

# USC Graduate School

## *DIA JumpStart*

### SUMMER RESEARCH PROGRAM FOR UNDERGRADUATES

USC's Graduate Initiative for Diversity, Inclusion, and Access (DIA) aims to increase the pool of diverse PhD applicants by providing academic and financial support and professional development opportunities.

DIA JumpStart works with USC schools and programs to invite diverse candidates from outside institutions to apply for 10-week summer research opportunities in various PhD disciplines. Available opportunities range from lab-based research to mentored participation in other types of faculty projects.

Summer 2020 program dates are **June 1 through August 7**, unless otherwise noted by the research opportunity.

#### PROGRAM BENEFITS

The Graduate School provides JumpStart scholars with a stipend and health coverage. Those who successfully complete the program will also have their application fees waived if they apply to USC PhD programs.

To complement their summer research experience, JumpStart scholars will participate in Graduate School sponsored sessions led by USC faculty and staff. Sessions include graduate admissions, PhD funding, PhD student life, and more. JumpStart scholar's research will be featured in an end of summer poster symposium.

#### APPLICATIONS

Students completing their sophomore or junior year at outside institutions prior to the summer are encouraged to apply through JumpStart for available research opportunities.

Applications are evaluated by the research program, or faculty, and the Graduate School. Applicants may be contacted for an interview.

Applications for research positions through DIA JumpStart are currently available at <https://provost.sma.usc.edu/prog/DIAJumpStart>.

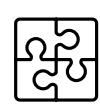
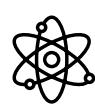
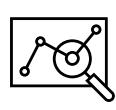
**THE APPLICATION DEADLINE:** Friday, January 17, 2020

As part of the application, students will be required to submit:

- Personal statement and research interests
- Short statement on academic and professional goals
- Resume or CV
- Current transcripts (unofficial or official)
- One (1) letter of recommendation from faculty

#### FOR MORE INFORMATION

Questions about DIA JumpStart should be sent to [GradDIA@usc.edu](mailto:GradDIA@usc.edu). Additional information can also be found by visiting <http://graduateschool.usc.edu/dia/>.



# WHAT DID **LAST YEAR'S PARTICIPANTS** SAY ABOUT THE PROGRAM?

“The most helpful was being able to conduct research, learn from a seasoned professor, attend workshops, and complete the program with research and skills that can help me in the future.”

“I was able to see first-hand what graduate studies would be like. I also had the opportunity to work with and collaborate with professors that were willing to share their knowledge, expertise, and guidance.”

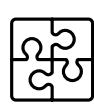
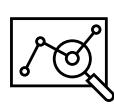
“The research experience exceeded my expectations, as I got to start my own project and fully understand the methodology of what I do and what my results are telling me.”

“It is a great opportunity to expand your knowledge, establish new connections with students in the real world of graduate school.”

“Thank you DIA JumpStart program for the opportunity to working with passionate faculty in their labs, for letting us be part of such an incredible experience extending our knowledge in research and having an insight of what graduate school entails.”

# WHERE DID THEY COME FROM?





## 2020 AVAILABLE RESEARCH OPPORTUNITIES

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### **USC CHAN DIVISION OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL THERAPY**

Sensory Adapted Dental Environments (SADE) – 2

2

### **DEPARTMENT OF CHEMISTRY**

Snapshots of Chemistry

3

### **DIVISION OF BIOKINESIOLOGY AND PHYSICAL THERAPY**

A Study of Pain Sensitivity in Healthy and Individuals with Chronic Pain

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### **NEUROSCIENCE GRADUATE PROGRAM**

Neuroscience Experience Undergraduate Research and Learning Program

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### **NORRIS COMPREHENSIVE CANCER CENTER**

Development of a Powerful New Organoid Model to Study Lung Adenocarcinoma

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### **SCHOOL OF PHILOSOPHY**

USC Meaning Lab

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### **DEPARTMENT OF PSYCHOLOGY**

NeuroEndocrinology of Social Ties (NEST) Lab

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### **PSYCHOLOGY AND OCCUPATIONAL SCIENCE**

Brain and Creativity Institute

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### **USC SCHOOL OF PHARMACY**

Summer Undergraduate Research Fellowship

### **DEPARTMENT OF SOCIOLOGY**

Comparing the Effects of Voter ID Laws on Immigrant Rights Organizations' Strategies across State Contexts

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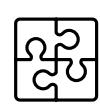
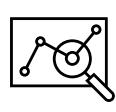
### **SPATIAL SCIENCES INSTITUTE**

Population, Health, and Place PhD Program

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### **TITUS DEPARTMENT OF CLINICAL PHARMACY**

Influencing Alcohol Consumption Behaviors and Alcohol-Induced Immune Activity



## **USC CHAN DIVISION OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL THERAPY**

### **SENSORY ADAPTED DENTAL ENVIRONMENTS (SADE) – 2**

The DIA Jumpstart scholars will be part of an interdisciplinary research study (Occupational Therapy, Psychology, Dentistry, Statistics, and Health Economy) designed to examine the sensory characteristics of children with autism spectrum disorder and Down syndrome and their effects on children's oral care. This study is funded by the National Institutes of Health.

There are numerous opportunities to attend educational information sessions and presentations. One of the presentations will be of Occupational Therapy Doctorate residents presenting their leadership portfolios. There are opportunities to observe several occupational therapy clinics such as the Pediatric Therapy Network clinic. The DIA Jumpstart scholars will also meet with admissions and leadership personnel from the occupational science PhD program. Additionally, there are opportunities to tour other research labs and attend lectures within the Division of Occupational Science and Occupational Therapy. DIA Jumpstart scholars will participate at research team meetings as well as attend mentorship meetings with the Principal Investigator, PhD candidate, other team members, and Division faculty.

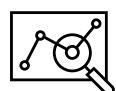
The DIA Jumpstart scholars will provide assistance in day-to-day administrative tasks, and will be trained in the use of the Common Application Framework Extensible (Café) database and Research Electronic Data Capture (REDCap) application to assist with data quality control. In addition to these activities, they will also be trained to utilize a journal database, conduct literature searches, and update the study's publicity document.

This position requires excellent attention to detail, organization, and understanding of study protocols. Additionally, the position will require proficiency in Microsoft software applications such as, Word, Excel, and PowerPoint. Fluency in Spanish is desirable but not essential.

#### **LEARNING OUTCOMES:**

The DIA Jumpstart scholars will gain preparatory skills for pursuing a doctoral degree. They will be mentored in the overall conduct of research of a Uo1 cooperative agreement grant including the research protocols, standard operating procedures, research compliance, and quality management. The DIA Jumpstart scholars will gain a deeper understanding of autism spectrum disorders and Down syndrome. They will also learn about social stories and multisensory environments including the use of the sensory adapted dental environment. The DIA Jumpstart scholars will gain skills in library research and learn how to conduct literature searches. This opportunity will also allow them to hone their organizational and interpersonal skills.

For more information, please visit <https://bit.ly/2NPUw9R>



## DEPARTMENT OF CHEMISTRY

### SNAPSHOTS OF CHEMISTRY

Spend 10 weeks of your summer carrying out research in residence in our Chemistry Department. We use the term "Snapshots of Chemistry" to emphasize our focus on gaining insights on key chemical features of molecular processes via visual images. Research projects will cover a broad range of topics, spanning from femtosecond time-resolved observations of transient events to synthesis of novel drugs, development of nanostructures and catalysis in energy research, biochemical and structural investigations of proteins and nucleic acids, and theoretical investigations using advanced algorithm and state-of-the-art computer graphics and multimedia capabilities.

We offer a broad selection of research groups in alternative energy, chemical physics, chemical biology, drug discovery, inorganic, materials/polymers, nanoscience, organic, physical, and theoretical chemistry.

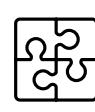
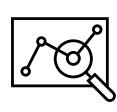
You will work one-on-one in a lab with a faculty advisor and graduate student mentor. We integrate student research activities with weekly meetings that feature professional development courses, showcase student research presentations, and highlight the breadth of chemistry across traditional and interdisciplinary areas. Included will also be tours of local research facilities such as the NASA's Jet Propulsion Laboratory, Loker Hydrocarbon Research Institute and team building activities. The summer will culminate with a poster session, where you will display your summer research and discuss it with Chemistry faculty and graduate students.

#### LEARNING OUTCOMES:

We provide comprehensive research opportunities, individualized and long-term mentoring, professionalization and social activities. This approach aims to build skills and confidence needed for each participant to pursue STEM degrees and chemistry-related careers. We believe that having access to research opportunities and long-term mentoring empowers students with knowledge and opportunities needed for professional success in many careers. Research topics conducted in our department deal with significant and critical issues in our society, and participants learn both chemistry perspectives and the large role of chemical research in solving the current societal and environmental issues.

**PROGRAM DATES:** May 26 - July 31

For more information, please visit <https://bit.ly/2WRIExs>



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## DIVISION OF BIOKINESIOLOGY AND PHYSICAL THERAPY

### A STUDY OF PAIN SENSITIVITY IN HEALTHY AND INDIVIDUALS WITH CHRONIC PAIN

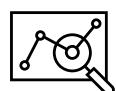
For individuals with chronic musculoskeletal pain, recurrent or non-responsive chronic pain can be debilitating. This is especially true for patients with shoulder pain, who have alarmingly high rates of recurrent or non-responsive pain, with 68% of people still experiencing pain after one year. Within the Clinical Biomechanics Orthopedic and Sports Outcomes Research (COOR) Laboratory, in collaboration with the Applied Mathematics and Physiology Laboratory (AMPL), we strive to optimize shoulder performance and enable the diagnosis, rehabilitation and treatment for patients with shoulder disorders. To improve treatment efficacy, we first need to effectively describe patients in terms of their abilities. Specifically, pain sensitivity is one factor that is highly variable across the population, and has been previously tied to the overall success or failure of traditional chronic pain therapies.

In this study, the applicant will be a member of a multidisciplinary team investigating links between an individual's sensitivity to pain and their overall experience of persistent shoulder pain. This study will be conducted in three phases:

1. Define normative values of one commonly used form of sensory testing, pressure pain threshold, and explore factors influencing this measure such as body site, age, and sex.
2. Identify individuals with shoulder pain who have heightened pain sensitivity by contrasting these individuals against the cohort of healthy participants.
3. Finally, evaluate the effectiveness of therapeutic interventions including single dose spinal manipulation and exercise for individuals with shoulder pain by contrasting the response of patients with and without heightened sensitivity.

The scholar will work closely with postdoctoral mentors in the lab to collect pressure pain threshold readings, and to generate custom analysis code using MATLAB. The scholar will be responsible for generating well-researched hypotheses regarding potential influential factors on an individual's pain sensitivity such as a person's age or sex. The scholar will be expected to report weekly on the progress of the project and may have the opportunity to present their research at internal, regional, or national conferences.

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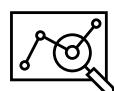
## DIVISION OF BIOKINESIOLOGY AND PHYSICAL THERAPY

A STUDY OF PAIN SENSITIVITY IN HEALTHY AND INDIVIDUALS WITH CHRONIC PAIN

### LEARNING OUTCOMES:

- Synthesize findings from previous studies relevant to the aims of the scholar's project. Review of published literature is a critical part of effective research. Students will first be tasked to read, understand, and bridge findings from previous research studies.
- Generate a set of evidence driven hypotheses to address the project aims. The hypotheses will be developed after students have had the opportunity to read and synthesize previous studies relevant to the project.
- Assist in research directed data collections, capturing pain sensitivity for both healthy controls and individuals with shoulder pain. The scholar will be expected to actively participate in data collections, and if appropriate, conduct data collections independently. Students will be expected to learn how to operate laboratory equipment including an algometer to measure pressure sensitivity, a handheld dynamometer to measure muscle strength, and an inclinometer to measure range of motion.
- Analyze data collected prior to and during the scholar's tenure in the lab. The scholar will work closely with a senior mentor to develop and test hypotheses and synthesize results. Students will be expected to learn MATLAB to visualize and analyze data.
- Disseminate findings of their project. Students will be expected to present periodic updates at lab meetings, and may have the opportunity to present their findings at regional or national conferences.

For more information, please visit <https://bit.ly/2PS4Oco>



## NEUROSCIENCE GRADUATE PROGRAM

### NEUROSCIENCE EXPERIENCE UNDERGRADUATE RESEARCH AND LEARNING PROGRAM

The USC Neuroscience Experience Undergraduate Research and Learning Program (USC-NEURAL) is devoted to providing outstanding research experiences and professional development opportunities for underrepresented minority undergraduates who have a strong interest in pursuing an advanced degree in the neurosciences. The USC Neuroscience Graduate Program (NGP) established the program in 2017, working to provide an enriching on-campus experience for the visiting NEURAL scholars, who work in a laboratory for 8-10 weeks during the summer in Los Angeles.

The Program has the following goals:

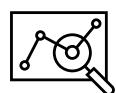
- Partnering NGP training faculty members with a visiting NEURAL scholar.
- Provide a roadmap for the scholar to learn about a specific area of neuroscience, read original literature, perform experiments and learn analytical strategies.
- Foster interactions with current NGP graduate students and other faculty to learn about advanced training in the neurosciences.
- To discover outstanding opportunities for career development in academic, private sector, education and policy arenas.

The Program has weekly scheduled discussion topics that cover various areas. This year the topics included the following:

- Ethics and Data Reproducibility Issues
- Science Advocacy
- Producing a competitive graduate school application, personal interview and written statement strategies
- Poster and Manuscripts - The Keys to Reporting
- Professional career opportunities beyond the Ph.D.

At the end of the summer program, each NEURAL scholar will have the opportunity to prepare and present a poster during a USC hosted research poster session.

For more information, please visit <https://bit.ly/33qv41n>



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## NORRIS COMPREHENSIVE CANCER CENTER

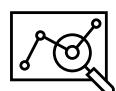
### DEVELOPMENT OF A POWERFUL NEW ORGANOID MODEL TO STUDY LUNG ADENOCARCINOMA

Lung cancer kills more Americans than the other top three cancers combined (colorectal, pancreatic and breast). Lung adenocarcinoma (LUAD) is the most common lung cancer subtype and also the most common lung cancer in never smokers and women. It arises in the alveoli or air sacs of the lung, which consist of alveolar epithelial cells. There are a few targeted therapies that specifically treat LUAD tumors with certain mutations, such as mutations in the epidermal growth factor receptor (EGFR) gene. Such therapies are much less toxic than conventional chemotherapy. However, the cancer usually becomes resistant by acquiring new mutations and then comes back, requiring “second line” and even “third line” therapies to treat the resistant cells. It would be very useful to have a tissue culture model for LUAD in which we can mimic the cells developing resistance, characterize the basis for resistance and screen for new drugs. To do this, one would need to be able to grow alveolar epithelial lung cells in culture.

The Offringa lab recently developed a method to successfully grow cultures of human alveolar epithelial cells. Using remnant transplant lungs, we have established cell lines from three (unidentified) individuals. The cells grow rapidly as a flat layer in petri dishes, allowing them to be easily cultured and genetically manipulated. When placed in 3-dimensional culture with fibroblasts (support cells), the cells form organoids reminiscent of alveoli. We are in the process of engineering these organoids by introducing different cancer driver mutations. The goal is to develop mini-tumors on the organoids that can be individually monitored. This innovative model will be a powerful tool to study the development of lung adenocarcinoma and the molecular basis for acquired resistance to targeted therapies. We will also use it to screen for new drugs for treatment of drug-resistant lung adenocarcinoma. The JumpStart scholar working on the project will learn to culture the cells in 2 and 3 dimensions and may use molecular cloning to engineer new constructs to introduce into the cells, and/or characterize existing cell lines we have developed. The scholar may use a variety of techniques including fluorescence microscopy, migration and metastasis assays, PCR, CRISPR/Cas9 (genome engineering) and transcriptional profiling.

#### LEARNING OUTCOMES:

- Understand what lung cancer is
- Understand the concepts of cancer driver genes, cellular transformation and the properties of transformed cells
- Understand how drug resistance might develop
- Be able to culture cells in vitro and be able to apply a variety of molecular biology techniques to engineer and/or molecularly characterize the cells



## SCHOOL OF PHILOSOPHY

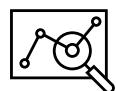
USC MEANING LAB

Linguists say that sentences are about events, but what does that mean? The USC Meaning Lab is conducting NSF-funded research focusing on the properties of the language that children and adults use to talk about events, and how it compares to talk of objects. This research lies at the intersection of philosophy of language and mind, linguistics, and cognitive psychology. The JumpStart scholar will take the lead role in conducting an experimental study investigating how individuals determine when something that happened counts as a proper 'event', and how that determination impacts comparison with words like 'more'. The project thus involves working closely with the Principal Investigator and other lab personnel in developing the study design and implementation, as well as recruiting study participants, conducting the experiment, analyzing and interpreting the results, and preparing a presentation describing their work.

### LEARNING OUTCOMES:

The JumpStart scholar will gain significant experience in all aspects of the research process in a social-behavioral lab, from study conception to dissemination. This includes training and exercise in basic programming, as well as statistical and data visualization methods. The scholar will gain insight into research that cross-cuts traditional disciplinary lines, enjoy frequent interaction with the Principal Investigator of a research lab, and lay the foundations for a cutting-edge research paper.

For more information, please visit <https://bit.ly/2WRQoKY>



## DEPARTMENT OF PSYCHOLOGY

### NEUROENDOCRINOLOGY OF SOCIAL TIES (NEST) LAB

The NEST Lab studies the transition to parenthood and its impact on parents' relationships, brains, and hormones. We have a special interest in understanding the fathering brain.

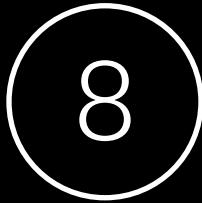
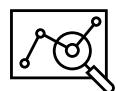
We are currently conducting the National Science Foundation (NSF) funded HATCH (Hormones Across the Transition to Childrearing) study to explore couple and family dynamics during the transition to parenthood. We recruit couples who are expecting their first child and follow them across the first year postpartum, with two laboratory visits (a prenatal visit and a postpartum visit) that include discussion tasks and questionnaires, plus neuroimaging scans of the new father. We are sampling hormones (cortisol, testosterone, oxytocin, and prolactin) and examining couple relationship functioning and psychological well-being over pregnancy and postpartum. We will also look at parenting, parent-child attachment, and early infant development.

In a sub-study linked with the larger HATCH study, we will be scanning expectant and new fathers both before and after the birth of their child, using a combination of structural and functional imaging to examine the fathering brain and how it is correlated with hormones and parenting behavior.

#### LEARNING OUTCOMES:

- Students will have the opportunity to gain hands-on experience running laboratory visits as well as gain exposure to functional magnetic resonance imaging (fMRI) data.
- Students will collaborate with graduate students in the lab to complete a research poster where they will 1) ask their own research questions, 2) learn to run independent analyses with SPSS, and 3) create a final poster product.
- Training in health psychology, close relationships, and perinatal processes

For more information, please visit <https://bit.ly/2qtcd7h>



## PSYCHOLOGY AND OCCUPATIONAL SCIENCE

BRAIN AND CREATIVITY INSTITUTE

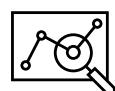
The JumpStart scholar will assist in everyday functioning of a research lab, which uses neuroimaging techniques to explore questions of social cognitive neuroscience. The current project looks at sensory functioning, gut microbiome, and brain activity, and their potential involvement in processing emotions, empathy, and social communication in Autism Spectrum Disorder. The JumpStart scholar will be required to maintain the RedCap data basing system, ensure data quality control, assist in recruiting, communicate with collaborators and participant families, and assist in acquisition of behavioral and neural data.

This position requires excellent attention to detail, organization, and an understanding of the study protocols, measures, and reporting requirements. This position also requires excellent communication and interpersonal skills because the JumpStart scholar will be working directly with participants and families from clinical populations to acquire paper and video data.

### LEARNING OUTCOMES:

- Deeper understanding of neuroscience, Autism Spectrum Disorders, behavioral and psychological testing, and MRI acquisition
- Experience with the inner workings of and R01 level study in a research lab setting
- Clarity on the process and information regarding potential next steps in higher education, and success within graduate programs

For more information, please visit <https://bit.ly/34DdvLE>



## USC SCHOOL OF PHARMACY

### SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP

The USC School of Pharmacy's Summer Undergraduate Research Fellowship (SURF) program is geared towards increasing learning and networking opportunities for undergraduate students committed to pursuing either professional or academic research careers across the entire pharmaceutical continuum including drug discovery, delivery, mechanism of disease and drug action, clinical and translational studies, data science/bioinformatics, regulatory science, health outcome and economic analysis and policy development. Scholars will develop confidence and independence in conducting research and communicating scientific concepts under the guidance of faculty and other mentors. In addition to daily engagement in the research setting, scholars will attend biweekly entrepreneurship/professional development seminars and participate in a workshop on the graduate school application process so as to aid in the pursuit of graduate study. At the end of the summer, students will give an oral presentation of their research to their peers and faculty.

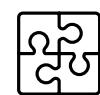
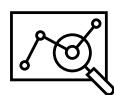
#### PROGRAM REQUIREMENTS:

- Have a strong desire to pursue a PhD degree in one of the disciplines offered by the USC School of Pharmacy graduate programs in the Pharmaceutical & Translational Sciences and Health Economics (<https://pharmgradprograms.usc.edu/>)
- Strong academic background (GPA of 3.5 or higher) in the fields related to biology, chemistry, biochemistry, microbiology, biomedical engineering, and/or economics
- Scholars should have a working knowledge of lab skills and concepts learned through college courses such as chemistry and biology

#### APPLICATION INSTRUCTIONS:

- When applying, please indicate three (3) faculty from USC School of Pharmacy whose research is of interest to you.
- Housing may be provided on USC's University Park Campus. Consideration will include a demonstrated financial need and availability of funding. Evidence of financial need can be demonstrated by emailing your most current FAFSA package directly to [GradDIA@usc.edu](mailto:GradDIA@usc.edu).

For more information, please visit <https://bit.ly/32qJUDJ>



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## DEPARTMENT OF SOCIOLOGY

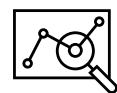
### COMPARING THE EFFECTS OF VOTER ID LAWS ON IMMIGRANT RIGHTS ORGANIZATIONS' STRATEGIES ACROSS STATE CONTEXTS

In recent years, there has been growing political discourse about the threat of voter fraud, which has driven efforts to implement voter ID requirements across a number of states. As of April of 2019, 35 states had enforced or were scheduled to begin enforcing voter ID requirements. Much research tests the effects of these voter ID laws on voter turnout, with mixed evidence. Some work shows that these effects are particularly pronounced for racial and ethnic minorities and immigrants. Other studies argue that these effects exist but that they are negligible. A third hypothesis is that because these laws politicize targeted communities and draw their attention to politics, they can increase voter turnout. However, beyond these direct effects, studies show that racialized policies like voter ID laws have spillover effects on political culture and how groups, like immigrant rights organizations, organize and do political work. From a separate stream of research, we know that immigrant rights organizations have powerful effects on immigrants' political participation. They are crucial mediators between individuals and the political system.

This research is centered on examining this relationship between Voter ID laws as they shape the political context and the organizations working on immigrant political engagement. We examine: 1) How do Voter ID laws impact immigrant rights organizations' strategies? 2) How do these effects compare across different state contexts? To answer this question, we use a comparative, longitudinal research design to examine whether and how adopting state-level Voter ID laws shapes organizational strategies. We analyze strategies for immigrant rights organizations across four state contexts (Alabama, Georgia, Mississippi, North Carolina), operationalized across a number of political and cultural measures. We look specifically at immigrant-serving organizations for consistency, although there are numerous other organizations working on these issues. First, we use the 501(c)3 database, GuideStar, to build a unique database of immigrant-serving organizations accounting for a range of organizational variables that are theorized to matter for strategic decision-making (e.g. mission, age, size, resources). Next, we are in the process of building a qualitative dataset of organizational materials (e.g. press releases, reports, posters, web pages) before and after the enactment of the Voter ID law. Using ATLAS.ti, we will code the organizational documents and the newspaper articles to determine whether strategies shifted, how it shifted, and finally, how these effects compare across states.

As we enter another major election year, we will continue collecting data in real time to give us a better sense of the larger spillover effects of voter ID laws as they reshape political contexts. Ultimately, these findings can inform on the most effective strategies for contending with voter ID laws and for increasing immigrant political engagement within this political context.

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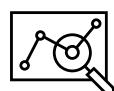
## DEPARTMENT OF SOCIOLOGY

**COMPARING THE EFFECTS OF VOTER ID LAWS ON IMMIGRANT RIGHTS ORGANIZATIONS' STRATEGIES ACROSS STATE CONTEXTS**

### LEARNING OUTCOMES:

- The JumpStart scholar will learn to develop and use a mixed-method database by collecting and managing multiple types of data including organizational records, surveys, newspaper text, and archival data. Using this database, students will code the data and identify emerging themes that will allow them to develop expertise in the research questions of interest
- During this time, scholars will collaborate closely with faculty and a graduate student advisor requiring the student to effectively communicate and use their problem-solving skills
- Training in mixed methods to both engage a variety of learning styles and to build their expertise in a range of modes of social scientific research

For more information, please visit <https://bit.ly/36Hs6b1>



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## SPATIAL SCIENCES INSTITUTE

### POPULATION, HEALTH, AND PLACE PHD PROGRAM

This program will run concurrently with the SSCI 601ab research practicums scheduled for summer 2020. For the first 7-weeks of the summer session, with guidance from faculty and participants from the cognate fields, we will conduct research projects with the Ph.D. students and the DIA JumpStart scholars aimed at developing dissertation research at the intersection of Population, Health, and Place. There will be 9 Ph.D. students involved this summer.

The JumpStart scholars will have some choice as to which projects to work on. Past examples of projects include library research, computer work and fieldwork on the following topics:

- Access of homeless populations to water, sanitation, and hygiene (WaSH)
- Exploration of spatial and temporal methods in interdisciplinary research
- Research on how locations of licensed versus unlicensed cannabis retail locations affect health equity in the California
- Modeling exposures to noise pollution in the Los Angeles urban environment

One potential project for the upcoming summer includes further work on cannabis retail locations in California. We will investigate how these locations may affect propensity for underage cannabis use. This project is part of a large, multi-year longitudinal study funded by the Tobacco Related Disease Research Program (TRDRP) for which data is currently be gathered by surveying high school students throughout California.

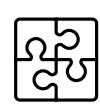
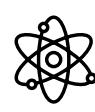
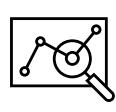
DIA Jumpstart scholars will be expected to attend seminar discussions and team meetings, read articles alongside the Ph.D. students, and assist with various data gathering and processing tasks, including working with geographic information systems, depending on each scholar's skill level and how rapidly they can be trained for these data-intensive tasks.

#### LEARNING OUTCOMES:

- Conduct library research and organize sources in order to build the foundation needed to create a literature review for a carefully defined topic in Population, Health, and Place
- Understand and communicate the value of basic principles of spatial analysis and Geographical Information Systems (GIS) software to analyze data and make maps.
- Conduct intermediate to advanced spatial analysis (depending on the scholars entering skill level and aptitude).

**PROGRAM DATES:** May 20 - August 7

For more information, please visit <https://bit.ly/2Cobel4>



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## TITUS DEPARTMENT OF CLINICAL PHARMACY

### MANIPULATION OF THE GUT MICROBIOME: INFLUENCING ALCOHOL CONSUMPTION BEHAVIORS AND ALCOHOL-INDUCED IMMUNE ACTIVITY

The bacteria that colonize the mammalian gastrointestinal system, known collectively as the gut microbiome, play critical roles in the development and function of multiple host activities throughout an organism's lifetime. The benefits include conferring protection from pathogens through resource and habitat competition, supplementing immune system maturation, and regulating nutrient absorption and metabolism. Building evidence suggests bi-directional communications between the central nervous system (CNS) and microbiome, and this communication plays a role in affecting the pathophysiology of CNS-related disorders, such as Alzheimer's disease, Parkinson's disease, autism, and depression. Recent findings suggest that patients diagnosed with alcohol use disorder (AUD) express altered gut microbiome compositions as compared to healthy individuals. These changes are thought to be attributed to prolonged exposure to alcohol and its ability to affect immune responses and enteric microbial ecosystems. However, there is limited mechanistic data to explain how the microbiome influences alcohol intake behaviors. To begin to investigate this potential, we administered broad-spectrum antibiotics to adult mice (using a binge model of alcohol drinking) and measured changes in alcohol intake. The preliminary findings found that the treated mice significantly increased their alcohol consumption compared to untreated mice. The present study is designed to begin to understand some of the mechanisms involved in propagating alcohol abuse and identifies potential targets for developing microbiome-directed therapeutics to augment the current psychology-based standards of AUD treatment. Notably, this project is perfectly suited for someone that can collaborate with other undergraduate students in the laboratory in that the project has multiple experiments running in parallel, so that each student can accomplish a research endeavor over the course of the summer.

**Roles of DIA JumpStart Scholar:** The training of potential future scientists is critical to the long-term success of science. To this end, the project incorporates an introduction to all aspects of a career in research and critical thinking: conceptualizing the project, reading and understanding laboratory standard operating procedures (SOPs), designing and performing well-controlled experiments, collecting and analyzing data, and writing up the project. Notably, as this is a team driven project, the students learn responsibility to self and colleagues, problem-solving, proper laboratory technique, and ethical responsibility while working as a team to solve a complex problem. Part of this training includes taking both the appropriate lab safety training as well as the animal training as provided by our Department of Animal Resources.

For more information, please visit <https://bit.ly/34Mkmmn>