



EYE INSTITUTE OF NORTHWESTERN MEDICINE

CENTER FOR THE AGING EYE

The Center for the Aging Eye within the Eye Institute will unite and advance a group of translational researchers who are dedicated to investigating the aging changes of the retina and optic nerve. Specifically, our investigators will explore the pathogenesis of both macular degeneration and glaucoma. The Center for the Aging Eye will be an outgrowth of the Department of Ophthalmology's productive Forsythe laboratories and will help us build upon our previous programs in retinal aging.

Ocular Imaging Program

With the potential for a cutting-edge program through collaboration with our colleagues on the Evanston campus, including the world-class McCormick School of Engineering, we have the opportunity to develop novel methods for imaging (Photoacoustic and Adaptive Optics Imaging). These new imaging methods could have significant implications for the management of macular degeneration, diabetic retinopathy, and glaucoma.

Macular Degeneration Program

Our macular degeneration program will focus on translational research related to the pathogenesis of macular degeneration and novel approaches to new therapies first developed in our laboratories. While we have entered an age of new treatments for this condition, many questions remain unanswered about its cause. Programs to explore genetic risk factors, the role of inflammation, the role of Muller cells, and environmental triggers will be developed. Currently no treatment exists for the dry or geographic form of this condition. Through collaboration with other Northwestern researchers interested in non-ocular degenerative diseases, we will test novel treatments.

Ocular Drug Delivery Program

Through our Center for the Aging Eye, we will launch a translational research program in Ocular Drug Delivery. By partnering our faculty with Northwestern's nanotechnology resources and expertise, we will give the Eye Institute's translational scientists a great advantage in developing novel ways of sustained drug and genetic material delivery to the eye. A complementary program in pharmacogenetics also will help us set the stage for cutting-edge research in the treatment of macular degeneration and glaucoma.

Ocular Stem Cell Research Program

Through the Center for the Aging Eye, we plan to advance an Ocular Stem Cell Research Program by collaborating with regenerative medicine experts in other departments such as Dermatology and Neurology. At Northwestern, we have a significant program dedicated to the ocular surface and reestablishment of the healthy corneal epithelium through transplantation of stem cells. We would like to extend this robust effort and recruit a regarded translational scientist who is interested in developing methodologies for the delivery of stem cells to the retina and optic nerve.



Ocular Surface and Inflammatory Disease Program

The Department of Ophthalmology seeks to expand its expertise in clinical and translational research related to ocular inflammatory disease. This condition can cause irreversible damage to the ocular surface and the eye itself when left unchecked. Ocular inflammatory disease is often an ophthalmic manifestation of systemic inflammatory disease and cancer treatment. An opportunity to collaborate with scientists already at Northwestern University Feinberg School of Medicine with significant expertise in inflammation will be an attractive area for the recruitment of a translational scientist. In addition, new drugs and methods of drug delivery need to be developed and tested in clinical trials.

Glaucoma Program—Mechanisms and Clinical Management

The Eye Institute will seek to expand expertise and programs centered on studying the mechanisms underlying the pathogenesis of glaucoma and its treatment. Currently, our scientists are looking at the role of nerve growth factors in glaucoma. This innovative approach to glaucoma could present a novel opportunity for treatment and limit the damage that high pressure does to the ganglion cells of the eye. New medical and surgical treatments for glaucoma are being developed, and our Department of Ophthalmology’s physicians will be there to evaluate these treatments in clinical trials.

Diabetic Retinopathy Program

Translational research in diabetic retinopathy will be focused on the mechanism of blood vessel damage in the retina and how it affects oxygen delivery through the smallest blood vessels in the eye. A translational scientist collaborating with existing expertise in Biomedical Engineering could develop a research program dedicated to studying the mechanism of impaired retinal oxygenation and to developing novel treatments directed at oxygen delivery.

Opportunities to name:

Eye Institute \$25 million

Center for the Aging Eye
\$10 million

Ocular Imaging Program
\$5 million

Macular Degeneration Program
\$5 million

Ocular Drug Delivery Program
\$5 million

Diabetic Retinopathy Program
\$5 million

Ocular Stem Cell Research Program \$5 million

Ocular Surface and Inflammatory Disease Program \$5 million

Glaucoma Program
(Mechanisms and Clinical Management) \$5 million

Endowed Professorship
\$3 million

Endowed Postdoctoral Fellowship \$1.5 million

Unrestricted Research Fund \$500,000

Endowed Lectureship
\$100,000

