UC DAVIS HEALTH | Department of Pathology and Laboratory Medicine

UC Davis College credit opportunities are available for students interested in pre-med, pre-vet, or scientific medical research. Faculty in the Department of Pathology and Laboratory Medicine at UC Davis School of Medicine invite qualified undergraduate students to enroll in the **PMD 199** course, which provides credit for participating in scientific research. This course allows students to gain valuable research or pre-medical experience with state-of-the-art equipment and techniques while receiving course credit. Additionally, if you are not interested in receiving course credit, **volunteering is an option as well**. Time contributed by volunteers can sometimes be used as internship credits by some programs. Additionally, medical students interested in research can enroll in **PMD 499**. All students, both undergrad and medical students, must contact the faculty mentor in advance and obtain their consent to register for the appropriate course. A list of interested faculty and their research areas are:

- **Verónica Martínez-Cerdeño, Ph.D.** Contact: vmartinezcerdeno@ucdavis.edu
  The goal of the Martínez-Cerdeño laboratory is to determine the etiology and pathology of certain forms of autism. In addition, her lab studies the role of stem cells in the development, evolution, and pathogenesis of the mammalian cerebral cortex. The anatomy and pathology of autism and related diseases in postmortem brains are studied and based on the findings, animal models are developed for autism research. Laboratory website: www.ventricular.org

- **Ralph Green, M.D., Ph.D., FRC PATH** Contact: rgreen@ucdavis.edu
  Professor Ralph Green studies the roles of micronutrients in the maintenance of normal health and how nutrients and their pathways contribute to the pathogenesis and manifestations of disease. A major focus has been the characterization of B vitamin status in acquired and genetic diseases. Recently, his laboratory has performed studies on sickle cell anemia, cancer and degenerative neurological disorders, including Parkinson's Disease and Alzheimer Disease and population studies on declining cognitive status in the elderly. Methods used in the laboratory include hplc, enzyme immunoassays (ELISA) and multiplex proteomic assays.

- **Konstantinos Zarbalis, Ph.D.** Contact: kzarbalis@ucdavis.edu
  The Zarbalis laboratory focuses on uncovering the genetic and environmental causes of neurodevelopmental disorders. Both in vivo and in vitro models are used to reveal the effects of gene mutation and environmental influences in pathological processes leading to congenital abnormalities. A wide variety of techniques is employed in the process, including methods in molecular biology, molecular histology, protein biology, biochemistry, and bioinformatics.

- **Yu-Jui Yvonne Wan, Ph.D.** Contact: yjywan@ucdavis.edu
  Study the role of gut microbiota in contributing to and preventing obesity and metabolism-associated health issues including fatty liver, systemic inflammation, skin disease, mental and neurological issues, and cancer aiming to uncover means for treatment.

- **Kristin Grimsrud, D.V.M., Ph.D., CVA** Contact: kngrimsrud@ucdavis.edu
  Assistant Professor Grimsrud's research focuses on pharmacokinetics and pharmacogenetics in pediatric special populations, particularly burn patients, with a larger focus on anesthetics and analgesic drugs. Additionally, she is a translational clinician and specializes in laboratory animal medicine, translational animal models and rare disease.

- **Richard Levenson, M.D.** Contact: rmlevenson@ucdavis.edu
  The Levenson Lab: Advanced Microscopy Research: Our lab develops novel microscopy methods, including FIBI, which enables slide-free histology for rapid pathology diagnosis from fresh, unsectioned tissue specimens. Current projects include:
  1. Alternative Staining Techniques: Investigating stains beyond hematoxylin and eosin to improve image content and detect additional tissue components (e.g., collagen, elastin, amyloid).
  2. Immunofluorescence in FIBI: Developing approaches to capture molecular data alongside histology images, exploring new contrast agents and non-antibody-based probes.
  3. Digital FIBI Atlas: Creating a comprehensive image collection of normal and diseased tissues from various species (working with the vet school). Disease could include those involving parasites.
  Useful skills and interests include imaging experience, software and coding expertise for image processing, histology knowledge, interest in AI applications

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- **Izumi Maezawa, Ph.D.** Contact: imaezawa@ucdavis.edu
  The Maezawa lab investigates the biology and pathology of microglia and astrocytes using primary murine cultures, iPS cell models, and mouse models. The goal is to identify addressable therapeutic targets in glia for neurological disorders. Currently the laboratory has identified therapeutic targets for Alzheimer's disease, Rett syndrome, and neonatal brain injury. These novel targets include potassium channels, lipid mediators, and simple and complex sugars. A potassium channel blocker identified by Maezawa and collaborators has been advanced to a clinical trial for early stage Alzheimer's disease.

- **Kuang-Yu Jen, M.D., Ph.D.** Contact: kyjen@ucdavis.edu
  Professor Jen's research focuses on using histopathologic data to predict clinical outcome, focusing on native kidney disease and renal transplants. Histopathologic data consists of morphologic findings obtained from traditional microscopic examination as well as developing and using state of the art deep learning-based image analysis on digital images. Currently, Jen is a multiple-PI for an NIH R01 grant titled Computational Image Analysis of Renal Transplant Biopsies to Predict Graft Outcome. He is looking for motivated undergraduate students who would like to contribute to the development of a digital archive for kidney transplant biopsies.

- **Kenneth Iczkowski, M.D.** Contact: kaiczkowski@ucdavis.edu
  Our translational research concerns the role of loss of DACH1, a tumor suppressor, in prostate cancer. Working with Richard G Pestell (at Baruch S Blumberg Institute) we are studying sets of patients with our multiplex fluorescence immunostain and correlating this clinical outcome; this test performance is also being correlated with commercial send-out tests such as Decipher. The Decipher results will have to be searched for and pulled.
  A second project will ramp up in the coming months, with prospective testing of Zinc finger-like1 protein in the serum to predict subsequent detection of prostate cancer, or recurrence of cancer after surgery. This is in conjuction with Girish V Shah (U of Louisiana) and also requires pulling chart data.

- **Ashna Aggarwal, M.D.** Contact: axaggarwal@ucdavis.edu
  Assistant Professor Aggarwal is an AP/CP Board certified pathologist with specialty training in gastrointestinal and liver pathology. Aggarwal is willing to serve as a mentor.

- **Denis Dwyre, M.D.** Contact: dmdwyre@ucdavis.edu
  Professor Dwyre focuses on clinical research in the areas of coagulation, apheresis, and hematology.

- **Farnoush Moen, M.D.** Contact: fmmoen@ucdavis.edu
  We are working on an interesting case of aplastic anemia with PNH clone, mutation of U2AF1 and coexistent T- LGL Clonal T cells. The aim would be an institutional experience of aplastic anemia, clonal hematopoiesis, hypoplastic MDS, and its relation to T-LGL and possible immune related pathogenesis and prognostic significance.
  We are working on expression of PDL1 in T cell Lymphoma, specifically Follicular T Helper Cell Lymphoma and application of multiplex IHC/IF.

- **Jaclyn Watkins, M.D., M.S.** Contact: jcmwatkins@ucdavis.edu
  Associate Professor Watkins' research involves clinicopathologic, immunohistochemical, and molecular exploration of benign, preneoplastic, and neoplastic lesions of the gynecologic tract, with a special interest in HPV-independent vulvar squamous lesions and common, morbid diseases such as endometriosis.

- **Swikrity U Baskota, M.D., M.B.B.S.** Contact: subaskota@ucdavis.edu
  Assistant Professor Baskota's clinical research focuses on hormone receptor positive breast carcinomas. Her research is targeted to better understand the hormone receptors expression on treatment response of breast carcinomas.
  Baskota also works on various clinical research of cytopathology and lung carcinoma and to correlate with molecular findings. Useful skills and interests: Data gathering, biostatistics application, application of digital and AI algorithms.

- **Lee-Way Jin, M.D., Ph.D.** Contact: lwjin@ucdavis.edu
  Professor Jin's laboratory is affiliated with UC Davis Alzheimer's Disease Research Center (ADRC) and MIND Institute. He is a neuropathologist working on biochemical and molecular biological analyses of brain pathologies in human samples and mouse models. Recently he has taken the leadership of the biomarker efforts of the ADRC and has assembled teams to investigate established and candidate blood biomarkers using SiMoA, lipidomics, glycomics, and glycoproteomics technologies. Jin also collaborates closely with Professor Izumi Maezawa to identify therapeutic targets for Alzheimer's disease, Rett syndrome, and neonatal brain injury using cell culture and mouse models.

If you are interested in working with any of these faculty members on research, please contact them through email. For PMD 199, two or three hours per week correspond to one unit. Most of the professors are located at the School of Medicine and UC Davis Health campus in Sacramento; however, busing for students is available between the two campuses.

Please contact Tina Scheib, tlscheib@ucdavis.edu, or 916-734-0694, if there are any questions.

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