2016 Summer Research Program Mentors and Project Descriptions

Mentor: Dr. Gaya Amarasinghe

Student Level: Undergraduate, graduate and medical

Required Skills: Lab experience. biochemistry background preferred!

Project Description: Interferon (IFN) production and signaling control cellular processes that determine the outcome of viral infections. We are interested in biochemical and structural studies of host viral interactions that control host IFN responses.
Location: St. Louis

Learning Experience: basic biochemical skills to characterize hostviral interactions that control viruses that cause public health concerns.

Mentor: Dr. Ana Maria Arbelaez

Student Level: Graduate and medical

Required Skills: Proficient in Spanish to communicate with patients and staff. Self motivation. High level of responsibility. Strong communication skills. Experience with data Entry and Microsoft office. Knowledge on fundaments of good clinical research practices.

Project Description: This investigation seeks to define the adverse consequences of chronic malnutrition on brain structure, function and cognitive performance during middle childhood. To achieve these goals, children with and without chronic malnutrition will undergo multimodality neuroimaging and standardized neuropsychological assessments. The study will be conducted in Cali, Colombia.
Location: Cali, Colombia South America

Learning Experience: Learn how to conduct a clinical research project. Obtain experience with data entry and management (RedCap). Gain exposure on how to administer a variety of different cognitive tests, or do brain MRI's in children, or diffuse optical tomography in children, or process MRI data.

Mentor: Dr. Joaquin Barnoya

Student Level: Medical

Required Skills: data collection and analysis, results presentations (e.g, posters), manuscript writing,

Project Description: The student will design its own research to be implemented over his time in Guatemala. If required, heshe could work with a dyad in Guatemala. These projects have to be focused on chronic diseases (cancer or cardiovascular diseases) or congenital heart disease. Tobacco and nutrition, as the leading risk factors, are of particular interest. We have some ongoing projects on those some topics that could be discussed with the applicant.
Location: Guatemala

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Learning Experience: The student will acquire skills on protocol writing, IRB approval, data collection, entry and analysisl. In addition, mentoring will be provided on manuscript writing and knowledge translation. The student will have the opportunity to work with other students in Guatemala.

Mentor: Drs. Arbi Ben Abdallah, Thomas Cox, Anshuman Sharma

Student Level: Undergraduate, graduate and medical

Required Skills: Communication, writing skills and some basic data analysis experience.

Project Description: Patient expectations as a predictor of outcome satisfaction: Retrospective data.
Location: St. Louis

Project 2 Description: OSA, obesity and persistence pain after surgery: Retrospective data.
Location: St. Louis

Learning Experience: Student(s) will learn 1) how to combine EMR & survey data, 2) how to design a research study using retrospective data, and 3) how to present and write the findings of a research study.

Mentor: Dr. Pratim Biswas

Student Level: Undergraduate, graduate and medical

Required Skills: Some lab experience and data analysis experience.

Project Description: Distribution of wireless particulate matter sensors and correlating to health impacts.
Location: St. Louis

Project 2: Nanoparticle synthesis for nanomedicine applications.
Location: St. Louis

Learning Experience: Learn about health impacts of aerosols; synthesis and tailor made nanomaterials for drug delivery applications.

Mentor: Dr. Jacco Boon

Student Level: Undergraduate, graduate and medical

Required Skills: Lab experience is preferred but not necessary.

Project Description: Determine how the human protein SAMD9L restricts influenza virus infection. Perform interface mapping to identify which domain and residue is

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important for restricting virus infection.
Location: St. Louis

Project 2 Description: Perform genetic analysis on IFI35 to determine how it stimulates the innate immune response to pathogens. Ectopically express full-length and truncated versions of IFI35 protein and analyze intracellular localization and induction of innate immunity.
Location: St. Louis

Learning Experience: Influenza disease, influenza virus and host-pathogen interactions. Laboratory skills, molecular biology, virology.

Mentor: Dr. David Brown

Project: The Atahualpa Project is an ongoing population-based cohort study designed to reduce the increasing burden of non-communicable diseases in rural Ecuador. Atahualpa was selected as a village representative of the region. As detailed elsewhere, more than 95% of the population belong to the Native/Mestizo ethnic group (Amerindians) and their living characteristics are homogeneous. The idea is to conduct follow-up Ankle-Branchial Index (ABI) exams in the population aged ≥60 years to assess disease progression and correlation with stroke and ischemic heart disease. All persons to be investigated were screened one year ago.
Location: Ecuador

Required Skills: Students should be familiar with ABI (ankle-brachial index) determinations and EKG recordings. Fluency in Spanish.

Student Level: Medical student

Learning Experience: This research training will familiarize the students with the general principles and conduct of an epidemiologic study. It will teach them how to perform several useful medical tests on patients. In addition, the students will experience the relation between culture and disease in a very different society than the United States.

Mentor: Dr. Heather Corcoran

Student Level: Undergraduate and graduate

Required Skills: Visual design experience, with emphasis in information design; knowledge of the Adobe Suite software package, as well as HTML or other web development platform; knowledge of design practice/methods; interest in public health projects (background, if possible).
Project Description: In this two-part project, Heather Corcoran and team will survey and map university projects in public health, evaluating factors including area of health/content, existing partners, funding sources, connections to intended audiences, potential for visualization, challenges, etc. The goal is to understand the landscape of projects and to position visual design/design practice as a contributor to innovative results. Project outcomes will be shared across the university and beyond.
Location: St. Louis

Learning Experience: Students will learn to conduct design-centric research. They will learn about a wide variety of projects in public health at a high level. They will

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acquire or improve visual mapping and information design skills, as well as gain experience in using technology to support data visualization.

Mentor: Dr. Bettina Drake

Student Level: Graduate and medical

Required Skills: Literature review, manuscript preparation, data entry

Project Description: Our team focuses on prostate cancer research including community-based evaluation of outreach events and epidemiological investigations using a prospective prostate cancer cohort. The project may include attending prostate cancer community outreach events, collecting and entering evaluation data. In addition, the student may work on a number of ongoing prostate cancer epidemiology research papers from our prospective cohort on predictors of prostate cancer recurrence.
Location: St. Louis

Learning Experience: Community-engagement, data entry and analysis and manuscript preparation.

Mentor: Dr. Alexis Duncan

Student Level: Graduate

Required Skills: At minimum, students should have passed a graduate-level course in biostatistics and have experience using a statistical software package, such as SPSS, SAS, Stata or R.

Project Description: Disordered eating and problem substance use frequently co-occur. Despite the fact that obesity is also strongly associated with certain forms of disordered eating, the relationship between obesity and problem substance use is complex. The objective of this project will be to explore interrelationships between disordered eating, obesity and substance use in data from a community sample of adolescents and young adults.
Location: St. Louis

Project 2 Description: Results from epidemiologic research have often shown differences in the prevalence of eating disorder diagnoses by gender, race/ethnicity, and sexual orientation; however, the reasons for these differences have yet to be identified. For project we will seek to uncover potential explanations for these differences by analyzing data on eating disorders at the symptom - rather than the diagnostic - level using data from a community sample of adolescents and young adults.
Location: St. Louis

Learning Experience: During this summer training experience, the student will learn how to critically evaluate scientific literature , perform multivariable analysis using SAS and/or Stata, and present their research findings.

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Mentor: Dr. Bradley Evanoff

Student Level: Graduate and medical

Required Skills: Should be proficient in spoken English, interact well with blue-collar workers, and be personable. Prior data analysis experience is preferred, but not necessary.

Project Description: Assist with field-based data collection on injuries and safety programs of construction companies. Duties would include collecting data at construction sites including daily records of job tasks, worker surveys and interviews, and other documents of safety training and worksite audits. Students may have the opportunity to conduct qualitative and quantitative data analyses.
Location: St. Louis

Project 2 Description: Collect and analyze data to assess outcomes of a workplace participatory health promotion intervention. Duties would include collecting surveys and conducting interviews with grocery store workers at their worksite. Students will have the opportunity to conduct qualitative and quantitative data analyses using the data they collect.
Location: St. Louis
Learning Experience: Students will learn skills and procedures in data collection, field research, data coding, quantitative and qualitative data analysis, and workplace health and safety.

Mentor: Dr. Mario Feldman

Student Level: Undergraduate, graduate and medical

Required Skills: good knowledge of molecular biology techniques and basic knowledge of bacterial pathogenesis

Project Description: Many Acinetobacter species have emerged as significant human pathogens due mainly to the rapid emergence of multi-drug resistant (MDR) phenotypes. As such we are interested in understanding the mechanisms these pathogens use to cause human disease with the ultimately goal of generating novel treatments.
Location: St. Louis

Learning Experience: This project will require a student to learn to construct mutants in Acinetobacter species, utilize different cloning techniques, develop and master protein techniques such as SDS-PAGE and western blot.

Mentor: Dr. James Fleckenstein

Student Level: Undergraduate, graduate and medical

Required Skills: ability to interact with others only prerequisite

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Project Description: Our laboratory works on basic molecular pathogenesis of enterotoxigenic E. coli an important cause of diarrheal illness in developing countries to inform development of future generations of vaccines. We work closely with a large group of investigators in Bangladesh, elsewhere in translating our discoveries into practical applications in vaccine development. Projects suitable for students are available on multiple fronts ranging from basic pathogenesis to immune profiling of vaccine candidates.
Location: St. Louis

Learning Experience: Depending on the project, students can learn about the impact of diarrheal illness in developing countries, basic cloning, microbial genetics, or immunologic assessment of vaccines.

Mentor: Dr. Jeff Gill

Student Level: Undergraduate, graduate and medical

Required Skills: Data analysis. Programming. Basic statistics.

Project Description: Analyzing data from a study of the effect of chronodisruption on preterm birth. Data are: biomarkers, accelerometer output, survey responses, and qualitative responses. We are enrolling 1,000 St. Louis women in a study funded by the March of Dimes.
Location: St. Louis

Learning Experience: How to analyze and present a wide range of data from an important study.

Mentor: Dr. Daniel Goldberg

Student Level: Undergraduate, graduate and medical

Required Skills: Prior molecular biology lab experience

Project Description: The malaria parasite *Plasmodium falciparum* exports hundreds of proteins into the host red blood cell. By doing so, it totally transmogrifies the red cell. We are interested in understanding the function of these exported effector proteins. We will do knockouts and knockdowns of exported protein genes.
Location: St. Louis

Learning Experience: The student will learn about malaria, biology, molecular approaches and scientific method.

Mentor: Dr. Lori Holtz

Student Level: Graduate and medical

Required Skills: lab experience, data analysis

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Project Description: Our lab focuses on disorders of the developing childhood gut and employs metagenomics, virology, and epidemiology to begin to define the stool virome in health and disease. We are currently focused on diarrhea and environmental enteropathy, two disorders that negatively impact much of the developing world's children. This project would be to define the prevalence of specific viruses in stools from children with diarrhea using PCR.
Location: St. Louis

Learning Experience: The student will learn how to develop and validate PCR assays for known and novel viruses. They will also learn cloning, sequencing, and sequence analysis.

Mentor: Dr. Shabaana Khader

Student Level: Graduate

Required Skills: Lab experience
Project Description: Recent work from my lab has demonstrated that different strains of Mycobacteria in vivo induce different levels of cytokines in antigen presenting cells (APCs) and drive differing T cell responses. Thus during this training, the student will characterize the differences in cytokine production by APCs by treating lung DCs with heat killed Mycobacteria from differing strains and study their ability to drive T cell responses.
Location: St. Louis

Learning Experience: The student will learn to isolate lung DCs, isolate T cells and coculture them together to study T cell response using techniques such as ELISAs and flow cytometry.

Mentor: Dr. John Kirby

Student Level: Graduate and medical

Required Skills: Maturity to use the time reviewing clinical database informatics well as we move toward focused publised articles well.

Project Description: Clinical comparative effectiveness research Clinical process improvements Both of these targets to tie into both the Clinical Safety Quality Improvement Projects and the Population Based Health Informatics within the Department of Surgery. Students interested in pursuing the newly created MS in Pop Health Sciences or the MS via the CSTP programs would be ideal candidates to see how a project could begin now to be expanded over time with their training, particularly for budding surgeons.
Location: St. Louis

Project 2 Description: Second is same as the first. Both students would be encouraged to submit their work through the Missouri Chapter of the American College of Surgeons to be presented in June 2016--if inclusion on this year's timeline possible or in June 2017 if not.
Location: St. Louis

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Learning Experience: Fundamentals of how clinical research projects contribute the career education and development of academic ACCS surgeons.

Mentor: Dr. Ira Kodner

Student Level: Graduate and medical

Required Skills: Selecting and investigating a medical, ethical challenge and preparing a manuscript for publication in a medical journal.

Project Description: see above
Location: St. Louis

Learning Experience: Learn basic principles of medical ethics and how the apply to real-life medical challengess

Mentor: Dr. Sebla Kutluay

Student Level: Graduate and medical

Required Skills: Some lab experience.

Project Description: Alternative splicing of HIV-1 pre-mRNAs generates over 100 mRNA species in infected cells. This process regulates transcript abundance, increases the coding potential of the viral genome and allows temporal regulation of viral gene expression. Using next-generation sequencing-based methodologies and complementary biochemical approaches, we propose to elucidate the molecular mechanisms that regulate this key process in HIV-1 replication.
Location: St. Louis

Project 2 Description: Recent evidence suggests that HIV-1 Integrase has a separate key role during particle assembly and maturation, likely involving its binding to RNA molecules of unknown identity. This process can be blocked by an emerging class of compounds, which lead to defects in particle maturation. Our goal is to understand the mechanism of action of these drugs, which may provide the basis for future antiretroviral therapies.
Location: St. Louis

Project 3 Description: Although a handful of interferon-inducible host factors that limit HIV-1 replication and their viral antagonists have been identified over the past decade, several lines of evidence indicate that these factors collectively cannot account for the effects of interferon on HIV-1 replication. Our goal is to employ next-generation sequencing-based methodologies to identify novel antiviral host factors and elucidate their mechanisms of action.
Location: St. Louis

Learning Experience: The student will learn various cutting-edge next-generation sequencing-based methodologies and will get familiar with general virology, molecular biology and biochemistry techniques.

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Mentor: Dr. Timothy McBride

Student Level: Graduate and medical

Required Skills: It would be best if the student and has some data and analysis skills. And some experience or interest in China.

Project Description: This project focuses on the global burden of population aging, a Cross-National project to explore simulation policy-relevant models in China and the U.S.
Location: St. Louis
Learning Experience: Simulation methods, global health policy comparisons, about health system reform in China and the U.S.

Mentor: Dr. Amy McQueen

Student Level: Undergraduate, graduate and medical

Required Skills: I can tailor the responsibilities for any level of experience I think. Ideally though, some research methods and statistics coursework is preferred. A med student may have more value to me for this.

Project Description: Physicians will be recruited to complete an online survey to assess consensus on the contraindications and cautions to the use of 7 FDA-approved pharmacologic cessation aids among smokers trying to quit. Tasks: Manage the online survey recruitment, reminders and completion rates and basic analyses.
Location: St. Louis
Learning Experience: Survey design, sampling and recruitment, data analysis, reporting research results in tables and text, comparing results to scantmixed literature. Hands-on experience with online survey program.

Mentor: Dr. Jason Mills

Student Level: Undergraduate, graduate and medical

Required Skills: wet lab experience

Project Description: We work on gastric cancer, one of the top 3 cancer killers worldwide, in particular because patients in East Asia and CentraLatin America are susceptible. Susceptibility depends largely on the stomachs reaction to the bacterium Helicobacter pylori, with different H pylori strains in different parts of the world causing the increased cancer risk. We are examining the molecular interactions among the bacteria, stem cells, and mature cells that can be reprogrammed into future cancer cells.
Location: St. Louis

Learning Experience: Interactions between this globally diverse pathogen (we have samples from patients we have collected in Korea, Nicragua and here int he US) and gastric cells in mouse models, human tissues, and in 3-D stomach cultures grown from human and mouse tissues, so bacteriology, cell culture, histopathology.

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Mentor: Dr. Rob Mitra

Student Level: Graduate and medical

Required Skills: Programming in Python, Lab experience

Project Description: There is still a great deal to learn about the design principles that guide vertebrate development. Since all cells in an organism contain the same genes, transcribing different sets of genes is what confers a cell's specialized role. Which genes get turned on or off to create a particular cell type at the right time, in the right place during the development of an organism? This is one of the pivotal questions in developmental biology. We have developed a technology, Transposon "Calling Cards" that will help answer this question, and we are using this technology to understand the development of the nervous system.
Location: St. Louis

Learning Experience: Computational Biology, Molecular Biology

Mentor: Dr. Nancy Morrow-Howell

Student Level: Undergraduate and graduate

Required Skills: Interested applicants should have strong verbal, written, organizational skills as well as an interest in aging. Previous experience with qualitative or quantitative research is preferred, but not required. A valid driver license and car is preferred, but not necessary.

Project Description: Our summer experience will provide an opportunity to work with one of two projects: 1) a qualitative study on the civic engagement of older adults in a St. Louis community; 2) development of a training strategy for professionals in settings outside of health and social services who work with older clients. Applicants do not need to have prior experience in aging, but must have an interest in exploring issues relevant for older adults and aging societies.
Location: St. Louis

Learning Experience: The selected summer program participant will receive faculty mentorship, an introduction to community-based aging services, further development of research skills, as well as skills in translating data and information for various audiences.

Mentor: Dr. Diana Parra Perez

Student Level: Graduate

Required Skills: Data analysis either SPSS, STATA or SAS, Arc View GIS , and good writting and abstraction skills

Project Description: The public network of bicycle paths in Bogota Colombia has approximately 376 kilometers of bicycle paths distributed throughout the city. The program has contributed to increase and facilitate bicycle use in the city, but there are some concerns regarding disparities in the design and distribution of the routes, this project assess if distribution and design of a citywide bicycle path network differs by SES.

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Location: St. Louis

Learning Experience: Learn about physical activity and replation to built environment in a city from Latin America and how that can potentially have an impact on health outcomes.

Mentor: Dr. Rupa Patel

Student Level: Graduate and medical

Required Skills: Preferably experiences or skills include data analysis experience or related coursework. Coursework would be related to biostatistics.

Project Description: The project will be related to biomedical HIV prevention known as PrEP among sexual minorities. The intern will shadow the PrEP clinic twice to see the real world use. After that, the intern will work on a dataset related to the clinic and help clean and organize the data for chi square and regression statistics in SPSS or a software of their choice. Current projects look at looking at cost, insurance status, and medication adherence.
Location: St. Louis

Learning Experience: The intern will learn the intersection of public health, community health, HIV prevention, and clinical medicine. Heshe will have exposure to patient care.

Mentor: Dr. David Patterson

Student Level: Undergraduate and graduate

Required Skills: data analysis, lit review, manuscript development, if possible
Project Description: The student will work within Community-Academic Partnership on Addiction (CAPA). There are opportunities to develop a small targeted survey-based study or use our existing data to develop research questions, analyze data and submit a product (manuscript or conference paperposter.
Location: St. Louis

Learning Experience: The student will hopefully learn how to work within a research and community-based organization team, how to develop and analyze data and how to transfer those efforts into a peer-reviewed product.

Mentor: Dr. Mary Politi

Student Level: Undergraduate, graduate and medical

Required Skills: strong communication skills, understanding of the needs of underserved populations

Project Description: We will be collecting stakeholders' feedback on likelihood of adoption and implementation of a decision support tool about health insurance in the ACA marketplace. We will used mixed methods (quantitative and qualitative) to explore implementation outcomes. The student can be involved in either helping to

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analyze data from a randomized trial of the health insurance decision tool, or get experience with qualitative methods through conducting and analyzing interview data, depending on interest.
Location: St. Louis

Learning Experience: Understanding of shared decision making, health communication research, vulnerable populations, familiarity with mixed methods approaches to data collection, knowledge of health insurance.

Mentor: Dr. Rumi Price

Student Level: Undergraduate, graduate and medical

Required Skills: Data analysis experience would be preferable but not a requirement. Technology products and pipeline familiarity, clinical field experience would be preferable.

Project Description: A cluster of related studies and projects on human trafficking 1. Human trafficking in the St. Louis region (epidemiological and clinical) 2. Global labor trafficking exploratory work. 3. Koinonia Home social entrepreneur project - technology and product driven project to assist survivors of human trafficking surviors.
Location: St. Louis, with potential collaboration with sites outside St. Louis or a foreign country

Project 2 Description: Posttraumatic stress disorder (PTSD) and substance abuse and other psychiatric phenotypes among veterans and military personnel 1. Wrist- and smartphone-based monitoring and intervention of PTSD symptom triggers. 2. Data analysis of existing studies
Location: St. Louis

Learning Experience: Hands-on training on public health research; how to do psychiatric instrumentation; learn to work with scholars outside psychiatry (biomedical engineering, social work); learn new analytical skills.

Mentor: Dr. Laura Schuettpelz

Student Level: Undergraduate, graduate and medical

Required Skills: basic lab experience helpful

Project Description: The student would work on a project looking at the effects of infammatory signals on hematopoietic stem cells in mouse models. Heshe would learn basic cell and molecular biology assays, flow cytometry, and others.
Location: St. Louis

Learning Experience: basic bench techniques in cell and molecular biology (PCR, cell culture, etc) and flow cytometry, cell sorting, and analysis of hematopoiesis using mouse models.

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Mentor(s): Drs. Anshuman Sharma, Arbi Ben Abdallah and Thomas Cox

Student Level: Graduate and medical

Required Skills: Data analysis - also should have good scientific writing skills

Project Description: Comparison of acceptability of patient safety checklists in the OR across different cultures
Location: St. Louis

Mentor: Dr. Haina Shin

Student Level: Undergraduate, graduate and medical

Required Skills: basic bench skills (ie pipetting), basic familiarity with techniques such as qPCR and flow cytometry and subsequent data analysis

Project Description: "Prime and pull" is a vaccine against genital herpes that recruits and establishes a population of tissue-resident memory CD8 T cells (CD8 TRM) in the female genital tract. CD8 TRMs are important for protection against infection with herpes simplex virus, but the mechanism by which they are recruited is unknown. This project would determine whether vaccination induces production of chemoattractants from the genital tract and their role in T cell recruitment.
Location: St. Louis

Learning Experience: The student will gain understanding of the cues that are important for T cell recruitment to mucosal tissues. They will learn and apply molecular techniques such as RNA isolation, primer design and qPCR as well as in vitro migration assays.

Mentor: Dr. Laurence Sibley

Student Level: Undergraduate, graduate and medical

Required Skills: Some experience with PCR, gel electrophoresis, cloning would be useful, but we can teach most of these skills

Project Description: Developing new diagnostic methods for decting infection with Toxoplasma gondii. Project will focus on cloning, expression and purification of candidate anigens, defining antigenic epitopes and testing reactivity.
Location: St. Louis

Learning Experience: Protein expression and purification techniques, computational skills with protien analysis and epitope mapping

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Mentor: Dr. Susan Stark

Student Level: Masters (MPH, MSW, MPHS), Medical student

Required Skills: Ability to visit community (having a car is helpful)
Project Description 1: Keywords: Community, older adults, medication adherence, environmental barriers
Community-dwelling adults over 65 years old disproportionately consume 30% of the nation's medications in order to cure or manage acute and chronic disease, extend life-expectancy, and to improve quality of life. The ability to live independently in the community is dependent on medication adherence. Non-adherence to medication routines can result in serious, preventable health consequences. Students will be engaged in an ongoing study of the barriers to medication adherence for frail, underserved older adult with multiple chronic conditions. The objectives of the study are to 1) determine if older adults are taking inappropriate medications and 2) identify the barriers to medication adherence. Students will participate in prospective data collection in the homes of older adults. They will be trained to administer assessments in the field and will work with occupational therapists to deliver interventions to reduce barriers to medication adherence.

Project Description 2: Keywords: Older adults, falls, environmental barriers, home hazards
Falls remain the leading cause of injury, long-term disability, premature institutionalization, and injury-related mortality in the older adult population. Falls are the most common cause of traumatic brain injury and fracture for older adults, and they have serious complications such as institutionalization, functional dependence, and paralyzing fear of falling. Every 29 seconds, an older adult dies from the consequences of a fall. Falls are an eminent threat to a frail, older adult's ability to maintain independence in the community. Approximately 1 in 3 community-dwelling adults aged 65 years and older fall each year, and those older than age 70 have an especially high fall risk. Older adults who have experienced a previous fall are at a greater risk of falling again. The majority of falls experienced by older adults, particularly more frail, high-risk older adults, occur in the home, and measurable home hazards are associated with an increased risk of older persons falling in the US. There is currently no evidence based list of fall hazards available to guide intervention. Students will be involved in secondary analysis of an existing dataset of over 200 fall reports. Students will identify the 1) environmental hazard causing the fall; 2) the severity of falling associated with different environmental hazards.

Required Skills: Ability to visit community (having a car is helpful)

Student Level: Masters (MPH, MSW, MPHS), Medical student

Learning Experience from Projects 1 & 2: Students have the opportunity to work within an ongoing research project. Some skills include gaining knowledge about:
•Aging and community living issues, •Funding, •Community engaged research approaches, •Ethical issues in underserved communities and cultural competency, •Assessment in the community, •Data collection, entry, cleaning and analysis, •Dissemination of findings to community professionally

Mentor: Dr. David Wang

Student Level: Undergraduate, graduate and medical

Required Skills: some experience in molecular biology ideal.

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Project Description: The student will be involved in novel virus characterization. This will entail sequencing, cloning and computational analysis of the resulting sequences. Novel viruses from human and animal specimens are currently under investigation, some of which may be linked to diseases such as diarrhea.
Location: St. Louis

Learning Experience: Student's will experience laboratory research in biology focused on analysis of novel viruses and will be exposed to molecular epidemiology.

Mentor: Dr. Jason Weber

Student Level: Undergraduate and graduate

Required Skills: lab experience and some data analysis or database analysis would be helpful

Project Description: ADAR1 is critical for proper RNA editing in mammalian cells. Our lab has recently discovered that this gene is involved in re-programming RNA in tumor cells to promote aggressive growth and metastasis. This project will involve understanding how ADAR1 functions in lung and breast cancer RNA editing.
Location: St. Louis

Learning Experience: The student will learn basic cell and molecular biology techniques and numerous cancer database analyses.

Mentor: Dr. Chengjie Xiong

Student Level: Graduate

Required Skills: strong background in statistical models , preferably in longitudinal analyses. Experience in using standard statistical packages such as SAS or R

Project Description: The student will be working with a large and longitudinal database in aging and dementia, and conduct extensive univariate and multivariate analyses, including both cross sectional analyses and longitudinal analyses.
Location: St. Louis

Learning Experience: The student will learn real world experience in statistical modeling of aging and dementia data.