Dr. Heather Anderson’s research interests include pediatric, binocular vision, and objective measurement of accommodation. In addition, Dr. Anderson conducts research with individuals who have Down syndrome with the goal of optimizing visual performance for this population. Her work with Down syndrome includes evaluation of objective spectacle prescribing strategies for refractive error, assessment of accommodation, and measurement of corneal anomalies and optical aberrations.

Dr. Melissa Bailey’s laboratory, Lab4Eyes (u.osu.edu/~bailey352), is devoted to helping children and adults see better and read better. Dr. Bailey has an active research program, studying ciliary muscle development and how it relates to myopia, accommodative function, and academic achievement. She is also working to develop and commercialize new devices that will allow healthcare providers to make more accurate eye measurements and improve access to vision care for patients around the world.

Dr. Angela Brown studies color vision and infant visual development. She collaborates with Dr. Delwin Lindsey in a study of the perception and naming of colors by the Somali people who live in Columbus Ohio. Recently, Dr. Brown was the first person ever to measure the contrast sensitivity of newborn and premature infants, and she is working to develop her visual acuity and contrast sensitivity test for use in clinical infant vision testing worldwide.

Dr. Colleen Cebulla’s research interests include translational research on retinal disease with a focus on the role of inflammation. Her work aims to identify mechanisms of retinal cell death and glisosis due to retinal detachment, macular degeneration, and other diseases that lead to visual loss. Her work also focuses on gene polymorphisms that may predispose individuals to disease and serve as biomarkers. The ultimate goal is to translate these findings into improved therapies for patients.

While Dr. Heather Chandler’s primary research focus examines the mechanisms by which cataracts and secondary cataracts form, there are several ongoing projects in her laboratory that pertain to protein regulation in the cornea. Research opportunities include: reducing secondary cataract formation through surgical or pharmacologic intervention and improving corneal wound healing. While Dr. Chandler’s research is laboratory-based, the overall goal of her lab is to take bench research findings and clinically apply them to the chairside.

Dr. Stacey Choi’s research interest is the application of adaptive optics (AO) retinal imaging systems to enhance understanding of disease mechanisms of retinal and optic nerve diseases. The AO technology allows us to visualize cellular structures in the retina and optic nerve head in living eyes. We are particularly interested in identifying early biomarkers of these diseases from our in-vivo images and functional tests for earlier diagnosis, hence leading to better prognosis for the patients.

Dr. Jackie Davis’ research interest is issues that impact the visual health of communities. She is currently working with a high school, assisting academically challenged students to receive comprehensive vision exams and glasses when needed. Those students needing correction will be offered the opportunity to be re-fit with contact lenses. Our project will investigate if those students will experience any changes in their self-perception and/or academic performance following this visual health intervention.
Dr. Nathan Dobie's research interest is the design, construction and use of high resolution retinal imaging systems to study the structure and function of the human eye. This is achieved through the development of adaptive optics to overcome the ocular aberration allowing for the ability to observe single cells in vivo. The overall aim is to use cell based measurements of retinal health to predict disease at a much earlier stage than is currently possible clinically. 

Dr. Bradley Dougherty conducts research to better our understanding of the impact of vision impairment and to evaluate rehabilitation approaches for patients with low vision. He is currently conducting a study in collaboration with the Department of Ophthalmology of the relationships among transient visual evoked potentials, infiltration and treatment outcomes in patients with age-related macular degeneration. Another research focus is road safety in drivers with low vision who use biotic telescopic spectacles.

Dr. Andrew Fischer’s research interests are centered on understanding the molecular and cell signaling pathways that underlie the ability to support cell survival, the Muller glia, to be reprogrammed into stem cells with the capacity to regenerate neurons. Long-term goals are to determine the precise mechanisms that enhance the neurogenic and regenerative potential of Muller glia-derived progenitor cells to develop novel therapies to treat degenerative diseases of the retina.

In Dr. Nick Fogt’s laboratory, eye movements and head movements are monitored with a variety of devices. The eye movement studies are focused in two main areas. The first is to study how short-term changes in head and eye movements are coordinated during sports. The second area of study looks at the neural pathways involved in coordination of the two eyes. Problems with eye movement coordination between the two eyes are common clinically. Signals travel from the eye to the brain via retinal ganglion cells (RGCs). In addition to the axons of these neurons are the focus Dr. Andy Hartwick’s research investigations. He is particularly interested in studying the function of a subset of RGCs that capture light and directly convert it into an electrical signal. In addition, he directs clinical studies that examine the effect of conditions such as traumatic brain injury and retinal diseases on RGC photoreception.

Dr. Juan (Jenny) Huang’s research focuses on investigating whether adding 0.01% low concentration atropine to soft bifocal contact lens wear will result in a greater effect of slowing myopia progression than administering soft bifocal contact lenses alone in children. Another research interest in her laboratory is to evaluate the relationship between short-term changes in choroidal thickness and long-term regulation of myopia progression and ocular growth.

Dr. Lisa Jones-Jordan is responsible for the data coordination of the Convergence Insufficiency Treatment Trial – Attention and Vision testing for children with Autism Spectrum Disorder. In addition, Ms. Mitchell serves as a collaborator for studies in accommodative dysfunction, myopia, and vision testing for children with Autism Spectrum Disorder. She also collaborates with ophthalmic researchers within the college and outside OSU in the areas of study design and analysis.

The focus of Dr. Don Mutili’s research is to understand the optical and structural development of the eye in order to learn the causes of refractive errors like myopia and hyperopia. The aims of current projects are to explore the basis of the beneficial effects of time outdoors on myopia, understand the causes for myopia, and test the effectiveness of treatments to slow myopia progression, and how best to address hyperopia in infants and children.

Dr. Teng Leng Ooi uses psychophysical methods to study how surface, contour and top-down processing influence the sensorimotor mechanisms of stereoscopy, binocular rivalry and perceptual alternations, and how knowledge gained is used to advance clinical care of low and binocular vision. An ongoing research seeks to reduce eye-dominance and improve stereopsis in adult amblyopes and people with Down syndrome using a Push-Pull training protocol that capitalizes on basic understanding of cortical plasticity and inhibitory-excitatory balance. A major goal of Dr. Timothy (TJ) Plageman’s research is to elucidate how embryonic eye tissues shape themselves during development at a cellular and molecular level and how disruptions in these mechanisms lead to ocular malformations. To accomplish this goal, embryonic development of the eye is studied in both the mouse and chicken model systems and a variety of techniques are utilized that include live fluorescence microscopy, histology, and molecular biology.