Optometric Glaucoma Society
17th Annual Scientific Meeting

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GLAUCOMA
SOCIETY

NOVEMBER 5-7, 2018

Grand Hyatt San Antonio

San Antonio, Texas

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President's Welcome

Michael Chaglasian, OD
OGS President

It is a great privilege and honor to welcome you to San Antonio for the 17th scientific meeting of the Optometric Glaucoma Society. We are very proud to present this year's program showcasing some of the world's best scientific and clinical experts in glaucoma. The OGS continues to be a model of excellence in specialty education within optometry. The relationship with the Academy continues and allows us to share a snapshot of our world class OGS scientific meeting with our colleagues from outside the OGS. This allows the OGS to share some of our world-renowned educators with those professionals attending the Academy meeting.

This is my second year as President and it is an honor to be able to introduce and welcome such a stellar program and panel of renowned speakers, researchers and awardees as well as our expert members and guests. As I try to follow in the large footprints of our past Presidents: Ben Gaddie, John Flanagan and Murray Fingeret, I am fortunate to be surrounded by OGS members who work diligently to bring this entire meeting together. My first acknowledgement is to Suresh Viswanathan who has put today's program together and assembled a unique integration of expert clinicians and scientists. The OGS meeting is renowned for its small meeting format that allows for intimate dialog and discussion on the most current and novel topics in glaucoma. A recurring comment from past honoree speakers is consistent praise for the interactive environment and scientific rigor of our meeting. With that, we encourage interaction with our expert presenters by commenting at one of the microphones located in the aisles.

This year we are extremely fortunate to have Dr. Jay Katz from Wills Eye Hospital, as our 2018 OGS Honoree. Jay Katz, MD is Chief of the Wills Eye Glaucoma Service and a Professor of Ophthalmology at Sidney Kimmel Medical College. I am also very pleased to announce this year's President Award honoree, Dr. Robert Feldman, chair for the Department of Ophthalmology & Visual Science at McGovern Medical School at UTHealth. This packed program also includes top notch presentations from Alex Huang, Arthur Sit, Donald Miller, Thom Freddo and OGS Ezell Fellow, Nevin El-Nimri. We are grateful to all our expert speakers responsible for this world class scientific and clinical meeting.

As the OGS Executive Director, Kellie Rogers does the vast majority of the logistics for this meeting. Her duties include: tracking all the numerous minute details such as venue selection, catering, meeting rooms, member and guest registration, industry vendor contracting, catering, receptions, meals, awards, and speakers (just to name a few!). Kellie has been an asset well beyond her role in the meeting planning and has assumed virtually all of the day to day tasks of running an organization with 130 members. As you see Kellie around the meeting, please introduce yourself and give her a big thanks.

I would not be an effective President without the dedicated support of the OGS Executive Board, this includes Rich Madonna as Vice President, Danica Marrelli as Secretary, and Eric Schmidt as Treasurer. Their support and contributions are invaluable. Ben Gaddie is our Executive Vice President and Murray Fingeret is always gracious in lending his support and guidance. I extend a big thank you to all our members and the numerous Committee Chairs who continue to give their time and expertise to pull off this great meeting.

Finally, I want to recognize the continued support from so many industry colleagues whose sponsorship make this meeting possible. I view all of them as dedicated partners who support optometric glaucoma education and the OGS mission.

Enjoy San Antonio, I look forward again to seeing you next year.

Michael Chaglasian, OD
OGS President

Optometric Glaucoma Society
17th Annual Scientific Meeting
November 5-7, 2018

Grand Hyatt San Antonio
600 E. Market Street
San Antonio, Texas, 78205

CE sponsored by

Monday, November 5, 2018

Crocket AB
4:00 – 5:00 PM Executive Committee Meeting
5:00 – 5:30 PM General Business Meeting (for all members)
5:30 – 6:00 PM OGF Executive Committee Meeting

Republic
6:00 – 9:00 PM Opening Reception

Tuesday, November 6, 2018

Texas BC
7:20 – 7:50 AM Breakfast (opportunity to visit vendor exhibits)

Texas A
7:50 AM Welcome from Michael Chaglasian, OGS President

Session 1: Imaging structure and function in glaucoma Moderated by John Flanagan

8:00 – 8:15: Nevin El-Nimri (OGS Ezell Fellow): The myopia - intraocular pressure- glaucoma triad: pathological and therapeutic implications
8:15 – 8:20: Discussion and questions

8:20 – 9:05: Donald Miller: Imaging the cells that die in glaucoma
9:05 –9:15: Discussion and questions

9:15 – 9:50: Alex Huang: Aqueous humor angiography
9:50 – 10:00: Discussion and questions

Texas BC
10:00 – 10:30: Morning Break (opportunity to visit vendor exhibits)

Session 2: Emerging perspectives in glaucoma Moderated by Richard Madonna
Texas A

10:30 – 11:15: Jay Katz (OGS Honoree Lecture): Is Glaucoma a Reversible Disease?
11:15 – 11:25: Discussion and questions

11:25 – 11:50: Alex Huang: Retinal angiography in glaucoma
11:50 – 12:00: Discussion and questions

Texas BC
Noon – 1:00: LUNCH (opportunity to visit vendor exhibits)

Session 3: Glaucoma: Old and new thoughts Moderated by Michael Chaglasian
Texas A

1:00 – 1:45: Robert Feldman (President's Lecture): Primary angle closure glaucoma, a bigger problem than you think
1:45 – 1:55: Discussion and questions

1:55 – 2:20: Jay Katz: Normal Tension Glaucoma: Old and New Thoughts
2:20 – 2:30: Discussion and questions

2:30 – 2:50: Robert Feldman: Refractive surgery and glaucoma
2:50 – 3:00: Discussion and questions

Texas BC
3:00 – 3:30: Afternoon Break (opportunity to visit vendor exhibits)

Session 4: Intraocular pressure variation and management Moderated by Michael Sullivan-Mee
Texas A

3:30 – 4:10: Arthur Sit: IOP Variability: Causes and Clinical Significance
4:10 – 4:20: Discussion and questions

4:20-4:40: Thomas Freddo: Validation of a more reliable method of eye drop self-administration
4:40 – 4:50: Discussion and questions

4:50-5:10: Arthur Sit: What's New in Medical Therapy for Glaucoma
5:10 – 5:20: Discussion and questions

Session 5: Panel Discussion Moderated by Murray Fingeret

5:20 – 6:00: Panel discussion with all speakers

Texas D
6:30 - 9:30: Reception and Dinner

Wednesday, November 7, 2018 OGS/AAO Joint Symposium

8:00-8:25 AM: Arthur Sit: IOP Variability: Causes and Clinical Significance
8:25-8:30 AM: Discussion and questions

8:30-8:55 AM: Robert Feldman: Refractive surgery and glaucoma
8:55-9:00 AM: Discussion and questions

9:00-9:25 AM: Jay Katz: Is Glaucoma a Reversible Disease?
9:25-9:30 AM: Discussion and questions

9:30-9:40 AM: Panel Discussion

COPE

The November 6th OGS Meeting is approved for COPE credit.
Please have your forms stamped as you exit.

We do not upload attendance data to ARBO. Please self-report with the event and course numbers found on your attendance certificate.

Speakers

Nevin El-Nimri, OD, MS

OGS 2017 Ezell Fellow

Nevin El-Nimri is an optometrist currently working toward a PhD in Vision Science at the University of California, Berkeley. She completed her undergraduate training at UC Berkeley and returned there after earning her OD and Masters in Vision Science at The Ohio State University in 2014. The main focus of her current research is the mechanisms underlying the increased risk of glaucoma in myopes. As part of this research, she is investigating the efficacy of topical ocular hypotensive drugs as novel myopia control therapies that may also directly reduce the risk of glaucoma. Her research has a translational emphasis and involves both the guinea pig as an animal model for myopia and human subjects. Nevin is a fellow of the American Academy of Optometry and the recipient of the 2017 OGS Ezell Fellowship.

Robert Feldman, MD

President's Lecturer

Dr. Robert M. Feldman is professor and Distinguished University Chair of the Ruiz Department of Ophthalmology and Visual Science at the McGovern Medical School, part of The University of Texas Health Science Center at Houston (UTHealth). Dr. Feldman earned his medical degree at the Chicago Medical School. He completed a residency at the University of California-San Diego, a research fellowship at Wills Eye Hospital in Philadelphia, and a clinical fellowship in glaucoma at Baylor College of Medicine in Houston.

He is a recipient of the American Academy of Ophthalmology's Achievement Award and has been recognized for his work to advance research and technology in the field of ophthalmology. Dr. Feldman's clinical and research interests focus on all aspects of adult and pediatric glaucoma including surgical, pharmacological, and devices.

Dr. Feldman is an active member of numerous scientific and medical organizations, including Board of Directors member of the American Glaucoma Society (2012-2014), the Hermann Eye Fund, Glaucoma Research Foundation Councilor, and an Editorial Board member for the Journal of Glaucoma. He has authored over 300 journal articles, abstracts, book chapters, and given over 300 presentations worldwide that cover a wide range of topics in ophthalmology. He is editor and contributor of the textbook Complications of Glaucoma Surgery.

Thomas Freddo, OD, PhD

Dr. Thomas Freddo completed his BA at The University of Connecticut, his OD at The New England College of Optometry and PhD at Boston University School of Medicine, where he also completed a Fellowship in Ophthalmic Pathology. For 25 years, Dr. Freddo served as Professor of Ophthalmology and Pathology at Boston University School of Medicine where he also maintained a hospital-based practice of Optometry and Directed the Surgical Eye Pathology service at the Boston Medical Center hospitals. He also directed an NIH-funded, research program in anterior uveitis and glaucoma. Dr. Freddo was the first optometrist to be named a Vice-Chairman of an academic department of ophthalmology. From 2006-2014 Dr. Freddo served as Professor and Director of the School of Optometry and Vision Science at the University of Waterloo. He is now semi-retired, serving as an Adjunct Professor at the MCP Health Sciences University School of Optometry. He is a recipient of the Glenn Fry Award for Excellence in Research. He was also honored to receive the Academy's Koch award, 11 teaching awards

from two institutions and two honorary doctorates from the State University of New York and the University of Montreal. He is a past-President of the International Society for Eye Research, and served on the Board of the American Academy of Optometry, the Scientific Advisory Committee of RPB, the Long Range Planning Board of ARVO, as a consultant to the FDA Ophthalmic Medical Devices committee and the Board of Regents of Beta Sigma Kappa. He is the author of nearly 100 research articles, many chapters and review articles and a new clinical textbook on anatomy of the eye and orbit. Most recently, Dr. Freddo was named a Fulbright Senior Fellow by the U.S. State Department's Bureau of Educational and Cultural Affairs. In this role, Dr. Freddo recently completed a visit to the University Johannesburg School of Optometry where he assisted in curricular design and sequencing as the Republic of South Africa begins to address its vast unmet need for medical eyecare.

Alex Huang, MD, PhD

Dr. Alex Huang graduated from Pomona College and completed his MSTP (Medical Scientist Training Program) MD/PhD program at The Johns Hopkins University School of Medicine with Lasker Award winning Dr. Solomon Snyder in the Solomon H. Snyder Department of Neuroscience. After completing his residency at then USC/Doheny Eye Institute, Dr. Huang left USC to complete his glaucoma fellowship with Dr. Robert N. Weinreb at the prestigious Shiley Eye Institute. Joining the USC faculty as a clinician scientist Dr. Huang left USC for the second time and became one of the inaugural faculty members of the Doheny Eye Institute/Stein Eye Institute/UCLA affiliation.

Dr. Huang is a National Institutes of Health/National Eye Institute supported clinician-scientists on a K08 award. Clinically, Dr. Huang is recognized as a thought leader in new angle-based minimally invasive glaucoma surgeries (MIGS) that he offers to his patients. He has directed his clinical acumen in MIGS into a research program dedicated to developing a combined Structure: Function understanding of aqueous humor outflow using OCT and aqueous angiography. Dr. Huang has lectured regarding his research at American Glaucoma Society, American Academy of Ophthalmology, Chinese Ophthalmological Society, World Glaucoma Congress, and World Ophthalmology Congress. Aqueous Angiography and Dr. Huang's research program has been featured in Ophthalmology Times, Eyeworld, and The Ophthalmologist magazines.

Dr. Huang has also been awarded the American Glaucoma Society Mentoring for Advancement of Physician-Scientists award (MAPS) two times (2013 and 2014) and was given the American Glaucoma Society Young-Clinician Scientist Award in 2015. Fight For Sight recognized Dr. Huang as an Undergraduate Research Award Mentor in 2015. Most recently, Dr. Huang was honored with the Research to Prevent Blindness Career Development Award (1/2016) and the Heidelberg Engineering Xtreme Research award (6/2016). He was named the #1 Rising Star by The Ophthalmologist magazine in 2017.

L. Jay Katz, MD

OGS Honoree

L. Jay Katz, MD, FACS is Director Emeritus of the Glaucoma Service at Wills Eye Hospital and Professor of Ophthalmology at Thomas Jefferson University in Philadelphia, PA.

Dr. Katz received his BA, summa cum laude, from Case Western Reserve University and his MD from Yale University School of Medicine, where he received an award for his medical thesis. He completed his ophthalmology residency at Yale and then moved to Wills Eye Hospital for his glaucoma subspecialty training. Dr. Katz has been on the faculty at Wills Eye ever since.

Dr. Katz has wide-ranging interests in glaucoma, including drug evaluation, the roles of laser and medical

management in glaucoma treatment, and optic nerve scanning methodologies. In addition, he studies glaucoma surgical techniques, including new technologies such as the iStent. Lately, he has also been involved in studies of gene expression in primary open angle glaucoma and in the study of new instruments for intraocular pressure measurements. Dr. Katz has participated in major NEI/NIH collaborative studies, including the Glaucoma Laser Trial, the Advanced Glaucoma Intervention Study and the Collaborative Initial Glaucoma Treatment Study.

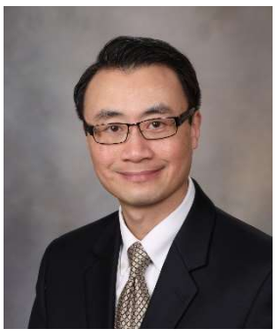
The author of approximately 196 journal articles and 35 book chapters, Dr. Katz has delivered hundreds of lectures, teaching sessions and courses. He serves as a Section Editor for Survey of Ophthalmology and is on the editorial boards of Graefe's Archive for Clinical and Experimental Ophthalmology and the Journal of Glaucoma. Dr. Katz's awards include the Senior Honor Award of the American Academy of Ophthalmology, the Yale University Eye Center Distinguished Alumnus Award, the Wills Eye Hospital Silver Tray Award and the Lifetime Achievement Award from the Wills Eye Hospital Glaucoma Service 50th Anniversary Celebration.

Donald Miller, PhD

Dr. Donald T. Miller earned a BS in applied physics from Xavier University (1988) and a PhD in optics from University of Rochester (1996). Most of his doctoral work was conducted at the Center for Visual Science, where he developed a high-resolution retina camera that captured the first images of individual photoreceptor cells in the living human eye. As a postdoctoral fellow at Rochester, he was instrumental in the development of the first adaptive optics instrument for correction of ocular aberrations. This was followed by a National Research Council Research Associate position at Wright-Patterson Air Force Base in Dayton, Ohio. He joined the faculty at Indiana University School of Optometry in 1998 and currently holds the rank of Professor.

At IU, Dr. Miller splits his time between teaching optics to professional and graduate students and conducting research on the optical properties of the eye. He has received the Trustees' Teaching Award twice for excellence in teaching. He is a founding member of the Center for Adaptive Optics, a consortium of university, government, and industry researchers funded for 10 years by the NSF. He was also a member of a NIH Bioengineering Research Partnership hosted at the University of California, Davis. The partnership received an R&D 100 Award for its development of a MEMS-based Adaptive Optics Optical Coherence Tomography instrument. He is a recipient of multiple NIH-R01 grants.

Dr. Miller is actively involved in numerous vision and eye-related professional societies, acting as a reviewer and guest editor for journals, an invited speaker and a member of program organizing committees. He has twice chaired the OSA Adaptive Optics Topical Meeting and regularly serves on the program committee of the SPIE Ophthalmic Technologies Conference. He is a Fellow of the Optical Society of America.



Arthur Sit, MD

Dr. Sit is a Professor of Ophthalmology, Glaucoma Fellowship Director, and Vice Chair of the Department of Ophthalmology at the Mayo Clinic in Rochester, Minnesota. Prior to medical school, he completed his bachelor's degree in Mechanical Engineering at the University of Toronto, and a master's degree in Mechanical Engineering at the Massachusetts Institute of Technology. He completed his medical school and residency at the University of Toronto, and a glaucoma fellowship at the University of California San Diego.

His research interests focus on aqueous humor dynamics, the variations in intraocular pressure, ocular biomechanics, the role of intracranial pressure in glaucoma, and novel technologies for the diagnosis and treatment of glaucoma. Recently, this has included the development of a novel device for the measurement of episcleral venous pressure, and a novel device for in vivo assessment of ocular biomechanical

properties. His work has been supported by the National Eye Institute, BrightFocus Foundation, Research to Prevent Blindness, and industry grants.

Dr. Sit has been the recipient of the American Glaucoma Society Clinician-Scientist Award and the World Glaucoma Association Young Clinician Scientist Award. He has been named to Best Doctors in America and Who's Who in America. Dr. Sit is co-Chair of the Program Committee for the World Glaucoma Congress. He is the immediate past Chair of the Research Committee for the American Glaucoma Society, and is the immediate past President of the Minnesota Academy of Ophthalmology.

OGS 2017 Annual Meeting Attendees, Chicago, IL

Optometric Glaucoma Society Ezell Fellow

The Optometric Glaucoma Society established an Ezell Fellowship in 2007, dedicated to fund post-graduate research in the area of glaucoma. The award is done in partnership with the American Optometric Foundation and meant to encourage talented individuals to pursue a career in research and education.

Laura Pardon, OD, MS, FAAO

Dr. Laura Pardon received a Bachelor of Science degree in Molecular and Cellular Biology and Psychology from the University of Illinois at Urbana-Champaign. She then attended Indiana University, where she earned Doctor of Optometry and MS in Vision Science degrees. Following graduation, Laura completed a residency in Ocular Disease/Primary Care at the VA New York Harbor Healthcare System. Laura is currently in the 5th year of the PhD program in Physiological Optics and Vision Science at the University of Houston College of Optometry. Her research uses optical coherence tomography and ultrasonography to investigate normal variations in optic nerve structure, as well as structural changes in pathologies involving abnormal intracranial or intraocular pressures, in humans and non-human primates.

Corporate Partnership Award

In recognition of our friend and colleague; an innovator whose work has improved the care for millions around the world.

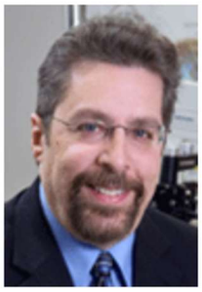
Vincent Michael Patella, OD

Vincent Michael Patella, OD, FAAO is a graduate of Pomona College and took his OD degree from the UC Berkeley School of Optometry. He has devoted his professional career to the development of automated diagnostic devices for Optometry and Ophthalmology, while also maintaining a small private practice for much of that time.

Dr. Patella led the development of the Humphrey perimeter in collaboration with Anders Heijl and has co-authored two books and many scientific papers on automated perimetry. He also has been directly involved in the development of Optical Coherence Tomography.

Dr. Patella was one of the four founders of the Optometric Glaucoma Society. He also was one of the founding employees of Humphrey Instruments, now called Carl Zeiss Meditec, from which he retired in January of 2018. Dr. Patella remains actively engaged with both Optometry and Ophthalmology. He continues to lecture globally and to maintain collaborations with friends and colleagues throughout the world.

The following was originally published on May 7, ,2018 in Optometric Physician, a weekly e-journal edited by Art Epstein, O.D. (Volume 18, Number 19).



Off the Cuff: Greatness in Our Field: Guest Author Murray Fingeret

A wonderful part of my career has been the friendships I've developed with individuals who have shaped our profession. I've long been planning to dedicate some of this space to recognizing and sharing their work and accomplishments. At the top of that list is Dr. Murray Fingeret. Most know only a small fraction of what Murray has done for our profession, but in typical fashion, when I last spoke with him, he asked if he could "borrow Optometric Physician" to focus on an individual who changed the profession and touched him. I couldn't refuse. What follows was written by Murray Fingeret:

Dr. Mike Patella

The Humphrey Visual Field Analyzer (HFA) is one of the most important and iconic instruments used in eye care. Its development dates back to the early 1980s, not long after the introduction of automated perimetry. Several companies had introduced automated perimeters, the first being the Octopus perimeter in 1978. Automated perimetry took Goldmann perimetry, which was tedious, time consuming and dependent upon a skilled technician, and automated it. The result was improved reliability, ease of use and a dramatic advance in visual field testing.

One concern was that the original Octopus perimeter was expensive. In 1976, a company was started by Dr. Luis Alvarez, a University of California Berkeley (UCB) faculty member, to commercialize products that would use some of his optics patents, specifically the Alvarez lens. Bill Humphrey joined as technical director and hired a UCB optometry student, Michael Patella. This young student became Humphrey Instrument's thirteenth employee and was soon involved in the development of the Humphrey Vision Analyzer. It was a device that was far ahead of its time, but it never really took off commercially.

The next project Dr. Patella was involved with was the development of the HFA perimeter. The objective was to develop a perimeter that could do everything the more expensive devices did at a fraction of the cost. Mike contacted a Swedish ophthalmologist, Anders Heijl, who had experience in building a perimeter, to provide additional consult. This team led to the introduction of the HFA perimeter, which rapidly became the gold standard for perimetery worldwide.

Perhaps the most amazing thing is that almost 40 years later, the HFA perimeter continues its place at the forefront of perimetry. Michael Patella, who at the onset was a young optometrist charged with the HFA's development, has recently retired from Carl Zeiss Meditec. Few optometrists have had a more important role in eye care; yet few ODs realize that it was one of their brethren who led the perimeter's development.

Mike, for years, had an optometry practice in the Bay area in addition to his role at Zeiss because he felt it important to maintain a clinical presence to understand how his products may be utilized. Mike has always championed optometry and continues to be one of its biggest advocates. I would like to congratulate Mike on a long and illustrious career and look forward to seeing what he does in his next chapter.

Murray Fingeret, OD

Q & A WITH MIKE PATELLA, '78

Triple Threat

Optometrist, Instrument Designer, Engineer

Mike talks about working with Bill Humphrey and Nobel Laureate Luis Alvarez, how private practice helped inform his design decisions, and the missing instrument in the OD's toolkit.

One of the most clinically influential optometrists of our time, Dr. Patella played a key role in the development of the Humphrey Visual Field Analyzer, among other devices, and is also the Berkeley Optometry Alumnus of the Year.

Q What led you to optometry?
A At the age of 25, I was working as an aerospace engineer and realized that very few of my colleagues were over the age of 50, due to age discrimination, the wild pace of the work, and the need to change companies every few years. I wanted a more stable life and I thought optometry might be the answer. There was also a personal aspect. My own optometrist had impressed me with his intelligence and professionalism, and I thought that this might be a role for me as well.

Q Tell us about your summer job with Bill Humphrey while you were an OD student? How did you get that gig?
A In my first semester of optometry school, we all took a basic optics course in the physics department. The teacher was a wonderful physicist named Frank Crawford. Toward the end of the semester, Professor Crawford told us we were going on a field trip to meet the people who were going to put optometry out of business. Those people were Bill Humphrey and Nobel Laureate Luis Alvarez. And the company was a Berkeley startup called Humphrey Instruments, which today is known as Carl Zeiss Meditec. On that field trip, Bill demonstrated a prototype of the Humphrey Vision Analyzer, which was—and still is—the coolest subjective refraction device ever built.

After the field trip, I called Bill and said that I wanted to work for him. My argument was that I had been working with NASA on optical devices, which were at least as complicated as the Vision Analyzer, AND that I was an optometry student and thus understood what needed to be done to make the product successful in the clinic.

So, Bill hired me for a week—to see if I could make myself useful. I worked as one of his lab rats, mostly doing technical photography and clinical trials. Forty years later, I'm still here.

Q How did the idea for the Humphrey Visual Field Analyzer come about?
A A number of automated perimeters hit the market in the early 1980's. We could see that many of the inexpensive perimeters didn't work well and that the ones that worked well cost too much. We decided to build a perimeter that worked very well *and* didn't cost very much—and that is what we did. The first Humphrey perimeter did everything that the most expensive competitor did, and cost only one quarter as much.

Q Do you have a favorite story from the time you spent working with Bill Humphrey and Nobel laureate Dr. Luis Alvarez?
A Soon after going to work at Humphrey, I became Luis's optometrist, or more precisely, his refractionist. There were problems with such a relationship, the least of which was the fact that I was only a first year optometry student. The primary problem was that Luis always checked my work himself.

Humphrey Instruments was formed to take advantage of a number of Luis's optics patents, including one for a variable focus lens. The Alvarez lens, as it was known, consisted of two specially shaped pieces of plastic. When one plastic piece was set precisely atop the other, the lens was plano. If you slid the top piece of plastic to the left, lens power became increasingly negative. If you slid the top piece to the right, you got increasingly positive sphere power. The assembly fit in your shirt pocket and that was where Luis always carried his very own Alvarez lens.

As soon as he received his new glasses—and it seemed like he needed new ones all too often—he would step outside and do an over-refraction with his Alvarez lens—to see if I had gotten the right answer. The problem was that Luis had no sense of the tolerances and uncertainties that are associated with refraction, as well as with the fabrication of any pair of glasses. The first time I gave him a pair of glasses, he went outside with his lens and immediately found that I had missed by a whole eighth of a diopter in one eye. Not being the most tolerant man I ever met, Luis demanded that I explain how I had made such a careless error! No discussion about the imprecision of refraction or ophthalmic optics was allowed, and I finally had to carefully demonstrate that his refractive error changed by an eighth of a diopter just from the change in pupil size associated with going outside to check my work! At last he was satisfied, and I was ever so much the wiser about the many hazards of proper patient management.

The thing you should know about Luis is that he was even more demanding of himself than he ever was of the people around him. He was my mentor and friend, and I still miss him sorely—twenty-eight years after his death.

Q What did you learn working with such greats?
A True leaders—the greats if you will—care very little about the petty details of life. They just want to know that you know things that they don't, that you can do things that they can't, that you always do what you say you're going to do and that your heart is in the right place. Having settled the basics above, they want you to lead, follow, or get out of the way, and as long as you promptly do one of those three things, it all turns out fine.

Q You had a previous career as a meteorologist for the military. That seems like a long way from optometry and instrument design. How did that experience impact your career path?
A That experience convinced me of two things: First, I don't enjoy public embarrassment, and trying to forecast the weather indeed did lead to many red-faced situations. Second, I didn't much like being in the military, but in those days there was little choice.

Within a week of getting out of the military I found a job as a meteorologist working on a NASA project called Skylab. When I realized that they didn't really need a full time meteorologist, I reverted to doing systems engineering work for them, on a team that was integrating some very high-tech optical devices into the Skylab space station. High-tech optics then led to optometry and also to a job at Humphrey Instruments.

Q Before devoting your career to instrument design, you worked in private practice. How did your clinical practice influence your design ideas?
A After graduation from optometry school, I spent five years practicing half time while also working half time at Humphrey. I then took on full-time status at Humphrey, but still saw patients one day a week. This went on for fifteen years.

The main reason I continued to see patients for all those years was that I was hugely aware of the fact that instrument development has to be responsive to real clinical needs. Moreover, as one of my favorite Berkeley Optometry teachers, Kermit Kors, used to say, "Life is full of little compromises." In designing clinical instruments, you have to know what compromises you can make and which ones you cannot make. And the only way to know those things is to live the reality of clinical care long enough and fully enough that such things have become intuitive.

Q What do you think is the missing instrument in the OD's toolkit?
A When I was trained, a direct ophthalmoscope was considered high tech. Today, we have so much high technology that doctors—optometrists and ophthalmologists—are drowning in **data**. We need to integrate and combine all that data into simpler, more reliable and more understandable bits of actionable **information**—information that doctors can turn into better informed healthcare decisions.

Some people call this *decision support*, but I call it giving the doctor a lot less data and lot more information.

> "In designing clinical instruments, you have to know what compromises you can make and which ones you cannot make."

Q What are you working on now?
A In perimetry, I have the privilege of working with Dean Flanagan and with Anders Heijl on next generation testing strategies. We hope to cut perimetric testing time in half again, without giving up any diagnostic validity.

In OCT, we are introducing OCT angiography right now, a method that produces high resolution angiograms without dye injections.

Q How did your time at Berkeley help you prepare for the work you're doing now?
A Berkeley Optometry prepared me to start professional life in the clinic. Of course, one can only learn part of what you need to know in school; the rest you have to learn on your own. In that sense, optometry is no different from any other profession. For example, I learned most of what I now know about glaucoma *after* leaving school. But my training at Berkeley taught me what I needed to know to get started, and that's all you can ask of any school experience.

Q What are your best memories from your time as an optometry student here at Berkeley?
A My memories are closely tied to specific people. I loved learning contact lenses from Mort Sarver, corneal physiology from Irv Fatt, color vision from Tony Adams, low vision from Ian Bailey, ophthalmic optics from Kermit Kors, and binocular vision from Mert Flom. These were my mentors and every one of them fully understood the importance of proper clinical training. I also remember my classmates—a truly extraordinary group who have made their own marks on this profession.

Q What are you most proud of?
A I am proud of how far optometry has come during my career—and I am proud to have participated in that process. When I started practice, we couldn't dilate a pupil or numb a cornea. In the years following graduation, we all taught ourselves Goldmann tonometry, binocular indirect ophthalmoscopy, fundus photography, and gonioscopy. Now, I am trying to learn angiography. It never stops, and I like it that way.

Q What advice would you give to current optometry students?
A Don't let your professional work become just work. Find some part of your profession that makes your blood pump and your heart sing, and pursue that part with your full energy. You will never regret it.

Optometric Glaucoma Foundation

Mission Statement

The mission of the Optometric Glaucoma Foundation is to support glaucoma education for the optometric profession. This includes supporting and developing educational programs for students, residents, educators and practitioners. The OGF will work with different groups to meet our goals including industry and educational institutions, as well as optometric and ophthalmologic organizations.

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2nd Annual Educators Program
Saturday, September 8, 2018
UC Berkeley School of Optometry
Berkeley, CA

The Optometric Glaucoma Foundation held its 2nd annual Glaucoma Educators meeting at the School of Optometry University of California Berkeley on September 8, 2018. The objective is to bring together individuals involved in the teaching of glaucoma at the schools and colleges of optometry and provide focused education to specific areas. This year Jason Bacharach, MD discussed minimally invasive glaucoma surgery (MIGS), how the devices are evolving and what is involved in the pre and post-operative management. The other speaker was our own Michael Patella, OD who reviewed visual fields and discussed why perimetry is still important in these days of OCT and imaging. Thirty-five faculty from 16 schools of optometry attended the program. We plan to hold our 3rd meeting next year in Chicago at the Illinois College of Optometry with one theme being how communication may be taught to our students, and why this is important for the patients we manage with glaucoma.

OGS Leadership & Committees

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Michael Chaglasian – President
Richard Madonna – Vice President
Eric Schmidt – Treasurer
Danica Marrelli – Secretary
Ben Gaddie – Executive Vice President

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Murray Fingeret 2001-2008
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Ben Gaddie 2012-2016

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Mark Dunbar, OD
David Evans, PhD
Murray Fingeret, OD
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William A Hare OD, PhD
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Chris Johnson, PhD
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John McSoley, OD
Ron Melton, OD
Vincent Michael Patella, OD
Bruce Onofrey
Robert Prouty, OD
Chris Quinn, OD
Daniel Roberts, OD, MS
Pam Sample, PhD
Leo Semes, OD
Joseph Sowka, OD
William Swanson, PhD
James Thimons, OD
Randall Thomas, OD
Robert P. Wooldridge, OD

In Memoriam
Larry J. Alexander, OD
Thom J. Zimmerman, MD, PhD

OGS Ezell Fellows
2018 Laura Pardon, OD, MS
2017 Nevin W. El-Nimri, OD, MS
2016 Jack Phu, BOptom, MPH
2015 Lakshmi Priya Rajagopalan, BS, PhD
2013 Kevin Ivers, OD, PhD
2012 Kevin Ivers, OD, PhD
2011 Nimesh Patel, OD, PhD
2010 Nimesh Patel, OD, PhD
2008 Joe Wheat, OD, PhD

Founders Award
2016 Gerhard Zinser, PhD
2015 Harry A. Quigley, MD
2012 Robert N. Weinreb, MD
2011 Douglas R. Anderson, MD

Distinguished Service Award
2016 Ben Gaddie, OD
2013 John G. Flanagan, MCOPtom, PhD
2012 Louis J. Catania, OD
2011 Tom L. Lewis, OD, PhD
2010 V. Michael Patella, OD
2008 Murray Fingeret, OD

Research Excellence Award
2014 Donald Hood, PhD
2013 Ronald S. Harwerth, OD, PhD
2009 Sir Peng Tee Khaw, MD, FRCOphth

Corporate Partnership Award
2018 V. Michael Patella, OD
2016 Rick Halprin
2013 Richard D. Bay

OGS Annual Meetings

Dates	Location	President's Lecturer	OGS Honoree
November 5-7, 2018	San Antonio, TX	Robert Feldman, MD	L. Jay Katz, MD
October 9-11, 2017	Chicago, IL	David Friedman, MD, MPH, PhD	Robert Fechtner, MD
November 7-9, 2016	Anaheim, CA	Felipe A. Medeiros, MD, PhD	George A. Cioffi, MD
October 5-7, 2015	New Orleans, LA	Jonathan S. Myers, MD	Mae Gordon, PhD
November 10-12, 2014	Denver, CO	Steven L. Mansberger, MD, MPH	David Garway-Heath, MD
October 22-23, 2013	Seattle, WA	Anthony Realini, MD, MPH	Claude Burgoyne, MD
October 23-24, 2012	Phoenix, AZ	Brad Fortune, OD, PhD	Jost Jonas, MD
October 11-12, 2011	Boston, MA	Keith Martin, MD, FRCOphth	Jeffrey Liebmann, MD
November 15-16, 2010	San Francisco, CA	Kuldev Singh, MD, MPH	Wallace L.M. Alward, MD
November 9-11, 2009	Orlando, FL	Christopher A. Girkin, MD	George L. Spaeth, MD
October 20-22, 2008	Anaheim, CA	Theodore Krupin, MD	Robert Ritch, MD
October 22-23, 2007	Tampa, FL	David Greenfield, MD	Paul Kaufman, MD
December 5-6, 2006	Denver, CO	Balwantray Chauhan, PhD	Harry Quigley, MD
December 7, 2005	San Diego, CA		Stephen Drance, OC, MD
December 8, 2004	Tampa, FL		Douglas R. Anderson, MD
December 9, 2003	Dallas, TX		Anders Heijl, MD
December 11, 2002	San Diego, CA		Robert N. Weinreb, MD

Welcome New OGS Members

Matthew Bovenzi, OD, FAAO
State University of New York
College of Optometry
New York, NY

Brett King, OD, FAAO
Indiana University
School of Optometry
Bloomington, IN

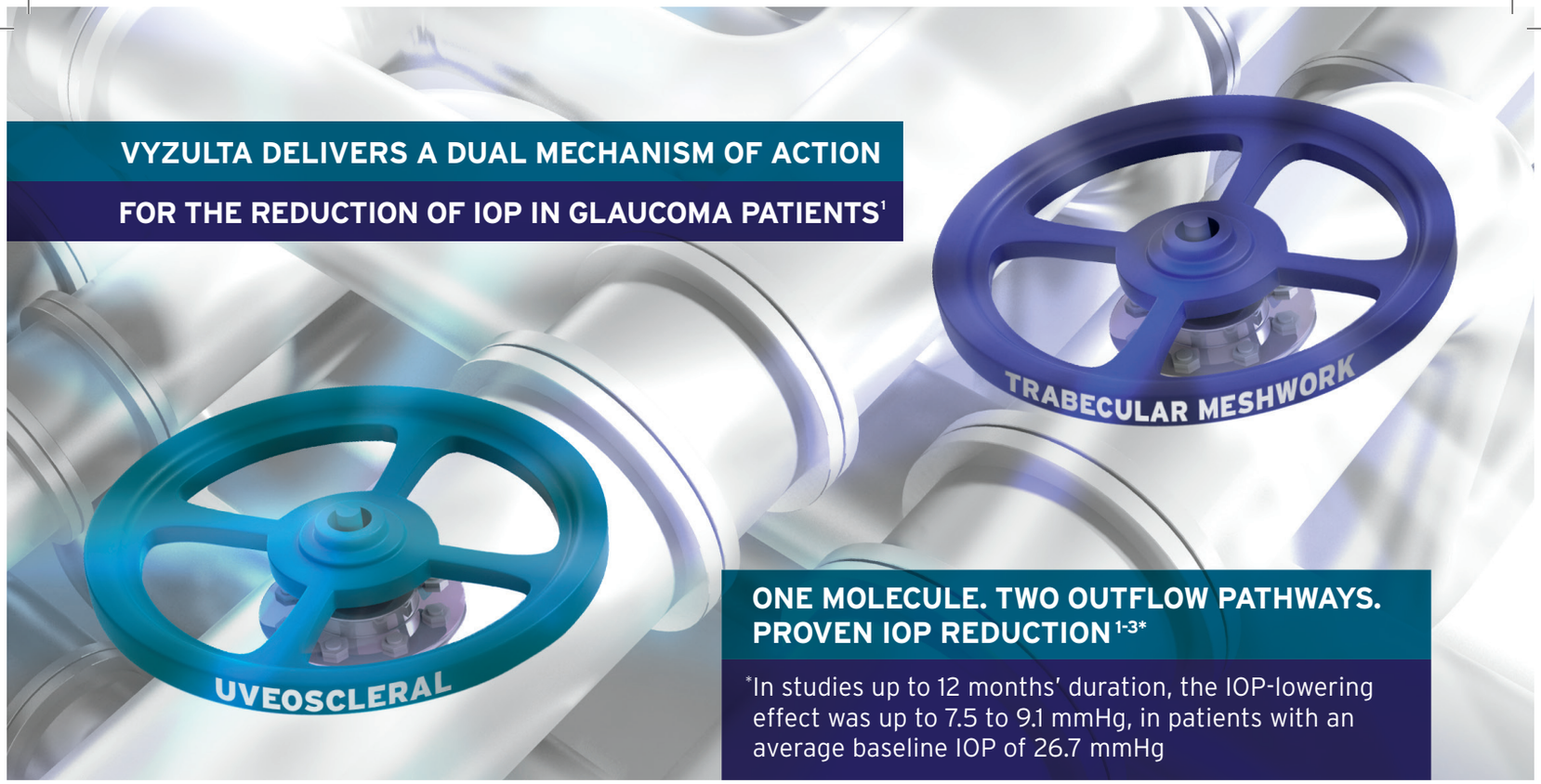
Shira Kresch
Columbia University Medical Center
Department of Ophthalmology
New York, NY

Ian McWherter, OD, FAAO
Bennett & Bloom Eye Centers
Louisville, KY

Anthony W. Van Alstine OD, MS, FAAO
Wm. Jennings Bryan Dorn VAMC
Columbia, SC

OGS Mission Statement

The Optometric Glaucoma Society (OGS) mission is to promote excellence in care of glaucoma patients through professional education and scientific investigation. The society's major objectives are to promote education of optometrists related to all aspects of glaucoma; promote the acquisition of new knowledge about glaucoma, in part through the development of glaucoma research within optometry; facilitate the dissemination of information about glaucoma to healthcare providers and the public; and establish collaborative relationship with other related organizations.



INDICATION

VYZULTA™ (latanoprostene bunod ophthalmic solution), 0.024% is indicated for the reduction of intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

IMPORTANT SAFETY INFORMATION

- Increased pigmentation of the iris and periorbital tissue (eyelid) can occur. Iris pigmentation is likely to be permanent
- Gradual changes to eyelashes, including increased length, increased thickness, and number of eyelashes, may occur. These changes are usually reversible upon treatment discontinuation
- Use with caution in patients with a history of intraocular inflammation (iritis/uveitis). VYZULTA should generally not be used in patients with active intraocular inflammation
- Macular edema, including cystoid macular edema, has been reported during treatment with prostaglandin analogs. Use with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema

IMPORTANT SAFETY INFORMATION (CONTINUED)

- There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products that were inadvertently contaminated by patients
- Contact lenses should be removed prior to the administration of VYZULTA and may be reinserted 15 minutes after administration
- Most common ocular adverse reactions with incidence ≥2% are conjunctival hyperemia (6%), eye irritation (4%), eye pain (3%), and instillation site pain (2%)

For more information, please see Brief Summary of Prescribing Information on next page.

References:

1. VYZULTA Prescribing Information. Bausch & Lomb Incorporated. 2017.
2. Weinreb RN, Sforzolini BS, Vittitow J, Liebmann J. Latanoprostene bunod 0.024% versus timolol maleate 0.5% in subjects with open-angle glaucoma or ocular hypertension: the APOLLO study. *Ophthalmology*. 2016;123(5):965-973.
3. Medeiros FA, Martin KR, Peace J, Sforzolini BS, Vittitow JL, Weinreb RN. Comparison of latanoprostene bunod 0.024% and timolol maleate 0.5% in open-angle glaucoma or ocular hypertension: the LUNAR study. *Am J Ophthalmol*. 2016;168:250-259.

For more information about VYZULTA and how it works, visit vyzultanow.com

BAUSCH + LOMB

VYZULTA™
(latanoprostene bunod ophthalmic solution), 0.024%

BRIEF SUMMARY OF PRESCRIBING INFORMATION

This Brief Summary does not include all the information needed to use VYZULTA safely and effectively. See full Prescribing Information for VYZULTA.

VYZULTA™ (latanoprostene bunod ophthalmic solution), 0.024%, for topical ophthalmic use.

Initial U.S. Approval: 2017

1 INDICATIONS AND USAGE

VYZULTA™ (latanoprostene bunod ophthalmic solution) 0.024% is indicated for the reduction of intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

4 CONTRAINDICATIONS

None

5 WARNINGS AND PRECAUTIONS

5.1 Pigmentation

VYZULTA™ (latanoprostene bunod ophthalmic solution), 0.024% may cause changes to pigmented tissues. The most frequently reported changes with prostaglandin analogs have been increased pigmentation of the iris and periorbital tissue (eyelid).

Pigmentation is expected to increase as long as latanoprostene bunod ophthalmic solution is administered. The pigmentation change is due to increased melanin content in the melanocytes rather than to an increase in the number of melanocytes. After discontinuation of VYZULTA, pigmentation of the iris is likely to be permanent, while pigmentation of the periorbital tissue and eyelash changes are likely to be reversible in most patients. Patients who receive prostaglandin analogs, including VYZULTA, should be informed of the possibility of increased pigmentation, including permanent changes. The long-term effects of increased pigmentation are not known.

Iris color change may not be noticeable for several months to years. Typically, the brown pigmentation around the pupil spreads concentrically towards the periphery of the iris and the entire iris or parts of the iris become more brownish. Neither nevi nor freckles of the iris appear to be affected by treatment. While treatment with VYZULTA™ (latanoprostene bunod ophthalmic solution), 0.024% can be continued in patients who develop noticeably increased iris pigmentation, these patients should be examined regularly *[see Patient Counseling Information (17) in full Prescribing Information]*.

5.2 Eyelash Changes

VYZULTA may gradually change eyelashes and vellus hair in the treated eye. These changes include increased length, thickness, and the number of lashes or hairs. Eyelash changes are usually reversible upon discontinuation of treatment.

5.3 Intraocular Inflammation

VYZULTA should be used with caution in patients with a history of intraocular inflammation (iritis/uveitis) and should generally not be used in patients with active intraocular inflammation as it may exacerbate this condition.

5.4 Macular Edema

Macular edema, including cystoid macular edema, has been reported during treatment with prostaglandin analogs. VYZULTA should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

5.5 Bacterial Keratitis

There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products. These containers had been inadvertently contaminated by patients who, in most cases, had a concurrent corneal disease or a disruption of the ocular epithelial surface.

5.6 Use with Contact Lens

Contact lenses should be removed prior to the administration of VYZULTA because this product contains benzalkonium chloride. Lenses may be reinserted 15 minutes after administration.

6 ADVERSE REACTIONS

The following adverse reactions are described in the Warnings and Precautions section: pigmentation (5.1), eyelash changes (5.2), intraocular inflammation (5.3), macular edema (5.4), bacterial keratitis (5.5), use with contact lens (5.6).

6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

VYZULTA was evaluated in 811 patients in 2 controlled clinical trials of up to 12 months duration. The most common ocular adverse reactions observed in patients treated with latanoprostene bunod were: conjunctival hyperemia (6%), eye irritation (4%), eye pain (3%), and instillation site pain (2%). Approximately 0.6% of patients discontinued therapy due to ocular adverse reactions including ocular hyperemia, conjunctival irritation, eye irritation, eye pain, conjunctival edema, vision blurred, punctate keratitis and foreign body sensation.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

There are no available human data for the use of VYZULTA during pregnancy to inform any drug associated risks.

Latanoprostene bunod has caused miscarriages, abortion, and fetal harm in rabbits. Latanoprostene bunod was shown to be abortifacient and teratogenic when administered intravenously (IV) to pregnant rabbits at exposures ≥ 0.28 times the clinical dose. Doses ≥ 20 µg/kg/day (23 times the clinical dose) produced 100% embryofetal lethality. Structural abnormalities observed in rabbit fetuses included anomalies of the great vessels and aortic arch vessels, domed head, sternebral and vertebral skeletal anomalies, limb hyperextension and malrotation, abdominal distension and edema. Latanoprostene bunod was not teratogenic in the rat when administered IV at 150 mcg/kg/day (87 times the clinical dose) *[see Data]*.

The background risk of major birth defects and miscarriage for the indicated population is unknown. However, the background risk in the U.S. general population of major birth defects is 2 to 4%, and of miscarriage is 15 to 20%, of clinically recognized pregnancies.

Data

Animal Data

Embryofetal studies were conducted in pregnant rabbits administered latanoprostene bunod daily by intravenous injection on gestation days 7 through 19, to target the period of organogenesis. The doses administered ranged from 0.24 to 80 mcg/kg/day. Abortion occurred at doses ≥ 0.24 mcg/kg/day latanoprostene bunod (0.28 times the clinical dose, on a body surface area basis, assuming 100% absorption). Embryofetal lethality (resorption) was increased in latanoprostene bunod treatment groups, as evidenced by increases in early resorptions at doses ≥ 0.24 mcg/kg/day and late resorptions at doses ≥ 6 mcg/kg/day (approximately 7 times the clinical dose). No fetuses survived in any rabbit pregnancy at doses of 20 mcg/kg/day (23 times the clinical dose) or greater. Latanoprostene bunod produced structural abnormalities at doses ≥ 0.24 mcg/kg/day (0.28 times the clinical dose). Malformations included anomalies of sternum, coarctation of the aorta with pulmonary trunk dilation, retroesophageal subclavian artery with absent brachiocephalic artery, domed head, forepaw hyperextension and hindlimb malrotation, abdominal distention/edema, and missing/fused caudal vertebrae.

An embryofetal study was conducted in pregnant rats administered latanoprostene bunod daily by intravenous injection on gestation days 7 through 17, to target the period of organogenesis. The doses administered ranged from 150 to 1500 mcg/kg/day. Maternal toxicity was produced at 1500 mcg/kg/day (870 times the clinical dose, on a body surface area basis, assuming 100% absorption), as evidenced by reduced maternal weight gain. Embryofetal lethality (resorption and fetal death) and structural anomalies were produced at doses ≥ 300 mcg/kg/day (174 times the clinical dose). Malformations included anomalies of the sternum, domed head, forepaw hyperextension and hindlimb malrotation, vertebral anomalies and delayed ossification of distal limb bones. A no observed adverse effect level (NOAEL) was established at 150 mcg/kg/day (87 times the clinical dose) in this study.

8.2 Lactation

Risk Summary

There are no data on the presence of VYZULTA in human milk, the effects on the breastfed infant, or the effects on milk production. The developmental and health benefits of breastfeeding should be considered, along with the mother's clinical need for VYZULTA, and any potential adverse effects on the breastfed infant from VYZULTA.

8.4 Pediatric Use

Use in pediatric patients aged 16 years and younger is not recommended because of potential safety concerns related to increased pigmentation following long-term chronic use.

8.5 Geriatric Use

No overall clinical differences in safety or effectiveness have been observed between elderly and other adult patients.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Latanoprostene bunod was not mutagenic in bacteria and did not induce micronuclei formation in the *in vivo* rat bone marrow micronucleus assay. Chromosomal aberrations were observed *in vitro* with human lymphocytes in the absence of metabolic activation.

Latanoprostene bunod has not been tested for carcinogenic activity in long-term animal studies. Latanoprost acid is a main metabolite of latanoprostene bunod. Exposure of rats and mice to latanoprost acid, resulting from oral dosing with latanoprost in lifetime rodent bioassays, was not carcinogenic.

Fertility studies have not been conducted with latanoprostene bunod. The potential to impact fertility can be partially characterized by exposure to latanoprost acid, a common metabolite of both latanoprostene bunod and latanoprost. Latanoprost acid has not been found to have any effect on male or female fertility in animal studies.

13.2 Animal Toxicology and/or Pharmacology

A 9-month toxicology study administered topical ocular doses of latanoprostene bunod to one eye of cynomolgus monkeys: control (vehicle only), one drop of 0.024% bid, one drop of 0.04% bid and two drops of 0.04% per dose, bid. The systemic exposures are equivalent to 4.2-fold, 7.9-fold, and 13.5-fold the clinical dose, respectively, on a body surface area basis (assuming 100% absorption). Microscopic evaluation of the lungs after 9 months observed pleural/subpleural chronic fibrosis/inflammation in the 0.04% dose male groups, with increasing incidence and severity compared to controls. Lung toxicity was not observed at the 0.024% dose.

Distributed by:

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Bridgewater, NJ 08807 USA

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Optometric Glaucoma Society
18th Annual Meeting
October 21-23, 2019
Orlando, FL

ACADEMY 2019 ORLANDO
3rd World Congress of Optometry
AMERICAN ACADEMY of OPTOMETRY
WORLD COUNCIL OF OPTOMETRY

OPTOMETRIC GLAUCOMA SOCIETY

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