Researcher Spotlight

Meet Dr. Lois Smith
Boston Children's Hospital and Harvard University

By Beth Piocos, PhD, MLERF Director 2024-25

MLERF has been funding clinician researchers for nearly 75 years, and we have been told about the impact of these funding not only to their research but also to patients around the world. The interview below with Dr. Lois Smith, MD, PhD, Professor of Ophthalmology, Harvard Medical School and Boston Children's Hospital, captures all these impacts having been a recipient of MLERF grants multiple times. It is also an inspiring story of a fascinating and admirable person.

Learn more about Dr. Smith's research at https://www.childrenshospital.org/directory/lois-smith. In future Eye Catcher editions, we will feature more researchers from the different institutions that MLERF funds.

What 5 words describe you and why?

Clinician/scientist. I first completed a PhD in chemistry, then went to medical school so I could study the basis of eye disease but also translate these finding to clinical practice.

Mentor. I have trained 2 generations of translational scientists and clinicians worldwide (Japan, China, Sweden, Canada, France, Denmark, Germany, Chile). I also set up a program in my lab to train recent graduates from college to get them into medical school and also teach them how to do science. There are over 60 now in ophthalmology and other specialties in the US.

Environmentalist. For many decades I have been involved with and then led an international foundation that gives grants to limit environmental destruction as we live in an ecosystem that must be protected.

Mother, grandmother. I get great joy from my two children and two grandchildren. Grandchildren are the best antidote to any tendency towards excessive self-regard. They keep life real, in the moment and fun and they keep you humble.

Humanitarian. I truly believe that we need to take care of all patients and consider all people fairly. We need to provide compassionate care for every person we encounter.

Why did you get into medicine and research? How did you choose your area of specialty?

I specialized in ophthalmology after medical school because vision is so critical. It is part of the brain, and we can learn so much about both visual function and brain function by studying the eye and the retina. When I started my career as an ophthalmologist there was no treatment for age-related macular degeneration and the only treatment for diabetic retinopathy and retinopathy of prematurity was destruction of most of the retina with laser. So I wanted a more

rational approach. I set up a mouse model of retinopathy allowing me to work on the biochemical pathways involved in the disease processes. I found many pathways we could manipulate to prevent or treat disease and found interventions that went through clinical trials and/or are now in clinical use including anti-VEGF, IGF-1 and approaches to improve mitochondrial function in the retina during disease.

When did you first receive an MLERF grant and what was it for?

When I started as a new faculty member at Boston Children's Hospital and Harvard Medical School in 1983, I had no research funds from the hospital or from NIH. I received in the 1980's a grant from MLERF which was invaluable to help me start; first to establish a mouse model of retinopathy, then so I could study disease pathways.

What would be the biggest impact(s) of the research you have done through the years?

Change in the way we treat retinopathy: anti-VEGF, IGF-1 and now topical steroids and compounds taken orally to promote mitochondrial function. The mouse model I developed has been the most widely used model for studies worldwide in retinopathy. There are over 35,000 citations of this work in other scientists' publications.

What are the top 3 advice you would give a young doctor and researcher? Why?

1) Look at major gaps in our understanding of disease and study how to fill those gaps: understand fundamental mechanisms and translate them into clinical care.

2) Make time for your family and friends and give generously to the younger generation, your own children, your scientific children and others.

3) Collaborate widely with other clinicians and scientists to multiply the benefits of the work- make friends for life and share the fun of discovery and make a difference in the lives of patients.