Dr. Melissa Bailey's laboratory, Lab4Eyes (u.osu.edu/bailey352), is devoted to helping children and adults see better and read 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 gliosis 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 to 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. Jackie Davis’ 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 refit 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 Doble'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 use of adaptive optics to...
Dr. Bradley Dougherty conducts research to better our understanding of the impact of vision impairment and to evaluate the habilitation services for patients with low vision. He is currently conducting a study in collaboration with the Department of Ophthalmology of the relationships among stress and depression, inflammation, and treatment outcomes in patients with age-related macular degeneration - a disease that causes vision loss among the elderly. His research focuses on reducing vision loss and improving the quality of life for people with macular degeneration through the development of new therapeutic strategies.

Dr. Andrew Fischer’s research interests are centered on understanding the molecular and cellular signaling pathways that influence the ability of support cells in the retina, the Müller 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 Müller 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 area of study involves eye and head coordination in 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), and the anatomy and physiology of these neurons are explored by Dr. Anne Kretz in the laboratory. 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 glaucoma and traumatic brain injury 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 of the laboratory is to determine 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 coordinating center for the Bifocals In NearSighted Kids (BLINK) Study, which has shown that bifocal contact lenses wear is beneficial in children. In the laboratory, the majority of the work focuses on studying adverse events related to contact lens wear. We are continuing to perform studies patient population for studying adverse events related to contact lenses.

Dr. Andy Hartwick’s research investigates the relationship between visual impairments and neurobehavioral outcome measures in at-risk children. He is interested in understanding how visual impairments affect learning and development, and how they can be prevented or treated. His research includes the use of eye and head movement recording devices as well as comprehensive assessment of functional vision, and outcomes in patients with age-related macular degeneration.

Dr. Tom Raasch’s research activities concentrate on issues in low vision, visual performance, and visual optics. He uses various techniques to evaluate the optical and visual characteristics of the eye, and novel techniques to design and correct optical defects of the eye. His research interests include the design, fabrication, and measurement of freeform optical systems, such as progressive addition lenses.

Dr. Dean VanNasdale’s primary research focus is advanced retinal imaging, with an emphasis on normal aging changes and pathological changes associated with diabetic retinopathy and age-related macular degeneration. Changes to the normally well-ordered retinal structure can be highlighted by emphasizing specific light/tissue interactions. The goal of the lab is to distinguish normal aging changes from threat-threatening pathology and detect retinal damage earlier in the disease process using both commercially available and laboratory-based instruments. As a founding member of the Contact Lens Assessment in Youth Study Group, Dr. Heidi Wagner’s research focused on determining whether youth is an independent risk factor for contact lens complications, and has since expanded toward understanding risk factors associated with adverse contact lens events in both children and adults to promote healthy contact lens wear for all ages.

Research in Dr. Jeffrey Walline’s laboratory focuses on clinical questions in the area of pediatric contact lenses and refractive error. Past research includes comparison of contact lens wear between children and teenagers, attempts to slow myopia progression with alignment-fitted gas permeable contact lenses, children’s perceptions of other children wearing glasses, and the effects of contact lens wear on children’s self-perceptions. Current research focuses on slowing myopia progression with soft bifocal contact lenses.

Dr. Deyue (Dion) Yu’s research focuses on visual perception, perceptual learning, and their neural basis in normal and low vision. Research goals include investigating essential causes of the limitations faced by visually-impaired people, understanding the mechanisms underlying the behavioral and neural changes resulting from learning and visual impairment, developing efficient methods to obtain comprehensive assessment of functional visual performance, and establishing a general framework to guide the development of visual diagnostics and rehabilitation programs for visual disorders.

Dr. Aaron Zimmerman’s research interests involve sports vision and adverse events with contact lens wear. The majority of the sports vision research has been conducted using eye and head movement recording devices and assessing how those coordinate with each other while trying to intercept a baseball. At Ohio State we have an excellent patient population for studying adverse events related to contact lens wear. We are continuing to perform studies evaluating corneal conditions.