RGV SUMMER SCIENCE INTERNSHIP 2023
The goal of the Rio Grande Valley Summer Science Internship (RGVSSI) is to expose high school students to university-level research, thus encouraging an increase in the number of students who graduate college with science degrees, particularly Hispanics/Latinos from the RGV. This year, we have internship positions with the University of Texas Health Science Center at Houston School of Public Health in Brownsville (UTHealth), The University of Texas Rio Grande Valley Brownsville and Edinburg campuses (UTRGV), and Our Lady of the Lake University (OLLU). Selected students will be matched with a mentor and project based on their interests indicated in the application.

As part of the program, students work for 6 weeks with their mentor and are required to complete 20 hours of science-related work per week. The program culminates with each student presenting his/her work to faculty, friends, family, and the community at large in a formal, in-person setting. Students must provide their own transportation to the internship placement sites and receive a stipend upon completion of the 120 required hours.

Partnerships

The University of Texas Rio Grande Valley  
OLLU Our Lady of the Lake University Rio Grande Valley  
UTRGV UT Health Rio Grande Valley School of Medicine  
UTHealth Houston School of Public Health
STUDENT APPLICATION INFORMATION

APPLICATION DEADLINE: WEDNESDAY MAY 31, 2023

Our application process is quick and easy! Before you apply, please be sure to have your 350-word essay completed so that you do not have to start and stop the application. If you do, you may lose your information and may need to restart the application. By having your essay ready, you can simply copy and paste the text of your essay into the application!


ESSAY
Students are required to complete a 350-word essay as part of their online application. Your essay should include the following:

1. Why are you applying to this program?
2. Why do you think you would be a good candidate for this program?
3. List your future goals and how this program will help you reach your goals.

NOTE FOR STUDENTS
You will see a confirmation screen when you submit a reference form. Please feel free to email rgvssi@uth.tmc.edu or call (956)755-0600 to confirm your form was successfully submitted.

You will need one (1) recommendation form completed as part of this application. After you submit your application, please make sure to direct your teacher or counselor to this site complete and submit the recommendation form on your behalf.

Students will receive a $500 stipend for successfully completing the program!

RECOMMENDATION FORM

For teachers/counselors only! The reference form is to be completed on behalf of the applicant (student) by a teacher/counselor who has worked with the student.

NOTE TO TEACHERS AND COUNSELORS: You will see a confirmation screen when you submit a reference form. Please feel free to email rgvssi@uth.tmc.edu or call (956)755-0600 to confirm your form was successfully submitted.

Please consider printing this confirmation screen for your records in case you need to contact us about a reference form.

FREQUENTLY ASKED QUESTIONS:

1. When will I be notified if I was accepted into the program?
You will be notified by on Monday June 5, 2023. You will receive a phone call and also be emailed an acceptance letter with details regarding orientation dates/times and items that you will need to bring with you that day.

2. Will transportation be provided during the internship?
There will be NO transportation provided. When selecting your internships remember that you will have to arrange your own transportation to and from the internship site on the days you are scheduled to be there. The stipend provided at the end of the internship can help cover some of the internship-related costs, for example, gas, lunch, etc.

3. If accepted, what will my schedule be like?
Due to the nature of some of the projects you may need to work on specific dates/times. This will be arranged with your mentor. You will be able to communicate with your mentor once you are selected. You will be expected to work 20 hours per week. This may be done in longer blocks of time on fewer days or evenly spread across days of the week.

4. Will my mentor work with my schedule if I’m participating in academic, extra-curricular activities or going on summer vacation? (e.g. Upward Bound, Summer band or other responsibilities)
In order to meet the requirements of this program you MUST complete 20 hours a week for the six weeks. You will only be allowed to reschedule a maximum of 12 hours during the internship. If you miss hours, you will have to make those hours up. We strongly encourage you to evaluate your schedule/activities for this summer. If you are unable to commit to these requirements, do not apply.

If you have any questions, please email rgvssi@uth.tmc.edu or call 956-755-0600. You may also submit questions through our Facebook www.facebook.com/RGVSSI

RGVSSI website

Rio Grande Valley Summer Science Internship FAQ
The Fels Longitudinal Study started in 1929 and consists of participants from birth to adulthood. The study was originally developed to examine child growth and development. Later the study expanded its focus to also include risk factors for cardiovascular disease and obesity, and biostatistical analyses and aging. The Fels data includes genetic, obesity, bone health, blood lipids, cardiovascular disease, quality of life and imaging data. The students will be guided to develop a research question related to the variables of this study and the statistical analysis approach to answer the research question.

Intern Responsibilities and Expectations
1. Complete CITI training to engage in human subject research
2. Conduct a literature review and learn about the study design and variables.
3. Formulate a research question and determine methods.
4. Conduct analysis and summarize findings.
5. Assist help with the digitization of hand-wrist radiographs (X-rays), which are used to determine skeletal age. That is, taking x-ray files of hands and converting them into another file format so that skeletal age can be determined.
6. Develop a presentation of methods and results for the final SSI presentation event.
Intervention Research to Address Chronic Diseases among Hispanic Adults

Project Description

Research funding from several sources including the National Institutes of Health have funded the School of Public Health to carry out intervention research examining multilevel strategies to prevent and control chronic diseases including obesity, diabetes, certain cancers and recently COVID 19 among Mexican Americans. The Texas-Mexico border is a region with excessive burdens associated with such conditions. This research is conducted with community partner leadership and guidance. Over the span of this long-standing research, we have designed and disseminated a health campaign to ten partner communities in Cameron and Hidalgo Counties, which is called Tu Salud, ¡Si Cuenta! It involves many diverse features, such as mass media outreach, community newsletters, and interventions led by community health workers, all with the goal of encouraging the control and prevention of disease. We particularly focus on the promotion of healthy eating and increased physical activity.

Intern Responsibilities and Expectations

The intern’s project will focus on supporting data collection efforts regarding the evaluation of the intervention, which will include the administration of surveys and other qualitative methods. This will prepare the intern to properly analyze and interpret the survey data. Subsequent analysis of the data collected will also be part of the intern’s responsibilities. The Intern will also be involved in data analysis regarding other chronic conditions and COVID 19. He/she will visit have the opportunity to visit educational and exercise classes taught by community health workers in the community and analysis of media campaign. The intern will help administer surveys assessing the participants' satisfaction with classes and benefits obtained from attending. In addition, to launch the project, the intern will perform a thorough search of the literature. A final report will be generated to summarize the findings and a final presentation will capture key findings from the research. The intern will work directly with the faculty and staff of this research project.
Algae Molecular Biology and Biochemistry

Project Description

My laboratory does research in the area of algae molecular biology and biochemistry. The main topics of research in my lab are: The transformation of algae with recombinant DNA, the cryopreservation of algae, extraction, and characterization of lipids via thin-layer chromatography, and other projects that involve the use of algae to produce potential biofuels. I also have a project in collaboration with Dr. Krystel Castillo from The University of Texas San Antonio which deals with the modeling of lipid production by algae for the use in industrial scale-up projects for the commercial applications of the use of algae to produce biofuels.

The research topics available to students are multidisciplinary in that not only do the students learn about algal cell and molecular biology, but they also learn many techniques in supporting fields such as biochemistry, analytical chemistry, instrumental analysis, and algal culture that are necessary for the execution of the broader experiments in various fields of biology.

Intern Responsibilities and Expectations

1. Plan and execute experiments in the laboratory.
2. Formulate a testable hypothesis.
3. Collect data in the lab from experiments.
4. Analyze data from lab experiments.
5. Construct and give a presentation on the results of the lab experiments.
6. Participate in program student cohort activities.
Diabetes and Metabolic Effects on Skeletal Health in Mexican Americans

Project Description

The Cameron County Hispanic Cohort Study/Type 2 diabetes mellitus is a risk factor for osteoporosis, a thinning of the bone trabeculae and cortex, which increases with age. Osteoporosis underlying fractures is the most prevalent metabolic bone disease in older adults with over 10 million US people afflicted and another 43.4 million individuals at risk. Hispanics/Latinos (H/L) are a large, poorly studied minority population with high rates of diabetes, disproportionately afflicted by additional risk factors such as obesity that predispose them to poor bone health as they age.

This project will examine the relationship between measures of diabetes risk (glucose, HbA1c, insulin) and bone quality measures in Mexican American adults (age >= 50 years) using a cross-sectional study approach. This project will use data from the Cameron County Hispanic Cohort study, a large (n>5000) population-based cohort recruited from randomly selected households of Mexican Americans living along the Texas-Mexico border. Student(s) will have the opportunity to work with the research team to examine existing metabolic biomarkers data and bone image data collected using Dual Energy X-ray absorptiometry (DXA) and statistical analysis.

Intern Responsibilities and Expectations

1. Learn basic skills in the protection of human subjects in research and ethics training using CITI program
2. Learn basic skills in hands on data collection (Trabecular Bone Score) using dual energy X-ray absorptiometry
3. Learn basic skills in data management using REDCap or Excel
4. Learn basic skills in statistical data analysis using R/R studio
5. Learn how to read and critique journal articles and use a citation program (e.g., Zotero)
6. Learn how to present research findings (written reports, poster, or oral presentations)
The survival of patients with Glioblastoma Multiforme (GBM), the most common and invasive form of malignant brain tumors, remains poor despite advances in current treatment methods including surgery, radiotherapy, and chemotherapy. Systemic concurrent delivery of a chemotherapy agent that will impede the growth of cancer cells and an anti-angiogenic factor that will block blood vessel formation have been shown to be advantageous for the treatment of brain tumors; however, the outcomes have still been very modest. Due to the difficulty and high cost related to developing new therapeutics, this proposed study aims to optimize existing therapies by focusing on applying biomaterials to locally deliver currently available chemotherapy and anti-angiogenic drugs concurrently at the tumor site using functionalized materials that will target cells of interest and thus, further decrease non-targeted toxicity and increase bioactivity on targeted cells. The students on this project will help with 1) fabricating microparticles and/or biomaterial scaffolds and evaluating the release of drug from these materials and 2) evaluate the response of GBM and endothelial cells to these materials.

Intern Responsibilities and Expectations

1. Learn how to and assist in fabricating biomaterials
2. Learn how to and assist in evaluating the release of drugs from these biomaterials
3. Learn how to and assist in evaluate the response of glioblastoma and endothelial cells to these biomaterials
4. Learn how to read and use information from journal articles to design their project and report their data
5. Learn how to analyze data and draw conclusions from them
6. Learn how to present research findings
Relationship among physical activity, body composition, and arterial elasticity, metabolic syndrome risk factors, diet, sleep, body composition, blood flow restriction training, and various biomarkers in Hispanic population.

Project Description

My research focuses on the relationship among physical activity, body composition, and arterial elasticity, metabolic syndrome risk factors, diet, sleep, body composition, blood flow restriction training, and various biomarkers in Hispanic population. In addition to ongoing research studies, we will collect data to compare physiological and salivary feedback to virtual reality exercises with traditional resistance exercises during summer 2023. The student will be guided to develop a research question related to the above-mentioned topics.

Intern Responsibilities and Expectations

1. Complete all necessary CITI training to engage in human subject research and be able to work with an existing data set.
2. Complete assigned readings: about virtual reality, different exercise training modalities, arterial elasticity, etc.
3. Learn more about and help with study participant recruitment, data collection, and data entry.
4. Devise his/her research study project with a research question and appropriate methods.
5. Learn more about basic steps to analyze data.
6. Construct and give a presentation on the results.
7. Participate in program student cohort activities.
Examine the effects of placing bilinguals in either a Monolingual or Bilingual Language Mode on lexical access and situational model creation

Project Description

Inhibition models of lexical access have been developed to explain how lexical items are accessed by bilinguals based on the language which is in need. Also, models of lexical access predict if and how lexical items from multiple languages may compete for selection (Green, 1998; Macnamara & Kushnir, 1971). The purpose of the current study was to examine the effects of placing bilinguals in either a Monolingual or Bilingual Language Mode on lexical access and situational model creation (i.e., comprehension ability). 100 balanced bilinguals were either presented with an all-Spanish, all English, or Codeswitched story passage and were subsequently given a lexical decision task and a comprehension assessment. Results confirmed that bilinguals were slower at responding at to the first initial switch trial when placed in a Monolingual Mode (i.e., only English or only Spanish) than when placed in a Bilingual Mode (i.e., Codeswitched), although no significant difference was found between the English and Codeswitched conditions. Based on the current results, the placement of bilinguals in either a Monolingual or Bilingual mode creates differences in terms of lexical accessing times.