and MaryJane was working in ophthalmology on a sustained release Xalatan project. I said to MaryJane after leaving Pfizer, "I have this idea that human growth hormone (HGH) could help heal the cornea. What do I do with it?" She responded, "Why don't we start a company?" We both had left Pfizer by then so we started Jade.

ARVONews: Starting out with just the two of you, how did you build your business?

Rafii: We started with knowing what we wanted to do, where we wanted to go and how we wanted to get there. With answers to those questions, our reputation and our experience in the business in the U.S. and Europe, we were able to pull in resources that we had developed in the past. With some founding capital in place, we slowly expanded from our living room. We were awarded grant funding through the state of Utah. They were extremely generous to us being that we were a women-owned business and our idea was very innovative. Now, after five years we have grown into the real deal with a full research lab, including research scientists and a determined and driven leadership team. We've come a long way in a very short period of time.



ARVONews: What was the biggest challenge in going from the two of you to where you are now?

Rafii: We started during a depressed market. The venture capitalists were very shy about putting any money into ophthalmology. There weren't many products moving or much innovation happening since the money was not around to fund those innovations. So, we had to make do with what we had and become as commercially attractive as possible.

Because we both participated in major due diligence and licensing activities in Pfizer, we knew what the large pharmaceutical companies would be looking for — we've been on the other side of the table.

ARVONews: What role have SBIR grants played in supporting Jade Therapeutics?

Rafii: Thanks to SBIR grants through the NSF and DoD, we have been able to do some really excellent and innovative science. It kept our programs moving forward when there was no outside funding to be had. About a year ago, people started making investments in ophthalmology again. Now, we have something to offer those who are truly interested in this small but very innovative space thanks to over \$2 million in SBIR support.

ARVONews: Tell us about the Jade Therapeutics technology and products.

Wirostko: We started the company around a thiolated, cross-linked hyaluronic acid (HA) polymer as a drug delivery platform for proteins. The polymer degrades into neutral pH products, which do not destabilize the polymer's cargo. This proprietary HA has been everywhere in the body, including the brain. It has successfully, safely and with excellent tolerability delivered proteins over weeks and months.

When we moved the product along, we realized there was a huge unmet need at the



MaryJane Rafii, MBA, PhD



Barbara Wirostko, MD

See **Corneal wounds**, continued on page 18

Corneal wounds continued from page 17

front of the eye for treating dry eye and corneal wounds. Uniquely, this product is already in the market being sold by Bayer Animal Health for exactly those two indications. What we are now doing is accelerating those two products — one for dry eye and one for corneal wound repair — and moving them into the clinic, based on all the animal data collected from thousands of animals using that product. In head-to-head masked studies of our crosslinked HA vs. non-crosslinked HA, our product is superior — a “Super HA.” We know this is a great opportunity, and with our data in hand we believe we can meet the unmet need.

ARVONews: What value does the DoD see in your products?

Wirostko: Their support is based on our product delivering HGH to slowly heal non-healing corneal wounds. What we are now sharing with DoD is that our corneal repair gel, what we call JDE-003, could be applied on the field or during triage to the ocular surface to create an environment that would facilitate and promote wound healing. The other funding we have with the DoD is a phase 2 SBIR contract on using the polymer

as a film or large bandage over the cornea. Our polymer has a long history of helping to heal dermal wounds as a film; we manufacture it as a bio-degradable film that can stay on the eye, release HA as a lubricant, prevent adhesion and scarring and assist cells as a regenerative matrix to help heal.

ARVONews: What’s next for Jade Therapeutics?

Rafii: We are growing. In the near future, we plan on securing funding from sources in the U.S. or E.U. We’re actively looking for licensing options, strategic partners or to be acquired.

ARVONews: With five years of experience running your own company, do you have any advice for someone thinking of making the leap to being an entrepreneur?

Rafii: Success is imminent if you don’t do everything yourself. Progress doesn’t only come from product development, but from gathering all your resources to move the programs forward in a stepwise manner and strategizing properly. The good thing we have in our company is the mix between a clinician-scientist and someone who knows more about the commercial, business and strategic aspects. All small businesses come with growing pains, but the key is to recover quickly, move effectively, learn, and apply what you learn. But what you must have first is passion and drive as well as the spirit of entrepreneurship.

Wirostko: That’s a key point; look at your strengths and weaknesses, don’t do it alone and be creative. As our Board of Directors member and Moran Eye Center CEO Randall Olson, MD, has stated, “It has been a pleasure to see how much this team has been able to accomplish through grants and unconventional funding avenues. This has helped Jade as a company to greatly advance its mission without dilutive funding.” Get people to help, build a team and engage and empower those helping you. We are fortunate to have a fantastic research team, management team and board members who stand behind us, support us and advise us.

“Thanks to SBIR grants through the NSF and DoD, we have been able to do some really excellent and innovative science.”

ARVO EDUCATION ONLINE

ARVO’s online education portal has new self-paced courses available:

- ARVO’s guide to scientific publishing
- Guide to scientific peer review
- Strategies for effective grant writing
- Guide to scientific networking

Engage and explore today.

<http://arvoconnect.arvo.org/arvoeducation>

Researchers and clinicians working together to help patients

Vision and traumatic brain injury: The outlook for therapeutics

After successful gatherings in Seattle at ARVO 2013 and last year in Denver, the Vision and Traumatic Brain Injury (TBI) session is scheduled to return on Saturday, April 30, 10am – 1pm at the Washington State Convention Center. The session — starting the day before the Annual Meeting — will feature introductory remarks by ARVO President John Clark, PhD, FARVO, and two moderated panels. The first panel will discuss traumatic brain injury and its effect on visual function. After a short break, the second panel will focus on potential therapies aimed at protection and intervention against TBI.

The panelists and moderators provided ARVONews with a sneak peek into the science they plan to discuss in Seattle.

Part 1: Traumatic brain injury and visual function

Moderator

Mary G. Lawrence, MD, MPH

Former Interim Deputy Director, DoD/VA Vision Center of Excellence
Former Professor of Ophthalmology, University of Minnesota Medical School



“As the Iraq and Afghanistan conflicts started to rage, we began seeing poly-trauma patients with traumatic brain injury (TBI) present to eye clinics at VA Polytrauma Centers across the country. Many injured service members with TBI that I saw in the VA Eye Clinic had concurrent visual complaints without obvious globe injuries. Since those early days, we have observed much about the association of visual dysfunctions with TBI, and indeed the co-occurrence is seen in non-military TBIs, including motor vehicle accidents and sports-related brain injuries. Much more research is urgently needed to understand the effects of trauma on the visual system, to determine the specific pathophysiology of visual dysfunctions, to find effective preventions, and to discover successful treatments for patients suffering with visual dysfunctions associated with TBI.”

Brain injury and vision in veterans and athletes



Ann C. McKee, MD

Chief of Neuropathology, National Veterans Affairs and ALS Brain Bank Center for the Study of Traumatic Encephalopathy. Boston University, School of Medicine

“Veterans and contact sports athletes who experience concussions and other brain trauma are at risk for long-term neurologic and behavioral problems, including chronic traumatic encephalopathy (CTE).

CTE has been associated with American football, boxing, soccer, ice hockey, baseball, rugby and military-related activities. Veterans are particularly susceptible to CTE given their combined exposure to traumatic brain injuries from sports, recreational activities, combat exposure, motor vehicle accidents and other trauma. There is also increasing evidence that sub-concussive hits, smaller impacts that are not severe enough to cause concussion symptoms, are associated with CTE. In our brain bank series, 16% of individuals diagnosed with CTE had no history of concussion, suggesting that sub-concussive hits and cumulative exposure to trauma are sufficient to lead to CTE.

There is also increasing evidence that sub-concussive hits are associated with CTE.

“The clinical symptoms of CTE typically develop insidiously — years to decades after exposure to repetitive brain trauma and progress slowly over years. Early behavioral symptoms include explosivity, verbal and physical violence, loss of control, impulsivity, paranoia and rage behaviors. Cognitively, the most prominent deficits are memory, executive functioning, impaired attention and cognitive loss. Approximately 60% of subjects with CTE develop visual symptoms including blurred vision, double vision, vision loss or light sensitivity. Currently, there is no way to diagnose CTE during life; if specific changes can be identified in the eye in CTE, they might be useful for diagnosing CTE before



See [Vision and TBI](#), continued on page 20

Vision and TBI, continued from page 19

death. The incidence and prevalence of CTE is not known. However, several recent studies suggest that CTE is more common than currently appreciated.”

Experimental approaches to neurotrauma and the eye

Lee E. Goldstein, MD, PhD

Neurology,
Pathology,
Ophthalmology,
and
Bioengineering,
Boston
University,
School of
Medicine



“TBI is a leading cause of death, disability and visual impairment around the world. Contact sports and military-related head injuries are also associated with a wide range of persistent symptoms, including vision disability and blindness, headache and other facial pain disorders, mood and behavioral changes and cognitive problems. TBI is also associated with increased risk of later development of neurodegenerative disease, including Alzheimer’s disease and chronic traumatic encephalopathy (CTE). The mechanisms and pathways that link TBI, persistent neurobehavioral problems, and neurodegenerative diseases are poorly understood. My presentation will focus on new experimental animal models of TBI that replicate injury biomechanics, pathological consequences and chronic neurobehavioral impairments associated with military- and sports-related TBI in humans.

“We have developed, validated and compared new animal models of blast and impact neurotrauma that accurately reproduce core clinical features of TBI and CTE in humans. Analysis of experimental results in these animal models have uncovered key determinants and mechanisms that trigger acute and chronic effects of neurotrauma in humans. The availability of these animal models opens new avenues for development of urgently-

needed diagnostics, treatments and rehabilitative strategies for people affected by TBI and its aftermath. I’ll be discussing the implications for trauma-related ocular injury, visual disability and blindness.

“I am a physician, neuroscientist, vision researcher, father, citizen, taxpayer and intermittent weekend athlete. My life has been touched in all of these roles by the effects of traumatic brain injury. Observing and reporting the brain-damaging effects of sports- and military-related neurotrauma in teenagers and young adults has left an indelible impression that has inspired me and my team to understand this seriously understudied problem that affects millions of people of all ages around the world. Fundamental mechanisms leading to acute and chronic effects of neurotrauma are beginning to emerge.

“This progress and our research gives me great hope that we will soon be able to diagnose, treat and perhaps prevent long-term effects of neurotrauma, including those affecting vision.”

Do visual manifestations of TBI progress?



Randy H. Kardon, MD, PhD

Director,
Veterans
Affairs Center
of Excellence
for Prevention
and Treatment
of Visual Loss,

Pomerantz Chair in Ophthalmology, Carver College of Medicine, University of Iowa

“Very little is known about the chronic visual consequences of mild TBI, its progression and its correlation with central nervous system (CNS) deficits. Currently, it is not known if neuronal loss in the retina and brain after mild TBI continues to progress over time, giving rise to chronic traumatic encephalopathy (CTE). Closing this knowledge gap will be important for understanding and treating TBI-related visual symptoms and for establishing whether ocular biomarkers can be used to predict risk of CNS dysfunction and its progression over time. A more complete

picture of the spectrum of visual sensory disturbances after mild TBI will be obtained by utilizing more detailed tests of visual function and ocular motility, as well as newer structural analyses of the retina, combined with functional MRI imaging of visual pathways in the brain.

“Currently, it is not known if neuronal loss in the retina and brain after mild TBI continues to progress over time.

“I have been a VA physician since 1989. I see patients in the VA Eye Clinic with vision problems associated with TBI ranging from light sensitivity to focusing problems to higher order difficulties with processing vision during complex visual tasks. I wanted to investigate the possible cause and mechanisms. We started applying new technological tools to study veterans with TBI in conjunction with Glenn Cockerham, MD (Palo Alto, Calif.), and Kelvin Lim, MD (Minneapolis, Minn.), and found that a significant number of veterans had evidence for thinning of the inner retinal layers, quantified by OCT. More recently, we have received funding by the VA and Department of Defense through the Chronic Effects of Neurotrauma Consortium (CENC) to find out whether there is a similar progression of loss of visual pathway neurons over time.”

Part 2: Potential therapies based on disturbances in vision

Moderator

Tonia Rex, PhD

Department of
Ophthalmology
& Visual
Sciences,
Vanderbilt
University



“We study how a burst of air impacting onto the eye affects vision. Even in the absence of TBI this impact causes damage to the retina and optic nerve resulting in vision loss over time. Others, including some of the speakers at the ARVO TBI session, have demonstrated that a more diffuse impact of a burst of air on the entire head

or whole body can also result in vision loss. Thus, vision problems as a result of a blast can result from damage to the eye alone, brain or both. My laboratory is now focused on testing promising therapeutics to prevent vision loss after eye trauma.

“We must work together as a clinical and research community to help these patients.

“I am interested in trauma-related vision loss because a large number of civilians and military service members are affected every year and yet there is currently no treatment available for them. It is a difficult area to work in because trauma is inherently complex. However, I am not one to believe that just because something is challenging that we should not give our best effort to understand it. If we do not try, clinicians will forever be turning away patients telling them, ‘I am sorry, there is nothing we can do for you.’ We must work together as a clinical and research community to help these patients. This workshop will provide insights from the patients, from clinicians who are working avidly to identify sensitive and reliable clinical measures to detect the visual disturbances in the patient’s experience, and from bench researchers who are working to understand the effects of trauma on the visual system and test promising therapeutics that will hopefully one day reach the clinic.”

Potential therapies based on disturbance in vision

Wing Commander Robert AH Scott, MBBS, FRCS(Ed), FRCOphth, DMi
University of Birmingham, U.K.



“A patient exposed to an explosive blast wave may have limited clinical evidence of injury, but significant occult damage at the

microscopic level. The spectrum of injury after an ocular primary blast injury (PBI)

can be divided anatomically into anterior and posterior segment injuries, with the posterior segment of the eye particularly susceptible. In the anterior segment, the conjunctiva is frequently affected with lacerations and subconjunctival hemorrhages. The iris and ciliary body can be damaged with hyphaema, traumatic iritis with iris sphincter rupture, dialysis and spiral tears. In common with blunt force trauma, damage to the delicate angle structures can cause angle recession with secondary glaucoma, cyclodialysis clefts or iridodialysis. Ciliary muscle atrophy may result in reduced accommodation making reading difficult, with associated eyestrain. Traumatic cataracts are commonly seen after PBI, but may spontaneously resolve.

“The posterior segment is affected in around 60% of cases, even though the blast wave traverses the anterior segment to reach it. Injuries can include posterior vitreous detachments, with or without associated vitreous hemorrhage, retinal tears and detachments, as well as macula commotion retinae. Traumatic optic neuropathy is a well-known effect of PBI and optic atrophy often follows massive retinal atrophy, induced vasoconstriction of the optic nerve blood supply or mechanical disruption of optic nerve axons as they exit the posterior globe through the lamina cribrosa.

“My presentation will outline potential new treatments for some of these blinding injuries using small interfering RNA molecules and inhibitors of apoptosis. Further new treatments of traumatic glaucoma corneal and intraocular scarring using the matrikine Decorin will be discussed.”

Blast concussion and mild TBI in veterans: Implications for vision

Elaine R. Peskind, MD
Department of Psychiatry and Behavioral Sciences; Veterans Affairs Puget Sound Health Care System, University of Washington

“Repetitive blast concussion and mild TBI has been termed the signature injury of the wars in Iraq and Afghanistan. Repetitive mild TBI may place young service

members and veterans at risk for long-term brain degeneration. We study blast concussion mild TBI in both veterans



and in a mouse model that mimics battlefield-relevant blast concussion. In both veterans and mice, we have found that blast concussion produces abnormalities in the cerebellum, the part of the brain that integrates sensation and movement. These abnormalities may have implications for visual abnormalities following blast concussion.”

The Link between photophobia and head injury



Andrew T. Hartwick, OD, PhD
College of Optometry, The Ohio State University

“We have been working with patients who have had previous head injuries and have experienced increased light sensitivity (photophobia) since the injury. We have been examining the response of their pupils to flashes of red and blue light, in addition to quantifying their sleep habits and light exposure during their daily lives. Even though photophobia is commonly associated with traumatic brain injury, we still don’t know exactly why. Many of the subjects we recruited for our study had great vision (20/20 acuity) and what appeared to be healthy eyes, as assessed using standard eye examination techniques. Yet, the chronic photophobia they experienced often significantly impacted their life and altered their daily activities. It is my hope that we will soon not only understand why photophobia is linked to head trauma, but use this information to develop better treatments for this debilitating symptom.”

ARVO/Alcon Keynote Series spotlights biotech CEO, vision genetics panel



During the opening keynote at the ARVO 2016 Annual Meeting, Jones will present an overview of the Allen Institute, its current projects and infrastructure, a few data highlights and a look at future directions.

Components, computation, cognition: The Allen Institute for Brain Science 2020 vision

Sunday, May 1, 12 – 1:15pm

Allan Jones, PhD

CEO, Allen Institute for Brain Science

Allan Jones, PhD, started his journey to CEO of Allen Institute for Brain Science with earning a degree in biology from Duke University, followed by a PhD in genetics and developmental biology from the Washington University in St. Louis. While studying plant biology at the University of Pennsylvania, Jones grew discouraged with the lack of funding for his research and left for industry. He transferred to a small diagnostic startup company, Avitech. Jones then became the project manager for Rosetta Inpharmatics's plant biology collaboration with Monsanto. After Rosetta was bought by Merck, he moved into gene expression work.

Jones began networking in the Seattle community where he lived, and he wound up

pitching the idea of an open-source functional brain map to Mark Boguski and Paul Allen — founding directors of what was becoming the Allen Institute for Brain Science. Jones joined the company in 2003 with Allen's original commitment to give \$100 million to create a functional map of the wiring of the mouse brain. The team was asked to create the map of mouse brain circuitry in three years.

When founder Boguski left the company, Jones filled his position as senior director of operations, and in 2006, Jones and his team delivered the full brain map of an adult mouse. Next, they completed mapping the spinal cords of mice and humans and the mapping of the human brain. Jones and his team's groundbreaking mapping has led to better understanding of how the brain works, as well as the causes of diseases such as Alzheimer's and Parkinson's. All of the maps are in the public domain for free use by scientists.



Allan Jones, PhD, CEO, Allen Institute for Brain Science

Panel discussion — Genetics of vision: Problems and solutions

Thursday, May 5, 2 –3:15pm

Anneke den Hollander, PhD

Professor, Radboud University
Nijmegen Medical Center

Anneke den Hollander, PhD, is the recipient of the ARVO 2015 Cogan Award that recognizes young researchers who have made important contributions directly related to disorders of the human eye or visual system. Her work has contributed to the understanding of the molecular causes of a series of retinal diseases, including the identification of the majority of the genetic causes of Leber congenital amaurosis. Her group recently identified mutations in the RAB28 gene as a novel cause of cone-rod dystrophy, highlighting a new disease mechanism. This work was published in the *American Journal of Human Genetics*.

Janey L. Wiggs, MD, PhD, FARVO

Harvard Medical School
Paul Austin Chandler Professor of Ophthalmology,
Department of Ophthalmology
Co-Director, Glaucoma Center of Excellence
Associate Director, Ocular Genomics Institute
Massachusetts Eye and Ear Institute
Associate Director, Howe Laboratory
Associate Chief Ophthalmology Clinical Research
Senior Scientist

Janey Wiggs, MD, PhD, FARVO, is a clinician scientist specializing in the genetics of glaucoma and inherited ocular disorders. Her lab directs a CLIA-certified clinical diagnostic laboratory where patients are tested for mutations in genes that can cause inherited retinal disorders, early-onset glaucoma or primary optic neuropath. Wiggs has been continuously funded from the National Eye Institute (NIH) for over 15 years and is the principal investigator of the NIH funded NEIGHBORHOOD consortium. She is also the PI for an NIH-funded study to identify genetic and environmental risk factors for exfoliation syndrome and exfoliation glaucoma.

Deborah A. Nickerson, PhD

Professor of Genome Sciences
Adjunct Professor of Bioengineering
University of Washington School of Medicine
Seattle, Washington

Deborah Nickerson, PhD, is an internationally known geneticist who pioneered a new method,

“exome sequencing,” that streamlines the ability to read DNA in the search for genetic signatures for diseases. Currently, her lab’s research is focused on the identification and typing of the human genome known as single nucleotide polymorphisms (SNPs). Her team is developing and testing novel SNP and haplotype-based approaches for association mapping of common human diseases, and they are exploring the relationships that may exist between genotype and trait expression at the RNA and protein levels.

Jay Shendure, MD, PhD

Professor of Genome Sciences
University of Washington School of Medicine
Seattle, Washington

Principal investigator Jay Shendure, MD, PhD, has developed a broad range of technologies in human genetics and molecular biology. At present, his lab is developing and applying new DNA sequencing technologies, which include: next-generation human genetics, genome contiguity and completeness, massively parallel functional analysis, molecular tagging, synthetic biology and translational genomics.

At this year’s closing keynote session, two ARVO members will discuss the major biomedical problems in the genetics of human vision. They will be joined by two prominent University of Washington researchers who will provide insight into developing genomic and genetic technologies to address those problems.



Anneke Den Hollander, PhD



Janey L. Wiggs, MD, PhD, FARVO



Deborah A. Nickerson, PhD



Jay Shendure, MD, PhD

Message from the chair

15 Years of supporting vision researchers worldwide



J. Mark Petrash, PhD, FARVO

In 2001, several visionary ARVO leaders, headed by John Dowling, PhD, FARVO, came together to organize the ARVO Foundation for Eye Research. Their goal was to create a means to “assure a stable support mechanism for educational initiatives designed to enhance the conduct and dissemination of eye research.” True to its original mission, the Foundation today aims to provide support for innovative and novel vision research, particularly work with translational impact that fosters collaboration between clinicians and basic scientists.

In achieving this ambitious goal, the Foundation relies on a tremendous amount of work by its Board of Governors, ARVO staff and generous financial support by many individuals and groups. To date, the Foundation’s Dowling Society has over 70 members comprising over 52 households, who have given at least \$10,000. Since 2001, individuals, plus corporate and university donors (listed below) have given over \$3.6 million to fund educational initiatives and over 850 awards, grants and fellowships to young vision researchers worldwide.

There are many ways you can be a part of the community to support the Foundation’s activities. Financial giving to the Foundation can be accomplished online at arvo.org/foundation or through other means described on the website. Donors can allocate any portion of their gift to various programs, including established travel grants or even by establishing a new travel grant according to the donor’s preferred award criteria. A gift to the Foundation is a meaningful way to honor and memorialize individuals for their contributions to the vision research and eye care communities. From 2001 through 2015, more than 70 individuals have been honored and memorialized through donations to the ARVO Foundation.

Clearly, the seed planted by our founding members 15 years ago has taken root and is making a big difference in opportunities for young researchers today. With support from the ARVO community, it should be possible for the Foundation to reach a total of 1,000 awards granted during its first 15 years of existence. I can’t wait to see what the next 15 will bring!



Corporate and University donors

Abraham J. & Phyllis Katz Foundation
 Al Noor Foundation
 Alcon Foundation, Inc.
 Alcon Independent Medical Education Grant Office
 Alcon Laboratories - South Africa
 Alcon Labs Inc
 Allen Press Inc
 Allergan CIS SARL - Russia
 Allergan Foundation
 Amgen Inc
 ASKIN
 Bausch & Lomb
 Biogen Idec
 BioLegend
 Braun Research Inc.
 BrightFocus Foundation
 Champalimaud Foundation
 Charles River
 Clemson University Foundation
 Coe-Truman Technologies, Inc.
 Combined Federal Campaign
 Dean McGee Eye Institute
 Deseret Community Vision Institute
 Fight For Sight Inc
 Fondazione G B Bietti per Studio e Ricerca
 Foundation Fighting Blindness
 Freeman

Fundacion de Investigacion Oftalmologica
 Genentech Inc.
 Glaucoma Foundation
 Gordon and Llura Gund Foundation
 International Retinal Research Foundation
 Juvenile Diabetes Research Foundation
 Kazickas Family Foundation Inc.
 Knights Templar Eye Foundation
 Kowa Pharmaceutical Company Ltd.
 Kresge Eye Institute
 KWB Health Communications, Inc.
 Lighthouse Guild
 Litho Industries
 Merck
 NIHR Biomedical Research Centre
 Novartis Foundation
 Novartis Institutes for BioMedical Research
 Ocular Immunology and Uveitis Foundation
 Ocular Physiology Research & Education Foundation
 Ophthotech Corporation
 Ora, Inc
 Oregon Retina LLC
 Othera Pharmaceuticals, Inc.
 Otsuka Pharmaceutical Co., Ltd.
 Pan-American Ophthalmological Foundation

Pfizer Foundation Matching Gifts Program
 Pfizer Inc.
 Point Guard Partners
 Reader’s Digest Partners for Sight Foundation
 Regeneron Pharmaceuticals Inc
 Research to Prevent Blindness, Inc.
 Retina Foundation of the Southwest
 Retina Research Foundation
 Russian Nobility Association
 Santen Inc
 Santen Pharmaceutical Co Ltd
 Seattle CVB
 Sentiss
 Sirion Therapeutics Inc
 Tate & Tryon
 The C. Stephen & Frances B. Foster Foundation Inc.
 Thomson Reuters Matching Gifts Program
 Univ. of Colorado, Dept. of Ophthalmology
 University of Pennsylvania
 University of Wisconsin-Madison
 University of Witwatersrand
 Visit Baltimore
 Vistakon
 Wells Fargo

Beyond boundaries: Connecting and influencing

A conversation with Geeta K. Vemuganti, 2016 WEAVR Luncheon speaker

Clinician-scientist Geeta K. Vemuganti, DNB, FAMS, MD, is dean and professor at the School of Medical Sciences at the University of Hyderabad (UoH). Her recent ophthalmic research has largely focused on evaluating cancer stem cells in retinoblastoma. In 2013, the ARVO Foundation awarded Vemuganti the Merck Collaborative Research Fellowship with David Sullivan, MS, PhD, FARVO, of Schepens Eye Research Institute, Harvard Medical School. Since 1999, she has been an author of more than 30 ARVO Annual Meeting abstracts — both posters and papers — and has organized several sessions and a symposium. Her ARVO committee involvement includes the ARVO Annual Meeting Program Committee (AP Section), and serving as the current chair of the Global Members Committee.

As a prelude to her talk at this year's WEAVR Luncheon, Vemuganti shares with *ARVONews* the value of networking within and outside of her professional specialization.

What's been some of the best advice you've received about networking?

Dr. Savitri Sharma, my colleague at LV Prasad Eye Institute (LVPEI), was instrumental in guiding me and mentoring me for international travel. She told me that the first time you attend a conference, no one will know you; people will look at your work but may not remember you. The second time, they probably will look at you with faint recall. The third time, they will know about your work and look forward to seeing you. After the fourth meeting, they will invite you to talk and by the fifth meeting they will miss you. All this will happen provided you do good work and keep publishing.

Many people taught me about networking through example. My mentor, Dr. Gullapalli Rao, chairman, LVPEI network, is an excellent communicator. He starts networking before a meeting by contacting people he would like to meet with while there. He takes notes and keeps in contact throughout the following months to develop collaborations. Dr. Narsing A. Rao, director, Uveitis at USC, advised me to spend time in the lab with experts. Dr. Carol Shields remembers each and every case a newcomer presents and encourages them to continue their work. Dr. Jacob Pe'er would encourage me to network at meetings by introducing me to people I had never met before.

How has networking outside of your specialization enhanced your career?

As a physician-pathologist entering the emerging interdisciplinary field of stem cell research and tissue engineering, networking outside my pathology group was extremely useful and complemented my research. During my visit to UIC Chicago to work in the lab of Dr. Deepak Edward and Dr. Bob Folberg in 2000, I used the time in the afternoons and evenings to learn about cell culture from other labs and technical staff. Today, I find that experience one of the most useful in my career.

Similarly, the discussion to start working on limbal stem cells with Dr. Virender Sangwan was initiated over a cup of tea. This conversation led us to initiate what is now the world largest cell therapy for severe ocular surface disease.

Were there any barriers you had to overcome?

I once met a management consultant at a party who trains professionals, including doctors, on management principles. She said people are all the same deep inside and share the same problems or conflicts. One should think beyond profession when dealing with people. I found her advice very useful in dealing with conflicts in administration. Barriers to networking are mostly internal — one needs to overcome those and move forward.

How do you think a program like WEAVR might help young researchers expand their connections?

I think WEAVR influences young minds to think big. As India's past president, Dr. A.P.J. Abdul Kalam said, "Dream big. To think small is a crime." One never knows when we enter into a positive spiral in life. So be open to ideas, suggestions and opportunities. Young researchers will interact with experts all over the world, learn from their experience, gain confidence and use their expanding network to enhance their careers.

What is most rewarding about sharing your expertise with young researchers?

One of the most rewarding comments I received from students and young people is that they were inspired by my talks and that they have taken up challenges in their careers and are able to make a life-career balance. Nothing succeeds like success. If young researchers are inspired to network, overcome their inhibitions and take up key roles in ARVO, then I think my time "giving back" is as successful as the rest of my career!



Geeta K. Vemuganti, DNB, FAMS, MD

Women in Eye and Vision Research Luncheon

Tuesday, May 3,
12noon – 1:30pm
Seattle, Wash.

ARVO
2016

RESEARCH: A VISION FOR HOPE
MAY 1 – 5 | SEATTLE, WASH.

Collaborative Research Fellowship recipients advance treatment of ROP

Datuashvili studies long term Avastin treatment

Lana Datuashvili, MD, an ophthalmologist at L.J. Clinic in Kutaisi, Georgia, was one of two Collaborative Research Fellowship recipients in 2014. A native of Kutaisi and graduate of Kharkiv Medical Academy, Datuashvili collaborated with Graham E. Quinn, MSCE, MD, FARVO, at the University of Pennsylvania. Here, she explains the project and her future aspirations.



Lana Datuashvili, MD

Choosing ophthalmology

Vision is one of the most important functions of the human brain, without which the world would be perceived without its colors and charm. An ophthalmology career gave me the ability to help people see better.

The collaboration

When I learned about the fellowship from the ARVO website, I decided to apply, because it would be additional experience for me to work with proficient colleagues in another country. The project, “The long term follow up of Avastin treated retinopathy of prematurity (ROP) — refractive changes,” observed patients from 2011 until 2015. We studied 50 premature infants and examined half of them twice in six months to observe the changes. The study was carried out in two clinics: the L.J. and the I.Q Clinics in Tbilisi. The results were very interesting for me because a study like this had not been carried out in Georgia before, and it was fascinating to study the refractive changes in ROP after the Avastin treatment.

What's next?

I am doing this research in my country, but I am still working with Professor Quinn, which has been very informative. The collaboration has changed my career direction. I am more interested in ROP now and want to continue research or practical work around this disease.

As Georgia is ranked a third-world country, we have a lot of problems in ROP. We need more coordination between ophthalmologists and neonatologists to decrease ROP cases. And in cases of diagnosis, we need to have full treatment services, not only Avastin — as we have now — but laser and vitrectomy surgery in cases where it's necessary. This means we need professional ophthalmologists, as well as appropriate equipment. So my future goal is to work hard to help Georgia get closer to where first-world countries are in the field of ophthalmology.

Padhi examines technology's effect on detection

Friends help friends learn about funding opportunities. At least that is what happened to Tapas Ranjan Padhi, MD, when a colleague at LV Prasad Eye Institute (LVPEI) encouraged him to apply for the 2014 fellowship.

Padhi serves as consultant of retina vitreous services at LVPEI in Bhubaneswar, the city where he was born and lived before attending medical school at Maharaja Krishna Chandra Gajapati Medical College & Hospital in Berhampur. Following medical college, he completed an ophthalmology residency at JIPMER Pondicherry and a fellowship in Sankara Nethralaya in Chennai.

It was 2014 when he learned about ARVO's collaborative research fellowship opportunity. “I was trying to partner with a pediatric retina group for a few years to learn the technology being used in the U.S. so I could apply it to my locality where a huge number of patients could benefit,” he says. “I approached the pediatric retina team at the University of Michigan, and they agreed it was a great opportunity so we went ahead and applied.”

Padhi has been struggling for years to expand his city-based retinopathy of prematurity (ROP) program to the state level. The lack of adequate skilled manpower and cost-effective technology have been major hurdles in achieving this goal. He proposed to collaborate on a telemedicine research project with his mentor, Cagri G. Besirli, MD, PhD, assistant professor, Ophthalmology & Visual Sciences at Kellogg. Besirli was working on a method that would allow retinal photographs to be interpreted on a smartphone, using special software to condense multiple images into a single montage.

The two began working together on the project in May 2015. Two months later, Padhi returned to India where he continues the research to validate this method of screening as a more efficient way to detect retinopathy of prematurity.

Based on his year working in the U.S., Padhi sees value in working in another country. “Both institutions are working for the same goal — finding better solutions, a remedy for pediatric retina eye diseases,” says Padhi. “But the number one difference is that funding support for lab research is more easily available in the U.S. There are many hurdles and difficulties in terms of acquiring funding, expert scientists and well-equipped labs in India.

“Also, the U.S. has dedicated research staff to support the research. In India if I want to do the research I have to do everything — the work of the principal investigator, the scientists, as well as the coordinator.” However, Padhi points out that being a clinician in India has many advantages. “The volume of cases and variety of diseases we see is a huge advantage for India. The variety of clinical cases would be much less for our counterparts in the U.S.”

Thanks to the Collaborative Fellowship, Padhi was invited to work on many other projects. It also gave him the opportunity to attend the ARVO 2015 Annual Meeting in Denver, and network with many vision scientists working in ROP and related retinal disorders from across the world. He expanded the exposure of India’s high-level research while establishing relationships with researchers that he now can rely on for second opinions.

Padhi is excited about what this collaboration will mean for his pediatric patients at risk for developing ROP. “It will help expand our outreach from local to statewide,” he says. “If screenings can be transmitted through this technology, it will grow and strengthen our treatment of patients without creating an extra load on manpower.”

Ultimately, he sees this collaborative project as an impetus for establishing an international retina research center in India. “I hope that someday we will be able to train and help researchers from neighboring countries and other countries, such as such as Bangladesh or Nigeria,” says Padhi. “If I can extend my support and train others like I was trained at the University of Michigan, I will feel that I’ve done my job.”



Cagri Besirli, MD, PhD and Tapas Padhi, MS

2015 – 2016 Officers

J. Mark Petrash, PhD, FARVO
Chair

Cheryl Mae Craft, PhD, FARVO
Vice Chair

Paul P. Lee, MD, JD, FARVO
Immediate Past Chair

Paul Sternberg, Jr., MD, FARVO
Treasurer

ARVO Foundation office

Iris M. Rush, CAE
Executive Director

1801 Rockville Pike, Suite 400
Rockville, MD 20852-5622
Phone: +1.240.221.2900
Fax: +1.240.221.0370

arvofoundation.org

It's a new year: New funding, new developments, new policies



Paul A. Sieving, MD, PhD, FARVO
Director, National Eye Institute,
National Institutes of Health

As we move into a new year, there is new NIH funding to celebrate. There are also new developments in the Audacious Goals Initiative to watch, training opportunities to consider and new policies to know when applying for an NIH grant.

NIH budget

In December, the president signed into law an omnibus funding bill that gives NIH \$32 billion in fiscal year 2016, up from \$30 billion in FY 2015. This is a 6.6% increase and the largest single infusion into the NIH budget in more than a decade. The law brings the NEI budget up to \$716 million from \$684 million, a 3.9% increase and the first bump above our 2012 pre-sequestration budget of \$704 million. About \$5 million from the NEI budget will be transferred to the BRAIN initiative, which is funded at \$85 million in FY 2016, up from \$70 million last year.

NIH also received \$200 million for the Precision Medicine Initiative (PMI) in FY 2016. The PMI will leverage advances from the Human Genome Project to develop molecular therapies for a broad range of conditions and diseases. The budget includes \$130 million for the NIH Common Fund and \$70 million for the National Cancer Institute's PMI for Oncology.

NEI Audacious Goals Initiative (AGI)

The NEI AGI continues to advance toward our goal to restore vision by regenerating neurons and their connections within the visual system. In August 2015, we began soliciting applications for projects to identify factors influencing neural regeneration in the visual system. There was a strong response, and we hope to have several projects up and running by summer 2016.

A recent analysis of all best-scoring NEI grants funded in FY 2015 revealed that 24 included AGI-related aims and nine went to new investigators. We take that as a good sign that we are reaching people new to NIH and possibly new to vision research who will help energize the AGI.

We are continuing to hold workshops to guide new AGI funding opportunities. You can

now read the synthesis of ideas from an AGI workshop on photoreceptor regeneration and integration held during ARVO 2015. The report was authored by workshop co-chairs David Gamm, MD, PhD (University of Wisconsin-Madison), and Rachel Wong, PhD (University of Washington), and published in *Translational Vision Science & Technology*. It addresses several critical issues, including potential cell sources for photoreceptor regeneration, strategies for delivering cells to the retina, measuring function of regenerated cells and potential target patient populations.

In October 2015, NEI hosted a panel discussion on reconnecting neurons in the visual system. Michael Crair, PhD (Yale), and Carol Mason, PhD (Columbia), co-chaired this satellite event at the Society for Neuroscience annual meeting. Invited panelists and audience members framed current challenges in regenerating retinal ganglion cells, guiding their axons to appropriate targets and then persuading them to engage with other cells. A report will be published this spring.

There are many upcoming opportunities for engagement in the AGI. We recently launched the AGI Seminar Series in Neuroregeneration, which explores topics in regenerative neuroscience with special emphasis on the visual system. The seminars take place at NIH in Bethesda, Md., but you can view them at www.nei.nih.gov/audacious. Joshua Sanes, PhD (Harvard), gave the inaugural seminar in November 2015. Dennis Clegg, PhD (UC Santa Barbara), presented the seminar in February, and John Flanagan, OD, PhD (Harvard), will present on April 6.

If you are attending ARVO 2016 in Seattle, I encourage you to participate in the AGI town hall on regenerative medicine on May 1. This will be a moderated discussion about which ocular diseases and disease states would be suitable targets for regenerative therapies.

Finally, to extend the exceptional exchange of ideas we've seen at AGI events, I'm pleased to announce that we are launching an online AGI discussion forum. Watch for it soon at www.nei.nih.gov/audacious. For more details about the AGI and other NEI research

programs, please tune in to my recent presentation to the NIH Advisory Committee to the Director.

Training opportunities

Application deadlines are approaching for many training opportunities that NEI supports. These include postdoctoral fellowships (F32), and predoctoral fellowships (F30, F31) for training leading to a PhD, MD/PhD or equivalent. These fellowships have rolling application cycles, with deadlines three times per year. We also offer fellowships to support clinicians seeking to develop skills as independent investigators (K series). The next deadlines for new applications are early April for the F series and early June for the K series. For more information, see <https://researchtraining.nih.gov/>.

Grants policy changes

Reproducibility: I've written previously about recent studies on "the science of science" to improve the flow of research from preclinical stages onward. Studies have revealed widespread difficulty in the ability to reproduce peer-reviewed, published findings from preclinical research. As a result, NIH has added four new criteria to consider during the peer review process: 1)

the scientific premise of the proposed research, 2) rigorous experimental design for robust and unbiased results, 3) consideration of relevant biological variables and 4) authentication of key biological and/or chemical resources. For due dates on and after Jan. 25, 2016, these issues need to be addressed in the Research Strategy section of grant applications. Reviewers are now asked to evaluate these issues as a part of the significance and approach criteria. For more information, see NOT-OD-103 (<http://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-103.html>).

Sex as a biological variable: Sex and gender play important roles in health and disease. NIH now expects that sex as a biological variable will be factored into research designs, analyses and reporting in vertebrate animal and human studies beginning with applications due Jan. 25, 2016 and beyond. This need not require doubling the number of subjects, but strong justification from the scientific literature, preliminary data or other relevant considerations must be provided for applications proposing to study only one sex. Per the new policy, the sex of cells and tissues should be reported when available and reliable. For more information, see NOT-OD-15-102 (<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-102.html>).



ARVO IMAGING IN THE EYE
CONFERENCE

Where imaging is going

April 30, 2016
Washington State Convention Center
Conference Center, Tahoma Level
Seattle, Wash.
arvo.org/imaging

Exceeding expectations

As we announced in the previous issue of *ARVONews*, our family of journals is now open access. We are excited to see how the new, unrestricted model will enhance submissions and increase readership. We also are pleased to report that each of our three journals experienced growth and improvement in 2015.



Investigative Ophthalmology & Visual Science exceeded 2,300 submissions in 2015 — the highest to date. To meet the demands of the many submissions, we have decreased the average review time to just over 30 days from time of submission to first decision.

In 2016, we will introduce a new program: New Investigator Peer Review. This program will allow members who are new to serving as manuscript reviewers to take an online course on critical review of manuscripts prior to serving as a reviewer for *IOVS*. This will expand our reviewer profiles and allow new investigators the opportunity to learn the process and become the next generation of expert reviewers. We also plan to explore ways to create a more user-friendly table of contents, such as listing papers under common topics.

And finally, we would be remiss if we did not extend an enormous thank you to the reviewers,

editorial board members and associate editors who work hard to get the best visual science research into *IOVS* for all to enjoy.



In exciting news, the *Journal of Vision* will celebrate its 15th year of publication in 2016. The first issue was published in May 2001 and generated 69 submissions. Volume 1 published 13 articles. It was the realization of a dream — to have a top-quality journal covering all aspects of functional vision, freely available to anyone, anywhere, at any time.

Today, *JOV* is well-established as one of the leading journals in the field. Figure 1 below illustrates the rapid growth in submissions and papers published over the last 14 years. With 521 manuscripts submitted and 284 published in 2015, the curves appear to be reaching an asymptote at \approx 500 submissions per year, with roughly half being published. This is a mark of a mature, established journal — and one with a superb international board of editors solidly integrated into the ARVO family of journals.



Translational Vision Science & Technology continues to grow as a scientific journal. Submissions have increased by about 340% since 2012 with more than 100 manuscripts being submitted annually. Currently, approximately 60 papers are published per year. The pace of submissions and publications continues to increase. The acceptance rate gradually has decreased from 70% in 2012 to 59% in 2015.

The scope of research represented in *TVST* is quite broad. Some recent examples include the following:

- The use of a conjunctivally applied neurotrophic factor to protect photoreceptors from light damage
- Use of a Rayleigh scatter-based ocular flare analysis meter for flare photometry of the anterior chamber
- The effect of signal intensity on measurement of ganglion cell complex and retinal nerve fiber layer scans in Fourier-domain optical coherence tomography

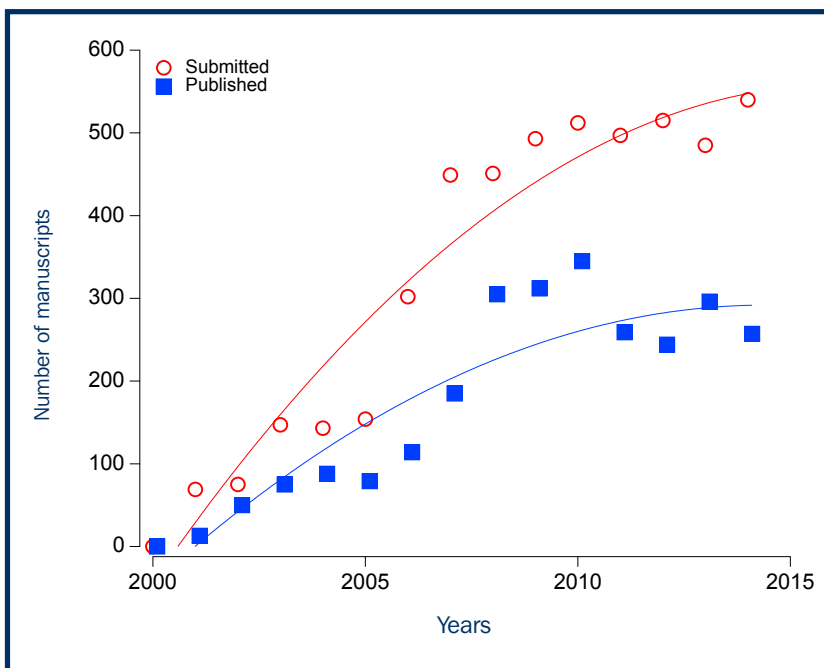


Fig. 1. The number of manuscripts submitted (red circles) and published (blue squares) per year in *Journal of Vision* since its inception.

- Survival and integration of pig retinal progenitor cells in normal recipients
- Computer-based image analysis of plus disease for diagnosis in retinopathy of prematurity
- Feasibility of structural and functional MRI acquisition with unpowered implants in Argus II retinal prosthesis patients

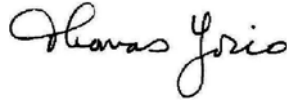
In addition, special issues like Restoring Vision to the Blind — The Lasker/IRRF Initiative for Innovation in Vision Science and reports, such as Report on the National Eye Institute Audacious Goals Initiative: Photoreceptor Regeneration and Integration Workshop are regular features of the journal.

As an open access journal, *TVST* articles are listed in PubMed Central — ensuring research published in *TVST* is widely available to everyone interested in translational vision science. This winter, we applied for Thomson Reuters' Web of Science indexing, which eventually could lead to an Impact Factor. Once awarded an Impact Factor, the number of submissions very likely will increase substantially.

We will continue to advertise *TVST* at various scientific meetings (not only those directly focused on vision science) to continue to increase awareness of the journal

in the scientific and engineering communities and to further broaden the scope of work represented in *TVST*.

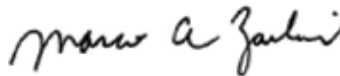
Together, each ARVO journal adds to vision science coverage. We are proud of the advancements the ARVO family of journals is making, and look forward to seeing the new research that will be submitted with the move to open access. We anticipate a bright and focused 2016!



Thomas Yorio
Interim *IOVS* Editor-in-Chief



Dennis Levi
JOV Editor-in-Chief



Marco Zarbin
TVST Editor-in-Chief

SOE2017



EUROPEAN SOCIETY OF OPHTHALMOLOGY
10-13 JUNE 2017 | BARCELONA, SPAIN

**SEE YOU IN
BARCELONA**
www.soe2017.org



A close-up photograph of a child's eye, showing the iris and pupil in detail. The eye is light-colored, possibly green or blue, and is looking slightly to the right. The background is a soft, out-of-focus green.

Since 1989
EACH EYE
HAS ITS IRIS

IRIS PHARMA SPECIALIZES IN OFFERING PRECLINICAL AND CLINICAL OPHTHALMOLOGY RESEARCH SERVICES WORLDWIDE.

- **PRECLINICAL SERVICES** (GLP or non-GLP):

Proof of concept, Efficacy, Tolerance, Pharmacokinetics, Non-GMP Formulation, Bioanalysis

- **CLINICAL SERVICES:**

Phase 1 to 4, Marketing Surveys, Project Management, Monitoring, Medical Writing, Regulatory Affairs, Central Laboratory

- **CONSULTING**

➔ Specific Focus on Ophthalmology and Highly Skilled Staff for Drug & Medical Device Development.