DOVS RESEARCH INTERESTS

Basic Science Faculty

Curtis Brandt, PhD
DOVS
crbrandt@wisc.edu

- 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

Amita Domalpally, MD, PhD
DOVS
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
DOVS
dgammm@wisc.edu

- 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
DOVS
shaoqingong@wisc.edu

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

Mrinalini Hoon, PhD
DOVS
mhoon@wisc.edu

- 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
• 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

• 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

• 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

• 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

• 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

• HSV-1 infections in corneal scarring and blindness
• Epigenetic controls regulating HSV-1 latency
Robert Nickells, PhD
DOVS
nickells@wisc.edu

- 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
DOVS
tmnork@wisc.edu

- 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
DOVS
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
DOVS
ryoung6@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
DOV’S
mmaltaweel@wisc.edu
• 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 panuveitis
• Uveitic macular edema
• Ocular melanoma

Barbara Blodi, MD
DOV’S
hablodi@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
DOV’S
ysbradfield@wisc.edu
• 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
DOV’S
cburkat@wisc.edu
• Ophthalmic reconstructive and cosmetic surgery

Jonathan Chang, MD
DOV’S
jchang4@wisc.edu
• 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
DOV’S
rchanra@wisc.edu
• Retina, macula, and vitreous diseases
• Diabetic retinal neuro-degeneration
• Artificial intelligence
• Big data
Gregg Heatley, MD, MMM
IDOVS
ghatley@wisc.edu
- Glaucoma, comprehensive ophthalmology, anterior segment & cataract surgery
- Glaucoma in nonhuman primates
- Presbyopia in nonhuman primates
- Big data

Karina Conlin, OD
IDOVS
kconlin@uwhealth.org
- Specialty contact lens optometry

Justin Gottlieb, MD
IDOVS
jlgottlieb@wisc.edu
- Age-related macular degeneration, diabetic retinopathy, diseases of the retina

Yanjun “Judy” Chen, MD, PhD
IDOVS
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

Daniel Knoch, MD
IDOVS
dwknoch@wisc.edu
- Research in medical student education
- Surgical procedures

Laura Kopplin, MD, PhD
IDOVS
ljkopplin@wisc.edu
- Epidemiology and risk factors for inflammatory eye diseases
- Clinical trials of uveitis therapeutics
- Biomarkers for uveitis outcomes
- Clinical management of ocular inflammatory disease
Mihai Mititelu, MD, MPH
DOVS
mititelu@wisc.edu
- Retina, age-related macular degeneration, diabetic retinopathy
- Multimodal imaging, intravitreal injections, retinal vascular disease, medical education and mentoring
- Clinical trials
- International health

Mark Lucarelli, MD
DOVS
mlucasel@wisc.edu
- 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)

Yao Liu, MD
DOVS
liu463@wisc.edu
- 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

Anna Momont, MD
DOVS
acmomont@wisc.edu
- Ergonomics in residency training
- Glaucoma therapies, clinical trials participation

Alexander Miranda, MD
DOVS
armiranda@wisc.edu
- Pediatric eye diseases
- Eye disease registries
- Big data

Sanbrita Mondal, OD
DOVS
sanbrita.mondal@uwmf.wisc.edu
- Low vision resources
- Low vision rehabilitation
- Augmented reality for low vision
Steve Sauer, MD
DOVS
sksauer@wisc.edu
• Educational research into surgical competency and training

Kathleen Schildroth, MD
DOVS
kathleen.schildroth@wisc.edu
• Diabetic retinopathy
• Macular degeneration
• Ocular trauma
• Retinal detachment
• Retinal laser
• Retinal vascular disease
• Vitreoretinal surgery

Melanie Schmitt, MD
DOVS
maschmitt@wisc.edu
• Pediatric ophthalmology, hereditary retinal disorders
• Inherited Retinal Degeneration Database (IRD)
Kimberly Stepien, MD
DOVIS
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
DOVIS
mestruck@wisc.edu

- Albinism
- Pediatric ocular diseases

Andrew Thliveris, MD, PhD
DOVIS
arthlive@wisc.edu

- Comprehensive ophthalmology, cataracts, ocular genetics
- Colon cancer

Suzanne van Landingham, MD
DOVIS
svanlandingh@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
DOVIS
cjwarner@wisc.edu

- Cornea
- Clinical Trials
Affiliates

Anne Griep, PhD
Cell and Regenerative Biology
agriep@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
dmpeter2@wisc.edu

• Fibronectin's role in the modulation of intraocular pressure

Raunak Sinha, PhD
Neuroscience
raunak.sinha@wisc.edu

• 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
cmsorenson@pediatrics.wisc.edu
- 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
leandro.teixeira@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
- Extracellular matrix abnormalities in ocular disease

Yuhang Zhao, PhD
Computer Sciences
yuhang.zhao@cs.wisc.edu

- 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**  
*Marquardt Institute for Research*  
verhoeve@wisc.edu

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

**Robert Slater, PhD**  
DOVIS  
rbslater@wisc.edu

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

**Stuart Tompson, PhD**  
DOVIS  
stompson@wisc.edu

- 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**  
DOVIS  
verhoeve@wisc.edu

- 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**  
DOVIS  
iszaitoun@wisc.edu

- Hypoxic-ischemic 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