

Medical students who have been newly accepted and have committed to our medical school have the opportunity to spend their summers as part of research projects. A group of faculty research mentors provides a range of research in which students can participate through the Medical Student Summer Research Program. The available research projects for the summer program are listed below. Summer projects are not limited to those below. If you have worked with research previously and have a project that can be completed in the allotted timeframe, those will also be considered.

Student Requirements

1. You must have been accepted by the Sanford School of Medicine and committed to attending to be considered for the program.
1. You will need to contact a mentor prior to applying to discuss the project.
2. You must be in contact with the mentor stating that you have committed to the project prior to submitting the application.

2024 Medical Student Summer Research Mentors

Mentor	Project Descriptions	Project Type & Location	Contact Information
Victor Huber PhD	Vaccines: The Huber lab is working toward an influenza vaccine that will simultaneously stimulate immune responses against influenza viruses that circulate in pigs and in humans. The goal of this vaccine effort would be to limit the interspecies transmission events that are often associated with influenza pandemics. One potential project in the lab would study the true breadth of vaccine-induced immunity that can be achieved with these vaccines.	Lee Med, Vermillion-in person	victor.huber@usd.edu P-605-658-6390
Victor Huber PhD	Super-infections: Influenza virus infections can turn deadly when they are complicated by secondary bacterial pneumonia. The Huber lab has recently identified influenza virus proteins that have the potential to modulate the severity of a bacterial superinfection. One project in the Huber lab would be toward defining the impact of these viral proteins on host immune responses within our super-infection model.	Lee Med, Vermillion-in person	victor.huber@usd.edu P-605-658-6391

<p>Victor Huber PhD</p>	<p>SARS-CoV-2: This project will evaluate the burden of SARS-CoV-2 infection in a susceptible host after natural infection, with emphasis on patients with cancer. Specifically, we will characterize the quality of the immune response in this compromised host population and the effect of COVID-19 on cancer biomarkers that can be detected in serum. Our efforts in SARS-CoV-2 research also include surveillance in primary swab samples and wastewater.</p>	<p>Lee Med, Vermillion- in person</p>	<p>victor.huber@usd.edu P-605-658-6392</p>
<p>Pilar de la Puente PhD</p>	<p>Role of Extracellular Matrix remodeling in ovarian cancer immune evasion High-grade serous carcinoma (HGSC) is the most common type of “ovarian” cancer and one of the deadliest forms of cancer in women. Unfortunately, more than 80% of patients either relapse or succumb to the disease as a result of aberrant extracellular matrix (ECM) production leading to chemotherapy resistance. ECM remodeling is a complex process involving changes in abundance, concentration, structure, and organization of individual ECM components. ECM-derived biochemical and biomechanical cues in tumors critically contribute to cancer cell’s ability to promote growth, resist treatment, avoid the immune system, and metastasize. While there is evidence that the stromal cells of the tumor microenvironment exclude T cells from the vicinity of cancer cells, little is known about the role of ECM remodeling in T cell exclusion and response to immunotherapy. We hypothesize ECM remodeling is a key contributor to immune evasion in HGSC. We</p>	<p>Sanford Research, Sioux Falls. In-person only</p>	<p>pilar.puente@sandfordhealth.org P-605-312-6042</p>

	<p>will use our previously reported 3D model, as well as other physiologically relevant preclinical models able to recapitulate key ECM remodeling contributions such as stiffness and ECM deposition in order to study the influence of ECM remodeling on immune infiltration and further identify if targeting ECM remodeling (pharmacologically) can overcome immune evasion and enhance immunotherapy efficacy. Students will learn tissue culture, tissue engineered techniques, imaging and flow cytometry, as well as data analysis.</p>		
<p>Pilar de la Puente PhD</p>	<p>Effects of aging in ovarian cancer immune remodeling High-grade serous carcinoma (HGSC) is the most common type of “ovarian” cancer and one of the deadliest forms of cancer in women. Unfortunately, more than 80% of patients either relapse or succumb to the disease as a result of aberrant extracellular matrix (ECM) production leading to chemotherapy resistance. Age is one of the main risk factors of cancer; and a reduced deposition of specific ECM components and an altered inflammatory response is linked with the aging process. In particular, the impact of age on systemic immunity and the tumor immune infiltrate should be considered, given the expanding role of immunotherapy in cancer treatment. Unfortunately, the interactions between cancer cells and immune cellular subsets and whether specific cancer diseases states such as advanced age influences ECM remodeling in HGSC, are not well defined. We hypothesize that immune subsets from</p>	<p>Sanford Research, Sioux Falls. In person only</p>	<p>pilar.puente@sandfordhealth.org P-605-312-6042</p>

	<p>older patients lead to reduced ECM remodeling and altered cytokine/chemokine response in HGSC patients. We will investigate ECM deposition and inflammatory response associated to immune aging in HGSC. Characterization of the pro-inflammatory mediators, as well as immune functionality in the context of age is critical for improving the outcomes of HGSC patients. Students will learn tissue culture, tissue engineered techniques, RNA extraction and sequencing, cytokine array, imaging and flow cytometry, as well as data analysis.</p>		
<p>Michelle Baack MD, PhD</p>	<p>Analyze and interpret single cell-RNA-sequencing data (genomic data) from rat embryos to understand how maternal high-fat diet and a periconceptual CoQ10 intervention changes gene expression at early developmental stages to influence multigenerational health.</p>	<p>Sanford Research Center Sioux Falls In-person only</p>	<p>michelle.baack@sanfordhealth.org</p>

<p>Michelle Baack MD, PhD</p>	<p>Analyze echocardiographic and ischemia/reperfusion histopathologic data to examine multigenerational effects of maternal high fat diet and diabetes on cardiac health of progeny (rat model).</p>	<p>Sanford Research Center Sioux Falls In-person only</p>	<p>michelle.baack@sanfordhealth.org</p>
<p>Michelle Baack MD, PhD</p>	<p>Examine human placenta and trophoblast cells to understand how maternal-placental-fetal interactions contribute to high-risk pregnancy and infant health outcomes (preterm birth, diabetic pregnancy, fetal overgrowth/undergrowth and essential fatty acid deficiency).</p>	<p>Sanford Research Center Sioux Falls In-person only</p>	<p>michelle.baack@sanfordhealth.org</p>
<p>Henry Travers MD</p>	<p>Historical Aspects of Disease. Drawing on internment records of the Mt. Pleasant Cemetery, this project uncovers the causes of death for over 4,000 citizens of Sioux Falls between 1880 and 1940. Unusual disease prevalence (e.g. myocarditis), common disease incidence (e.g. cancer), and unusual disease occurrence (e.g. summer complaint, Bright's disease, neurasthenia) are examined for their incidence, prevalence and effects on medical practice and community health. The research also encompasses historical disease management in comparison to modern times and the prior gaps in medical knowledge that supported contemporary management.</p>	<p>Variable, Sioux Falls In-person or Remote</p>	<p>Henry.Travers@usd.edu</p>

<p>Henry Travers MD</p>	<p>Religion and Medicine: The Middle Ages. Medicine, the most visible discipline of natural philosophy, was intertwined with theology from its beginnings. Christianity, in both its religious practice and its theology, became a transformative force in the Middle Ages. While both medicine and Christianity owed a formative debt to Aristotle, a core question was whether natural philosophy, including medicine, was the necessary “handmaiden” of theology. This became a more difficult question as both disciplines, particularly within universities, threw off the yoke of Aristotelian philosophy. Research will explore how the 1,200 year prelude to the Renaissance set the stage for the transformations of medicine and Christianity in the Enlightenment. This is one part of a larger project exploring religion and medicine from 500 BCE to the present.</p>	<p>Variable, Sioux Falls In-person or Remote</p>	<p>Henry.Travers@usd.edu</p>
<p>Henry Travers MD</p>	<p>Piltown Man. The hoax, begun in 1912, involved not only the “discoverer” of the fossil skull that was its basis (Charles Dawson), but the anatomist Sir Arthur Keith, theologian Pierre Teilhard de Chardin, and even Sir Arthur Conan Doyle. Keith, who, with Martin Flack, discovered the sinoatrial node of the cardiac conduction system, may have been fooled by his presumption of large-brained human ancestors. The suggestion, by Stephen Jay Gould, of Chardin’s culpability, has provoked considerable controversy. In this research, we examine the hoax to reassess in the involvement of Keith and Chardin.</p>	<p>Variable, Sioux Falls In-person or Remote</p>	<p>Henry.Travers@usd.edu</p>

Jose Pietri PhD	Several laboratory research projects are available. These are broadly focused on understanding the mechanisms by which cockroaches transmit human diarrheal pathogens such as Salmonella and E. coli as well as how cockroaches contribute to the evolution of virulence and antimicrobial resistance in these pathogens. Approaches to be used by the student include bacterial culture and antimicrobial susceptibility assays, quantitative RT-PCR analysis of gene expression, and high-throughput whole genome sequencing.	Lee Medical Building Vermillion SD In-person only	Jose.Pietri@usd.edu
Tomasz Stys MD	The aim of our research is to investigate the correlation of polygenic risk scores with various common types of cerebrovascular diseases in order to improve health risk assessments for our patients. Multiple different projects available.	Sanford Heart Hospital Sioux Falls SD In-person or remote	tomasz.stys@sanfordhealth.org
Keith Baumgarten MD	Determining Clinical Outcomes of Total Shoulder Arthroplasty	Orthopedic Institute- Sioux Falls SD In-person or remote	kbaumga@yahoo.com
Sue Benson-Davies PhD, DCN, MPH, RDN, LN, FAND	Metabolic/Bariatric Surgery & Body Composition	Rapid City SD In-person Only	susan.davies@usd.edu
Sue Benson-Davies PhD, DCN, MPH, RDN, LN, FAND	Metabolic/Bariatric Surgery & Indirect Calorimetry	Rapid City SD In-person Only	susan.davies@usd.edu

Chengetai Mahomva MD	Association of pesticide exposure and self-reported hay fever: a cross-sectional population-based study.	Avera- Sioux Falls SD Virtual/Remote	chengetai.mahomva@usd.edu
Indra Chandrasekar PhD	<p>Urinary uromodulin in diuretics treatment. Diuretics are widely prescribed medications for treatment of cardiovascular disease and hypertension. Adaptation of renal tubules in the kidney with prolonged diuretic treatment is known but there are no experimental procedures to detect this adaptation in patients. Based on data from our preclinical mouse model we hypothesize that urinary uromodulin (uUMOD) levels and glycosylation status can be used as a readout for renal tubular adaptation in the distal nephron and collecting duct. We propose to test the changes in UMOD levels in the urine and its glycosylation pattern in patients undergoing diuretic treatment. The clinical significance of this work is to provide experiment based understanding of how kidneys adapt to diuretic treatment (IRB approved project in collaboration with Dr. Ismail Omran, Sanford Nephrology Clinic).</p>	Chandrasekar Lab, Sanford Center, 2301 E 60 th Street North, Sioux Falls, SD In-Person Only	indra.chandrasekar@sanfordhealth.org
Indra Chandrasekar PhD	<p>Characterization of kidney sodium transporter(s) and epithelial sodium channel in diabetes and high fat exposed rat models and their offsprings.</p> <p>Dr. Michelle Baack's laboratory in Sanford Research studies the influence of maternal diabetes and high fat diet induced changes in cardiac function, mitochondrial dynamics in cardiomyocytes</p>	Chandrasekar Lab, Sanford Center, 2301 E 60 th Street North, Sioux Falls, SD In-Person Only	indra.chandrasekar@sanfordhealth.org

	<p>in the offspring using rat models. Kidney epithelial cells that regulate ion transport have dynamic mitochondria that are essential for its function. We hypothesize that there are changes in expression of sodium transporter(s) and channels in the kidney epithelium in diabetic mothers with high-fat diet as well as their offspring. We will characterize the expression and localization pattern(s) of major sodium transporters such as NHE3, SGLT2, NKCC2, NCC and epithelial sodium channel (ENaC) in the kidneys of these models compared to controls using immunostaining methods.</p>		
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple mentors for each project</p>	<p>Retrospective analysis of data from the Avera Sequencing and Analytics (ASAP) Protocol- The ASAP study, which started with a soft launch in November 2021, will enroll up to 3,000 patients a year, including those with cancer and those at risk for developing cancer. Study participants will receive genomic sequencing of their tumor and hereditary cancer and pharmacogenomics testing to identify targeted, personalized treatment options. Avera will then utilize this clinical and genomic data to improve the understanding of the molecular characteristics in all stages of cancer patients to advance precision oncology treatment. Opportunities to present and publish the work based upon effort and time involved.</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple</p>	<p>Outcomes for patients with TP53 alterations that have received therapy with a VEGF or VEGFR inhibitor</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>

physician mentors for each project			
Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project	Evaluation of patients with HER2 low in diseases other than breast cancer using proteomics and NGS / IHC	Avera Cancer Institute- Sioux Falls SD In-person or Hybrid	casey.williams@avera.org
Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project	Evaluation of molecular signatures in patients that received dual checkpoint inhibitors and assessing differences between responders and non-responders	Avera Cancer Institute- Sioux Falls SD In-person or Hybrid	casey.williams@avera.org
Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project	Assessment of patients with FGFR alterations that received lenvatinib for treatment	Avera Cancer Institute- Sioux Falls SD In-person or Hybrid	casey.williams@avera.org
Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project	Evaluation of proteomics in SCCHN and/or gynecologic malignancies and correlation with DNA/RNA and treatment outcomes	Avera Cancer Institute- Sioux Falls SD In-person or Hybrid	casey.williams@avera.org

<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project</p>	<p>IO response and immune markers/MHC</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project</p>	<p>Taxane resistance / PIK3</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project</p>	<p>risk assessment of Mosaiq for patient safety- top 3 risk of the EMR</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician mentors for each project</p>	<p>Breast program - compile CESM data</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>
<p>Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple physician</p>	<p>Cost-effectiveness and quality related to cancer services</p>	<p>Avera Cancer Institute- Sioux Falls SD In-person or Hybrid</p>	<p>casey.williams@avera.org</p>

mentors for each project			
Casey Williams Pharm.D., MBA, BCOP, FHOPA *Multiple Physician mentors for each project	"Develop longitudinal research project with a mentor that may extend beyond summer 2024 Options include developing an investigator-initiated clinical trial, retrospective real world data review, and/or working on a current ongoing project"	Avera Cancer Institute- Sioux Falls SD In-person or Hybrid	casey.williams@avera.org
Nathan Skelley MD	"3-D printing in Orthopedics- We have projects related to a 3-D printed external fixator for fracture care."	Sanford Orthopedics & Sports Medicine In-person Only	Nathan.Skelley@sanfordhealth.org
Nathan Skelley MD	3-D printing in Orthopedics- virtual remote surgery applications we will be studying this summer.	Sanford Orthopedics & Sports Medicine In-person Only	Nathan.Skelley@sanfordhealth.org
Nathan Skelley MD	3-D printing in Orthopedics- trying to set up a new 3D printer for anatomic model creation.	Sanford Orthopedics & Sports Medicine In-person Only	Nathan.Skelley@sanfordhealth.org
Kevin Francis PhD	Determine how cholesterol metabolism regulates stem cell fate and functionality. Cholesterol metabolism varies greatly across species and between cell types, resulting in varied responses to changes in cholesterol homeostasis and causing a class of pediatric disorders. However, how cholesterol	Sanford Research Center- Sioux Falls In-person only	kevin.francis@sanfordhealth.org

	<p>metabolism affects stem cell function and differentiation is unclear. Using in vitro stem cell culture methods, gene expression, biochemical analyses, and fluorescent imaging of differentiating neural cell types, we are seeking to define how changes in cholesterol homeostasis and similar metabolites regulate cellular phenotypes and function. We believe these studies will allow us to identify susceptible cell types and signaling pathways which lead to functional, clinical deficits in pediatric disease.</p>		
<p>Kevin Francis PhD</p>	<p>Define how changes in cell metabolism impact expression and localization of responsive proteins. We are interested in how lipid metabolism and expression of lipid classes are temporally and spatially regulated during human stem cell differentiation. We have used lipidomics to create a detailed catalog of lipid species expression as stem cells transition to mature cell types found within the brain. We now want to delineate the requirement for lipid pathways of interest as cells transition between developmental stages, similar to previous analyses of gene and protein expression changes during development. These projects will utilize techniques including CRISPR/Cas9 gene editing, stem cell differentiation methods, molecular biology, cell biology, and biochemistry.</p>	<p>Sanford Research Center- Sioux Falls In-person only</p>	<p>kevin.francis@sanfordhealth.org</p>
<p>Kevin Francis PhD</p>	<p>Determine the impact of lipid homeostasis on cellular transport mechanisms and signaling. Recent work from our lab has determined that membrane lipid biochemistry which is associated with rare human</p>	<p>Sanford Research Center- Sioux Falls In-person only</p>	<p>kevin.francis@sanfordhealth.org</p>

	<p>diseases dramatically alters the uptake and excretion of molecules via membrane-associated vesicle transport. We believe these defects are due to structural changes to membrane function and are critical contributors to functional deficits found in patients. Using super resolution microscopic analysis, cell culture, and biochemical studies, we will define the mechanisms whereby patient-associated lipid changes leads to impaired cellular transport and tissue dysfunction.</p>		
<p>Jianning Tao PhD</p>	<p>Cancer research - focusing on the pathogenesis and treatment of osteosarcoma, rhabdomyosarcoma, breast cancer, and leukemia.1. In person project – This is a cell model-based project to examine the in vitro effects of targeting NOTCH1-RBPJ interaction using a small molecule inhibitor of RBPJ (RIN1) against human osteosarcoma cells. The effects of the drugs on cellular functions such as cell proliferation, osteoblast differentiation, and target gene expression will be examined. The project was conducted by a former SPUR summer student using a cell line. Data summary/abstract has been published in Cancer Res, 15 June 2022, Volume 82, Issue 12_Supplement, 6308. Complementary studies using another cell line are required to complete the project.</p>	<p>Sanford Research Center-Sioux Falls SD In-person or remote</p>	<p>Jianning.Tao@Sanfordhealth.org</p>
<p>Jianning Tao PhD</p>	<p>Congenital diseases - focusing on the study of the genetic causes and treatment of congenital kyphosis.2. Remote project – This is a bioinformatics-based project designed to examine a mutation landscape of a human patient-derived xenograft cell line (termed</p>	<p>Sanford Research Center-Sioux Falls SD In-person or remote</p>	<p>Jianning.Tao@Sanfordhealth.org</p>

	<p>COS-33) that was generated and published in my laboratory. My laboratory performed whole-genome sequencing using genomic DNA from COS-33. The raw data has undergone preliminary processing. Completing the project requires completing the remaining genomic analysis of the cell line and comparing the results with currently published data. Applicants need to have the drive and desire to complete this program. This project will be completed together with our current bioinformatics collaborators.</p>		
<p>Lisa MacFadden PhD</p>	<p>Biomechanics Data Analysis- Data analysis using already collected data from baseball, golf, ACL, and other research studies to assess biomechanical trends in movement in young athletes and their relationship to injury or sports performance outcomes. We have collected movements from hundreds of athletes through different prospective research protocols. The project may also include prospective data collection during the Summer of 2024 in Sioux Falls or Vermillion.</p>	<p>USD Gear Center, Sioux Falls SD In-person or remote</p>	<p>lisa.macfadden@usd.edu</p>
<p>Lisa MacFadden PhD</p>	<p>3D printing for medical education -3D printing has emerged as a pivotal tool for medical education and communication. This research project will focus on the development and effectiveness of leveraging 3D printing as a tool for medical education. Educational modules or courses will be developed along with 3D models of human anatomy and disease for medical education and provided to medical students. Surveys will be used to assess the effectiveness of 3D printing to</p>	<p>USD Gear Center, Sioux Falls SD In-person or remote</p>	<p>lisa.macfadden@usd.edu</p>

	augment medical education.		
Lisa MacFadden PhD	<p>Development of tools for quantifying human movement using artificial intelligence. Students do not need programming experience to work on this project. This project aims to improve biomechanical assessments in clinical settings by addressing limitations of current motion capture technology, such as high costs and space requirements. We are leveraging wide field-of-view cameras and artificial intelligence in computer vision and data science to quantify human movement in close proximity without the subject wearing markers or sensors. The ultimate goal is to create a fully functional treadmill prototype integrated with markerless motion capture technology, facilitating natural subject movements for broader clinical adoption.</p>	<p>USD Gear Center, Sioux Falls SD In-person or remote</p>	<p>lisa.macfadden@usd.edu</p>
Denise Arrick	<p>Hyperostosis Cranialis Interna (HCI) is a bone disorder is characterized by multiple nodules along the lamina of the calvaria and the skull base. It typical occurs and can be observed in the frontal bone. We have a rare case of severe HCI that has developed on the entire of the calvaria in a cadavear. We aim to study this unique and rare case of HCI by studying the impacts on the skull and the brain. Etiology is unknown and though, is a common finding of the frontal lobe, it is rare to observe the severity of the entire skull. The overgrowth of skull can potential affect</p>	<p>USD SSOM Vermillion Campus, Settles Gross Anatomy Lab In-person or remote</p>	<p>Denise.Arrick@usd.edu</p>

	<p>brain development, neurological development, entrapment, dysfunction of cranial nerves and musculoskeletal deformities.</p> <p>The cadavear has various other pathologies that could be associated with the HCI that have not been described by literature. Research on this case could provide further insight of the effects of HCI.</p> <p>This project will be a long term study as we aim to investigate the frequency of HCI among cadavears and discuss clinical implications.</p>		
Thayne Munce PhD	<p>The primary focus of my lab's research is studying brain health in contact sports athletes. This includes investigations of concussion and repetitive head impacts in various athletic populations. The student(s) will work with the PI to generate research questions pertaining to existing data on head impact exposure and neurologic function of contact sport athletes (e.g., youth football players). The student(s) will take the lead on analyzing data and developing a manuscript that can be submitted to a scientific journal. Additional opportunities for hands-on data collection and manuscript co-authorship may be available.</p>	<p>Sanford Sports Center and Sanford Center- Sioux Falls SD</p> <p>In-person or remote</p>	<p>thayne.munce@sanfordhealth.org</p>
Alexander Kloth PhD	<p>Neurodevelopmental disorders (NDDs)- neuropsychiatric diseases that include autism spectrum disorders (ASD) and intellectual disability-related rare disorders-constitute a tremendous burden on patients, their families, and society as a whole. To understand the mechanisms underlying NDDs and to develop effective treatments, neuroscientists are developing mouse models of</p>	<p>Augustana University, Sioux Falls SD</p> <p>In-person Only</p>	<p>akloth@augie.edu</p>

	<p>the factors that lead to impaired early-life brain development. My research uses these mouse models to address broad themes-the identification of biomarkers and the assessment of potential new therapies-at the intersection of behavioral testing and neurobiological investigation of observed behavioral deficits. 1. This summer, we will be performing work that follows up on a previous project demonstrating that a neurogenic and neurotropic compound known as carbamoylated erythropoietin (CEPO) can rescue social behavioral deficits related to autism spectrum disorders. Using juvenile female BALB/c mice, we will document the behavioral effects of semichronic CEPO injection and harvest brain tissue for future processing and compare these effects to two different control groups. Prior experience with rodent animal husbandry and animal behavior required.</p>		
<p>Barrett Eichler PhD</p>	<p>Synthesis of antimicrobial compounds-Infectious diseases are one of the top five health challenges facing humanity. Novel antimicrobial compounds are always needed to kill bacteria and yeast on surfaces and in solutions. Many antiseptic compounds are known as quaternary ammonium compounds (QAC). QACs work by disrupting the cell membranes of bacteria and yeast.</p> <p>In 2023, we began to make QACs using click chemistry. We used symmetric diarylacetylenes, when combined with click chemistry, will be used to make antimicrobial compounds with 1,2,3-</p>	<p>Augustana University, Sioux Falls SD In-person only</p>	<p>barrett.eichler@augie.edu</p>

	triazolium moieties, which are QACs. These compounds will be tested using assays to determine their antibiotic properties versus gram-positive bacteria, gram-negative bacteria, and yeast.		
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