Strong collaborative interdisciplinary environment and a history of superb graduate mentoring and training

Graduate students have the option of interacting with clinical ophthalmology faculty, gaining valuable experience in clinically relevant issues that impact their research

Graduate students in vision science receive a travel allowance to one national conference each year

Ability to interact with a critical mass of faculty with the common interest to understand the visual system at a variety of different levels: eye development in infants and young adults, ophthalmic optics, aqueous humor dynamics, retinal cell biology plus retina, cornea and lens physiology

Ryan Winet
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Vision Science Graduate Program
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Potentially blinding diseases affect over 80 million people in the United States alone. Faced with an aging population, these figures threaten to worsen over the next twenty years. Meeting this challenge will require a new generation of vision researchers who are capable of engaging with multiple scientific fields.

The University of Arizona’s Interdisciplinary Graduate Training in Vision Science provides students the opportunity to study the eye within a wide breadth of disciplines, ranging from molecular biology to ophthalmic optics. Moreover, students interact daily with core faculty members dedicated to better understanding the mechanisms that underlie blinding diseases. These core faculty members represent 7 different Graduate Programs and 11 different Departments. The research programs in Vision Science are cutting edge, exploring novel ways to diagnose and treat blinding diseases.

In terms of curriculum, students will learn the visual system in core courses, clinical and laboratory rotations and colloquia that explore different aspects of vision. A distinguished group of experts in vision science from around the world present at our monthly “Science of Eye Disease Seminar Series” and students, faculty and technical staff present at our weekly journal club, making a graduate training experience that is both comprehensive and unique.

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**TRAINING FACULTY AND THEIR RESEARCH**

**Todd Altenbernd, MD.** The treatment of adult glaucoma using a variety of different treatments, including medicines, lasers and surgeries.

**Nicholas Delamere, PhD.** The regulation of ion transport mechanisms in relation to cataract and glaucoma.

**Velma Dobson, PhD.** Vision in infants and young children, including measurement of visual acuity, visual fields, and refractive error in normal and at-risk infants and children.

**Katalin Gothard, PhD.** Neurophysiology of visual perception – how facial recognition triggers emotional, endocrine and cardiovascular responses.

**Erin Harvey, PhD.** Vision screening, critical periods for the treatment of amblyopia in children, measurements of visual deficits in children with amblyopia and astigmatism, and visual perception.

**Ronald Heimark, PhD.** The roles of cadherins and catenins in the transformation of epithelium to mesenchyme during progression of prostate cancer, and in the differentiation of mesenchymal cells from endothelium to form heart valves.

**Charles M. Higgins, PhD.** Visual neuroscience in insects, focusing on visual motion detection, including fly electrophysiology, computational modeling, and hybrid bio-robotics.

**Alan Marmorstein, PhD.** The etiology and mechanisms of age-related macular degeneration.

**Lihua Marmorstein, PhD.** The study of inherited maculopathies reminiscent of AMD to pinpoint the defective cellular pathways in macular degeneration.

**Brian McKay, PhD.** Research in RPE transplantation methods for AMD therapy, and protein expression in glaucoma.

**Joseph M Miller, MD, MPH.** Development of vision in presence of refractive error, ophthalmic optics, public health relating to vision.

**John Nichols, MD.** Stem cell repair of ocular surface disorders.

**Jim Schwiegerling, PhD.** Development of ophthalmic instrumentation and lens design for improvement of cataract and refractive surgery and retinal imaging diagnostics.

**Mohammad Shahidullah, PhD.** Physiology and pharmacology of aqueous humor secretion and development of glaucoma drugs.

**Robert Snyder, MD, PhD.** Corneal drug penetration, surface infections and wound healing.

**W. Daniel Stamer, PhD.** To investigate and understand the molecular and cellular mechanisms that regulate aqueous humor outflow such that novel targets can be identified and used for the development of therapeutics to effectively lower intraocular pressure in people with glaucoma.

**Nicholas Strausfeld, FRS.** Functional organization of visual system circuitry, compound eye, evolution of visual neuropils, neuroanatomy, electrophysiology, visual learning and memory.

**Dan Twelker, OD, PhD.** Refractive error in Native American children and pediatric refractive problems.

**Roxana Ursea, MD.** Imaging techniques of the anterior segment of the eye using the high-resolution high-frequency ultrasound and the anterior segment optical coherence tomography (OCT). Role of cytokines in diagnosis and treatment of ocular inflammatory diseases.

**Jonathan Vande Geest, PhD.** Experimental and computational biomechanics of the sclera and optic nerve head in glaucoma.