

CMP

Cellular and Molecular Pathology

REMINDERS

SEMINAR/JOURNAL CLUB/THESIS DEFENSE

The Fall 2012-13 Seminar Series can be found on-line at <http://www.pathology.wisc.edu/Seminars/>

Submit Newsletter Material to:

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CMP Graduate Program

Committee Memberships
2012-13

Steering Committee

Zsuzsa Fabry, PhD (Chair) (i)
Anna Huttenlocher, MD (i)
Donna Peters, PhD (st)
Matyas Sandor, PhD (i)
Erik Ranheim MD, PhD ©
Emery Bresnick, PhD (st)
Bo Liu PhD, PhD (st)
Adel Talaat, MVSc, PhD (i)
Ex officio: Joanne Thornton,
Graduate Program Coordinator
Student PhD Candidates:
Anna Ritter, Holly Hung,
Ben Clarkson

First Annual Michael N. Hart, MD Pathology Research Day is a Huge Success!

The Department of Pathology and Laboratory Medicine held its first, all-day, Translational Research Event on Thursday, August 23, 2012.

The day opened with Faculty, Resident and Graduate Student Research Presentations and culminated in a Department Poster Session and Reception. The HSLC Atrium was electric with conversation between old friends and new!



Michael Hart, MD, Professor Emeritus, Past Pathology Chair, enjoys lunch with CMP Director, Professor Zsuzsanna Fabry, PhD and Professor B. Lynn Allen-Hoffmann, PhD.

(Thanks to Andreas Friedl, MD, Chair, Department of Pathology and Laboratory Medicine for these candid pictures!)

Admission and Recruitment Committee

Caroline Alexander, PhD (c)
Bo Liu, PhD (st)
Shelby O'Connor, PhD(i)
Matyas Sandor, PhD (i)
David O'Connor, PhD (i)
Dan Loeb (c)

Student PhD Candidates:

Utibe Bickham, Stephanie Lawry,
Chelsea Hope, Mike Khan, Caitlin
McNair, Zulmarie Perez, Maggie Maes,
Joe Ollar, Jose Rodriguez Molina

Pathology Seminar Series

Erik Ranheim (Chair) ©
Zsuzsa Fabry (i)
Matyas Sandor (i)
Student PhD Candidates
Stephanie Morgan
Ex officio: Joanne Thornton

First Year Advising & Orientation

Donna Peters, PhD (Chair) (st)
Chris Seroogy, MD (i)

Curriculum

Deric Wheeler (Chair) ©
Zsuzsa Fabry, PhD (i)
Erik Ranheim, MD, PhD ©
Craig Atwood, PhD (n)
Donna Peters, PhD(st)
Student PhD Candidates
Melba Marie Tejera
Melissa Wilking
Ex officio: Joanne Thornton

Ethics

Zsuzsa Fabry, PhD (Chair) (i)
Bo Liu (st)
Student PhD Candidate
Student: Melissa Wilking
Ex officio: Joanne Thornton

Diversity

Adel Talaat (Chair) (i)
Riccardo Lloyd, MD, PhD
Zsuzsa Fabry, PhD(j)
Student PhD Candidate: Melba Marie
Tejera
Ex officio: Joanne Thornton

CMP External Review Committee

Professor Gail Robertson
Physiology (Chair)
Professor Ronald Kali
Ophthalmology & Visual Sciences
Center for Neuroscience



Pathology Faculty, Residents and Graduate Students enjoy conversation over lunch.



Zsuzsanna Fabry, PhD, CMP Director introduces the afternoon speakers.



Third year CMP Student, Danielle Stewart, explains her research to second year CMP Student, Zulmarie Perez Horta.

and the Research Day Awards go to....

Research Presentation Talk

Pathology Resident: Jason Rosenbaum, MD

"INSM1 as a marker for neuroendocrine cancer"

CMP Poster Session Results in a Tie

CMP Graduate Student: Toni Brand, PhD Candidate,

"Full length nuclear HER3 can regulate the cyclin D1 promoter via a bipartite transactivation domain"

CMP Graduate Student: Jeff Harding, PhD Candidate,

"A Novel Model of Mycobacterial Latency and Dissemination: Comparison of Local and Systemic Requirements for Host Protection Factors"

CMP WELCOME WEEK NEWS!

Welcome to Madison!

After a full day of orientation, new and continuing students gather informally at the Memorial Union.



Welcome Week/ Month continues...

Our new students joined continuing CMP students and current Pathology Residents and faculty at the First Annual Michael N. Hart, MD Pathology, Research Day event on August 23.

Our final welcome event took place on September 14, when 60 CMP Students and Trainers enjoyed a picnic and show at American Players Theatre in Spring Green WI.

Third Annual BOPS Preview Weekend Fair

As our new students settle in, we begin to look toward 2013. Thanks to CMP students, Jose Rodriguez Molina and Danielle Stewart as well as CMP Director, Dr. Zsuzsa Fabry and CMP Trainers, Dr. Ying Ge and Dr. Shelby O'Connor for representing CMP at the 3rd annual BOPS Graduate Fair.

The purpose of the Bioscience Opportunities Preview weekend is to expose qualified underrepresented prospective graduate students to the vast research opportunities in biological science at UW-Madison with the intent of encouraging them to apply, and ultimately, attending graduate school here.

The group discussed the "awesomeness" of our CMP program with several outstanding students that we hope to see during our recruitment season (starting in February 2013!).

CMP Student and Trainer News!

Toni Brand (Wheeler laboratory) won a travel award for her poster entitled "Full-length nuclear HER3 can regulate the cyclin D1 promoter via a bipartite transactivation domain" for the 37th symposium on Hormones and Cell regulation: Receptor Tyrosine Kinases: from structural biology to systems biology in Mont Ste. Odile,(France) on October 1-14, 2012.

Benjamin D. Clarkson (Fabry laboratory) received a 2-year pre-doctoral training fellowship from the American Heart Association. Ben's work is focusing on novel mechanisms that regulate tissue injury in stroke. Stroke is one of the leading causes of death and disability worldwide. Clinical and preclinical experimental studies suggest the importance of inflammation in long-term neuronal tissue damage following ischemic stroke; however, the mechanisms and cells involved in neuroinflammation are not fully understood. Ben's work shows that IL21 is a major regulator of neuronal injuries and IL21 antagonists are therapeutic in stroke.

Fabry and Sandor Laboratories received a new RO1 grant from the National Institute of Health to study the mechanism of mycobacterial dissemination into the Central Nervous System (CNS). In 1993, the World Health Organization (WHO) declared a tuberculosis (TB) global emergency and it is estimated that today 1/3, approximately 2 billion people, of the global population is infected with latent TB. CNS tuberculosis (CNSTB) is the most dangerous form of Mtb infection. The collaborative work from the Fabry and Sandor laboratories will enable the development of preventive and therapeutic strategies to cope with this disease.

The Kimple Laboratory's industry partnership award from the JDRF and Johnson & Johnson was renewed for another year, and I received a Type 1 and Translational Research Pilot Award from the UW-ICTR. These grants are both for Dr. Kimple's work with G-protein regulators of beta-cell biology.

Chelsea Hope (Asimalopoulos Laboratory) has been selected by the ASH Program Committee for presentation in an Oral Session at the 2012 Annual Meeting of the American Society of Hematology in Atlanta, Georgia. This is the premier hematology meeting in the world (over 20,000 attendees) and only about 5% of abstracts get selected for an oral presentation.

CMP Trainer, Kevin Kozak, MD, PhD, with Pathology Faculty, William Rehrauer, PhD and Co-Investigator: Anne Traynor, MD received one of 6 UWCCC awards given for Investigator Initiated Pilot Studies. The study: *Whole Exome Sequencing of Angiosarcoma and Non-small Cell Lung Cancer –*

CMP Student and Trainer News as reported by UWSMPH News

Dr. Colin Dewey of the Department of Biostatistics and Medical Informatics and CMP Trainer, Dr. Emery Bresnick of the Department of Cell and Regenerative Biology are co-investigators on a new \$1.1 million grant from the National Human Genome Research Institute (NHGRI).

The grant will support a School of Medicine and Public Health team of researchers who have created new computational tools to analyze important yet poorly studied areas of the human genome.

"We have developed new statistical methods that will help biologists look at the data more easily and effectively," says Dr. Sunduz Keles, associate professor of biostatistics and medical informatics who is one of three principal investigators on the project. "We hope that looking at the human genome data with our methods will contribute significantly to the human genome puzzle."

SMPH News, Date Published: 10/02/2012

CMP Student and Trainer News as reported by UWSMPH News – continued

Glioblastoma multiforme (GBM) is both incurable and the most frequently diagnosed brain cancer in adults. But new research from the University of Wisconsin School of Medicine and Public Health lab of **CMP Trainer, Dr. John Kuo, MD, PhD**, shows that at least one subtype is associated with a longer life expectancy.

People diagnosed with GBM live on average less than two years after diagnosis, despite undergoing aggressive surgery, radiation and chemotherapy. But not all GBM cancers are the same, and Kuo's study outlines a new method for sub-typing GBM tumor lines by the proteins they express.

The July issue of the journal Clinical Cancer Research highlighted the research with a commentary by Dr. Jeremy Rich, of the Cleveland Clinic, who wrote that the UW study changes the current understanding of the cancer stem cells believed to drive this type of cancer.

SMPH News, Date Published: 06/28/2012

Researchers at the University of Wisconsin School of Medicine and Public Health now believe Alzheimer's may develop in its early stages in the brain's "white matter," which coordinates various functions in the central nervous system.

Their study published in PLoS ONE, the peer-reviewed, open-access journal, involved 43 healthy middle-aged participants who had at least one parent with Alzheimer's disease. Samples of their cerebrospinal fluid, a clear fluid which surrounds the brain, were acquired through lumbar puncture.

The fluid can be tested for presence of proteins related to Alzheimer's, namely total tau protein, and the 42-residue form of beta-amyloid protein.

According to **CMP Trainer, Dr. Barbara Bendlin**, the lead researcher and assistant professor of medicine (geriatrics) at the UW School of Medicine and Public Health, brain scans given to the participants years later showed that proteins measured in cerebrospinal fluid predicted degeneration in the white matter. This was a surprise because the studied proteins are usually related to degeneration in the brain's gray matter.

SMPH News, Date Published: 06/08/2012

Breast-cancer researchers at the University of Wisconsin-Madison have found that two related receptors in a robust signaling pathway must work together as a team to maintain normal activity in mammary stem cells. Mammary stem cells produce various kinds of breast cell types. They may also drive the development and growth of malignant breast tumors.

Published recently in the Journal of Biological Chemistry, the research also suggests that a new signaling pathway may be involved, a development that eventually could take cancer-drug manufacturers in a new direction.

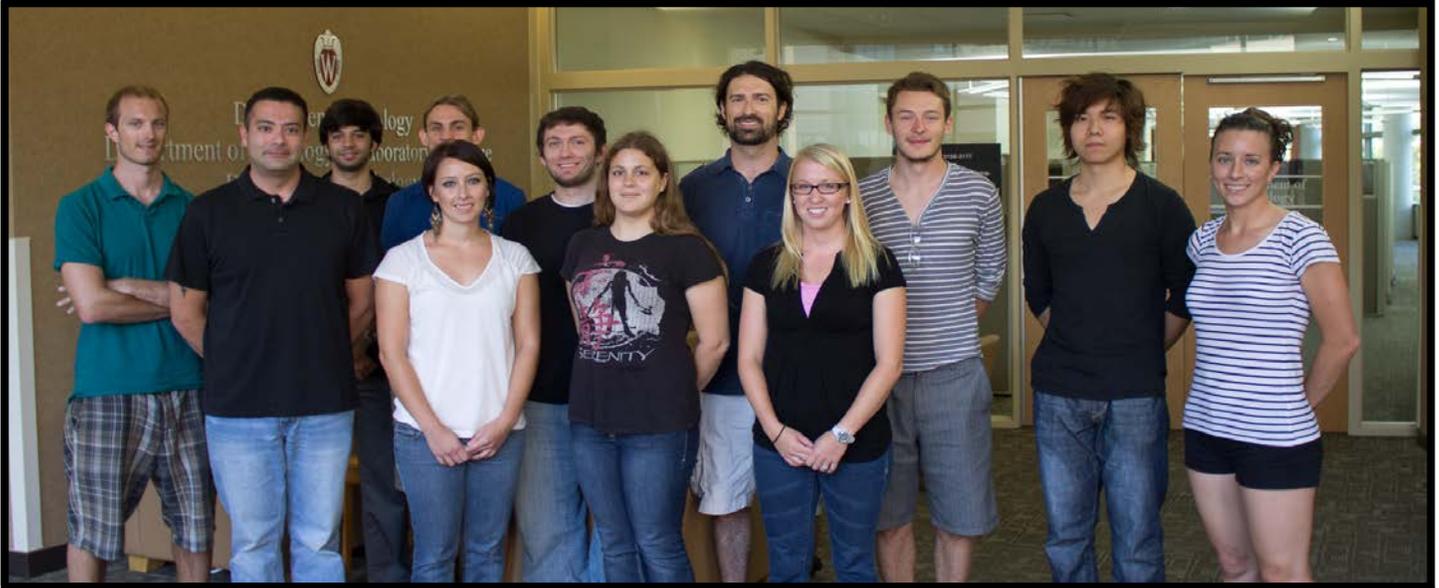
"We wanted to know if we could use this knowledge to inform us about what might be the transition that occurs to start tumor growth and maintain it," says senior author, **CMP Trainer, Dr. Caroline Alexander**, professor of oncology at the McArdle Laboratory for Cancer Research at the School of Medicine and Public Health.

SMPH News, Date Published: 05/29/2012

Josh Coon Wins Klaus Biemann Medal for Mass Spectrometry Research - The American Society for Mass Spectrometry has tightened the academic family circle by awarding Coon its Klaus Biemann Medal for "significant achievement in basic or applied mass spectrometry made by an individual early in his or her career."

SMPH News, Date Published: 05/11/2012

Pease join us in welcoming our 2012 Incoming CMP Students



Adam Bailey

Adam Bailey graduated Colgate University in the 2009 with a BA in Molecular Biology. Adam is interested in the study of viral immunology. During his time at Colgate, he worked in Dr. Stephen Dewhurst's lab on a gene therapy project. In 2008, he interned at the National Institutes of Health in a lab focused on viral immunology and its emphasis on in vivo models of infection. Under Dr. Geoff Holm, at the Laboratory of Molecular Pathogenesis at Colgate, he worked on the intracellular signaling events that activated the innate immune response during reovirus infection for his honors thesis. After graduating, he worked as a research scientist in Dr. William Osborne's gene therapy laboratory at the University of Washington designing gene therapy vectors and assisting in diabetes investigation. He joins CMP this Fall as part of his MD/PhD work here at University of Wisconsin-Madison.

Matthew Brown

Matthew graduated from University of Wisconsin-Madison in 1999 with a BS in Molecular Biology. He started his work as a lab technician and, later, manager in a University of Chicago Tumor Immunology lab. Most recently, he conducted stem cell research for James Thomson at Cellular Dynamics International in Madison. Matthew was the first person to reprogram human T lymphocytes into induced pluripotent stem cells (iPSCs), which appeared in a 2010 PLoS ONE publication. While studying with the CMP program, he would like to find a lab where he can study the mechanisms of cellular identity in relation to the understanding and novel use of iPSCs as well as to the transdifferentiation of somatic

cells into various other cell types or into subtypes within the source cell lineage. Matthew is interested in Stem Cell Biology as well as T Cell Biology and in potential dissertation projects related to transdifferentiation (of T cells into erythrocytes, for example) and potential therapeutic uses of T cell sourced iPSCs.

Eddie Dominguez

Eddie joins CMP having graduated from New Mexico State University with degrees in Biochemistry and Chemistry. For the past couple years, he has been conducting research on the isolation of DNA from wood in the NMSU's Biology department under Dr. Brook Milligan. Eddie also recently won awards for a summer research project at both the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) conference and the Annual Biomedical Research Conference for Minority Students (ABRCMS). Eddie spent a summer here in Madison with the IBS-SROP summer internship program, conducting research, under the guidance of Dr. Ahna Skop, studying the role of mammalian disease genes in *C. elegans*. Eddie is currently interested in research on HIV pathogenesis and possible vaccines.

Adam Ericson

Adam graduated from undergrad at the University of Wisconsin-Madison with a BS in Genetics in 2010. He went on to earn a MS in Comparative Biomedical Sciences in 2012. He spent two years working on vaccine vector development in the laboratory of Jorge Osorio (UW-Madison, Pathobiological Sciences) during his

undergrad. Adam also received a DAAD travel award to study immunological tolerance in the laboratory of Percy Knolle in Bonn, Germany, and also obtained a practical internship in the laboratory of Oliver Brüstle at the Life and Brain Institute in Bonn. Adam joined the Watkins lab in 2009 while completing his MS.

Sarah Franco

Sarah comes to CMP from the University of New Mexico where she graduated with a BS in Biology in 2010. Sarah worked as a Research Assistant in the UMN lab of Stephanie Ruby, PhD, Associate Professor, on the investigation of the role of the DExD/H-box protein, Prp5, in the accuracy of splicing and the formation of the spliceosome. She participated in a summer research internship program at The Scripps Research Institute in La Jolla, CA in Dr. Ulrich Mueller's lab where she worked closely with postdoctoral fellows on a project studying the genetics of mouse neocortical development. Additionally, Sarah was accepted into and completed a Post-Baccalaureate Research and Education Program (PREP) at UNM, a NIH-funded, full-time research program and then attended the UW Madison Bioscience Opportunities Preview (BOPs). Sarah's primary research interests are found in immunology and cancer research.

Ted Griggs

Ted Griggs graduated from the University of Minnesota – Twin Cities in the 2010 with a BS in Biochemistry and Microbiology. Through all four of his undergrad years, he worked on many projects in Dr. Michael P. Murtaugh's infectious disease research lab. Ted was accepted to pursue research under Dr. Stephen J. Russell at the Mayo Graduate School in the Summer Undergraduate Research Fellowship (SURF) Program where he set out to discover some of the biochemistry underlying syncytia formation of measles virus (MV)-infected cells. Through 2010, he was pursuing a research project involved in characterization of a new PRRSV protein. He joins CMP this Fall as part of his MD/PhD work here at University of Wisconsin-Madison.

James Johnson

James Johnson graduated in 2012 from the University of Wisconsin-Eau Claire with a BS in Biochemistry and Molecular Biology. Starting in 2010, James began working in Dr. Sanchita Hati's lab at the University of Wisconsin Eau Claire on "Statistical-Thermal Coupling Analysis for the Identification of Amino Acid Residues that Promote Dynamical Coupling between Domains in *Escherichia coli* Prolyl-tRNA Synthetase". His primary

responsibility in this study was to generate mutational data through the production, isolation, and assaying of the ProRSs. He presented this work at the American Chemical Society national conference. James is interested in cancer biology.

Chelsie Seivers (formerly Kohns)

Chelsie Seivers (Kohns) graduated from Iowa State University in 2011 with a BS in Genetics. During undergrad, Chelsie interned with Dr. Matthew Ellinwood's lab where our goal was to investigate where gene-therapy products localized in various mice tissues in the treatment of Mucopolysaccharidosis. She also worked on a project involving a survey of the nematode parasite population in equine host with regards to parasite resistance to anthelmintics in Dr. Richard Martin's lab. Chelsie concluded her undergrad research experiences in Dr. Cathy Miller's lab. For the past year, she worked as a full-time associate research specialist in the laboratory of Dr. Wei Xu, Department of Oncology, here at UW-Madison. In this position, Chelsie worked on furthering our understanding of estrogen receptor beta, ER beta isoforms, and ER alphabeta heterodimer's role in breast cancer and how they can be used as targets to treat triple-negative breast cancers. Chelsie joins CMP this fall with an interest in Cancer and Immunopathology.

Mary Lopez

Mary Lopez comes to the CMP Program from University of Hawaii at Manoa where she was awarded a BS Biology in May 2011. Until recently, Mary was working with the CMB Program of the John A. Burns School of Medicine as a Research Assistant and, later, a Research Associate. She studied mitochondrial energy metabolism in peripheral blood mononuclear cells (PBMCs) relative to cardiovascular disease phenotypes in HIV infected patients being followed longitudinally. Recently, she co-authored an American Heart Association Meeting poster showing that oxidative phosphorylation enzyme activities are associated with lipoprotein type and size. Mary is interested in the study of gene expression in multinucleate, unicellular species.

Heather Schmitt

Heather graduated from the University of Wisconsin-Madison with a BS in Microbiology and Biology in 2009. After, she went on to earn a MS in Biomedical Sciences from the University of Wisconsin-Milwaukee in 2011. During undergrad Heather conducted two independent studies involving identification of harmful pathogens in

the swine herd while working under Dr. Tom Crenshaw. During her graduate studies at the University of Wisconsin-Milwaukee, Heather was awarded a fellowship to assist Dr. Anthony Azenabor in immunological research with a focus on the modulation of T-cell and macrophage effector functions during *Chlamydia pneumoniae* infection. Over the past year, she researched the beneficial effect of photobiomodulation therapy on retinal degeneration in an animal model of retinitis pigmentosa in the laboratory of Dr. Janis Eells.

Yash Somnay

Yash Somnay received his BS in Cellular and Molecular Biology in 2009 from the University of Michigan at Ann Arbor. He participated in projects at the University of Michigan's radiation oncology department evaluating the effect of targeted therapies and ionizing radiation on signaling pathway activity in sarcoma models during high school. He also worked as a Student Research Assistant at the University of Michigan Medical School, Department of Radiation Oncology, during his undergrad. Last year, Yash completed a fellowship with the Howard Hughes Medical Institute conducting research on neuroendocrine cancers by characterizing the role of Notch3 under the mentorship of Dr. Herbert Chen here at UW. He would like to delve further into understanding the mechanisms that underlie Notch3 signaling in neuroendocrine tumors and connect it with the bigger picture of cancer biology and patient care. He joins CMP this Fall as part of his MD/PhD work here at University of Wisconsin-Madison.

Bowen Wang

During medical school, Bowen worked as a research student in Prof. Albert Yu's lab, focusing on the study of astrocyte where he investigated the implication of Aquaporin1 (AQP1) in glutamate-induced nuclear swelling in astrocyte. Last year, he interned in Dr. Zifen Gao's laboratory in the Department of Pathology at Peking University, working on the diagnosis and patient-based studies of hematological malignancies. After being chosen to be a research student in Jonsson Comprehensive Cancer Center, Bowen started experimenting on biopsy samples of Diffuse Large B-Cell lymphoma (DLBCL) patients to screen the expression levels of two microRNAs (mir-146a and mir-34a) and several related genes (NF-kappaB pathway members, p53, etc.) under the instruction of Dr. Dinesh Rao. While studying with CMP, he is interested in identifying novel biomarkers or signatures for diagnosis and predicting prognosis, and understanding their implication in the initiation and progression of tumors, and would like to engage in developing novel therapeutic approaches to combat cancer.

CMP Steering Committee Meetings

Steering Committee meetings are held on the third week of each month. If you have an item that you would like to be discussed, please, submit to: Joanne Thornton (jmthornt@wisc.edu).

Welcome New Trainers to the CMP Program!

David R. Andes, MD

Associate Professor

Department of Medicine

The focus of Dr. Andes' research is antifungal therapy and resistance. He is a leading authority in antifungal pharmacodynamics, antifungal drug resistance and drug development. He has recently identified the molecular basis for a novel fungal biofilm resistance mechanism and is now using these basic observations to discover new antifungal therapies targeted toward these difficult to treat infections.

Wade A Bushman, MD PhD

Vice Chair for Research & Academic Affairs

Professor of Urology

Robert F. & Dolores K. Schnoes Chair in Urologic Research

Dr. Bushman's research interests include clinical research in bladder and pelvic floor dysfunction and basic research in prostate development and prostate cancer.

Clifford S Cho, MD

Assistant Professor

Section of Surgical Oncology

Division of General Surgery

Dr. Cho conducts basic scientific research in the area of tumor immunology, investigating mechanisms by which tumors evade the host immune response.

Ying Ge, PhD

Assistant Professor

Department of Cell & Regenerative Biology

Dr. Ge researches Cardiovascular Systems Biology through High-resolution Mass Spectrometry-based Comparative Proteomics and Metabolomics

Jenny Gumperz, PhD

Associate Professor

Department of Medical Microbiology & Immunology

Dr. Gumperz lab studies human innate T lymphocytes, with a particular focus on a subset called Natural Killer T (NKT) cells.

Michelle E. Kimple, PhD

Assistant Professor

Department of Medicine

Dr. Kimple's research includes Guanine Nucleotide Binding Proteins, pancreatic beta-cell biology, insulin secretion, and diabetes pathophysiology.

Aparna Lakkaraju, PhD

Assistant Professor

Department of Ophthalmology & Visual Sciences

Cellular basis of retinal degenerative diseases such as inherited and age-related macular degenerations, drug discovery, epithelial cell biology, cholesterol metabolism, high-resolution & high-speed live imaging

Caitlin S. Pepperell, MD

Assistant Professor

Department of Medicine

Dr. Pepperell researches Bacterial Pathogenesis

Luigi Puglielli, MD, PhD

Associate Professor

Department of Medicine

Dr. Puglielli research includes aging of the brain, Alzheimer's disease, Neurodegeneration, Lipid signaling, Protein signaling, Post-translational modification, Membrane transport and Translational research.

Rupa Sridharan, PhD

Assistant Professor

Department of Cell & Regenerative Biology

Dr. Sridharan researches epigenetics of cell fate change

Masatoshi Suzuki, PhD, DVM

Assistant Professor

Department of Comparative Biosciences

To apply stem cell technology to expand integrative sciences in both basic and translational research.

Raghu Vemuganti, PhD

Associate Professor

Department of Neurological Surgery

Dr. Vemuganti's lab researches the Role of Endoplasmic Reticulum Stress after Traumatic Brain Injury, Role of ISG15 after Cerebral Ischemia, Role of MicroRNAs in Cerebral Ischemia, JAK-STAT-SOCS signaling in post-ischemic cerebral inflammation, Role of transcription factors Egr1 and C/EBP β in cerebral inflammation, Therapeutic potential of PPAR- γ agonists in controlling cerebral inflammation, Gene expression profiling following CNS Injury, and Stem cell proliferation after Stroke.