



DOVS RESEARCH INTERESTS

Basic Science Faculty



Curtis Brandt, PhD

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- Ocular infections, gene delivery, retinal gene therapy, and immunology, cornea, CORE lab
- Genetic drivers of virulence in ocular viral infection
- Innate/intrinsic immune responses to ocular gene delivery vectors
- Gene therapy for ocular diseases
- Antimicrobial drug discovery and development



**Amitha Domalpally, MD,
PhD**

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domalpally@wisc.edu

- Discovery, development and translation of imaging biomarkers for clinical trials in retinal diseases
- Artificial Intelligence for retinal imaging
- Clinical Trials in diabetic retinopathy, AMD, retinal vein occlusion and uveitis
- Imaging artifacts



David Gamm, MD, PhD

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- Diseases of the retina, stem cell biology
- Human pluripotent stem cells
- Disease modeling
- Regenerative medicine
- Retinitis pigmentosa
- Age-related macular degeneration
- Retinal, photoreceptor, and RPE cell development
- Retinal stem cell biology/human pluripotent stem cell biology
- Retinal development biology
- Inherited and acquired retinal degenerations
- Cell and gene therapies for retinal degenerations
- Stem cell-based retinal disease modeling



**Shaoqin "Sarah" Gong,
PhD**

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- Multifunctional drug/gene/cell delivery systems
- Nanomedicines
- Biomaterials CRISPR genome editing
- Tissue engineering
- Antimicrobial materials
- Cancer immunotherapy



Mrinalini Hoon, PhD

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- Diseases of the retina
- Determine the molecular and activity-dependent mechanisms that regulate synaptic connectivity between retinal neurons during development and circuit assembly
- Determine the structural and functional impact of retinal disease on synaptic connectivity between outer and inner retinal neurons
- Correlate synaptic plasticity mechanisms during retinal development and during disease conditions
- Determine genetic and/or pharmacological strategies that can recover synaptic organization and function in retinal disease conditions



Paul Kaufman, MD
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paul.kaufman@wisc.edu

- Glaucoma, accommodation/presbyopia, intraocular pressure regulation/aqueous humor dynamics
- Devise methods for obtaining accurate, reproducible measurements of Schlemm's canal pressure as the gateway to the distal aqueous outflow apparatus
- Develop gene therapies to enhance aqueous humor outflow and reduce intraocular pressure
- Study the anatomic and pathophysiological relationship between presbyopia and glaucomatous optic neuropathy
- Characterize all anatomical movements during accommodation (i.e., ciliary muscle, lens, sclera, choroid, vitreous fluid, vitreous membranes/fibers/strands) and their changes with age
- Elucidate the full mechanism of accommodation and the extralenticular pathophysiology of presbyopia



Julie Mares, PhD, MSPH
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- Epidemiology, diet and nutrition and eye diseases
- Assess the status of retinal carotenoids and relationship to genotypes and phenotypes
- Retinal carotenoids to retinal neurodegeneration, and relation to age-related macular degeneration, glaucoma and vision function
- Conduct epidemiological studies of the relationships of healthy diets and lifestyles to common age-related eye diseases



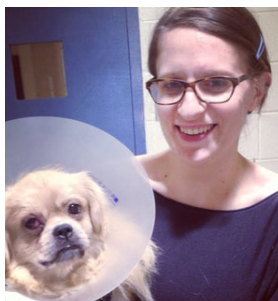
Colleen McDowell, PhD
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cmmcdowell@wisc.edu

- Molecular mechanisms for glaucomatous trabecular meshwork damage
- Regulation of Intraocular Pressure (IOP)
- Effect of elevated IOP on retinal ganglion cells (RGC) and optic nerve head (ONH) damage
- Cell culture models
- Multiple mouse model systems
- Profusion organ culture system for human donor eyes
- Co-Director of DOVS Biobank



Gillian McLellan, BVMS, PhD
DOVS, School of Veterinary Medicine
gillian.mclellan@wisc.edu

- Glaucoma, neuroprotection, ocular development, drug development, genetic ocular disease in animals
- Comparative glaucoma, including imaging of the retina and optic nerve, electrophysiology, aqueous humor dynamics, genetics and pathology of glaucoma in animals and humans



Freya Mowat, BVSc, PhD
DOVS, School of Veterinary Medicine
mowat@wisc.edu

- Comparative ophthalmology
- Retinal diseases of dogs; Sudden Acquired Retinal Degeneration Syndrome (SARDS)
- Oxidative damage on the canine central retina
- PPARGC1a or PGC1a on photoreceptor health in the aging retina



Donna Neumann, PhD
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- HSV-1 infections in corneal scarring and blindness
- Epigenetic controls regulating HSV-1 latency



Robert Nickells, PhD

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- Glaucoma, neuroprotection
- Regulation of ganglion cell death and the role of Bax
- Epigenetic changes in apoptotic ganglion cells leading to gene silencing
- Identification of ganglion cell death susceptibility alleles



T. Michael Nork, MD, MS

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- Diseases and surgery of the retina and vitreous
- Mechanisms by which various ocular diseases affect the outer retina
- How injury to the outer retina might, in turn, affect disease pathogenesis



Nader Sheibani, PhD

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nsheibanikar@wisc.edu

- Ocular vascular biology, diabetic retinopathy, retinopathy of prematurity, exudative age-related macular degeneration, drug development
- Metabolism and cellular function



Terri Young, MD, MBA

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tyoung6@wisc.edu

- Pediatric ophthalmology, molecular genetics of eye diseases, myopia
- Gene discovery and animal modeling of childhood glaucoma
- Gene discovery and animal modeling of heritable, degenerative high-grade myopia

Clinical Faculty



Michael Altaweel, MD

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- Retina imaging, reading center
- Diabetic retinopathy, uveitis, macular edema
- Diseases of the retina
- ADalimumab vs conventional ImmunoSuppression therapy for patients with non-infectious, intermediate, posterior, and panuveitides
- Uveitic macular edema
- Ocular melanoma



Barbara Blodi, MD

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bablodi@wisc.edu

- Age-related macular degeneration, diabetic retinopathy, vein occlusion, reading center, imaging research
- Artificial intelligence
- Analysis of new retinal imaging modalities (ultrawidefield retinal imaging, OCT-angiography)
- Telemedicine
- Adaptive optics



Yasmin Bradfield, MD

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- Pediatric ophthalmology, glaucoma, strabismus
- Pediatric glaucoma genetics
- Pediatric glaucoma vision outcomes and factors associated with visual development
- PEDIG clinical trial binocular amblyopia treatment vs standard of care
- Pediatric glaucoma anterior segment OCT imaging



Cat Burkat, MD

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- Ophthalmic reconstructive and cosmetic surgery



Jonathan Chang, MD

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- Diseases of the retina and vitreous
- Use of retrospective clinical data to review patient outcomes, including large national databases and our own data
- Use of clinical databases to evaluate physician/industry interaction and how this affects clinical care
- Determining cost-effectiveness and utility of clinical interventions
- Use of imaging to evaluate retinal diseases
- Big data

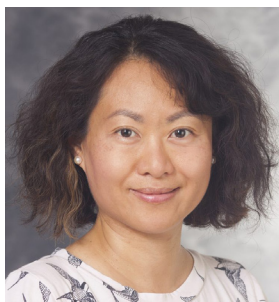


Roomasa Channa, MD

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- Retina, macula, and vitreous diseases
- Diabetic retinal neuro-degeneration
- Artificial intelligence
- Big data



**Yanjun “Judy” Chen, MD,
PhD**

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ychen344@wisc.edu

- Pupil research, neuroscience, optic nerve disease Study physiology of pupil reactivity
- Correlate pupil reactivity with ocular diseases that affect vision and ocular motility
- Correlate pupil reactivity with brain function
- Impact of lighting on general health and brain aging



Karina Conlin, OD

DOVS

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- Specialty contact lens optometry



Justin Gottlieb, MD

DOVS

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- Age-related macular degeneration, diabetic retinopathy, diseases of the retina



**Gregg Heatley, MD,
MMM**

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- Glaucoma, comprehensive ophthalmology, anterior segment & cataract surgery
- Glaucoma in nonhuman primates
- Presbyopia in nonhuman primates
- Big data



Daniel Knoch, MD

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- Research in medical student education
- Surgical procedures



Laura Kopplin, MD, PhD

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- Epidemiology and risk factors for inflammatory eye diseases
- Clinical trials of uveitis therapeutics
- Biomarkers for uveitis outcomes
- Clinical management of ocular inflammatory disease



Yao Liu, MD

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- Clinical trials of new medications and surgical devices
- Telemedicine for diabetic eye screening
- Macular pigment as a glaucoma risk factor
- Clinical and surgical glaucoma management



Mark Lucarelli, MD

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- Oculoplastic, cosmetic facial and orbital surgery
- Small incision/minimal minimally invasive oculofacial surgical techniques
- Facial synkinesis
- Orbital and adnexal malignancies
- Orbital, facial, and periocular anatomy
- Thyroid eye disease clinical trial (Immunovant)



Alexander Miranda, MD

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- Pediatric eye diseases
- Eye disease registries
- Big data



Mihai Mititelu, MD, MPH

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- Retina, age-related macular degeneration, diabetic retinopathy
- Multimodal imaging, intravitreal injections, retinal vascular disease, medical education and mentoring
- Clinical trials
- International health



Anna Momont, MD

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- Ergonomics in residency training
- Glaucoma therapies, clinical trials participation



Sanbrita Mondal, OD

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- Low vision resources
- Low vision rehabilitation
- Augmented reality for low vision



Sarah Nehls, MD

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- Cornea, infectious eye disorders, dry eye
- Clinical Trials



Nayan Patel, OD

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- Pediatric myopia
- Clinical trials



Heather Potter, MD

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hpotter@wisc.edu

- Comprehensive ophthalmology, anterior segment & cataract surgery, pathology
- Co-Director of DOVS Biobank



Steve Sauer, MD

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- Educational research into surgical competency and training



Kathleen Schildroth, MD

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- Diabetic retinopathy
- Macular degeneration
- Ocular trauma
- Retinal detachment
- Retinal laser
- Retinal vascular disease
- Vitreoretinal surgery



Melanie Schmitt, MD

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maschmitt@wisc.edu

- Pediatric ophthalmology, hereditary retinal disorders
- Inherited Retinal Degeneration Database (IRD)



Kimberly Stepien, MD

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kconlin@uwhealth.org

- Inherited retinal degenerations, diseases of the retina and vitreous, ex. age-related macular degeneration, diabetic retinopathy, and posterior uveitis
- Adaptive optics imaging
- High-resolution retinal imaging
- Investigator at the Wisconsin Reading Center at UW-Madison
- Non-invasive high-resolution retinal imaging to characterize cellular retinal findings in a variety of retinal pathologies
- Inherited Retinal Degeneration Database (IRD)



Michael Struck, MD

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- Albinism
- Pediatric ocular diseases



Andrew Thliveris, MD,

PhD

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atthlive@wisc.edu

- Comprehensive ophthalmology, cataracts, ocular genetics
- Colon cancer



Suzanne van Landingham,

MD

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svanlandingham@wisc.edu

- Oculoplastic, orbital, and facial cosmetic surgery
- Big data in ophthalmology - SOURCE and IRIS eye disease registries
- Facial nerve injury and facial synkinesis
- Functional impact of ophthalmic and ddnexal disease, including the impact of vision loss on driving
- Clinical trials in thyroid eye disease (Immunovant)
- Big data



Evan Warner, MD

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- Cornea
- Clinical Trials

Affiliates



Anne Griep, PhD

Cell and Regenerative Biology

aegriep@wisc.edu

- Molecular and genetic pathways regulating mouse eye development and disease using mouse models
- Cell cycle regulation in the lens
- Molecular and genetic regulation of lens cell structure
- Transgenic, knockout and gene edited mice



Olachi Mezu-Ndubuisi, MD, OD

Pediatrics

olachimezu@pediatrics.wisc.edu

- Retinopathy of Prematurity (ROP) and mechanisms of pathogenesis of ROP
- International global health research
- Chronic lung disease and neurodevelopmental outcomes in premature infants



Bikash Pattnaik, PhD,

MPhil

Pediatrics

pattnaik@wisc.edu

- Retinal diseases due to ion channelopathy



Donna Peters, PhD

Pathology and Laboratory Medicine

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- Fibronectin's role in the modulation of intraocular pressure



Raunak Sinha, PhD

Neuroscience

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- Visual processing in the retina

University of Wisconsin Collaborators



Kevin Eliceiri, PhD

*Medical Physics
Biomedical Engineering
eliceiri@wisc.edu*

- Optical imaging methods
- Development of software for multidimensional image analysis



Hongrui Jiang, PhD

*Electrical and Computer Engineering
hongrui@engr.wisc.edu*

- MicroElectroMechanical Systems (MEMS)
- Micro/nano sensors and actuators



Mikhail Kats, PhD

*Electrical and Computer Engineering
mkats@wisc.edu*

- Optics and photonics using nanoscale engineering
- Engineering devices to enhance color vision



**Krishanu Saha, PhD,
MPhil**

*Biomedical Engineering
ksaha@wisc.edu*

- Using human stem cells together with emerging engineering methods in material science and synthetic biology to make smarter therapeutics, model human disease, and advance personalized medicine



**Gillian C. Shaw, DVM,
PhD, DACVP**

*School of Veterinary Medicine
gillian.shaw@wisc.edu*

- Comparative ocular pathology
- Animal models of ocular disease with a focus in glaucoma
- Spontaneous ocular disease in domestic species
- Glaucoma in domestic animal species



Christine Sorenson, PhD

*Pediatrics
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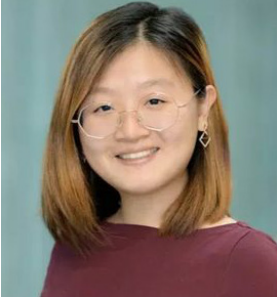
- Biomarker identification in age-related macular degeneration (AMD) treatment resistance
- Bcl-2 (anti-apoptotic) and bim (pro-apoptotic) family members' role in vascular development and function



**Leandro Teixeira, DVM,
MSc**

School of Veterinary Medicine
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- Comparative ocular pathology
- Animal models of ocular disease with a focus in glaucoma
- Spontaneous ocular disease in domestic species
- Glaucoma in domestic animal species
- Extracellular matrix abnormalities in ocular disease



Yuhang Zhao, PhD

Computer Sciences
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- Human-Computer Interaction (HCI)
- Accessibility, augmented and virtual reality (AR/VR)
- Human-centered AI Mobile interaction
- Intelligent interactive systems to enhance human abilities

PI Scientists



Jeremy Rogers, PhD

Morgridge Institute for Research
jdrogers5@wisc.edu

- Optical design and instrumentation development (OCT, microscopy, spectroscopy, polarimetry, AOSLO)
- Development of novel image contrast
- Quantitative measurement of optical scattering in tissue (goniometry, EBS)
- Computational modeling of light scattering in tissue using Monte Carlo simulations



Robert Slater, PhD

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- Artificial intelligence development and algorithms
- Deep neural networks
- Large scale databases
- Retinal AI



Stuart Tompson, PhD

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- Family studies to identify the molecular etiology of various inherited ocular diseases, e.g. high-grade myopia and primary congenital glaucoma
- Exome and whole-genome sequencing approaches
- Protein, cellular and tissue-based assays of protein function
- Mouse modeling of human mutations, via CRISPR-Cas9 genome editing



James Ver Hoeve, PhD

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- Visual electrophysiology
- Developing improved methods for assessing visual function. Specifically, to aid in the translation of research from animals to therapies for human disease



Ismail Zaitoun, PhD

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- Hypoxicischemic insult on retinal vascular integrity and function
- Hypoxia-inducible factors (HIFs) to retinal vascular damage
- Ischemic stroke insult on the neurovascular unit at the cellular level, both in vivo and in vitro
- Pro- and anti-apoptotic proteins in eye vasculature under developmental and pathologic conditions