Mentor Name	Department	Email	Project
Brijesh Patel	Cardiology	Brijesh.patel@wvumedicine.org	My research focuses on the intersection of cardiovascular diseases and cancer. In addition I am interested developing novel tools leveraging artificial Intellegence. The students do not need any particular training or background to join the projects.
Salik Hussain	Physiology, Pharmacology &Toxicology; Microbiology, Immunology and Cell biology	salik.hussain@hsc.wvu.edu	Project 1: Role of Alveolar Progenitor/Stem cells in Lung regeneration after Acute Lung Injury Project 2: Gene- Environment Interactions in chronic pulmonary diseases
Amna Umer	Pediatrics	amumer@hsc.wvu.edu	Substance use in pregnancy and adverse maternal and infant health outcomes Substance use includes: opioids, stimulants, cannabis, and anti-depressants
Paul R Lockman	Pharmaceutical Sciences	prlockman@hsc.wvu.edu	Chemotherapy distribution and efficacy in brain metastases Brain metastases continue to be a significant casue off mortality in patients that have primary melanoma, lung cancer and breast cancer. While chemotherapeutics appear to have benefit in the primary tumors, they have

			limited effect when the tumor has disseminated to the brain. While there are moilecular changes that opccur in the brain tumors, it is most not likely the cause of the failure of the therapy. The presence of the blood-brain barrier effectively limits drug concentrations to subtherapeutic concentrations. In this project student will gainf first hand experience with the treatment of brain metastases using chemotherapy, radiation therapy and immunotherapy. All of the modles we use are designed to mimic clinical studies. THe work is highly translational.
WenTao Deng	Ophthalmology/Biochemistry and Molecular Medicine	wen.deng@hsc.wvu.edu	Mechanism of Cone opsin transport in cone photoreceptors PI: Wen-Tao Deng The human retina consists of two types of photoreceptors: rods and cones. Cone photoreceptors are responsible for our visual acuity, color discrimination, and daytime vision. Cone opsins are essential structural components of the cone outer segment (COS) which houses all key proteins of the

			cone phototransduction pathway, they also are visual pigment proteins that absorb lights and convert them into electrical signals that are passed to our brain. We have three types of cone opsins: red, green, and blue, each responsible for our long-, medium- and short-wavelength sensitivities. Cone opsins are synthesized in the cone photoreceptor's inner segment (IS) and must be transported to OS to perform their function. Defects in the trafficking of cone opsin result in ciliopathies. This study centers on identifying cone opsin trafficking partners engaged by cone opsin in its migration process from IS to OS. The student will be working with postdoc, Ph.D. students, and biologists in the lab and will be exposed to a variety of techniques including genetically engineered mice, Electroretinograms for measuring visual function, fundus and optical coherence tomography to exam retinal morphology and structure,

			immunohistochemistry and fluorescent microscope, Western blot, PCR, cloning, etc.
James W Lewis	Neuroscience	jwlewis@hsc.wvu.edu	Human neuroimaging of sensory systems using fMRI and EEG. Potential projects include (1) self vs non-self representations in insular cortex (using fMRI data); (2) hearing perception related to voice (using EEG); (3) identifying functional pattern differences in autism spectrum disorder brain circuits (using rsfMRI); (4) Identify changes in brain topography as a function of age.
Joel Palko	Ophthalmology	joel.palko@hsc.wvu.edu	Risk factors for success and failure following minimally invasive glaucoma surgery. Using a combination of machine learning algorithms developed in Dr. Palko's lab and traditional statistics, the goal of this project is to determine if patient-level predictions of success or failure of glaucoma surgery can be determined using pre-operative features.
Soumya K Srivastava	Chemical & Biomedical Engineering	soumya.srivastava@mail.wvu.edu	At MESA lab, we specialize in the design, fabrication, testing, and validation of such micro platforms. Prior to the

			utilization of COMSOL Multiphysics software for designing these platforms, we obtain the intrinsic dielectric property data of the particles in interest. We will utilize infected blood samples to obtain these dielectric properties. These electrophysiological properties are unique towards each cell type and state which form the basis of our detection platforms. The performance of the device platform is validated using the pre-infected blood samples with the obtained theoretical/numerical results and the results from other diagnostic methodologies. This lab-on-a-chip technology will ultimately yield a platform that could be applied to concentrate / enrich and/or detect / characterize any particle of interest with high selectivity and sensitivity that is minimally invasive, label-free, and less expensive compared to the current technology.
Michael Kolodney	Dermatology	msk0012@hsc.wvu.edu	Determining the Pathogenesis of Xanthelasmas: Xanthelasmas are well

			demarcated lipid depositions in the dermis of the eyelids. Although other xanthomas are associated with severe hyperlipidemia, many patients with xanthelasma have normal cholesterol and triglycerides. We will use the UK Biobank to determine risk factors for xanthelasmas and explore associations between these relatively common xanthomas and cardiac disease.
EZEQUIEL SALIDO	Ophthalmology and visual science	ezequiel.salido@hsc.wvu.edu	This research experience aims to write a review of the vision diseases linked to mutations in the extracellular matrix genes IMPG1 and IMPG2. The student will research current literature and compose a preliminary version of a future review.
Lizzie Bowdridge	Physiology, Pharmacology and Toxicology	ebowdrid@hsc.wvu.edu	Adverse reproductive outcomes, such as miscarriages, are common in pregnant women working in occupational settings. These women are exposed to toxicants such as, nano-titanium dioxide (nano-TIO2) or electronic cigarettes (e-cig) via inhalation. One likely, but

			uninvestigated, way that inhaled toxicants may mediate these poor outcomes is by decreasing critical pregnancy hormones such as estradiol (E2) or perturbations in reactive oxygen species. Currently, our lab is focused on linking E2 and adverse reproductive outcomes due to maternal inhalation exposure, as well as understanding the role xanthine oxidase (XO) plays post-exposure. We aim to identify the roles of E2 and XO (along with their activators/inhibitors) across timepoints in gestation on placental function and fetal health following maternal exposure and determining the impact of maternal inhalation exposure on reproductive health of F1 female progeny. Ultimately, we are working to elucidate the roles of E2 and XO in regulating a healthy gestational environment for fetal development via uterine and placental vascular function, oxidant stress, and reproductive hormones during maternal inhalation

			exposure. This will be accomplished through serial blood sampling, in vitro vessel preparations and experimentation, as well as hormone and immunohistochemical assays. Students will be able to work with rodents as well as learn surgical and procedures and techniques.
Bethany Gibbs	Epidemiology and Biostatistics	bethany.gibbs@hsc.wvu.edu	Pregnancy 24/7 Study. This multi-center, NIH-funded cohort study studies 24-hour behavior in pregnant women during each trimester using state-of-the-art devices and links them pregnancy health outcomes abstracted from the medical record including hypertensive disorders of pregnancy, gestational diabetes, and preterm birth (among others). Students who rotate in our lab will be responsible for assisting with data collection and medical record abstraction for participants. They will also have the change to develop their own research question within the project, conduct secondary data analysis, submit a scientific abstract, and develop a

			scientific manuscript (if desired).
Meenal Elliott	Microbiology, Immunology and Cell Biology	melliott@hsc.wvu.edu	mechanism of Acute Respiratory Distress Syndrome (ARDS) in viral infections
H. Wayne Lambert	Pathology, Anatomy, and Laboratory Medicine	hwlambert@hsc.wvu.edu	Variant leg Muscles may cause tarsal tunnel syndrome. Tarsal tunnel syndrome, or posterior tibial neuralgia, is a neuropathy associated with compressive entrapment of the tibial nerve as it travels deep to the flexor retinaculum, or within the tarsal tunnel. A patient with tarsal tunnel syndrome may present with a variety clinical signs and symptoms, including, but not limited to, painful burning, tingling, and/or numbness. This pain or paresthesia is exacerbated with activity or when a physician applies pressure to, or taps upon, the compressed tibial nerve, which is called a positive Tinel sign. Surgical incision of the flexor retinaculum of the foot usually relieves these signs/symptoms because it creates additional space for the impinged tibial nerve in this

			compressive entrapment neuropathy. However, two variant leg muscles, the flexor digitorum accessorius longus (FDAL) and fibulocalcaneus (peroneocalcaneus) internus muscles, may be present within the tarsal tunnel, serving as space-occupying lesions. It is important for surgeons and radiologists to confirm or deny the presence of these two muscle variants or subsequent surgical incision of the flexor retinaculum may not provide relief for the patient. The FDAL muscle is present in 2-12% in imaging, surgical, and whole-body donor studies while the fibulocalcaneus internus is present in approximately 1% of legs. This study will show examples of these two variant muscles that reside within the tarsal tunnel, demonstrate the variability of the proximal insertion, course, and distal insertion of these muscular variants, and detail how a patient with these accessory muscles may be predisposed

			to symptoms of tarsal tunnel syndrome. This anatomical knowledge is crucial to surgeons that need to resect these variant muscles to relieve the signs and symptoms of tarsal tunnel syndrome in patients that possess FDAL or fibulocalcaneus internus muscles. In this study, we will search cadaveric donor legs and radiologic images to learn more about the FDAL and the fibulocalcaneus internus muscles. Students may also observe a surgeon performing the tarsal tunnel release procedure.
Paul Chantler	SOM-Exercise Physiology/Neuroscience	pchantler@hsc.wvu.edu	The lab is focused on basic science models of vascular contributions to dementia. Students will help with ongoing projects on this topic.
Michael Robichaux	Biochemistry and Molecular Medicine	michael.robichaux@hsc.wvu.edu	Super-resolution microscopy applications in photoreceptor cell biology, vision and eye disease. INTRO students will learn how to use advanced microscopy methods to investigate subcellular mechanisms that are required for vision and the molecular pathologies of

			blinding retinal diseases.
Sharan Bobbala	Pharmaceutical Sciences	sharan.bobbala@hsc.wvu.edu	Adjuvanted Nanoparticles for Vaccine Delivery
Anna Coy	Human Performance; Communication Sciences and Disorders	anna.gravelincoy@hsc.wvu.edu	Clear Speech Intervention in Parkinson Disease A novel speech therapy program has been developed for speakers living with Parkinson Disease. It is currently in testing phases with participants with PD. Students will assist with analysis of previously collected data and in preparing data for a perceptual research study.
Candice Brown	Neuroscience	cdbrown2@hsc.wvu.edu	Title: Bench-to-Bedside Stroke Research: Improved Diagnostic Criteria and Biomarkers for Silent Brain Infarcts Description: Silent brain infarcts, also known as silent strokes, are microinfarcts and microhemorrhages viewed on brain CT or MRI that are normally classified as incidental findings. However, numerous studies suggest a strong association between these findings and the increased likelihood of a future stroke and/or a more severe stroke. The project will consist of a retrospective review

			of silent brain Infarcts and a prospective study of plasma-derived extracellular vesicles as biomarkers for silent brain infarction. Medical students will have the opportunity to participate in Epic-based chart reviews and a systematic meta-analysis for the retrospective component of the internship. In addition, students will have the opportunity to consent admitted patients on the Neurology service at Ruby Hospital, process patient blood samples, and characterize extracellular vesicle profiles as part of an ongoing prospective study in the lab.
Aaron Robart	Biochemistry and Molecular Medicine	aaron.robart@hsc.wvu.edu	Exploring Small Molecule Inhibitors Targeting Mitochondrial Genome G-Quadruplexes for Treating Metabolically Linked Diseases Summary: This research project investigates the therapeutic potential of small molecule inhibitors targeting G-quadruplex structures within the mitochondrial genome. Dysregulation of

			mitochondrial function is implicated in various metabolically linked diseases. The study involves characterizing the interactions between these inhibitors and mitochondrial G-quadruplexes using biophysical techniques. Cell culture models will be employed to assess the impact on mitochondrial gene expression and function. This research aims to uncover novel insights into mitochondrial dysfunction and provide innovative strategies for treating metabolically linked disorders.
Mariya Cherkasova	Psychology	mariya.cherkasova@mail.wvu.edu	Repetitive Transcranial Magnetic Stimulation for Addictive Disorders The student will work on two closely related projects looking at repetitive transcranial magnetic stimulation (rTMS) for addictive disorders. The first focuses on optimization of rTMS delivery for reducing smoking cravings and involved both rTMS and functional magnetic resonance imaging (fMRI). The second looks at the effects of rTMS in

			patients with Parkinson's Disease suffering from impulse control disorders and involves rTMS and behavioral testing.
Ketaki Inamdar	Physical Therapy	ketaki.inamdar@hsc.wvu.edu	Mobile minds: Infant learning study This study is focused on assessing learning and memory in infants with prenatal drug exposure using a low-cost play-based test.
Sarah Dotson	Obstetrics & Gynecology	sjd0015@hsc.wvu.edu	Management of patients presenting to the emergency room for miscarriage before and after the West Virginia abortion ban This study will examine the care patients received in WVU affiliated emergency rooms before and after WV enacted a near total ban on abortion in Sept 2022. Outcomes will include consults/follow-ups with OBGYN and time from presentation until treatment is offered for miscarriage management. The primary role of the student research assistant will be review of charts to extract data in order to build a database to answer these questions.
Ming Pei	Orthopaedics	mpei@hsc.wvu.edu	Decellularized extracellular matrix,

			stem cells and cartilage regeneration To explore the mystery underlying stem cell rejuvenation by expansion on decellularized ECM for cartilage regeneration. The students will have the opportunity to shadow senior researchers in bench work and be actively involved in preparation of review articles.
Bradley End	Emergency Medicine	bradley.end@hsc.wvu.edu	Emergency Department Management of Tobacco Use Disorder - ongoing series of survey/trial data regarding best practices for treating tobacco use disorder from the Emergency Department
Shafic Sraj, MD, MBA	Orthopaedics Surgery	srajs@hsc.wvu.edu	We have multiple opportunities this summer. They include two basic science projects: 1- Testing a newly designed knotless tendon repair 2- Testing a newly designed external fixator for finger fractures. Clinical project options include understanding the reasons patients seek treatment for Dupuytren Contracture and how well patient-reported outcome measures

			truly capture those reasons. The selection of the project depends on the INTRO student's interest and the stage of the project at the time of joining. Other projects may become available later. Please feel free to reach out to learn more about the projects. SS.
Prashnna Gyawali	Lane Department of Computer Science and Electrical Engineering	prashnna.gyawali@mail.wvu.edu	AI for medical imaging
sabah servaes	radiology	sabah.servaes@hsc.wvu.edu	Brown Adipose Tissue Assessment with MRI
Amna Umer	Pediatrics	amumer@hsc.wvu.edu	Substance use (opioids, stimulants, cannabis, anti-depressants) in pregnancy and infant outcomes.
David Rasicci	Anatomy Division of Pathology, Anatomy, and Laboratory Medicine	david.rasicci@hsc.wvu.edu	Running Title: Prevalence and Anatomical Characteristics of Abdominal Aortic Aneurysms (AAA) in Rural Health Setting Abdominal aortic aneurysms (AAAs) are defined as a focal dilation of the abdominal aorta that typically measures >3.0cm in anteroposterior diameter. Many AAAs are asymptomatic and are only discovered incidentally during other abdominal imaging procedures such as USG, CT, or MRI. AAAs may

			precede aortic dissection, thrombosis, embolization, and rupture. Acute AAA rupture is a medical emergency, accounting for 4-5% of all sudden deaths. Important predictors of rupture include the size of the aneurysm and the rate of expansion. Reported prevalence of AAAs varies, ranging between 4-16% of populations studied. Associated risk factors include male sex, age (>60 years of age), hypertension, history of smoking, and Caucasian ethnicity. In the human anatomy lab at West Virginia University, a high prevalence of AAA has been observed in our donor population. Thus, the goal of this study is to record the prevalence and anatomical characteristics of the AAA in the gross lab setting. Measures will include (but are not limited to) transluminal diameter and transmural width of the abdominal aorta in several locations (level of celiac trunk, intermesenteric, and bifurcation), renal

			arteries, and common iliac arteries. Specific sections of the abdominal arterial tree will be processed via histopathological and biochemical analyses. Lastly, the project will involve collaboration with clinicians in Vascular Surgery within the Heart and Vascular Institute at WVU. We aim to develop a parallel arm of this study that may include review of medical records and clinical data. ((Note: While this would be your primary project, there are other research opportunities within the Anatomy Division. We could tailor a second project to your specific interests in medicine. Lastly, the Anatomy Division affords the opportunity to gain teaching experience in the human gross anatomy lab. Interested students are encouraged to contact me directly to discuss the INTRO research experience.))
Matthew Dietz	Orthopaedics	mdietz@hsc.wvu.edu	Osteolysis and Prosthetic Joint Infection -- Identifying the pathophysiology of how biofilm-

			producing bacteria (Staphylococcus aureus) triggers Osteoclastogenesis in patients with Prosthetic joint Infection (PJI) and developing a new therapeutic intervention to treat PJI. In this summer experience the student will quantify bone resorption in in vivo testing of a an established infection model and also establish in vitro skill evaluating the interactions of osteoclasts and S. aureus.
Brian Boone	Surgery	brian.boone@hsc.wvu.edu	Textbook outcomes in robotic pancreatic surgery - This project will evaluate textbook oncologic outcomes (TBOO) after robotic pancreaticoduodenec tomy and seeks to: 1) examine incidence of TBOO in RPD and compare to open, 2) identify factors that predict TBOO in RPD and 3) examine how TBOO influence long term survival.
Jim Bardes	Surgery	jbardes2@hsc.wvu.edu	Our group studies the impact of rurality and prolonged EMS transport on both trauma and critically ill patients.
J. W. Awori Hayanga	Cardiovascular and Thoracic Surgery	jeremiah.hayanga@wvumedicin e.org	Clinical and Outcomes Research in ECMO and Large Databases in a fast-paced ,

			rigorous, high-yield think tank.
Joel Palko	Ophthalmology	joel.palko@hsc.wvu.edu	The Effect of Scleral Buckling on the Risk of Primary Open-Angle Glaucoma: A Retrospective Cohort Study. This project will test the hypothesis that scleral buckle procedures are protective against glaucoma. The study will utilize a large dataset from the Sight Outcomes Research Collaborative (SOURCE) consortium to test this hypothesis. The student will be responsible for analyzing the data with the help of a biostatistician and writing the manuscript.
Zachary Zinn	Dermatology	zzinn@hsc.wvu.edu	Utilization of TriNetX Database to Evaluate Unanswered Questions in Dermatology - I have previously used TriNetX to answer questions pertaining to biologic risk in patients with covid, psychostimulant use in atopic dermatitis, and most recently, the association between dupilumab and cutaneous T-cell lymphoma. I intend to work with an MS1, Ireland Wayt, if she is accepted into the program. I will teach

			her to perform large database driven studies in dermatology, from study conception to completion, data analysis, and ultimately publication.
Daniel Grant	Orthopaedic Surgery	drgrant@hsc.wvu.edu	Improving Diagnosis and Treatment of Lyme Disease in Pediatric Patients in Rising Lyme Incidence Areas In the past decade, Lyme disease cases have surged dramatically in West Virginia, making it the third-highest incidence state in 2020, with a rate of 59.7 cases per 100,000 people. Pediatric Lyme disease often mimics bacterial joint infections, posing a clinical dilemma for orthopedic surgeons, necessitating rapid diagnostic clarity. Lyme tests' sensitivity, specificity, and processing times vary, lacking standardized guidelines. False positives can lead to severe consequences, including osteomyelitis, sepsis, and unnecessary surgeries. Improved Lyme disease testing is essential to prevent these outcomes. Our long-term goal is to enhance Lyme disease diagnosis and

			treatment for pediatric patients in rural Appalachia. The surge in cases in West Virginia, where we treated 195 pediatric Lyme arthritis patients in 2021-2022, inspired us to investigate the learning curve and practice changes that followed. The overall objective of this application is to evaluate the learning curve during this period of rapidly increasing cases in the WVU system and the practice changes that occurred. Our central hypothesis is that later in this curve the improved knowledge and testing capabilities resulted in fewer patients undergoing unnecessary operations, fewer hospitalizations, and improved treatment regimens. The rationale for this study is that by describing our learning curve with analysis of patient data during that period, we would provide other centers a framework to implement practice changes and improve patient care throughout rural Appalachia. To

			address this, we propose the following specific aims: 1) Develop a geospatial model to assess how county-level Lyme incidence affects the predictive value of prognostic labs and clinical findings in Lyme disease diagnosis and 2) Identify disparities in medical conditions, healthcare utilization, and socioeconomic status between Lyme disease patients and those with bacterial knee joint infections. Our research is innovative, offering insights into Lyme disease diagnosis across high and low incidence areas. Leveraging WVU Medicine electronic medical records, we provide a unique perspective unavailable elsewhere. We aim to refine clinical practice by establishing diagnostic test thresholds based on incidence levels. Additionally, Aim 2 will uncover medical and clinical condition disparities in Lyme disease patients compared to joint infection cases. This information is pivotal for future precision medicine and

			machine learning approaches as well as addressing health disparities in rural Appalachia. Current Project Status: This is an IRB approved project. We are currently extracting data from EPIC and will place it in RedCap. A further chart review on some elements of these patients will need to be performed.
Prashnna Gyawali	Lane Department of Computer Science and Electrical Engineering	prashnna.gyawali@mail.wvu.edu	Projects related to the application of AI in healthcare.
Heather Johnson	Clinical Pharmacy/Family Medicine	hejohnson@hsc.wvu.edu	Optimizing operational success and health outcomes in interdisciplinary clinics. In the Department of Family Medicine at the University Town Centre, there are multiple interdisciplinary clinics with a physician, pharmacist, dietitian, and clinical psychologist. The weight loss clinic, in particular, has a several month wait list at this point. The team is working on implementing technology and a unique patient assessment model to decrease wait time while maintaining outcomes. A student who is interested in working with multiple

			disciplines would be very helpful in implementing and assessing a quality improvement project within these clinics.
Matthew Zdilla	Pathology, Anatomy, and Laboratory Medicine	matthew.zdilla@hsc.wvu.edu	Title: Improving the Surgical Approach to Trigeminal Neuralgia through Geometric Morphometric Analysis Trigeminal neuralgia is a debilitating disorder marked by excruciating pain that is often only relieved through surgical interventions. The percutaneous approach to the management of trigeminal neuralgia involves inserting a needle through the cheek and, subsequently, a small opening in the cranial base through which the trigeminal nerve travels. Neurovascular structures of the infratemporal fossa are jeopardized inherently in the approach. Furthermore, anatomical variation adds complexity. This project will explore anatomical-surgical relationships between neurovascular structures and needle trajectory in order to identify best-trajectories for needle insertion. Nearby

			anatomical variation will also be assessed.
Kacie Kidd	Pediatrics	Kacie.Kidd@hsc.wvu.edu	PRIDE CF: Concept Mapping Study This is a sub-study within the larger PRIDE CF Team Science Award from the Cystic Fibrosis Foundation aimed at understanding the unique health needs of LGBTQIA+ people living with cystic fibrosis. In this study, we will be broadly exploring the experiences of this population in an effort to better understand their needs and experiences.
Benoit Driesschaert	Pharmaceutical Sciences	benoit.driesschaert@hsc.wvu.edu	Development of organic radical contrast agents (ORCAs) for MRI
Alexey Ivanov	Biochemistry and Molecular Medicine	aivanov@hsc.wvu.edu	Regulation of intracellular innate immune response by ZNF71 in lung cancer. Lung cancer is the leading cause of cancer related deaths. Previously, we have identified several biomarkers, including transcription factor ZNF71, which can predict lung cancer patient response to chemotherapy. We have shown that overexpression of ZNF71 downregulates genes involved in the intracellular innate immune response. The goal of this

			project is to characterize the molecular function of ZNF71 in lung cancer cells. We aim to identify direct transcriptional targets of ZNF71 and its role in lung cancer progression.