



**STANFORD
MATERNAL & CHILD HEALTH
RESEARCH INSTITUTE**

**DRIVE (Diversity, Respect, and Inclusion are Vital for Excellence) in Research Pipeline Award –
Pilot Program Summer 2021**

Student Research Project List

Faculty Mentor: Kanwaljeet Anand

Project Title: Biomarkers for Risk and Resilience in Children of Socially Disadvantaged or Minority Families

Project Description: Children admitted to hospital for severe illness, or traumatic injury, or surgery are exposed to scary experiences, painful procedures, parental separation – which can cause severe stress among young children. Voluminous published data show that severe stress exposures in early life (e.g., adverse childhood experiences or ACEs) lead to life-long negative effects on a child’s health, brain development, and subsequent behaviors. These harmful effects last for decades, even into adult life.

We have identified biomarkers (hair cortisol and hair oxytocin) for investigating cumulative stress in young children, but don't know their values among normal, healthy children. Like height, weight, or blood pressures checked in a doctor’s office, these biomarkers may have different values in children of different ages, genders, or racial/ethnic groups. From 1200 pre-school children and their parents, we will obtain hair samples painlessly by trimming the hair close to the scalp and also survey the parents about themselves, their child’s development, and their family environment. This study will help establish normative ranges for these biomarkers aged 9 months to 6 years, thereby helping us to define the degrees of stress occurring in hospitalized children or in special populations of children exposed to adversity (natural disasters, poverty, domestic violence, physical or mental abuse, homelessness, etc.).

Keywords: childhood, stress, adversity

Additional Information:

Profile: <https://profiles.stanford.edu/kanwaljeet-anand>

Lab: <https://med.stanford.edu/psnl-anand-lab/home.html>

YouTube Intro: <https://www.youtube.com/watch?v=PaeU8Wtzu-Q>

Faculty Mentor: Stephanie Chao

Project Title: Screening for PTSD among children after traumatic injury

Project Description: Injury is the leading cause of morbidity and mortality among children. Up to 30% of children will eventually develop signs of PTSD (post-traumatic stress disorder) that can impair social interaction, academic performance, and other aspects of health over an individual's life course. However, PTSD often goes undetected and untreated. Signs can be evident early after a traumatic event, even before the formal diagnosis of PTSD can be made. However, there currently exists no standard for predicting which children are at highest risk for developing PTSD and how best to screen for this population. The summer work will contribute to our research group's larger goal of creating an early screening tool for PTSD. The student will contribute to a systematic review of the literature, which will form the basis of our prospective studies. The student will also be invited to join weekly lab meeting where a variety of research topics are discussed. Current projects include racial disparities in child abuse, virtual reality use in pediatric procedures, and other pediatric

surgery topics. The student is welcome to join any of the other ongoing research projects of the lab that they may find interesting.

Keywords: pediatric surgery, childhood injury, PTSD

Additional Information:

<https://profiles.stanford.edu/stephanie-chao>

Faculty Mentor: William Collins

Project Title: Remote Monitoring of Respiratory Health

Project Description: This is a project looking at how different mobile applications and bluetooth devices can be used to advance the health of patients particularly those with known respiratory disease such as asthma. The goal of the project is to work on the design and initial roll out of studies on how to best use these types of devices in clinical and population health research as well as to study how these might be used as an adjunct to current patient care.

The project has a focus on asthma in pediatric patients. There is also a potential to look at lung function in school age populations and how it may change due to different environmental factors.

Interest in remote monitoring has increased significantly during the COVID-19 pandemic. The intent of this project is to work toward ways to use remote monitoring in other chronic diseases to improve access to and quality of care. An interested student would gain an increased understanding of mobile technology in healthcare, experience in project design, experience in project implementation, and be able to join meetings with our research group remotely.

Keywords: remote monitoring, asthma, digital

Faculty Mentor: Heike Daldrup-Link

Project Title: Cancer Imaging Techniques Mini-Fellowship for the Underserved Students

Project Description: A positive change towards Justice, Diversity, Equity & Inclusion is possible but requires conscious and consensus efforts. By all means, it is a slow and gradual process performed through continuous collaborations with each other and our inherent interest to allow changes. To this effort, a project titled "Cancer Imaging Techniques Mini-Fellowship" has recently awarded funding. The project goal is to create a unique opportunity for the underrepresented minorities to participate in the School of Medicine educational programs. The project will provide training and practical introduction of imaging technologies and applications to students who seek to pursue medicine, especially pediatric radiology and imaging.

The project will start this summer (2021) virtually including formal and informal lecture series, video recorded experimental demonstrations, virtual site visit/facility tours as well as panel discussions. The program is designed to share experiences and form peer to peer support system within the underrepresented students, post-doctoral and senior research scientist. Two Teaching/Research Assistant (TA/RA) preferably from the target minority students will be hired to get training through the program and assist by actively involving in specific tasks such as outreaching to minority students, preparation of video recorded experimental demos, perform evaluation surveys, and moderate lecture/demo series.

Keywords: cancer, imaging, molecular biology

Additional Information:

<https://canarycenter.stanford.edu/cancerimagingminifellowship.html>

<http://med.stanford.edu/sci3.html>

<http://daldrup-link-lab.stanford.edu/>

Faculty Mentor: Gary Darmstadt

Project Title: System dynamics modeling for improved maternal and child health in Bihar, India

Project Description: The Bihar System Dynamics (SD) Modeling Project focuses on developing a simulation model to gain insights into approaches to improve institutional delivery rates among marginalized women in a district of 4 million in Bihar, India. SD modeling is used to study complex issues in global health where multiple actors in the system interact and contribute to system behaviors over time. The SD model is used to identify the causes of poor system performance and leverage points for change, and to simulate the outcomes of proposed policy and program interventions, leading to greater precision and predictability in driving improved system performance and equity.

We conduct weekly meetings to elicit input from a multi-disciplinary, multi-country team of experts and analyze qualitative and quantitative data to formulate the model. The intern will work under the supervision of Prof. Gary Darmstadt, and will conduct literature review, learn the logic of the simulation model, and participate in the analysis and write-up of model outputs. The intern will gain experience from a maternal and child health modeling research project, advance his/her analytical and writing skills, and contribute to improved understanding of the use of SD modeling to advance greater precision and equity in public health interventions.

Keywords: maternal and child health, modeling, precision health

Additional Information:

<https://profiles.stanford.edu/gary-darmstadt>

Faculty Mentor: Tanja Gruber

Project Title: Delineating the Role and Immunogenicity of CBFA2T3-GLIS2 in Pediatric Acute Megakaryoblastic Leukemia

Project Description: The aims of this project are to 1) delineate the role the chimeric transcription factor CBFA2T3-GLIS2 plays in the leukemogenesis of a subset of pediatric acute megakaryoblastic leukemia and 2) interrogate the potential immunogenicity of the CBFA2T3-GLIS2 fusion peptide. Aim 1 will identify essential components to the CBFA2T3-GLIS2 transcriptional complex and uncover potential new therapeutic targets. Aim 2 will investigate the potential of the fusion to be specifically recognized by the immune system, which will provide support for the development of immunotherapies for this leukemia, for which there are currently very few options. Collectively, these aims will contribute knowledge to the fields of molecular oncology and immunobiology and help improve patient outcomes for this rare and aggressive cancer. The student will work remotely to review the literature of the fields of molecular oncology and immunobiology, analyze chromatin immunoprecipitation sequencing (ChIP-seq) data and single cell V(D)J TCR sequencing data, and help with designing experiments, interpreting data, and scientific writing.

Keywords: Pediatric Leukemia, Molecular Oncology, Immunotherapy

Additional Information: <https://med.stanford.edu/gruberlab.html>

Faculty Mentor: Henry Lee

Project Title: Family engagement in the NICU for preterm babies

Project Description: Preterm infants who are at risk for short- and long-term morbidities, as well as neurodevelopmental conditions such as cerebral palsy and developmental delay, can benefit from increased family presence in the NICU, which has been shown to impact these outcomes. However, there are disparities in

family visitations across race/ethnicity and socioeconomic status, which can occur over the several months long that a preterm baby is in the NICU.

We would like to explore the barriers for families to visit the NICU for their preterm babies. The student will help to design a study, perhaps using survey methods and interviews in order to explore this question. A large component of the at-risk population will be limited English proficient and we will plan to have survey materials and/or interviews conducted in Spanish (the most common primary language in this population), and potentially other languages. The work can all be done remotely. The student will participate in study design and based on the pace of the project, help to apply for IRB approval and perform various aspects of the study. For interaction with families in order to enroll in study, we will rely on PI (or clinical colleagues) for this aspect of the study.

Keywords: health equity, neonatal care, health policy

Additional Information:

<https://profiles.stanford.edu/henry-lee>

Faculty Mentor: Rishi Mediratta

Project Title: Respiratory distress QI virtual education in Gondar, Ethiopia

Project Description: Rishi Mediratta has been working at the University of Gondar Hospital since 2006. Currently, we are trying to improve the identification and management of children who present in respiratory distress at the hospital. I am partnering with several pediatricians in Gondar to implement this project. We have completed a needs assessment that documents how medical students and residents are interested in receiving more education about identifying and managing children with respiratory distress. Dr. de Araujo has and continues to shape this project, and you will have the opportunity to build on the work already completed.

Opportunities for your involvement:

- Review the analysis and write up about the needs assessment data collected in Qualtrics and provide feedback
- Review and analyze pre-and post-intervention surveys to assess response to educational interventions
- Research additional videos/ resources for instructional video curriculum based on videos that have already been created. The idea is to collect, edit, package, and pilot an instructional video curriculum to teach medical students and residents how to manage respiratory distress
- Create a simulation program, which would include specific scenarios designed to teach learners about managing respiratory distress. One type of simulation could be designed virtually

Keywords: Respiratory distress, quality improvement, Ethiopia

Faculty Mentor: Anisha Patel

Project Title: California Schools Response to Address Food Insecurity during the COVID-19 Pandemic

Project Description: Food insecurity is associated with poor health and educational outcomes. Prior to the pandemic, 15% of U.S. children were in food insecure households. This increased to 35% at the pandemic's start. When schools closed to reduce COVID-19 transmission, school districts continued to provide meals to students in innovative ways.

Our team has coded data from online sources (e.g., websites, social media) from all 1036 California public school districts. Data included: whether meals were distributed, distribution methods, types of meals provided, and use of key federal waivers instituted during COVID-19 (providing meals to all children in a community, allowing parents to pick up meals without children).

We are excited to work with an intern who is passionate about health disparities and nutrition policy. The goal of the internship is use data we have coded along with CA school meal participation data to understand what strategies were most effective in increasing school meal participation during COVID-19.

The intern will have an opportunity to learn about linking large datasets, data cleaning, data analysis, and literature reviews. The intern will also help disseminate results through publications and presentations to policymakers and school officials who can impact policy and practice.

Keywords: food insecurity, schools, policy

Additional Information:

Team website: <https://researchinchildhealth.org/>

Dr. Patel's CAP profile: <https://profiles.stanford.edu/anisha-patel>

This is a great opportunity for students interested in pursuing careers in medicine, public health, nutrition, or policy.

Faculty Mentor: Thomas Robinson

Project Title: Discovering Adolescents' Smartphone Food Environments

Project Description: This project will provide the first-ever comprehensive characterization of adolescents' smartphone food environments and examine relationships with dietary intake. We have developed a novel method to capture everything that appears on teens' smartphone screens – a fully encrypted record of digital life – by unobtrusively taking a snapshot of those screens every 5 seconds the devices are on. The resulting sequence of screenshots, including all words and images appearing on the screen, constitute an individual's "screenome," the unique, detailed structure of which can inform precision interventions and policy initiatives to improve nutrition and health. We are collecting smartphone screenshots and food frequency measures from a national sample of 100 adolescents (13-17 years) and approximately 50% low-income and/or racial/ethnic minority.

The student will help develop a new taxonomy for the food environment on adolescents' smartphone screens (in text and images), drawing from descriptions of the food environments in other media (television, movies, print) and from inductive analysis of screenomes. Roles can vary from research design to machine learning, based on the student's specific skills and interests. Opportunities to also learn from a large team of graduate students, postdocs and faculty. Computational skills (e.g., python, R, json, cloud computing) are a plus but not necessary.

Keywords: digital media and technology, nutrition and food, data science

Additional Information:

<https://profiles.stanford.edu/thomas-robinson>

<https://screenomics.stanford.edu>

Desire a highly motivated student eager to expand their knowledge and skill set. The summer project can be tailored to the specific skills and interests of the student. Opportunities for continuing research after the summer.

Faculty Mentor: Thomas Robinson

Project Title: Wise Social Psychological Interventions to Improve Outcomes of Behavioral Weight Control in Children with Obesity

Project Description: A randomized controlled trial to test the efficacy of adding two innovative "wise" social psychological interventions—growth mindset and self-affirmation—to an online behavioral weight control

program for children with obesity. Up to 200 10-14 year old children with obesity will be recruited nationally and randomized to the two conditions. All children will receive a usual care online behavioral weight control program. In addition, families randomized to the wise intervention condition will receive the growth mindset and self-affirmation interventions.

The student will learn hands on about research design and clinical trials -- recruiting participants, randomization, masking, measurement science, reliability and validity, quality control, data management and analysis. Emphases can vary from direct interaction with research participants to data analytics to social media marketing depending on the skills and interests of the student. Familiarity with and/or interest in learning to use Qualtrics, REDCap and/or R, are a plus but not necessary.

Keywords: clinical trial, childhood obesity, data analytics

Additional Information:

<https://profiles.stanford.edu/thomas-robinson>

<http://med.stanford.edu/solutions.html>

Desire a highly motivated student eager to expand their knowledge and skill set. The summer project can be tailored to the specific skills and interests of the student. Opportunities for continuing research after the summer.

Faculty Mentor: Lee Sanders

Project Title: Advancing Health Equity through Early Childhood Obesity Prevention

Project Description: A randomized controlled trial enrolling 900 parent-infant dyads (English and Spanish speaking) comparing Greenlight (control), a behavioral intervention focusing on nutrition, physical activity, media use, and sleep as compared to Greenlight Plus (intervention) which includes the above materials plus a health information technology (HIT) intervention aimed at supporting family goal-setting and behavior change during well-child checks throughout the first 2 years of life. Eligibility includes Spanish- or English-speaking parents who are bringing their infant for care at Gardner Packard Children's Health Center, a federally qualified health center that serves as the primary-care teaching site at Stanford.

The Research Assistant (RA) would assist in recruiting and interviewing study subjects (parents), with the potential to contribute to data analysis and literature reviews.

Keywords: health equity, health literacy, health promotion

Additional Information:

The Clinical Trial details can be found at <https://clinicaltrials.gov/ct2/show/NCT04042467>

The Greenlight Intervention materials are available at <https://www.greenlight-program.org/>

A description of the formative study is available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4035594/>

Faculty Mentor: Lee Sanders

Project Title: Immigrant Families and Childrens Health: The Intergenerational Health Impact of Federal and State Immigration Policy

Project Description: Our aim is to estimate the health effects of the laws directed at immigrants on members of mixed-status families, define as families in which the child is a US citizen and at least one parent is undocumented. There are 4.1 million US-born citizen children living in mixed-status families. Although current research points to a strong relationship between immigration status and lower levels of health care access, we have yet to develop a systematic way to measure this impact. In this partnership between the Stanford Immigration Policy Lab and clinician scientists at Stanford, Duke and OHSU, we will rigorously assess the impact

a range of local, state and federal policies and actions on the intergenerational health of US-born children in immigrant families.

Specifically, the student research assistant (RA) would be engaged in research that may include any of the following:

1. Examine publicly available information to identify specific immigration policies and actions, at the federal, state and local levels over the past 10 years, which may affect health care utilization and health outcomes for US-born children in mixed-status immigrant families.
2. Examine publicly available information to identify specific health policies and actions, at the federal, state and local levels over the past 10 years, which may have affected health care utilization and health outcomes for US-born children in mixed-status immigrant families.
3. Support primary research to examine potential mechanisms of effect.

Keywords: immigrant health, health policy, immigration policy

Additional Information:

Project Summary (NIH): <https://reporter.nih.gov/project-details/9885299>

PI = Jens Hainmuller, PhD (<https://politicalscience.stanford.edu/people/jens-hainmueller>)

Co-I = Lee Sanders, MD, MPH (<https://profiles.stanford.edu/lee-sanders>)