

Carol B. Toris, PhD

Dr. Toris reflects on industry's support of research as well as the value of Skittles when working with monkeys.

Who or what inspired you to focus on glaucoma?

After I completed my Master of Science degree in animal physiology, I answered an advertisement for a laboratory technician position in an eye research laboratory at the University of Minnesota. I knew nothing about eyes but thought the job would be a nice steppingstone to a career elsewhere. The head of the laboratory was Jonathan Pederson, MD, a brilliant scientist and well-known glaucoma specialist. Although I had no experience or background in ocular physiology, he took a chance and hired me. I have always been grateful for this decision, because it has led me down a highly rewarding path.

Dr. Pederson taught me about ocular anatomy, aqueous humor dynamics, and glaucoma. He took me to my first ARVO meeting, where I learned to talk in front of a large audience of world experts without fainting. While continuing to work for Dr. Pederson, I pursued a doctoral degree in physiology; my thesis topic was aqueous humor dynamics in nonhuman primates. I never would have believed then that I would be studying aqueous humor dynamics 25 years later.

What did you enjoy the most about collaborating on research with the late Carl Camras, MD?

Carl came to the University of Nebraska Medical Center a year after I did. We immediately began a productive 18-year collaboration. He provided invaluable clinical expertise and kept me focused on the clinical value of my animal research. Carl opened doors for me that I did not even know were there. He got me involved in the development of latanoprost for glaucoma therapy; I was awed by his commitment to this goal.

I thoroughly enjoyed sitting down to talk with Carl about our current and new research ideas. He was very critical but always encouraging. He could get irked about a half-baked idea one minute but then want to go out to lunch the next. He never held a grudge and never forgot a birthday. I still miss him.

The potential influence of industry on research and medical practice has received a lot of attention lately. As someone who consults with industry but also works

for an academic institution, what are your thoughts on the subject?

Much of my research support has come from industry; I have worked with more than 20 companies in my career. I have learned that, despite what some people may think, there are brilliant scientists in industry whose primary goal is to advance our scientific understanding of glaucoma. There are also those who simply want to market their drug, and working with them is not quite as much fun. Nevertheless, industry has given me opportunities that I would not have had otherwise. I have been able to support a colony of trained monkeys for years. I have been able to investigate state-of-the-art drainage devices and novel drugs. I have served on scientific advisory boards to help design the next generation of device or drug. My collaborations with industry have been fruitful, and many publications have come of these activities.

Industry provides unrestricted funds as well as directed funds for specific projects. I have used unrestricted funds to study 24-hour patterns of aqueous humor dynamics in patients with ocular hypertension and in healthy volunteers.

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FAST FACTS

- Director of glaucoma research and tenured professor, Department of Ophthalmology, University of Nebraska Medical Center in Omaha, 2007 to present
- Professor, courtesy appointment, Department of Physiology, University of Nebraska Medical Center in Omaha, 2007 to present
- Trustee of ARVO (2010-2015) and of the Association for Ocular Pharmacology and Therapeutics (1995-present)
- President of the International Society for Ocular Fluorimetry, 2005 to 2009
- Recipient of the Silver U Award from the University of Nebraska Medical Center in Omaha, 2010
- Recipient of the Fellow of ARVO (FARVO) Gold Award, 2009
- Recipient of the Dr. Stan Truhlsen Research Award from Prevent Blindness Nebraska, 2006

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My studies are designed to determine how a particular drug reduces IOP, not whether one drug is better than another.

I am a bit disturbed by all the negative comments about industry collaborations. I admit I have had a few negative experiences, but for the most part, I have benefited greatly and learned much from my colleagues in industry.

What surprised you the most about working with monkeys, and with what is their refrigerator stocked?

I have a group of 28 female cynomolgus monkeys with unilateral laser-induced glaucoma that I use to study new drugs and devices to lower IOP. These are phase 1 studies of efficacy, side effects, and mechanism of action. My colleagues and I collect as much data as possible in awake, trained animals, because anesthesia can affect some of our measurements.

Because the monkeys are awake, however, they pose some unique challenges. They will sit quietly for an IOP measurement or eye examination, as long as they get a treat afterward. They are so ready to earn treats that they get ornery if we do not work with them for a week or two. They particularly like Skittles and gummy bears. Those of us in the laboratory are often surprised by the monkeys' clever, conniving ways. They will sneak their little hands into our pockets to pilfer a treat before they earn it. Some of them use their tails to sweep a treat closer so that they can grab it. Some have learned how to open their cage doors and escape. They can be enticed back by a freeze pop or peanut butter honey ball, and we keep these items on hand for such emergencies.

The monkeys are housed in pairs. When one has to be euthanized for a medical condition such as endometriosis, my fellow researchers and I are convinced that the partner mourns the loss. We highly respect these precious animals. They provide us with countless humorous anecdotes and stories of mayhem.

How did you become such an avid badminton player?

I started playing badminton socially when I moved to Nebraska. Then, I attended several badminton tournaments in which my brother competed. I also watched some Olympic trials. That is when I learned that this sport is not simply a backyard game played at a summer picnic. I got to thinking I could compete, because the matches are scheduled based on age and gender and because there are not many healthy middle-aged women playing. Sometimes, I win a medal, not necessarily because I am good but because I am the last woman standing. The sport gives me an entertaining way to get some exercise. It sure beats staring at my basement wall while riding my stationary bicycle. □