

Department of Ophthalmology and Visual Sciences

UNIVERSITY OF WISCONSIN SCHOOL OF MEDICINE AND PUBLIC HEALTH

RESEARCH INTERESTS 2025

UNIVERSITY OF WISCONSIN-MADISON Department of Ophthalmology and Visual Sciences (DOVS)

BASIC SCIENCE FACULTY



CURTIS BRANDT, PhD _____ DOVS _____ crbrandt@wisc.edu

- Vice Chair of Research
- Ocular infections
- UW-Madison Vision Research 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
- The role of microtubule associated proteins in HSV neuronal infection



- AMITHA DOMALPALLY, MD, PhD _____ DOVS _____
 - Research Director of the Wisconsin Reading Center
 - Discovery, development, and translation of imaging biomarkers for clinical trials in retinal diseases

Associate Director of Vision Research

Human pluripotent stem cells

Age-related macular degeneration

Artificial Intelligence for retinal imaging

_____ domalpally@wisc.edu

- Clinical Trials in diabetic retinopathy, AMD, retinal vein occlusion and uveitis
- Imaging artifacts

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- DAVID GAMM, MD, PhD _____ DOVS _____ dgamm@wisc.edu
 Director of McPherson Eye Research Institute
 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

Training Program

Disease modeling

Regenerative medicine

Retinitis pigmentosa

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- Biomaterials
- CRISPR genome editing

MRINALINI HOON, PhD _____ DOVS _

- Diseases of the retina
- Determine the molecular and activitydependent 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

- Tissue engineering
- Antimicrobial materials
- Cancer immunotherapy
 - _____ mhoon@wisc.edu
- 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 -



- 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

DOVS -

- 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 extra lenticular pathophysiology of presbyopia

to common age-related eye diseases



JULIE MARES, PhD , MSPH ------ DOVS -— jmarespe@wisc.edu Epidemiology, diet and nutrition and Retinal carotenoids to retinal neurodegeneration, and relation to age- related macular eye diseases degeneration, glaucoma and vision function Assess the status of retinal carotenoids and relationships to genotypes and phenotypes Conduct epidemiological studies of the relationships of healthy diets and lifestyles



COLLEEN MCDOWELL, PhD	— DOVS ————————————————————————————————————	visc.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
- Gene therapy for glaucoma
- Intersection of glaucoma and Alzheimer's disease pathology

____ DOVS __

FREYA MOWAT, BVSC, PhD _____ DOVS, SCHOOL OF VETERINARY MEDICINE _____ mowat@wisc.edu

- Retinal aging and aging of the senses and the brain
- The relationship between diseases of the brain and diseases of the retina
- Multifactorial risk factors for retinal aging and age-related diseases

— dneumann3@wisc.edu

- Naturally occurring animal models of retinal dysfunction and degeneration
- Retinal diseases of dogs; Sudden Acquired Retinal Degeneration Syndrome (SARDS)
- Genetic variation in PPARGC1a and photoreceptor health in the aging retina



DONNA NEUMANN, PhD —

- HSV-1 infections in corneal scarring and blindness
- Epigenetic controls regulating HSV-1 latency

paul.kaufman@wisc.edu





- Developmental vascular sensitivity to oxygen
- Neurovascular crosstalk in retinal • development and disease
- Vascular apoptosis regulation

- Choroidal neovascularization (CNV) and fibrosis
- Proliferative vitreoretinopathy (PVR)

CLINICAL FACULTY



MICHAEL ALTAWEEL, MD _____ DOVS _____ mmaltaweel@wisc.edu

- Development of vitreoretinal surgical methods for ipsc Stem cell derived photoreceptors and RPE
- Retinal imaging, reading center for • multicenter clinical trials

- Surgical retina outcome studies, including • retinal detachment repair methods
- Diabetic retinopathy, medical and surgical management
- Uveitis and uveitic macular edema trials
- Ocular melanoma treatment trials



BARBARA BLODI, MD -----_____ DOVS ___ — bablodi@wisc.edu

- Medical Director of the Wisconsin **Reading Center**
- Clinical trials in dry and wet age-related macular degeneration, diabetic retinopathy, diabetic macular edema, retinal vein occlusion
- Retinal imaging research including • new retinal modalities
- Use of artificial intelligence for retinal imaging in reading center research and clinical trials



YASMIN BRADFIELD, MD ———	DOVS	ysbradfield@wisc.edu

- Pediatric ophthalmology
- Anterior segment OCT imaging
- Pediatric glaucoma
- . Pediatric access to eye care



CAT BURKAT, MD	DOVS	cburkat@wisc.edu

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Ophthalmic reconstructive and cosmetic surgery



JONATHAN CHANG, MD —

- Diseases of the retina and vitreous
- Outcomes of retina surgery
- Determining cost-effectiveness and utility of . clinical interventions
- Use of imaging to evaluate retinal diseases Big data in ophthalmology - SOURCE and

– jschang4@wisc.edu

IRIS eye disease registries





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DANIEL	кносп,		

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dwknoch@wisc.edu

- Research in medical student education•Curriculum development and assessmentResearch in resident education•Surgical procedures

ljkopplin@wisc.edu

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I AURA	KOPPLI	N MD	PhD —
LAVINA	NOFFE	IN, IND,	

- Epidemiology and risk factors for inflammatory eye diseases
- Clinical trials of uveitis therapeutics •

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• Biomarkers for uveitis outcomes Clinical management of ocular • inflammatory disease



ANDREW KORNAUS, OD, FAAO, FSLS —	- DOVS -	akornaus@wisc.edu

Optics and higher order aberrations • Specialty contact lenses • in the eye

oculofacial surgical techniques

- Ocular surface disease



/AO 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 Community-based research and health equity



MARK LUCARELLI, MD —	DOVS -		mlucarel@wisc.edu
 Oculoplastic, cosmeti and orbital surgery 	c facial	•	Facial synkinesis Orbital and adnexal malignancies
Small incision/minima	l minimally invasive	•	Orbital, facial, and periocular anatomy

• Thyroid eye disease clinical trial



MICHELE MARTIN, OD	– DOVS –	mmartin43@uwhealth.org
• Dry Eye	•	Graft versus host disease



ALEXANDER MIRANDA, MD —

____ Dovs ___

armiranda@wisc.edu

- Pediatric eye diseases •
- . Eye disease registries

Big data in ophthalmology - SOURCE and • IRIS eye disease registries

 MIHAI MITITELU, MD, MPH Medical Director of Clinical Eye Research Unit Retina, age-related macular degeneration diabetic retinopathy Multimodal imaging, intravitreal injections retinal vascular disease, medical educatio and mentoring 	– DOVS – n, s, n	•	Clinical trials International health Autoimmune retinopathy	mititelu@wisc.edu
ANNA MOMONT, MD Ergonomics in residency training	- DOVS -		ac Glaucoma therapies, clini participation	:momont@wisc.edu cal trials
 SANBRITA MONDAL, OD Low vision disparities, quality improvement Low vision technology 	– DOVS – nt	•	wisconsin Low Vision Reg and Data Repository (WIL	mondal4@wisc.edu gistry _VR)
• Cornea, infectious eye disorders, dry eye	– DOVS –		Clinical Trials	— nehls@wisc.edu
 NAYAN PATEL, OD Pediatric myopia Clinical trials 	– DOVS –		npa Specialty contact lenses	tel3@uwhealth.org
• Comprehensive ophthalmology, anterior segment& cataract surgery, pathology	– DOVS –		Co-Director of DOVS Bic	- hpotter@wisc.edu bank

	KATHLEEN SCHILDROTH, MD D	ovs -	kathleen.schildroth@wisc.edu
	 Diabetic retinopathy Macular degeneration Ocular trauma Retinal detachment 		Retinal laserRetinal vascular diseaseVitreoretinal surgery
	MELANIE SCHMITT, MD D Pediatric ophthalmology, hereditary retinal disorders	ovs –	 maschmitt@wisc.edu Inherited Retinal Degeneration Database (IRD)
	KIMBERLY STEPIEN, MD	ovs –	kstepien@wisc.edu
	 Inherited Retinal Diseases Diseases of the Retina including age-related macular degeneration, diabetic retinopathy, vascular occlusion Adaptive Optics Retinal Imaging High Resolution Retinal Imaging Inherited retinal disease clinical trials 	I	 Co-founder Wisconsin Advanced Imaging of Visual Systems (WAIVS) lab at UW-Madison Developer, UW Ocular Genetic Disease Registry Investigator, Wisconsin Reading Center at UW-Madison
	SUZANNE VAN LANDINGHAM, MD ——— D	ovs –	svanlandingh@wisc.edu
	 Oculoplastic, orbital, and facial cosmetic surgery Big data in ophthalmology - including AAO IRIS registry Facial nerve injury and facial synkinesis 		 Functional impact of ophthalmic and adnexal disease, including the impact of vision loss on driving Clinical trials in thyroid eye disease
	EVAN WARNER, MD D	ovs –	ejwarner@wisc.edu
	 Clinical trials in medical and surgical management of corneal disease Eye banking, cornea donor pool expansion, and cornea graft utilization Endothelial keratoplasty surgery and anesthesia 		 Education and training of corneal transplantation Dry eye disease and neurotrophic keratitis
	ERIC WEINLANDER, MD D	ovs –	eweinlander@wisc.edu
	 Ethics in eye banking and corneal transplantation Outcomes research for refractive surgery, cataract surgery, and corneal transplantation 	n	 Surgical technique and device development for anterior segment surgery Medical and surgical management of corneal and ocular surface disease

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



- NATASCHA MERTEN, PhD, MS POPULATION HEALTH SCIENCES Natascha.merten@wisc.edu
 - Investigation of general aging processes that affect multiple domains of brain aging focusing on sensory and cognitive aging and dementia
- Investigation of early biomarkers and potentially modifiable risk factors of brain aging to identify individuals at risk for decline in various health conditions



BIKASH PATTNAIK, PhD, MPHIL	PEDIATRICS	— pattnaik@wisc.edu
 Retinal diseases due to ion channelopathy Genomic medicine targeting RPE and PR channelopathy IRD 	 Viral and non-viral the the posterior retina Hypoxic-ischemic end impact on impairment 	erapeutic delivery to cephalopathy (HIE) t in pediatric vision



DONNA PETERS, PhD — PATHOLOGY AND LABORATORY MEDICINE — dmpeter2@wisc.edu

- Fibronectin's role in the modulation of intraocular pressure
- Role of integrin signaling in the trabecular meshwork and glaucoma



RAUNAK SINHA, PhD ——	NEUROSCIENCE	raunak.sinha@wisc.edu

Visual processing in the retina



YUHANG ZHAO, PhD _____ COMPUTER SCIENCES _____ yuhang.zhao@cs.wisc.edu

- Human Computer Interaction (HCI)
- Accessibility

- Augmented and Virtual Reality (AR/VR)
- Al-powered interactive systems

PI SCIENTISTS



JEREMY ROGERS, PhD _____ DOVS ____

- Director of the Wisconsin Advanced Imaging of Visual Systems (WAIVS) Lab
- 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 _____ DOVS ___
 - Artificial intelligence development and algorithms
 - Deep neural networks

- Large scale databases
- Retinal AI

	STUART TOMPSON, PhD	DOVS	stompson@wisc.edu
02	 Determine the molecular genetic causes underlying childhood glaucoma and high-grade myopia Map familial genetic disease loci using high-density SNP genotyping arrays and linkage analysis 		Generate rodent models of human genome variation using CRISPR-Cas9 genome editing Perform detailed ocular phenotyping of rodent models, including IOP, OCT, and histology (FFPE/cryo)
	 Determine gene/genome variants in fami using exome and whole-genome sequence Assay variant gene function through proteoverexpression in cultured cells 	lies • cing ein	Profile the transcriptomes of ocular tissues using single cell RNA sequencing (scRNAseq), including ocular tissue dissociation techniques and data analysis using Loupe Browser and Seurat
	JAMES VER HOEVE, PhD	DOVS	verhoeve@wisc.edu

- Non-invasive Visual Electrophysiology
- Glaucoma
- Inherited retinal disease

- Visual Development, Normal and Abnormal
- Comparative Ophthalmology

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