



ROBERT N. WEINREB, MD

Dr. Weinreb is the Chairman and a Distinguished Professor of Ophthalmology at the University of California, San Diego (UC San Diego), as well as the Director of the Shiley Eye Institute and the Director of the Hamilton Glaucoma Center. He also holds the Morris Gleich, MD, Chair of Glaucoma and is a Distinguished Professor of Bioengineering at UC San Diego.

1

What first drew you to ophthalmology and, specifically, to glaucoma?

With a background in mathematics and electrical engineering, I was interested in visual perception and thought it might be possible to interface computers with the brain to restore and enhance vision. I realized that I would need a medical degree to engage in clinical investigation. Early in my ophthalmology training, I placed my goal of interfacing computers and the brain aside, as I recognized that computation capabilities would be insufficient for decades. Through almost daily discussions and debates as a resident with Jon Polansky, MD (a brilliant Harvard Medical School classmate and laboratory scientist), and Jorge Alvarado, MD (a gifted physician-scientist and glaucoma specialist who had recently joined the faculty at UC San Francisco), I realized that glaucoma was replete with unmet needs and an unprecedented opportunity to translate laboratory discoveries to enhance care.

2

Your nominators referenced your significant contributions to glaucoma research. Which of your research projects has meant the most to you, and why?

As a resident, I compiled a list of unmet needs for glaucoma and have subsequently used this to guide my research. Dedicated and skilled colleagues throughout the world are addressing each of these problems today, and I have attempted to contribute to some extent to many of them as well. My research has ranged from the front to the back of the eye, and it impacts both glaucoma care and our understanding of the biologic basis of glaucoma. It has

NOMINATED BY JONATHAN MYERS, MD

“Dr. Weinreb has published more cutting-edge research in glaucoma than almost anyone (everyone?).”

NOMINATED BY TONY REALINI, MD, MPH

“Whether working hard at center stage or nurturing and encouraging from the wings, Dr. Weinreb has had a hand in nearly every good idea we have seen in glaucoma throughout my career.”



NOMINATED BY DOUGLAS RHEE, MD

“Dr. Weinreb has contributed thoughtful and meaningful research, extending the foundation of knowledge of ophthalmic disease as well as innovations that have affected the clinical practice of glaucoma.”

consisted of developing and investigating novel imaging technology (confocal scanning laser ophthalmoscopy, confocal scanning polarimetry, etc.), functional tests, IOP sensors for continual testing, and, more recently, medication adherence monitors.

Throughout my career, I have also been engaged in laboratory research to study outflow, particularly within the uveoscleral outflow pathway. These investigations provided a foundation for understanding the molecular mechanisms by which prostaglandin analogues lower IOP and can pigment the iris.

I am fortunate to have had more than 40 consecutive years of National Eye Institute funding, beginning during my residency. Currently, I am the principal investigator on two R01 grants and a K12 Institutional Mentored Physician Scientist Award. Throughout my career, it has been a privilege to work with exceptional collaborators who have taught me so much. In my office, I have a plaque with a quote by Michelangelo that reads, “I am still learning”; every day, I am reminded how fortunate I am to be able to do this.

3

Which areas of research and/or innovation excite you most about the future of glaucoma care?

There is no question that the future of glaucoma will be shaped by big data and data science. Deep learning and wearable technology will change the landscape of glaucoma care. Much of the diagnostic testing that is performed once or twice a year in an office will instead potentially be done in the patient's home and perhaps on a weekly or even daily basis. Genetic testing will soon be a routine part of care for enhancing diagnosis, identifying suitable treatments, and refining estimates of risk of disease progression. Sustained-release drugs will be widely used, ocular hypotensive eye drops will largely be a relic of the past, and microsurgery will continue to improve.

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What provides inspiration in your career?

Inspiration is everywhere, and I find it daily in my patients, research, and mentoring. Patients inspire me by placing their trust in me to make the right decisions and always act in their best interest. As a clinician-scientist and surgeon, I am inspired by meaningful innovation and discovery that is translated from the laboratory to the patient. Moreover, knowing that the individuals I mentor will change the lives of countless patients throughout the world now and into the future also is very inspiring.

5

When did glaucoma last surprise you? How?

I am always surprised that there are still many more questions about glaucoma than answers. It is these questions that will stimulate and challenge the next generation of clinician-scientists in glaucoma.

6

Outside of research and clinical care, in what other efforts have you been involved?

I have been dedicated to training and mentoring clinical and research fellows, who will be leaders in glaucoma. More than 20 of these individuals have become department chairs in the United States and around the world; numerous others are professors or have excelled as leaders in practice in their communities or industry. I continue to collaborate with, mentor, and learn from many of them as well.

As a former president of the Association for Research in Vision and Ophthalmology (ARVO), the American Glaucoma Society (AGS), World Glaucoma Association (WGA), Foundation of the American Glaucoma Society, and the Latin American Glaucoma Society, I have valued the importance of returning something meaningful to the profession and have been dedicated to improving educational opportunities and outreach of some leading organizations. ■

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