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1. What attracted you to the field of ophthalmology and, more specifically, the subspecialty of retina?

When I was in junior high school, I wanted to go into particle physics. I had a curious interest in bosons, neutrinos, and the like. I had 2 suspicions about this choice that led me to consider other options. One, I was good at mathematics, but I was unsure I had what it took to be a good particle physicist; they are, above anything else, exemplary mathematicians. The second concern was that I didn't want to work on weapons systems. Particle physics is not weapons development, but I didn't want to take a chance. When I went to ninth grade, my biology teacher, Mr. Smoyer, influenced me very much. He was a great teacher, and I discovered biology was a wonderful field to study. I got to be friends with Mr. Smoyer, and at the end of the school year he told me he was going to stop teaching and showed me a letter—his acceptance letter to medical school. I came from a rather humble background. On my father's side of my family were farmers—Mennonites—and on my mother's side were coal miners. My mother and father were the first people in my family line to go to high school, so going to medical school seemed like such a novel idea to me.

At the time, I was also interested in photography, but I thought it over and decided to become a physician instead of a photographer because that would give me a more direct opportunity to help people. I eventually went to the same medical school as Mr. Smoyer, and I had the idea to go into pediatrics. My first rotation in pediatrics cured me of that within a few days. I was still interested in art and photography, however. I went to art school at night when I was in medical school. It finally dawned on me that ophthalmology would be a good field because the eye is like a camera. Retina is the best subspecialty of ophthalmology and has the brightest and best-looking people. Somehow I was accepted into a retina fellowship, but I don't know how.

2. How do you envision the treatment of retinal diseases changing over the next 5 years?

There are some trends that are going to continue from current ones. Use of drugs directed against VEGF for the treatment of diabetic retinopathy and branch retinal vein occlusion will become more common, and laser will be less commonly used. We are going to become much more sophisticated in imaging and image analysis. Adaptive optics imaging will become more commonplace. With increased volume of production, deformable mirrors will become cheaper, and other methods of accomplishing the same ends will also become more standard. Multimodal imaging will become more of a necessity of practicing retina. Having expert systems would seem to be right around the corner given the amazing increase in computing power available at a cheap price. The integration of all of this will start us on the possibility of very targeted treatments. Of course gene therapy experimentation will become much more routine.

3. Of recent developments in retinal imaging, what do you consider most exciting?

The most exciting thing right now, in my opinion, is choroidal imaging. The choroid is an incredibly important tissue with a zen-like simplicity. However, in that simplicity are many hidden facets. The second most interesting imaging development is adaptive optics. Use of these instruments is currently limited by the huge pain it is to make a good image. You can tell Apple didn't write any of the software used in creating adaptive optics images. I think, once some larger companies get involved, the process of the image selection, averaging, and montaging required to come up with something useful will all be automated and user-friendly.

4. What do you think will be learned of the role of the choroid in retinal disease?

The choroid plays a big role in vision loss in several important diseases. High myopia is a state in which a patient has a refractive error of 6.00 D or more of myopia. People with high myopia compromise 1% of the US

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population, 5-8% in Japan, 15% in Singapore, and 38% of university students in Taiwan. In East Asia, the proportion of high myopes is increasing over time.

High myopia causes decreased vision through some mechanisms that don't seem related to the choroid, such as retinal detachment. However, high myopes get myopic chorioretinal atrophy later in life, which is where the choroid becomes so thin that it and the overlying retinal pigment epithelium essentially go away. Choroidal neovascularization is a common entity in high myopia, and many have theorized that ischemia, because of choroidal insufficiency, may play a role. We did a study of 2 patient groups, 1 in the United States and 1 in Japan, and, even for high myopes without macular abnormalities, the most important predictor of visual acuity was their subfoveal choroidal thickness. Because, by some estimates, high myopia is the second biggest reason for visual loss, understanding the choroid in myopes is very important.

Age-related choroidal atrophy is a condition that leads to remarkable thinning and loss of the choroid. It occurs

in older people and is associated with the appearance of pseudodrusen. By microperimetry testing, people with age-related choroidal atrophy have decreased threshold sensitivity, particularly if they have pseudodrusen. Age-related choroidal atrophy is much more common than geographic atrophy. Currently, there are a number of studies under way concerning this newly identified condition. Common among eyes with age-related choroidal atrophy is glaucoma, one of the biggest causes of loss of vision in older people. There does appear to be some link between the choroid and glaucoma.

Thus, the choroid, particularly when it becomes atrophic, is at the center of many important causes of visual loss.

5. If you were not an ophthalmologist, what profession would you pursue?

My inherent shyness would have prevented me from the natural thing for me to become—that is, a world-famous male underwear model. As you can tell, I am a terrible liar, which eliminates the possibility of me being in Congress. So that leaves photography. ■