GW Faculty Proposals for Medical Student Summer Research Projects

Please review this packet of faculty proposals for medical student 2022 summer research projects.

Email any faculty who list a program of interest. We encourage faculty to interview three students before selection.

Remember that you can also identify your own faculty research mentor and develop a project not in the packet.

Once a faculty member has selected you to work on the project, you can use that proposal, along with that research mentor, to apply for funding for the project.

You are encouraged to develop the proposal to apply to multiple funding sources. This increases the likelihood you will receive a competitive fellowship, since no single source is guaranteed.

Consider fellowship opportunities for medical students:

a. External national summer fellowships
b. External diversity-targeted national fellowships
c. Diversity Supplement to the mentor’s NIH grant
d. External Medical student opportunities at other institutions
e. GW Gill fellowships- Apply here
f. GW Health Services Scholarship Program
g. External national year-out fellowships

Click here for steps for a student to apply for funding. Work with your faculty research mentor to develop their proposal into your joint fellowship application.
Faculty Proposal for MD Student Research by Sonal Batra

* 1. Faculty Sponsor

* Name: Sonal Batra
* Degrees: MD, MST
* Title: Assistant Professor
* Organization: GW (MFA)
* Address: 2120 L Street NW
* Apt/Suite: Suite 450
* City: WASHINGTON
* State: District of Columbia
* Zipcode: 20037
* Office Phone: 2026776617
* Email Address: sonal@gwu.edu

* 2. Daily Supervisor

Name: Julie Orban
Degrees: MPH
Title: Research Scientist
Organization: GWU
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)

Social Mission Metrics Initiative: Tracking Progress Toward Health Equity.

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

* **5. Sponsor's Research Focus:**

* **6. Sponsor's translational level**
  * (Please select ONE)
  T4: Translation to Population Health

  The social mission of a health professions school is the contribution of the school in its mission, programs, and the performance of its graduates, faculty, and leadership in advancing health equity and addressing the health disparities of the society in which it exists. The Social Mission Metrics Initiative centers around the creation and use of metrics to measure social mission in dental, medical, and nursing schools across the United States. By providing school leaders with a tool to objectively assess the status of social mission at their school, the Initiative aims to advance the field of social mission measurement and enhance the national conversation around Social mission in health professions education.

* **8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).**
  - To disseminate and encourage use of a self-assessment tool for school leaders to understand their organization's social mission. Approximately 1000 schools (all accredited U.S. dental and medical schools as well as accredited nursing programs with either a bachelors or masters level program) will be invited. - To track and describe social mission engagement over time.

* **9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.**
  Selection criteria include:
  - The project design makes it likely that the objectives will be achieved
  - The project is likely to result in a report of interest to other scholars
  - The project fulfills discovery/original research
  In 2019, the research team implemented a national campaign with 242 schools around the country participating in the self-assessment and receiving feedback on their school's performance compared to the rest of the participating cohort. Two publications on aggregate results describing the state of social mission in this cohort as well as describing the impact of participating in this self-assessment on schools are under review. In order to allow schools to track performance over time, we intend to repeat this national campaign in 2022-2023. A comparative report describing changes over time between the two time periods of administration of the survey would be generated.

* **10. Describe the student's role in the project (200 word limit)**
  The student would spend the summer of 2022 working with the faculty mentor and research team members in the Fitzhugh Mullan Institute for Health Workforce Equity preparing for this national launch. Specific tasks will be established closer to the time period but would likely include assisting the team in developing relational databases (Filemaker or Salesforce), participating in weekly team meetings, literature review.

* **11. Describe the mentor's role in the project. (200 word limit)**
The mentor has been PI on this RWJF and HRSA funded project for 2 years and was Co-PI for 3 years prior to that.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Sushmita Malik Heba El-Naiem Crystal Xue Nicholas Jennings Jaileessa Casimir (medical student at CUNY) Autumn Nobles (medical student at Yale) CJ Patel

* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
This is a study of schools, not of human subjects.
Faculty Proposal for MD Student Research by Deena Berkowitz

* 1. Faculty Sponsor

* Name: Deena Berkowitz
* Degrees: Deena Berkowitz, MD, MPH Associate Chief, Acute Care | Division of Emergency Medicine | Children’s National Hospital Director, Pediatric Urgent Care Fellowship Associate Professor of Pediatrics & Emergency Medicine | George Washington School of Medicine & Health Science dberkowitz@childrensnational.org | O:202-476-3834 | F: 202-476-3573
* Title: Associate Professor
* Organization: Children’s National Medical Center
* Address: 111 Michigan Ave NW
* City: Washington
* State: D.C.
* Zipcode: 20010
* Office Phone: 202-476-4177
* Email Address: dberkowitz@childrensnational.org

** 2. Daily Supervisor

Name: Joelle Simpson
Degrees: Joelle N. Simpson MD, MPH (she/her/hers) Chief of Emergency Medicine, Emergency Medicine & Trauma Center Medical Director for Emergency Preparedness, Children’s National Hospital Associate Professor of Pediatrics & Emergency Medicine George Washington University School of Medicine & Health Sciences ---------------------------------------

Title: 
Organization: 
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)
Exploring a New Trigger to Decrease Medical Error in the Pediatric Emergency Department
4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
   Yes - Pediatrics
   Yes - Emergency Medicine

* 6. Sponsor's translational level
   * (Please select ONE)
   T2: Translation to Patients

7. Hypotheses (200 word limit)
The emergency department (ED) is a care setting with high risk for medical error. While medical error is common, it rarely results in harm. Because harm does not occur, reliably detecting medical error is challenging, but important in order to systematically improve patient safety. One common method of discovering medical errors is to use specific clinical events to trigger chart review. Triggers are clinical events that make it more likely that a medical error has occurred. We identified a new trigger to reduce emergency department medical error. Outcome metrics have been established utilizing quality improvement methodology. The tool has been tested on 300 charts and we are working on the second manuscript. First manuscript is in progress. The student will join the multidisciplinary team and conduct chart review. Through this project the student will learn quality improvement methodology, survey review, types of medical error in the emergency department and how to write up a literature review as the background for manuscript publication.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).

SMART aim: Decrease proportion of uptriaged patients classified as diagnostic error by 50% in 12 months Global Aim: implement new trigger tool to decrease medical error Student will review up to 80 charts

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
The project fulfills discovery/original research

Time frame: approximately 6-8 weeks. May be done remotely, mostly asynchronous but student will join in monthly multidisciplinary meetings. Project design: a multidisciplinary team is already established. The redcap survey for data collection is created and interacts with the EMR. The project is of interest in scholars engaged in quality/safety work and emergency department health services research. This trigger is original and fulfills original research.

* 10. Describe the student's role in the project (200 word limit)
The student will join the multidisciplinary team and conduct chart review and prepare the literature review for the manuscript. Through this work, the student will learn quality improvement methodology, survey review, types of medical error in the emergency department, and how to prepare a literature background for publication.

* 11. Describe the mentor's role in the project. (200 word limit)
As the mentor, I meet weekly with the student, set clear expectations, and teach the student the skills needed to succeed in their role on the project.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)
Selected Yes

Please provide IRB number and date

* IRB Number: 000015762

IRB Date: 4/2/21
Faculty Proposal for MD Student Research by Miriam Bornhorst

* 1. Faculty Sponsor

* Name: Miriam Bornhorst
* Degrees: MD
* Title: Clinical Director Gilbert NF program, Medical Director Cancer Genetics Program
* Organization: Children's National Hospital
* Address: 111 Michigan Ave NW
* Apt/Suite: 
  * City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-5068
* Email Address: mbornhorst@childrensnational.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)

Discovering novel genetic and epigenetic alterations in pediatric cortical brain tumors with DL-OGM

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

*Authors had equal contribution


* 5. Sponsor's Research Focus:
Yes - Genomics
Yes - Cancer

* 6. Sponsor's translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)
DL-OGM allows for identification of novel tumor specific genetic and epigenetic alterations associated with tumorigenesis.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Goal 1: Analyze 24 brain samples to assess for tumor infiltration Goal 2: Extract High molecular weight DNA from brain and brain tumor samples (goal 60 samples) Goal 3: Assist with Dual-Label Optical genome mapping for samples Goal 4: Assist with data analysis

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This study will use dual label optical genome mapping (DL-OGM), which is a form of DNA analysis that uses high molecular weight DNA to identify large structural variants such as deletions, duplications, inversions, translocations, etc. These types of structural variants are very important for brain tumor development, but because of the limitations of other types of sequencing, we don't fully understand the spectrum of structural variants in tumors. We also don't fully understand how structural variants change methylation patterns in brain tumors. Using dual label optical genome mapping, our ultimate goal is to analyze 24 normal brain samples and then an additional 36 tumor samples look at differences in structural variant and methylation patterns between these. This type of analysis has never been performed, but has the potential to greatly inform how tumors form so we can improve on our treatment options. This project will include the following tasks 1. Perform H&E and tumor marker staining (TP53, H3K27M, etc). on "normal"
brain samples that have been collected to ensure they do not have tumor infiltration. Up to 24 samples will be stained and analyzed. The expected timeframe for this task is up to 4 weeks. Perform DL-OGM on up to 60 samples: For this task, high molecular weight will need to be extracted, and samples will be run on the Bionano analyzer (up to 6 samples per week). Analyze DL-OGM data to identify novel structural variants and methylation patterns- This task will be done in tandem with sample analysis.

* 10. Describe the student's role in the project (200 word limit)
The student would assist with HMW DNA extraction from samples, staining of samples, taking pictures and analysis of samples to look for tumor infiltration, and preparing the samples for DL-OGM analysis. Although not required, the student would also have the opportunity to help with data analysis (identifying novel structural variants, methylation patterns) and assisting with the write-up of the data and manuscript preparation.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will ensure that the student has the appropriate training and support to perform the tasks, meet with the student on a regular basis to review progress, and can also provide shadowing opportunities in the oncology clinic at Children's National for students who are interested in pediatric oncology.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I have worked with high school and undergraduate students, but have not had a medical student in the lab

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00014594
* IRB Date: 9/23/2020
Faculty Proposal for MD Student Research by Randall S. Burd

1. Faculty Sponsor

- Name: Randall S. Burd
- Degrees: MD, PhD
- Title: Chief, Division of Trauma and Burn Surgery
- Organization: Children's National Hospital
- Address: 111 Michigan Ave NW
- City: Washington
- State: DC
- Zipcode: 20010
- Office Phone: 202-476-2151
- Email Address: rburd@cnmc.org

2. Daily Supervisor

Name: Randall Burd
Degrees: MD, PhD
Title: Chief, Division of Trauma and Burn Surgery
Organization: Children's National Hospital
Address: 111 Michigan Ave NW
City: Washington
State: DC
Zipcode: 20010
Office Phone: 202-476-2151
Email Address: rburd@cnmc.org

3. Project Title (250 character limit)
Predicting the Need for Urgent Airway Intervention after Pediatric Injury

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. **Sponsor’s Research Focus:**
Yes - Pediatrics
Yes - Surgery

6. **Sponsor’s translational level**
* (Please select ONE)
T3: Translation to Practice

7. **Hypotheses (200 word limit)**
The need for emergency department (ED) airway intervention after pediatric injury using only prehospital factors is intrinsically uncertain and based on a complex interplay of these factors.

8. **Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).**
Develop and implement an algorithm for predicting the need for airway intervention after pediatric injury based on prehospital features. Compare the performance of the algorithm against human judgment.

9. **Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.**

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Injury is the leading cause of death in children. Ensuring timely and appropriate care early after pediatric injury reduces the likelihood of death. Although standard protocols for the initial management of injured children have been developed, errors in these protocols remain even when deployed by experienced teams. Delayed or inappropriate deployment of airway management protocols has been identified as a cause of morbidity and mortality after injury. Increasing awareness of the likelihood of requiring emergency airway intervention may reduce errors and prevent associated adverse outcomes. To address this challenge, we are developing an algorithm for predicting the need for emergency airway intervention. When deployed, this algorithm will use available data to generate a probability estimate of the need for airway intervention, allowing teams to assess risk and make needed preparations. This project will use prehospital data available in the Trauma Registry at Children's National Hospital to generate a probability of needing urgent airway intervention. Using >2,000 records, several machine learning algorithms will be evaluated for predicting airway need. This algorithm will be assessed using an internal validation dataset and will be compared to human predictions in actual clinical practice.

10. **Describe the student's role in the project (200 word limit)**
The student will perform data cleaning and preparation for assessment in a panel of machine learning algorithms. This work will be performed in collaboration with members of Dr. Burd's research team. After the algorithm is developed and deployed, the student will compare the performance of the algorithm with actual clinical predictions using standard methods. The student will participate in all phases of the project and will be a contributor to related ongoing projects in Dr. Burd's group.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will assist the student in the development and drafting of a proposal for submission for intramural funding through the Gill or Health Services Research program. Dr. Burd will meet with the student weekly or more often if needed to review project progress.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Burd has had multiple Gill Fellows and Health Services Scholars over the past 15 years. The most recent student contributed to a project evaluating the deployment of a checklist for trauma resuscitation using video review of actual events. Most students have coauthored papers related to their summer work.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: 00000343
* IRB Date: 6/3/2021
Faculty Proposal for MD Student Research by Guenevere Burke

1. Faculty Sponsor

* Name: Guenevere Burke
* Degrees: MD, MBA
* Title: Assistant Professor of Emergency Medicine
* Organization: GW MFA
* Address: 2175 K St NW
* Apt/Suite: Suite 200
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 6462417212
* Email Address: gburke@gwu.edu

2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

3. Project Title (250 character limit)

The Atlantic Fellows for Health Equity based at the Fitzhugh Mullan Institute for Health Workforce Equity is looking to make an impact right here at GW. Entrants to the health professions do not reflect the great diversity of our community, and we are looking to learn more about the experience of under-represented minority (URM) students at GW interested in the health professions. The interested student would be tasked with organizing undergraduate focus groups and meeting faculty from relevant graduate and undergraduate schools to develop a report regarding resources currently available to URM students. This work would inform the development of programs to support existing students and attract future students from URM to health professions - improving the diversity of our healthcare workforce and promoting health equity for our communities.

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

https://journals.lww.com/lww-medicalcare/fulltext/2021/10001/health_workforce_for_health_equity.2.aspx

5. Sponsor's Research Focus:

Yes - Emergency Medicine
6. Sponsor's translational level
(Please select ONE)
T4: Translation to Population Health

7. Hypotheses (200 word limit)
Disparities and inequities within the U.S. health system have existed for decades with poorer health outcomes and shorter life expectancies well-documented among Black, Latinx, and Native American people. COVID-19 and the national discussion around racism has highlighted how structural factors contribute to health disparities. One factor that may contribute to health disparities is the underrepresentation of Black, Latinx, and Native American people in most health professions, particularly those requiring advanced education. While some schools, professions and states have made efforts to increase diversity in health professions, only limited progress has been made. The Fitzhugh Mullan Institute for Health Workforce Equity (GWMI) is committed to conducting research and policy analysis to promote greater equity in health care and society.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
- organize at least two (2) focus groups of URM undergraduate students interested in health professions (MD, PA, RN, PT)
- conduct key informant interviews with faculty and students from SMHS, SON, Columbian School of Arts and Sciences and Provost's office to understand existing counseling and other resources to support URM students pursuing health professions
- Develop a report summarizing the findings of focus groups and interviews

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

The Atlantic Fellows for Health Equity is an international fellowship program based at the Fitzhugh Mullan Institute for Health Workforce Equity. The program's advisory board includes representatives from the Provost's office, SPH and SMHS and the Institute includes experts on workforce diversity and social mission in health professions educations. The advisory board recently challenged the Atlantic Fellows leadership, Director Guenevere Burke, with advancing health equity at GW. Drawing upon the expertise of the Institute and the Fellowship, and with the support of key faculty advisors, this initiative is poised to have an important impact on the experience of undergraduates across the university.

10. Describe the student's role in the project (200 word limit)
The student would take the lead in scheduling and conducting interviews across the campus. Connection and outreach, development of interview tools would be supported by relevant faculty. The student would take primary responsibility for drafting a final report for internal distribution to inform the development of new support programs for undergraduates. The student would also be welcome to attend research meetings at the Mullan Institute regarding the Diversity tracker initiative https://www.gwhwi.org/workforcediversity.html and Social mission metrics https://www.gwhwi.org/social-mission-metrics.html to learn more about best practices in this area.

11. Describe the mentor's role in the project. (200 word limit)
As a mentor, I would provide the student with background materials on diversity in health professions education and the link the health equity and introduce the student to Mullan Institute faculty and staff. The student would meet with me at least biweekly to review findings to date and develop a draft report together by the conclusion of the project. We would also arrange a meeting of key stakeholders for the student to present his/her findings.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
We do not currently have medical students, but we do have a full time post-doc working on the Atlantic Fellows team.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
Internal quality improvement project
* 1. Faculty Sponsor

* Name: Conrad Russell Y. Cruz
* Degrees: MD PhD
* Title: Associate Professor
* Organization: Children's National Hospital
* Address: 111 Michigan Ave NW
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 2024762046
* Email Address: ccruz@childrensnational.org

* 2. Daily Supervisor

Name: 
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)
T cells reconfigured for antibody effector neutralization of neoplastic environments

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Cancer

* 6. Sponsor's translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)
Adoptive T cell therapy has shown great efficacy against hematologic malignancies, but its application for pediatric brain tumors is still in its infancy. We hypothesize that T cells capable of neutralizing the immune suppressive tumor environment will have improved efficacy against pediatric brain tumors.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
1. Gene modification of T cells to express a chimeric protein capable of neutralizing the tumor environment
2. Demonstration of neutralization of environment in vitro

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

*** Training - 1 month (or more) ***
1. T cell generation - 8 weeks (average of 3 weeks per T cell line; on a staggered schedule n=5 lines will probably take around 8 weeks)
2. Genetic modification - 1 week (incorporated in the schedule above)
3. Immune assays - 2 weeks (includes ELISA, ELISPOT, flow cytometry) following T cell generation

* 10. Describe the student's role in the project (200 word limit)
Student will be performing the immune assays to characterize the novel engineered T cells and NK cells (and if rotations permit, examining their effects in orthotopic mouse models). Student will also be involved in developing new constructs if necessary, if the original constructs do not pan out. Finally, student will also be involved in the analysis and write up of the results. As part of the review of related literature for the project, there may be an opportunity for the student to write a review with me and other collaborators.

*11. Describe the mentor's role in the project. (200 word limit)*

Mentor will be overseeing the student's entire project, and will be assigning a staff scientist or research tech to work closely with the student. Mentor will talk about the relevant literature related to the project in regular meetings with the student, and will also serve as resource for learning more about immunotherapy. As part of the review of related literature for the project, there may be an opportunity for the student to write a review with me and other collaborators - potential other mentor roles will then include helping the student write the paper and submitting.

*12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)*

I have hosted one successful Gill Fellow, a recent graduate, Sarah McCormack, who went on to publish a first author paper with me, and who went on to win the Speck Research Award. (Sarah actually had to decline the prize money from the Gill Fellows award because she also got support from the Alex's Lemonade Stand Foundation). I have also hosted three other GWU medical students during research rotations and writing review articles. One non-GWU medical student did a research rotation with us, and received support after being awarded an SZI fellowship here at Children's National.

*13. Do you have or will you obtain IRB approval for this project?*  
**Please note:** Students cannot begin a human subjects project without IRB approval.  
* (Please select ONE)  
Selected Yes

Please provide IRB number and date

* IRB Number: Pro00004033  
* IRB Date: 11/7/2021
Faculty Proposal for MD Student Research by Yves d'Udekem

* 1. Faculty Sponsor

* Name: Yves d'Udekem  
* Degrees: MD, PhD  
* Title: Chief, Division of Cardiac Surgery  
* Organization: Children's National Hospital  
* Address: 111 Michigan Avenue NW  
* Apt/Suite: W3-402  
* City: Washington  
* State: DC  
* Zipcode: 20010  
* Office Phone: (202) 476-2811  
* Email Address: yves.dudekem@childrensnational.org

* 2. Daily Supervisor

Name: Alyssia Venna  
Degrees: MBS  
Title: Program Lead  
Organization: Children's National Hospital  
Address: 111 Michigan Avenue NW  
Apt/Suite: W3-400/500  
City: Washington  
State: DC  
Zipcode: 20010  
Office Phone: 202-476-6119  
Email Address: avenna@childrensnational.org

* 3. Project Title (250 character limit)
Understanding the timing of negative outcomes in patients with a Common Atrioventricular (AV) Valve

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor’s Research Focus:
Yes - Cardiology
Yes - Surgery

* 6. Sponsor’s translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
If patients with a repaired Common AV Valve develop moderate Atrioventricular valve regurgitation, then they will experience a transition to severe regurgitation and decreased ventricular systolic function within 5 years.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Common AV Valve is a heart condition where the tricuspid and mitral valves are combined into one common valve. The common valve is reconstructed in the first months of life and involves separating the common valve into two components: left and right atrioventricular valve. Reintervention of the left atrioventricular valve occurs in 25% of patients because of regurgitation. It is unknown at which stage to re-operate. It is possible that patients may tolerate a moderate level of AV valve regurgitation for several years. This project will be a large retrospective study that will utilize more than 30 years’ worth of data from hundreds of patients with Common AV valve who were repaired at Children’s National Hospital. The idea is to observe the time lapse between the first time that moderate regurgitation is noted in these patients, how long it takes for the moderate regurgitation to evolve into severe regurgitation and at what timepoint moderate ventricular systolic dysfunction is noted. Our objectives are: • To understand timing of events following common AV valve repair • To evaluate and improve long-term outcomes of patients who had common AV valve repair • To identify risk factors for regurgitation and ventricular dysfunction

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

• The project design makes it likely that the objectives will be achieved
• The project is likely to result in a report of interest to other scholars
• The project fulfills discovery/original research
Our retrospective observational study will collect clinical data from hospital records and incorporate them into a registry database. To begin assessing outcomes, an initial retrospective data pull will gather a list of patients who have had a common AV valve repair at Children’s National Hospital. Echocardiographic data will be assessed to determine timing of transition from moderate to severe regurgitation. Follow up data will be collected to determine timing of ventricular systolic dysfunction. We have access to records from the early 1990s and we anticipate needing three months to develop a database, collect follow up data from these medical records, and analyze results to develop a scientifically just article.

* **10. Describe the student’s role in the project (200 word limit)**
The student will work with the Mentor to develop a research database using REDCap. They will review patient electronic medical records and collect information to populate the database. The student will assist in statistical analysis and will have the opportunity to further enhance their skills through scientific reports, posters, and oral presentations.

* **11. Describe the mentor’s role in the project. (200 word limit)**
The mentor will be responsible for overseeing the student’s progress through regular meetings and teaching sessions throughout the summer. The mentor will guide the student to produce high quality research questions and answers and will aid in enhancing the student’s skills in the development scientific publication.

* **12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)**
Danielle Healey GW MD Candidate 2024, Dr David Glineur, MD, PhD, Consultant Cardiac Surgeon, Cliniques Universitaires St-Luc, Belgium Dr Parla Astarci, MD, Consultant Cardiac Surgeon, Cliniques Universitaires St-Luc, Belgium Dr Nelson Alphonso, M.S., FRCS, FRCSI, Consultant Cardiac Surgeon, Head of the department of paediatric cardiac surgery, Alderhey Hospital, Liverpool, UK Dr Lyubomyr Bohuta, MD, Consultant Cardiac Surgeon, Head of department of paediatric cardiac surgery, Children’s Cardiac Centre, Kyiv, Ukraine Dr Ajay Iyengar, MBBS, PhD student, trainee in the cardio-thoracic surgery program of the RACS.

* **13. Do you have or will you obtain IRB approval for this project?**
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00015566
* IRB Date: 7/7/2021
**Faculty Proposal for MD Student Research by Lawrence Deyton**

* 1. Faculty Sponsor

* Name: Lawrence Deyton
* Degrees: MSPH, MD
* Title: Murdock Head Professor of Medicine and Health Policy and Senior Associate Dean for Clinical Public Health
* Organization: GW SMHS
* Address: 2300 Eye Street, NW
* Apt/Suite:
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 202 994-6468
* Email Address: LDeyton@gwu.edu

* 2. Daily Supervisor

Name: Lawrence Deyton
Degrees: MSPH, MD
Title: Murdock Head Professor of Medicine and Health Policy and Senior Associate Dean for Clinical Public Health
Organization: SMHS
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address:

* 3. Project Title (250 character limit)

Enhancing Medical Student Application of Public Health/Population Health Knowledge in Clinical Education (MS3-4 years) to Address Health Disparities

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

Teaching Public and Population Health in Medical Education: An Evaluation Framework
Johnson, Sherese B. MPH; Fair, Malika A. MD, MPH; Howley, Lisa D. MEd, PhD; Prunuske, Jacob MD, MSPH; Cashman, Suzanne B. ScD; Carney, Jan K. MD, MPH; Jarris, Yumi Shitama MD; Deyton, Lawrence R. MSPH, MD; Blumenthal, Daniel MD, MPH; Krane, N. Kevin MD; Fiebach, Nicholas H. MD; Stelnick, Alvin H. MD; Morton-Eggleston, Emma MD, MPH; Nickens, Chloe; Ortega, Lavonne MD, MPH Academic Medicine: December 2020 - Volume 95 - Issue 12 - p 1853-1863
https://journals.lww.com/academicmedicine/Abstract/9000/Teaching_Public_and_Population_Health_in_Medical.97000.aspx

* 5. Sponsor's Research Focus:

* 6. Sponsor's translational level

* (Please select ONE)
T4: Translation to Population Health

* 7. Hypotheses (200 word limit)
GW medical students’ pre-clinical curriculum (MS1-2 years) contains basic and clinical sciences and, recently, significant content in public and population health. The focus of this added content in public and population health is on preparing graduates to take on roles to recognize and address how to improve health system quality, access, and community health, and to diminish health disparities. Currently, there exists no organized reinforcement or intentional application of medical students’ pre-clinical public health/population health learning in the Core Clerkships in MS3-4 years of the clinical curriculum. HYPOTHESIS FOR THIS PROJECT: Intentional integration during Core Clerkships of medical education activities targeted to reinforce and apply pre-clinical public health/population health systems science learning will result in medical students’ performance at advanced levels as defined by Bloom’s Taxonomy of hierarchical ordering of cognitive skills.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).

GW SMHS Senior Associate Dean for Clinical Public Health, in collaboration with the Associate Dean for Clinical Education in the MD Program and Core Clerkship Directors, will identify opportunities in Core Clerkships to reinforce and apply the pre-clinical public health/population health education that GW medical students received in their Patients, Populations and Systems Courses and Clinical Public Health Summits. Based on those opportunities and working with SMHS Clinical Public Health Mentors, educational tools will be developed for Core Clerkship Directors to use to reinforce pre-clinical public health/population health learning in the clinical setting. In collaboration with the Associate Dean for Evaluation and Educational Research, we will develop and implement a pre/post assessment of learning and application of public health/population health in the clinical setting. Quantitative survey tools and qualitative methods (e.g., interviews and focus groups) will be developed for this purpose and included in MS3 and MS4 Clerkship and End of Year student surveys. These assessment tools will be used to evaluate higher order student learning and application based on Bloom’s Taxonomy for Teaching, Learning, and Assessment.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

The Institute of Medicine of the National Academies of Science, AAMC®, medical education accrediting bodies, and other health professional organizations have recommended the integration of public health/population health in medical education as necessary to address population health needs in a rapidly changing United States health and healthcare landscape. The U.S. population is becoming increasingly diverse, which requires a physician workforce that is culturally responsive to patient needs and equipped to address persistent health and healthcare disparities. The Covid-19 pandemic and an increased recognition of the health impacts of racism have highlighted the important roles clinicians must play in identifying and addressing public health/population health issues by working in health systems, communities and professional organizations. GW SMHS has led innovations in pre-clinical medical education that integrates public health, population health, health systems science with a goal to prepare physicians who can be equipped to address health and healthcare disparities. The ongoing Covid-19 pandemic and further documentation of the health impact of disparities and racism has highlighted the need to reinforce and expand public health/population health content in clinical education phase of medical education. This project fulfills discovery/original research goals since evaluation of reinforcement and application of medical student public health/population health knowledge in the clinical education setting – the focus of this project – has never been done. This project will be of interest to other medical education scholars and there are ample opportunities for transfer of knowledge generated by this project as these results will be relevant to health professions educators. The overall design and timeline of this project include: 1. Review of CUMEC approved medical education objectives of Core Clerkships for MS3-4 years. Week 1 of student work. 2. Identification of Core Clerkship current activities that currently require application of public health/population health/health systems science. Week 2 of student work. 3. Solicit input from Core Clerkship Directors to identify opportunities to reinforce and apply students’ pre-clinical public health/population health learning. Week 3-4 of student work. 4. Working with Clinical Public Health Mentors, create education materials to support Clerkship Directors ideas to integrate into Core Clerkships medical education activities to reinforce and apply pre-clinical public health/population health learning. Examples could include Clerkship-specific or longitudinal cross-clerkship cases, morning report assignments on public health/population health topics relevant to each Clerkship, public health/population health journal club topics and other-to-be-determined suggestions from Clerkship Directors. Week 4-6 of student work. 5. Working with Associate Dean for Evaluation and Educational Research, create evaluation questions to be included in MS3 and MS4 Clerkship and End of Year student surveys and/or focus group discussions. Week 6-7 of student work. 6. Write final report and recommendations. Week 8 of student work. The selected student for this project ideally will have knowledge and experience in public health.

10. Describe the student's role in the project (200 word limit)

Working under supervision of Dean Deyton: 1. Collect and review education objectives of the MD curriculum Core Clerkships. 2. Identify education activities in the Core Clerkships that reinforce and apply public health/population health learning accomplished in the pre-clinical MD program (Patients, Populations and Systems courses and Summits). 3. Meet with Dean Deyton and Core Clerkship Directors to solicit ideas for opportunities to reinforce and apply MS3-4 students’ pre-clinical public health/population health learning. 4. Participate in an ideas-generating session with Clinical Public Health Mentors to expand upon suggestions made by Core Clerkship Directors and solicit faculty help in developing educational materials. 5. Develop 4-5 medical education products such as those examples mentioned above. In collaboration with Clinical Public Health Mentors targeted for use by Core Clerkship Directors to reinforce and apply public health/population health learning accomplished in the pre-clinical MD program. 6. Work with Dean Deyton and Associate Dean for Evaluation and Educational Research to develop assessment tools to be included in required medical student Clerkship and Phase 2 evaluation surveys that address students’ application of public health/population health knowledge according to Bloom’s Taxonomy. 7. Participate in development of manuscript to be submitted for publication.
11. Describe the mentor's role in the project. (200 word limit)
Dean Deyton will directly supervise the selected student in all aspects of this project. Supervision will include twice-a-week planning and work sessions and any ad hoc guidance the selected student requests. Dean Deyton will accompany the student in all meetings with Associate Dean for Clinical Education – MD Program, Core Clerkship Directors, Clinical Public Health Mentors and the Assistant Dean for Evaluation and Education Research. Dean Deyton is a founding member of the AAMC Expert Panel on Teaching Public Health/Population Health in Medical Education. The project and evaluation proposed here is of great interest to the AAMC Expert Panel.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Past Gill Fellows and Health Services Scholars that have worked with our group include: Bridget Huysman - Gill Ashton Jenney – Health Services Amali Gunawardana – Gill Madeline Taskier – Health Services Jensen Galvis – Gill Brittney Gordon – Gill Adwoa Bamfo - Gill

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.

(Please select ONE)

Selected Yes
Selected No (Not Required)

Please provide IRB number and date
* IRB Number: IRB#: 041529
* IRB Date: unsure

Please specify why it is not required.
This project will be conducted under the umbrella GW IRB-approved study, “Innovations in Learning Design and Delivery” used by the GW SMHS Office of Evaluation and Educational Research for curriculum and education program improvement (study IRB#: 041529).
Faculty Proposal for MD Student Research by Daniel Donoho

* 1. Faculty Sponsor

* Name: Daniel Donoho
* Degrees: MD
* Title: Assistant Professor of Neurosurgery
* Organization: Children's National Hospital / GW SMHS
* Address: 111 Michigan Ave
* Apt/Suite: 
* City: Washington
* State: District of Columbia
* Zipcode: 20010
* Office Phone: 2024763020
* Email Address: ddonoho@cnmc.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Surgeon Performance Assessment Using Computer Vision and Augmented Reality

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
5. Sponsor’s Research Focus:
Yes - Anatomy
Yes - Neurology
Yes - Surgery

6. Sponsor’s translational level
* (Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
The central hypothesis of this work is that task-specific hand and eye parameter-based metrics generated by an augmented reality headset during a neurosurgical task are correlated with task outcome.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
The aims of this project are: 1. Measure hand and eye tracking while 10 surgical trainees and/or students perform a standard surgical task (for example, cannulation of the cerebral ventricles with a ventriculostomy catheter, or dural suturing). 2. Develop performance metrics using hand and eye tracking data predictive of task outcome. 3. Evaluate the feasibility of using the augmented reality headset in the operating room setting. These aims will serve as the foundation for a future project to perform tasks in the operating room.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
Summary: Now - March 1: IRB writing and submission May 1- Project start: literature review, recruit subjects and schedule sessions Week 1-2: Write necessary code for data collection and run test session to ensure data is collected. Week 3-4: Complete 2-4 sessions of primary data collection (depending on subject availability) Week 5-8: Data analysis and manuscript drafting.

10. Describe the student’s role in the project (200 word limit)
The student will - engage with the project daily - meet weekly in person / zoom and daily as needed - perform primary data collection from experiments - keep lab notebooks - perform data collection - adapt existing toolkits for extracting hand and eye tracking data - develop familiarity with 3D slicer, Unity XR and Microsoft mixed reality toolkit - perform data analysis at the appropriate level, depending on technical background and skills progression - lead the authorship of a manuscript and conference presentation - have the opportunity for follow-on projects depending upon interest
* 11. Describe the mentor's role in the project. (200 word limit)
My role as a mentor is to provide all of the necessary ingredients for project success. We will jointly set and maintain a timetable that is realistic to complete a project within the timeframe available. I will support the student to submit at least one peer-reviewed manuscript submission and at least one submission to a national neurosurgery conference by the end of the summer. I will ensure that the academic environment is optimized for success, including ensuring access to technical collaborators and organizing surgical trainees for data collection. The project team will meet weekly for at least one hour and I will be available to meet or correspond daily regarding project progress. Funding, software, computational and other support will be provided as needed from the mentor's funds.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I have mentored many prior medical students, including an award winner at the 2021 AANS national meeting. Several medical student mentees each year have successfully matched into neurosurgery. I have been a course instructor in procedural techniques at resident and medical student courses organized by national neurosurgical bodies.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Pending)
Faculty Proposal for MD Student Research by Melissa Dvorsky

* 1. Faculty Sponsor

* Name: Melissa Dvorsky
* Degrees:  Ph.D.
* Title: Assistant Professor of Psychiatry and Behavioral Sciences and Pediatrics
* Organization: Children's National Hospital the George Washington University School of Medicine and Health Sciences
* Address: 111 Michigan Ave NW
* Apt/Suite: CNRI/CTR-6, 6th Floor Main, CTR Suite, RM M7661
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 2024761752
* Email Address: mdvorsky@childrensnational.org

* 2. Daily Supervisor

Name: Melissa Dvorsky
Degrees: PhD
Title: Assistant Professor/Director of ADHD and Learning Differences Program
Organization: Children's National/GWU
Address: 111 Michigan Ave NW
Apt/Suite: CNRI/CTR-6, 6th Floor Main, CTR Suite, RM M7661
City: Washington
State: DC
Zipcode: 20010
Office Phone: 2024761752
Email Address: mdvorsky@childrensnational.org

* 3. Project Title (250 character limit)

Development and Evaluation of a Technology-Enhanced Executive Functioning Skills Intervention for Adolescents with ADHD

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Psychiatry

6. Sponsor's translational level
*(Please select ONE)*
T3: Translation to Practice

7. Hypotheses (200 word limit)
This study aims to co-develop with stakeholders and evaluate an online platform/mobile app for improving executive functioning skills for adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD) and their families. We will use an iterative user-centered design process whereby qualitative feedback will be obtained from potential end-users including adolescents, parents, and school providers. We will a) conduct focus groups with youth, parents, and providers before, during, and after development to guide and prioritize content and features; and b) conduct a pilot RCT of the behavioral intervention+online tool compared to the intervention alone. Hypothesis 1: Youth with ADHD, their parents, and mental health providers will identify key content and themes for features of the digital health tool. Hypothesis 2: Youth with ADHD, their parents, and mental health providers will rate the intervention as feasible, easy to use, acceptable, and responsive to their needs. Participants who receive the digital augmentation treatment will demonstrate significant improvements in skill utilization (primary treatment target) at post-treatment. We also hypothesize that the technology use will be associated with mechanisms of skill utilization (i.e., motivation/reward responsivity, executive functioning, social support) to skill utilization which is associated with subsequent skill utilization and improved outcomes.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
This project is part of an ongoing NIMH-funded study examining the feasibility, acceptability, usability and initial efficacy of a technology-enhanced executive functioning skills intervention designed to promote treatment engagement, skills use, and treatment response for adolescents with ADHD. The project is currently enrolling participants (enrollment began November, 2018). 80 participants (youth ages 11-15) with ADHD, their, and 12 providers) will complete three separate focus group/qualitative interview sessions and participate in an open trial (n=20), or the pilot RCT (n=60). Participants will complete 90-minute focus group/qualitative interview sessions either in-person or via videoconference and provide ratings of the technology's usability. Five additional adolescents with ADHD (ages 11-15) will participate in the open trial/extended usability testing of the technology-enhanced intervention and complete pre/post-treatment ratings. Assessments for the open trial are conducted pre-intervention, weekly during treatment, immediate post-intervention, and 6-months follow-up. Skills utilization and treatment adherence are assessed by observed and self-report measures in addition to real-time data collected via the digital
Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Digital health (dHealth) strategies offer unprecedented opportunities for increasing adolescents’ skills utilization, boosting effectiveness of EBTs, and reducing time and cost of care. This project leverages dHealth to overcome the barriers specific to ADHD by: (1) providing frequent opportunities for immediate reinforcement at the point-of-performance and motivating adolescents with game mechanics; (2) using interactive tools to reinforce in-vivo skill use and compensate for inherent EF deficits (e.g., forgetting); and (3) promoting social support and parents’ consistent reinforcement. By engaging these intermediate targets, we hypothesize the dHealth tool will increase adolescents’ in vivo skill utilization. This study aims to develop, refine, and preliminarily test a scalable dHealth augmentation that promotes skills utilization during treatment for young adolescents with ADHD. This project emphasize training in: 1) interactive health technology, 2) adherence promotion, 3) methods and statistical approaches for ecologically valid, real time assessment and adaptive intervention designs, 4) mechanism-based refinement and evaluation, as well as grant writing skills and dissemination. Intervention content is delivered in clinic and school settings through the ADHD and Learning Differences program at Children’s National Hospital. We are currently recruiting 20 youth ages 6-17, 20 parents, and 5 providers to participate in focus groups/qualitative interview sessions and complete ratings of usability/feasibility on the digital tool over the next 6 months. We are simultaneously recruiting 5 adolescents with ADHD to participate in an open trial investigation of the digital platform tool and the executive functioning intervention to determine if the digital tool provides added benefits to treatment adherence, engagement, and overall response relative to pre/post comparison results with prior trials. For the open trial, we are targeting enrollment to adolescents with ADHD who have not previously participated in an executive functioning or organizational skills intervention. Screening and consenting will be conducted over the phone and with the use of REDCap, and assessments are conducted pre-treatment, during treatment (weekly), and postintervention and 6-months follow-up. This project is currently in the second year of participant enrollment and is funded by the National Institutes for Mental Health (NIMH) through 7/1/2024. We are actively enrolling participants, developing/refining intervention content, and conducting initial assessments. Assessments are conducted at study visits at Children’s National Hospital and via online surveys through REDCap.

Describe the student’s role in the project (200 word limit)

Specific roles for a research fellow on this project include co-facilitating focus groups and/or qualitative interviews and in-clinic data collection including diagnostic interviews (structured and semi-structured), clinical background interviews, and other ADHD testing. The fellow also has the opportunity to complete data analyses with prior datasets from studies with adolescents with ADHD, including a large Randomized Controlled Trial of the executive functioning skills intervention and a longitudinal observational study of adolescents with ADHD, service utilization, and psychosocial functioning as well as substance use across the transition from high school to college. It is expected that the fellow will prepare an abstract for a national conference presentation and participation in manuscripts will be encouraged, depending on the fellow’s
interests. The fellow will also work with our ADHD & Learning Differences team to observe outpatient encounters with the executive functioning skills intervention program and contribute to clinical and community outreach initiatives in the ADHD & Learning Differences Program.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will take primary responsibility for training the research fellow, as well as the day-to-day supervision of the research fellow and will directly support training for data collection and analyses. The mentor will actively engage the medical student mentee in all aspects of ongoing research in the ADHD & Learning Differences program, including regular attendance at research team meetings, participant enrollment, data collection, developing abstracts for local and national conference submissions, and preparing manuscripts for publication. The mentor will also engage the research fellow in other training opportunities in Pediatrics, Psychiatry, Translational Research, and related areas as they come available at Children's National and locally.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Dvorsky has worked with a number of medical students. From 2020-2021 Dr. Dvorsky provided several mental health wellness workshops to GW residents and medical students as well as support group seminars for managing stress and mental health during COVID-19. Before starting her current faculty position here, Dr. Dvorsky mentored two medical students and four child/adolescent psychiatry fellows in ADHD research and clinical initiative as part of her role in the Hyperactivity, Attention, and Learning Problems program at the University of California, San Francisco. Dr. Dvorsky supervises two clinical psychological fellows (one research and one clinical), a clinical psychology extern (resident year of pre-doctoral training), and two clinical psychology externs (fourth year graduate students) in research and clinical activities. Dr. Dvorsky also has a full-time research coordinator to support day-to-day research activities and data management. Dr. Dvorsky has not previously mentored any GW fellows, although she works closely with Dr. Randi Streisand (Co-Investigator on the proposed project) who has mentored numerous GW Gill fellows and other GW medical students in behavioral diabetes/adherence research in recent years. Dr. Dvorsky will collaborate with Dr. Randi Streisand on this project and she will provide support with the medical student training in this fellowship.

* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00014877
* IRB Date: 11/4/2020
* 1. Faculty Sponsor

* Name: Tatiana Efimova
* Degrees: PhD
* Title: Assistant Professor
* Organization: Department of Anatomy and Cell Biology, Department of Dermatology, GWU SMHS, GW Cancer Center
* Address: 800 22nd Street NW
* Apt/Suite: Room 8160
* City: Washington
* State: DC
* Zipcode: 20052
* Office Phone: 202-994-2753
* Email Address: tefimova@gwu.edu

* 2. Daily Supervisor

Name: Alexi Kiss
Degrees: PhD
Title: Research Scientist
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Targeting p38 kinases in cutaneous melanoma

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
Yes - Cancer

6. Sponsor's translational level
(Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
Skin cutaneous melanoma (SKCM) accounts for 75% of skin cancer deaths, with incidence rates continuing to rise alarmingly. Therapeutic strategies for advanced melanoma, such as targeted therapies and immunotherapies, are rapidly emerging, but drug resistance and toxicity remain challenges for many patients. Understanding the underlying molecular mechanisms in SKCM is key to identifying novel biomarkers critical for predicting treatment response and discovering new targeted therapy approaches. The p38 protein kinases coordinate adaptive cellular responses to extracellular stimuli and modulate important processes dysregulated in tumorigenesis, such as proliferation, differentiation and survival. Although p38 signaling is of potential importance in melanoma, the isoform-specific functions of the p38 kinases in SKCM are largely unelucidated. Intriguingly, our recent findings from a comprehensive querying of the genomic, transcriptomic and proteomic data of SKCM samples from The Cancer Genome Atlas (TCGA) database support the hypothesis that p38 isoforms have distinct functions in different genomic subtypes of SKCM and at different stages of the disease progression. We will employ genetic (small interfering RNA (siRNA)-based) loss-of-function approach to delineate functional roles of p38 isoforms in human cutaneous metastatic melanoma cell proliferation, survival, clonogenic capacity, motility and invasion, as detailed below.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
The main goal of the present proposal is to characterize the roles of p38 isoforms in metastatic melanoma proliferation, survival, clonogenic capacity, motility and invasion by means of genetic (siRNA-based) targeting of the individual p38 kinases in cultured metastatic melanoma cell lines representative of different genomic subtypes of SKCM, specifically, melanoma cell lines with BRAF or NRAS driver mutations (as oncogenic mutations in BRAF and NRAS genes are the most common driver mutations in cutaneous melanoma).
Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

We will test the above stated hypothesis and determine the functional impact of silencing the individual p38 isoforms in melanoma cell lines representative of different genomic subtypes of SKCM in the following Specific Aims: Aim 1. Determine the effect of siRNA-mediated knockdown of p38 isoforms on the viability and clonogenic capacity of SKCM cell lines in vitro. To this end, pools of functionally validated potent 22mer siRNAs selectively targeting human p38 genes will be employed to silence the individual p38 kinases in cultured human SKCM cell lines. The efficiency and specificity of siRNA-mediated knockdown of p38 isoforms will be confirmed by immunoblot. Functional characterization of the effect of p38 isoforms knockdown by quantitative assessment of metastatic SKCM cell proliferation, viability, clonogenic capacity, and signaling in control and p38 isoform-specific siRNA-treated SKCM cell lines will then be performed. Aim 2. Determine the effect of siRNA-mediated knockdown of the individual p38 isoforms in metastatic SKCM cell lines with BRAF and NRAS driver mutations on cell motility and invasion. Here the roles of the p38 isoforms in SKCM cell motility and invasion will be evaluated, using in vitro cell migration and cell invasion assays. The siRNA-mediated knockdown of the individual p38 isoforms will be carried out as described in Aim 1, followed by in vitro scratch wound assay or in vitro cell invasion assay using standard protocols. Three independent experiments with each SKCM cell line will be carried out in triplicates for each of the specified end points. Statistical analysis: Data analysis will be conducted using GraphPad Prizm software. Differences between groups are evaluated for statistical significance by Student’s t-test. A P<0.05 is considered statistically significant. The successful completion of the proposed studies will improve our understanding of the pathophysiology of metastatic melanoma and highlight a potential path for translational research efforts.

Describe the student’s role in the project (200 word limit)

The student will design and perform the experiments outlined in this proposal, under the guidance and supervision provided by Dr. Efimova and Dr. Alexi Kiss, a Research Scientist in Dr. Efimova’s lab. The student will learn how to perform all the relevant techniques, including, but not limited to, melanoma cell culture, siRNA-mediated knockdown technology in melanoma cells, immunoblot, immunocytochemistry, fluorescent microscopy, secreted cytokine profiling, using commercially available multiplexed bead-based kits, RNA extraction, etc., as needed for the assessment of the specified experimental readouts. The student will be trained how to carry out data analysis and preparation of the figures for presentation(s) and future manuscript, and participate in weekly group meetings and regular individual meeting with Drs. Efimova and Kiss to assess his/her progress. To further enhance the translational appreciation of the proposed work and broaden his/her medical training, the selected student will have the opportunity to attend relevant basic science and clinical didactics offered by the Dermatology Residency Training Program as well as rotate one half day every other week in the MFA dermatology practice with Dr. Adam Friedman.

Describe the mentor’s role in the project. (200 word limit)
Dr. Efimova has the expertise, leadership, training, and enthusiasm necessary to successfully serve as the mentor in the proposed project. She has a broad background in mechanisms of skin neoplasia, and a long-standing interest in elucidating the cell type-specific roles of p38 isoforms in skin carcinogenesis, using mouse models as well as human 3D organotypic models of skin cancer development. Dr. Efimova will provide guidance and supervision to the student in designing and performing the studies outlined in the proposal. She will present the student with the literature pertinent to the project and challenge him/her to search the literature independently. Dr. Kiss, a Research Scientist in Dr. Efimova’s laboratory who has an extensive experience with the methodologies to be employed in this project, will provide hands on training and directly oversee the student's performance. Dr. Efimova will involve the student in weekly group meeting and weekly individual meetings to assess his/her progress. Dr. Efimova has an open door policy and welcomes frequent informal interactions and discussions. Dr. Friedman and Dr. Patel will offer a valuable perspective regarding the potential translational and clinical relevance of the research findings.

* 12. **Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)**

Current: Dillon Nussbaum, 06/2021 – present, Pre-Doctoral Dermatology Research Fellow (MD expected May 2023) Previous: Ramsin Yadgar, summer of 2016 Stephanie Kao, summer of 2017, a 2017 Gill Fellow Rose Milano, summer of 2018, a 2018 Gill Fellow Emily Murphy, 07/2018 – 07/2019, Pre-Doctoral Dermatology Research Fellow, a recipient of the 2019 Washington DC Dermatologic Society Grant to conduct a research project in my lab Samuel Yeroushalmi, summer of 2019, a recipient of 2019 Health Services Scholarship Sarah Millan, summer of 2019, a recipient of the 2019 Dermatology Foundation Diversity Research Supplement Award Julia Weiner, summer 2020, a recipient of 2020 Health Services Scholarship Simran Sandhu, summer 2021, a 2021 Gill Fellow Chapman Wei, 07/2019 – 05/2021, Pre-Doctoral Dermatology Research Fellow (MD May 2021), a recipient of the 2019 Washington DC Dermatologic Society Grant and of the 2020 La Fondation La Roche-Posay Grant to conduct research projects in my lab. Nagasai Adusumilli, 07/2020 – 07/2021, Pre-Doctoral Dermatology Research Fellow (MD expected May 2022)

* 13. **Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.**

* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: IBC # IBC-20-115
* IRB Date: 20 Nov 2020
Faculty Proposal for MD Student Research by Julia Finkel

* 1. Faculty Sponsor

* Name: Julia Finkel
* Degrees: MD
* Title: Director of Pain Medicine Research and Development Professor of Anesthesiology, Pediatrics and Critical Care Medicine, George Washington University
* Organization: Sheikh Zayed Institute for Pediatric Surgical Innovation, Children’s National Health System
* Address: 111 Michigan Ave. NW
* Apt/Suite:
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-4867
* Email Address: jfinkel@childrensnational.org

* 2. Daily Supervisor

Name: Julia Finkel
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email
Address:

* 3. Project Title (250 character limit)
Development of a physiologic measure of vincristine induced peripheral neuropathy (VIPN) in children and adolescents.

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Anesthesiology
Yes - Pediatrics
Yes - Neurology

* 6. Sponsor's translational level
* (Please select ONE)
T2: Translation to Patients

* 7. Hypotheses (200 word limit)
The primary objective of this study is the characterization of the neuropathy index in VIPN patients in order to measure VIPN severity. H1: The Nociceptive Index (NI) will be positively correlated with the TNS©-PV with the expectation that r = 0.5. H2: Over time, the change in NI will be positively correlated with the change in TNS©-PV with the with the expectation that r = 0.5.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
This study proposes to enroll 30 patients ages 6 to 18 in a longitudinal design. This pilot study utilizes pupillary reflexes to characterize pupillary responses to neuro-selective neurostimulation (nPRD) of the three major sensory nerve fibers (C, Ad, and Aβ). The characterization of the pupillary responses is used to generate a neuropathy index. This index will allow us to determine a disease-specific phenotype among pediatric CIPN patients that can be monitored over time. Ultimately, we will synthesize the information about the effects of neuropathic disease-states on the neuropathy index into algorithms that detect the specific stages of disease and provide clinical decision support. The primary outcome is the neuropathy index. This is a composite measure of the three sensory nerve fiber responses captured by the technology being used in this application. This measure will be captured at each time point for each patient. The secondary outcome variables is the subjective scale currently used as standard of care for this population, the Total Neuropathy Score© - Pediatric Vincristine. The TNS-PV will be captured at each timepoint and will be evaluated for correlation with the neuropathy index.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This is a single site study that aims to develop a novel device to evaluate and characterize chemotherapy-induced neuropathic pain. Subjects can be enrolled before chemotherapy and at any subsequent point. This enables the study of the onset of neuropathic symptoms as well as the characterization of the disease over time. There is no randomization or blindness in the present study. For Aim 1, the AlgometRx device will be used to assess the neurostimulus induced pupillary reflex dilation (nPRD). We will apply the electrodes to an index finger, not in an area of spontaneous pain. Each of the three fiber types will be assessed. Each measurement takes only 10 seconds with only 1 second of stimulus. We will use standardized innocuous intensities for each fiber derived from our preliminary studies (1.5mA for C and Ad and 3.0mA for Aδ). There will be a wait of 1 minute between each assessment. The nPRD testing procedure requires a maximum of 5 minutes. These measurements will be combined into a composite measure to form a nociceptive index for each measurement. This index will be compared to the other assessments (TNS-PV). After the baseline nPRD and other assessments, the patient will be monitored throughout the course of their treatment and follow-up. As this is an observational study, there will be no change to the treatment for any patient due to research activities. For each participant, following informed consent, initial measurements will be taken according to the aforementioned procedures. These measurements will then be repeated at each subsequent treatment or clinic visit for a period of one year. Depending on the chemotherapeutic agent the patient is receiving, they will undergo assessment by the TNS-PV.

10. Describe the student's role in the project (200 word limit)

The student would be directly involved in the recruitment, enrollment and data collection for this project. The student would be trained in the use of the devices associated with the protocol and be given the responsibility of recruiting participants from the patient population at Children's National. This would maximize the student's contact with patients as well as their time spent working with other staff and physicians to identify potential participants. The student would work directly with study participants for the duration of the study and serve as their main point of contact with the research team. The student will also be involved in the processing and analyzing of data generated from this study and be a major contributor to this method that could change the standard of care for many patients.

11. Describe the mentor's role in the project. (200 word limit)

The mentor will facilitate and oversee the involvement of the student in the project. The mentor will ensure that the student is able to conduct research and interact with patients with some independence. This will not only serve to benefit the student but will also greatly benefit the development of this technology. In addition, the mentor will provide lectures on material pertinent to the technology which will serve as supplemental education for the student.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
In the past couple of years, this team has mentored medical students from GW and other schools. The students have participated in various capacities on numerous research projects. After conducting the research and analyzing the data, many have gone on to present their research. More specifically, this team has hosted three Gill Fellows (David Strum, Tess Whiteside and Karol Suchowiecki) who have gone on to present their research at GW Research Days.

* 13. Do you have or will you obtain IRB approval for this project?
   Please note: Students cannot begin a human subjects project without IRB approval.
   * (Please select ONE)
   Selected Yes

Please provide IRB number and date
* IRB Number: Pro00015693
* IRB Date: 9/1/2021
Faculty Proposal for MD Student Research by Leigh Frame

*1. Faculty Sponsor*

* Name: Leigh Frame  
* Degrees: B.S. in Biochemistry, Mary Baldwin College, 2006  
M.H.S. in Immunology, Johns Hopkins Bloomberg School of Public Health, 2010  
Ph.D. in Nutrition, Johns Hopkins Bloomberg School of Public Health, 2015  
* Title: Director, Integrative Med.; Assoc. Direct., Resiliency & Well-being  
* Organization: GWSMHS  
* Address: 2600 Virginia Ave NW, Suite 300  
* City: Washington  
* State: DC  
* Zipcode: 20037  
* Office Phone: 202-994-0184  
* Email Address: leighframe@gwu.edu

*2. Daily Supervisor*

Name:  
Degrees:  
Title:  
Organization:  
Address:  
Apt/Suite:  
City:  
State:  
Zipcode:  
Office Phone:  
Email Address:

*3. Project Title (250 character limit)*

Investigating the relationship between vitamin D status and physical activity in the All of Us Research Cohort

*4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.*


* 5. Sponsor’s Research Focus:
Yes - Gastroenterology
Yes - Biochemistry
Yes - Endocrinology

* 6. Sponsor’s translational level
* (Please select ONE)
T4: Translation to Population Health

* 7. Hypotheses (200 word limit)
Vitamin D has been correlated with a number of health outcomes and disease states; yet, the relationship is confounded by the role of outdoor physical activity in exposure to the sun. In an attempt to determine the strength of the correlation between physical activity and vitamin D status, we will probe the All of Us Research Database, which has several markers of vitamin D status including the ability to distinguish between endogenous synthesis combined with some supplements and foods sources (D3) and prescription supplementation (D2).

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
Goal: To conduct correlation analysis of the data currently existing in the All of Us Research Database. There are many stages of the All of Us participant journey. More than 561,000 people have registered with the program by creating online accounts at JoinAllofUs.org, beginning the enrollment process. The snapshots below highlight participants in the All of Us Research Program: https://www.researchallofus.org/data-tools/data-snapshots/ The primary variables of interest include 25(OH)D3, 25(OHD)D3 + D2, total 25(OH)D a.k.a. vitamin D, calciferol (vitamin D2), cholecalciferol (vitamin D3), and FitBit data.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

The data is extant, so the analysis may begin immediately. This is a major advantage to the timeline, as there will be no delays in data collection. Further, working with a trained data scientist will be a meaningful experience all on its own. Then, this will be translated into a manuscript, which will be led by the medical student under the close supervision of the PI, Dr. Frame. This will complete the experience and in minimal time compared to most original research.

* 10. Describe the student's role in the project (200 word limit)
The medical student will be the primary driver of this research: pulling the data, organizing the data, assisting with data analysis, developing an outline for the manuscript, writing the manuscript, and integrating with the research team (PI and data scientist). As such, they will develop independent research capabilities. They will have access to the research team for assistance and mentoring throughout the process.

* 11. Describe the mentor's role in the project. (200 word limit)
Dr. Frame has worked with many students on similar projects in the past. She has a supportive approach that allows the students to get their hands messy and even struggle through the process to some extent, as this leads to the most robust learning. Through her years of experience, she has developed an approach to conducting such outcomes research with relative ease even with novice researchers.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Frame is currently working on a literature review with a medical student, which is due to be submitted by the end of the 2021. She has yet to work as the sole mentor for any Gill Fellows or Health Services Scholars since she joined GW in 2018 but has worked with Mikhail Kogan and his students.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
  Selected No (Not Required)

Please specify why it is not required.
Data analysis of extant data in the All of Us Research Database, no data collection or interaction with human subjects.
1. Faculty Sponsor

Name: Anand Gourishankar
Degrees: M.B.B.S., MRCP, MAS
Title: Associate Professor
Organization: Children's National Health System
Address: 111 Michigan ave NW, suite 480
Apt/Suite: 
City: Washington
State: District of Columbia
Zipcode: 20010
Office Phone: 2024764574
Email Address: agourishan@childrensnational.org

2. Daily Supervisor

Name: 
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

3. Project Title (250 character limit)
Clinical and Spatiotemporal factors associated with antibiotic-resistant urinary tract infections in children

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

* 5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Infectious Disease

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
1. The demographics, clinical characteristics, geographic locations, and clinical outcomes of children with ESBL UTIs compared with those without ESBL UTIs are not similar. 2. A disparity exists in Social determinants of health factors between ESBL and non-ESBL UTI in children

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
1. Collect demographic, clinical, and geographic information of children with and without ESBL urinary tract infection. 2. Compare between groups regarding the variables in the above three mentioned categories. 3. The applicant will review at least 1000 charts in the Cerner electronic health record. 4. The applicant will learn the Geographic information systems and mapping related to this project.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Administrative: CITI certification, REDCap access, Literature review basics, Cerner access within first two weeks. Research tools and methods: Orientation to Data collection form, Testing accuracy of data collection, and data abstraction for 4-5 weeks. Analysis: Data analysis, statistical application, and GIS/mapping for 2-3 weeks. Dissemination: Interpret graphs, statistical terms, and mapping principles leading to poster or manuscript writing. Overall, the scholar will understand basic clinical information on urinary tract infection, factors or risks associated with antibiotic resistance, and the geographical context of those risk factors.

* 10. Describe the student's role in the project (200 word limit)
The student-scholar will independently work on data extraction, understand operational variables (meaningful) in this project, apply statistical analysis, create graphs and maps, do a literature review, and write a narrative of his project results. They will have the flexibility of learning new things or expanding on previous knowledge and skill in this project.
11. Describe the mentor's role in the project. (200 word limit)
Dr. Gourishankar will schedule frequent meetings based on the mutually agreed times and their needs. In addition, there will be a formal weekly meeting in the summer to review the progress and performance. Also, provide ad-hoc support via zoom or telephone.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Rana Hamdy is an infectious doctor who collaborates on this project. She has worked with previous Gill Fellows. She is a great asset, and the scholar will benefit from two minds. I currently oversee Dr. Jordan Tyris (pediatric fellow) and Dr. Anthony Mcclenny (pediatric resident research track).

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00015478
* IRB Date: 7/12/2021
* 1. Faculty Sponsor

* Name: Monika Goyal
* Degrees: MD, MSCE
* Title: Associate Division Chief, Director of Academic Affairs & Research; Associate Professor of Pediatrics & Emergency Medicine
* Organization: Department of Emergency Medicine, Children’s National Hospital
* Address: 111 Michigan Avenue NW
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-2869
* Email Address: mgoyal@childrensnational.org

* 2. Daily Supervisor

Name: Meleah Boyle
Degrees: MPH
Title: Lead Clinical Research Coordinator
Organization: Children’s National Hospital
Address: 111 Michigan Avenue NW
Apt/Suite: 
City: Washington
State: DC
Zipcode: 20010
Office Phone: 202-476-5388
Email Address: mdboyle@childrensnational.org

* 3. Project Title (250 character limit)
Addressing Disparities in the Pediatric Emergency Department

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Emergency Medicine

6. Sponsor's translational level
(Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
The overarching goal of this pilot study is to explore the role of clinician implicit bias on pain management, patient-centered care, and communication during clinician-patient encounters among pediatric patients with appendicitis and long bone fractures in the emergency department. Our hypothesis is that clinician implicit bias is associated with worse quality of care as reported by patients and caregivers.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
To meet our overarching goal, we will complete two main objectives: 1) Measure the association between clinician implicit bias and pain management among children presenting to the emergency department with long bone fractures or appendicitis using data from the electronic health record and 2) Examine the association between clinician implicit bias and patient-reported clinical experience.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Racial/ethnic disparities have been consistently documented for numerous health conditions, including infant mortality, asthma morbidity, and COVID-19 as well as in health care access and quality of care. Understanding and eliminating racial and ethnic disparities are national priorities. The emergency department offers a unique source of health care access because it is universally available regardless of insurance status, race, ethnicity, or socioeconomic status. Given this role in our healthcare delivery system, there is an opportunity to understand whether care is being delivered equitably, independent of other access issues. Pain is the most common reason for seeking emergency department care. Oligoanalgesia or undertreatment of pain among children presenting to emergency departments has been well documented. Racial/ethnic disparities in use of analgesia, and specifically opioid analgesia, have been documented in a pediatric emergency department population. Our team previously demonstrated racial and ethnic disparities in the management of pain among children with long bone fractures and appendicitis across geographically and racial and ethnically diverse emergency departments. We found that these disparities extend not only to processes of care (e.g., type of analgesia used), but also outcomes (e.g., pain relief). Building on this work, we now strive to identify the causes of these disparities to help inform future interventions. Explicit (conscious) and implicit (unconscious) bias have been
identified as potential causes of disparities in healthcare. The Implicit Association Test (IAT) developed by researchers at Harvard University measures these unconscious biases. Implicit bias has been implicated along the causal pathway for healthcare disparities, but the association of implicit bias with actual patient-level outcomes has been sparsely documented. Additionally, a few studies, limited to adult populations have demonstrated that Black patients are more likely to poorly rate interactions with clinicians who have higher pro-white bias. Patient-centered, collaborative care is key to providing high-quality health care. Previous studies explored how implicit bias impacts the delivery of patient-centered care among diverse adult populations in primary care clinics. However, this has not been explored among pediatric patients in emergency departments. This is important and publishable research that will also lay the groundwork for larger studies on the role of clinician implicit bias and care in the emergency department.

* 10. Describe the student's role in the project (200 word limit)
The student will participate in all aspects of this pilot research study including the enrollment of eligible patients from the emergency department, survey administration, one-on-one interviews with patients, caregivers, and clinicians on disparities in healthcare, data collection/entry, and data analysis. There will also be opportunities for abstract preparation and presentation at national meetings along with authorship on manuscripts.

* 11. Describe the mentor's role in the project. (200 word limit)
Dr. Goyal and her team will oversee and lead all the research activities.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Since 2012 our mentoring team has had over 11 medical students participate in research, of those 5 students were Gill Fellows. The medical students engaged in a myriad of activities including medical record reviews, data entry using REDCap, phone interviews, literature reviews, in person surveys, and interviews. Three of our students have presented their research at national conferences and two of our students completed their projects including publications in JAMA Pediatrics, Journal of Adolescent Health and Pediatric Emergency Care.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00016107
* IRB Date: 07/26/2021
Faculty Proposal for MD Student Research by Andrea Gropman, M.D.

* 1. Faculty Sponsor

* Name: Andrea Gropman, M.D.
* Degrees: M.D.
* Title: Professor
* Organization: CNH, neurology/neuroscience
* Address: 111 Michigan Avenue, N.W
* Apt/Suite: 
* City: Washington
* State: D.C.
* Zipcode: 20010
* Office Phone: 202-476-3511
* Email Address: agropman@childrensnational.org

* 2. Daily Supervisor

Name: Andrea Gropman
Degrees: M.D.
Title: Professor
Organization: CNH
Address: 111 Michigan Avenue, N.W
Apt/Suite: 
City: Washington
State: D.C.
Zipcode: 20010
Office Phone: 202-476-3511
Email Address: agropman@childrensnational.org

* 3. Project Title (250 character limit)

Exploration of Neural networks in ornithine transcarbamylase deficiency (OTCD) using functional near infrared spectroscopy using the NIRSport2 system head cap.

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


This project evaluates the use of functional near infrared spectroscopy or fNIRS, which is a non-invasive FDA approved device that can be used to look at brain connectivity and brain hemodynamics in a repeatable and non-invasive manner. We are studying patients with Ornithine transcarbamylase deficiency (OTCD), a urea cycle disorder, versus age matched typical controls. We hypothesize that:

1) fNIRS in longitudinal study of patients with the Urea cycle disorder ornithine transcarbamylase deficiency (OTCD) will show differences in neural activation from infancy through adulthood.
2) Functional connectivity between and within different brain regions will lead to an activation map that correlates with deficits in executive function, working memory, and cognitive flexibility.
3) fNIRs will demonstrate changes in brain hemodynamic variations with age or alterations in plasma ammonia in OTCD.

This project will allow for development of biomarkers that will poise the Urea cycle to become clinical trial ready. We plan to apply machine learning methods such as feature extraction and classification to predict the disease outcome based on diagnosis and hemodynamic features.

For all subjects, who will be ages 36 months to 40 years, we will assess resting state data using fNIRS to investigate functional connectivity and hemodynamic response at different cortical regions. We previously used Stroop task as well as working memory task in adults. To include the lower age range, we will use the modified version of these functional tasks that is suitable for children. We will employ the day-night Stroop task aimed for children while using color-word Stroop task for adults. Since fNIRS had high temporal resolution compared to fMRI, the length of imaging session can be as short as 2 min. This would allow to study the brain activation in participants with lower attention span, such as toddlers and children as well as those with OTCD. We will also include working memory task in both visual and auditory domains to study auditory and visual processing. Given the deficiency and dysregulation of executive function and attentional network in OTCD subjects in demanding life activities, we will set up a dual mode task.
which requires both mental and physical skills. Driving task is example of one of these daily activities that will be executed using the simulator to create the realistic driving environment while recording the neuroimaging data using fNIRS. During the driving task which will be offered to patients 18 years and over, we will implement visual-spatial working memory task or short-term memorization tasks to study the effect of cognitive distraction. We will also implement changing the road direction unexpectedly (due to road closure or accident) to study the cognitive shift and flexibility. 18 months-36 months: In this age range toddlers can mostly attend to a passive task that does not require the subject response. For the resting state, subjects will watch short movie segments. Using videos for resting state has been used in fMRI extensively to reduce the motion artifact and reduce the subject’s attention drift. 36 months-6 years: In this age range we will implement the functional tasks as described previously along with the resting state assessments. These tasks will include simple attention task (N-back shapes and Day-Night Stroop Task) as well as watching passive video clips for resting state. 6 year-adulthood: Functional tasks, along with behavioral measures will be performed. These tasks include, Stroop task, Working Memory Task, and driving tasks for adults as well as resting state measurements. During the task performance, participants will be seated in front of a 28-inch monitor. The task will be shown on the screen and depending on the nature of the task subjects will response using the dedicate response key. The NIRS cap will be positioned on the subject head and data will be acquired during performance of functional tasks or at the resting state. fNIRS raw intensity data will be reviewed and analyzed by a trained biomedical engineer with the background explicitly in optical brain imaging. We will use a previously developed algorithm to convert the changes in the detected light intensity into changes in [O2].

**10. Describe the student's role in the project (200 word limit)**
The student will acquire skills in fNIRs in terms of understanding the physics and biology behind using the device. They will receive a tutorial on UCDs and previous work that has been done. This introduction to the field will then position the student to participate in a planned review article. The student will learn how to analyze the fNIRs data and will prepare a poster for GW poster day and/or Children's Research day or another specialty in person or virtual meeting. In the process, the student will also learn the IRB and regulatory processes needed to conduct human research and observe the consenting process with families.

**11. Describe the mentor's role in the project. (200 word limit)**
The mentor will provide supervision on all aspects of the project. The mentor will meet with the student briefly daily and have a more focused meeting once a week do discuss goals and progress. At the beginning of the project, the student and mentor will prepare a list of goals and deliverables with a time line.

**12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)**
I have had the opportunity to have Gill Fellows over the years, as well as medical students participating in research through the AAP, their own medical schools outside of the DC area and other students who had arranged projects with me on their own.

**13. Do you have or will you obtain IRB approval for this project?**
*Please note: Students cannot begin a human subjects project without IRB approval.*
* (Please select ONE)
Selected Yes
Please provide IRB number and date

* IRB Number: 13934
* IRB Date: 03/03/22
Faculty Proposal for MD Student Research by Kaiane Habeshian

* 1. Faculty Sponsor

* Name: Kaiane Habeshian
* Degrees: MD
* Title: Assistant Professor of Dermatology and Pediatrics
* Organization: GW School of Medicine/Children's National Hospital
* Address: 111 Michigan Ave NW
* Apt/Suite: Suite 3W-618
* City: WASHINGTON
* State: DC
* Zipcode: 20010
* Office Phone: 2024765000
* Email Address: kahabeshia@cnmc.org

* 2. Daily Supervisor

Name: Kaiane Habeshian
Degrees: MD
Title: Assistant Professor of Dermatology and Pediatrics
Organization: GW School of Medicine/Children's National Hospital
Address: 111 Michigan Ave NW
Apt/Suite: Suite 3W-618
City: WASHINGTON
State: DC
Zipcode: 20010
Office Phone: 2024765000
Email Address: kahabeshia@cnmc.org

* 3. Project Title (250 character limit)
Vulvar dermatoses, the Children's National multidisciplinary dermatology-gynecology Vulvar Dermatology Clinic, and related projects

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
5. Sponsor’s Research Focus:
Yes - Pediatrics
Yes - Dermatology
Yes - Obstetrics/Gynecology

6. Sponsor’s translational level
(Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
Pediatric vulvar dermatoses are an area of medicine in which dermatologists, gynecologists, and pediatricians alike may lack sufficient knowledge, comfort, and training. Our vulvar dermatology clinic, staffed by Dr. Kaiane Habeshian (pediatric dermatologist) and Dr. Tazim Dowlut-McElroy (pediatric and adolescent gynecologist) provides wealth of patient data for the purpose of better understanding vulvar dermatoses (predominantly lichen sclerosus and vitiligo as well as a variety of other conditions such as hidradenitis suppurativa and vulvovaginitis) through retrospective and prospective analyses, and in the future, interventional studies. Additionally, as vulvar dermatology experts, we are uniquely positioned to create surveys to be disseminated to clinicians with the aim of capturing practice patterns and better characterizing knowledge gaps that can be addressed by the creation of future guidelines for care and educational curricula.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
There are various ongoing projects with active IRBs, and many more to come. Pro00013836: A survey on pediatric vulvar lichen sclerosus management. Pro00014531: Retrospective review characterizing the CNH vulvar dermatology clinic. Pro00014541: Retrospective review differentiating lichen sclerosus and vitiligo.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
• The project design makes it likely that the objectives will be achieved
• The project is likely to result in a report of interest to other scholars
• The project fulfills discovery/original research

Pro00013836: A survey on pediatric vulvar lichen sclerosus management. This survey explored provider diagnosis and management of lichen sclerosus, an area in which care is not standardized. A lot remains to be learned about natural history of the disease in pediatric patients and optimal long-term management. Currently this study is in the data analysis/manuscript drafting stages. The data has confirmed that long-term care of LS is highly variable among practitioners. The student will have the opportunity to propose additional areas of study based on the information gathered from this survey. Pro00014531: Retrospective review characterizing the CNH vulvar dermatology clinic. This study is characterizing demographic data and diseases seen in the vulvar dermatology clinic from 2016-2019. The IRB is being expanded to include data to to the present
data. Demographic breakdown, diseases seen, and time from symptom onset to diagnosis is being explored, including breakdown of the data by age, race, and ward/district. The study is in the stage of data analysis with the aim of submitting a manuscript for publication within the next 6 months. The student may have the opportunity to participate in manuscript preparation and will propose additional areas of study, including interventional studies, based on the information gathered from this retrospective review. Pro00014541: Retrospective review differentiating lichen sclerosus and vitiligo. Lichen sclerosus (LS) and anogenital vitiligo can be difficult to distinguish and often misdiagnosed as each other, especially in darker skin tones in which "vitiligo LS" has been described. LS can scar and must be treated aggressively, while vitiligo can be monitored. Therefore, it is important to better understand disease presentation, especially in skin of color. The presentation of these diseases in our vulvar dermatology clinic will be explored. Data collection/analysis for this project has not yet begun. The student will have the opportunity to participate in multiple stages of this project.

*10. Describe the student's role in the project (200 word limit)*

The student will have opportunities to participate in many steps of the research process, including conceptualizing areas for further study, drafting and submitting IRBs for survey and retrospective studies, utilizing REDcaps, conducting data analysis, performing literature searches, submitting and presenting abstracts, and writing manuscripts for dermatology and gynecology journals. The above section describes ongoing studies, the third of which (Pro00014541) the 2022 summer student will be most involved. Projects for the near future (ie 1-2 years) that they will be involved in on a longitudinal basis include the creation of guidelines to differential LS and anogenital vitiligo, especially in skin of color; the creation of educational curricula/tools to educate providers about LS and vitiligo; and the creation of an LS severity scale that takes into account differences in disease presentation among various skin tones.

*11. Describe the mentor's role in the project. (200 word limit)*

The mentor team (Dr Habeshian and colleagues, predominantly Dr Dowlut-McElroy) will provide a conceptual groundwork for the student's projects as well as guide the student through the Children's National IRB drafting/submission process, use of REDCap, data analysis, literature searches, abstract/poster creation, and manuscript drafting/submission. Our goal is to empower the student to take ownership of these projects with the aim of first authorship for the student on multiple posters and journal publications.

*12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)*

Aneka Khilnani, MS III - 2020 Summer Gill Fellow with Dr Habeshian (two posters presented at the 2021 Pediatric Dermatology Research Alliance meeting, two abstracts submitted to both the 2022 Annual Academy of Dermatology yearly meeting and 2022 North American Society for Pediatric and Adolescent Gynecology annual meeting, and 1st and 2nd authorship anticipated on two publications). Rashmi Prasad - NIH student (working with Dr Dowlut-McElroy on related vulvar dermatology project not listed above)

*13. Do you have or will you obtain IRB approval for this project?*  
Please note: Students cannot begin a human subjects project without IRB approval.  
* (Please select ONE)  
Selected Yes
Please provide IRB number and date

* IRB Number: Pro00014541
* IRB Date: 8/10/2020
* 1. Faculty Sponsor

* Name: Dana Harrar
* Degrees: MD PhD
* Title: Assistant Professor
* Organization: Children's National Hospital
* Address: 111 Michigan Ave NW
* Apt/Suite: 
* City: Washington
* State: District Of Columbia
* Zipcode: 20010
* Office Phone: 2024762120
* Email Address: dharrar@childrensnational.org

* 2. Daily Supervisor

Name: Arnold Sansevere
Degrees: MD
Title: Assistant Professor
Organization: Children's National Hospital
Address: 111 Michigan Ave NW
Apt/Suite: 
City: Washington
State: District Of Columbia
Zipcode: 20010
Office Phone: 2024762120
Email Address: asansevere@childrensnational.org

* 3. Project Title (250 character limit)
Ketamine for the treatment of refractory status epilepticus in neonates with congenital heart disease

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

5. Sponsor's Research Focus:
Yes - Neurology

6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
We hypothesize that: 1. Neonates with refractory status epilepticus treated with ketamine will achieve seizure cessation as rapidly as neonates treated with midazolam 2. Neonates with refractory status epilepticus treated with ketamine will require fewer interventions to maintain adequate hemodynamics compared to neonates treated with midazolam 3. Neonates with refractory status epilepticus treated with ketamine will have a comparable rate of mortality as neonates treated with midazolam 4. Neonates with refractory status epilepticus treated with ketamine will have a comparable rate of morbidity as neonates treated with midazolam

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
The overall goal of this project is to compare children with refractory status epilepticus treated with ketamine to those treated with midazolam (historic controls). We will determine time to seizure cessation, need for hemodynamic augmentation, morbidity, and mortality as this has immediate implications for clinical care. We have monitored 420 patients in the cardiac intensive care unit using electroencephalography (EEG) since January 2018. We are in the process of identifying those patients who had refractory status epilepticus requiring a continuous infusion of midazolam or ketamine; we estimate that our final cohort will be comprised of approximately 20 neonates treated with one or the other of these medications. Specific goals: 1. Review the medical records of patients treated with either midazolam or ketamine for refractory status epilepticus and abstract their clinical data into a REDCap database. 2. Organize patient data for statistical analysis 3. Draft manuscript for peer review publication

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
Neonates with congenital heart disease are at risk for seizures and status epilepticus in the peri-operative period after congenital heart disease repair. This is often the consequence of brain injury, whether from arterial ischemic stroke, intracranial hemorrhage, or hypoxic ischemic injury. Nonetheless, seizures and status epilepticus are thought to be an independent predictor of a poor outcome. Historically, patients with refractory status epilepticus, defined as status epilepticus that persists after the administration of two anti-seizure medications, have been treated with a continuous intravenous infusion of midazolam. However, one of the major side effects of midazolam infusion, especially at the doses required to terminate status epilepticus, is hypotension. This is particularly problematic in neonates with congenital heart disease, given their already tenuous hemodynamic status. Ketamine has recently emerged as a potential treatment for refractory status epilepticus. Studies to date suggest that ketamine may be as effective as midazolam and pentobarbital, another commonly used infusion for the treatment of refractory status epilepsy. A major advantage of ketamine is that it does not result in hypotension or other hemodynamic compromise, making it an attractive option for the treatment of status epilepticus in critically ill children with congenital heart disease. We have begun using ketamine as our first line infusion for the treatment of refractory status epilepticus in the cardiac intensive care unit. The goal of this project is to compare children with refractory status epilepticus treated with ketamine to those treated with midazolam (historic controls). We will determine time to seizure cessation, need for hemodynamic augmentation, morbidity, and mortality as this has immediate implications for clinical care. We have monitored 420 patients in the cardiac intensive care unit using electroencephalography (EEG) since January 2018. We are in the process of identifying those patients who had refractory status epilepticus requiring a continuous infusion of midazolam or ketamine, and this will be complete by the spring of 2022. We estimate that our final cohort will be comprised of approximately 20 neonates treated with one or the other of these medications. We will use chart and EEG review to abstract information about patient demographics, cardiac disease, neurologic injury, seizure burden, timing of medication administration, hemodynamic side effects and need for hemodynamic augmentation, duration of intubation, length of ICU stay, mortality, neurologic deficits at discharge, and developmental outcome (for those patients with sufficient follow-up). Timeline: Week 1: Gain familiarity with the research question through background reading, lab meetings, and shadowing in the cardiac intensive care unit and Cardiac Neurodevelopmental Outcome Clinic. Obtain access to the electronic medical record, the Institutional Review Board, and REDCap. Week 2-6: Chart abstraction into REDCap database. Meet with supervisor daily during weeks 2-3 to address questions that arise during chart review. Meet with supervisor at least twice weekly, more often as needed during weeks 4-6 to address questions that arise during chart review. Continue background reading, attending lab meetings, and shadowing. Week 7-8: Data analysis and drafting of manuscript for peer review publication.

* 10. Describe the student's role in the project (200 word limit)
The student will review the medical records of neonates with congenital heart disease treated with midazolam or ketamine for refractory status epilepticus. This will involve the abstraction of clinical data into a REDCap database. Variables will include demographics, cardiac disease, neurologic injury, seizure burden, timing of medication administration, hemodynamic side effects and need for hemodynamic augmentation, duration of intubation, length of ICU stay, mortality, neurologic deficits at discharge, and developmental outcome (for those patients with sufficient follow-up). The student will then organize the data for statistical analysis and draft a manuscript for peer review publication based on the results of this analysis. The student will also have the opportunity to shadow in the CICU and CANDO clinic as well as participate in lab meetings of the Critical Care Neurology Program.
11. Describe the mentor's role in the project. (200 word limit)
The mentor will oversee all aspects of the project. Institutional review board approval has already been obtained. A REDCap database is under construction, and this will be ready for data entry by the spring of 2022. A cohort of 420 patients who underwent EEG in the CICU since January 2018 has been identified, and the subset of patients who had status epilepticus will also be identified by the spring of 2022. Initially, the mentor will meet with the student daily as they begin chart abstraction to familiarize them with the medical record and the REDCap database and to answer any questions that arise during the data entry process. The ongoing frequency of meetings will depend on the student’s needs and comfort with the data abstraction process. The mentor will facilitate statistical analysis of the data and will guide the student in drafting a manuscript for peer review publication.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Two medical students are currently working with our team on a project aimed at determining the incidence, risk factors, and best management of refractory status epilepticus in children with traumatic brain injury. Data collection is ongoing, and the medical students are participating in the chart review and data abstraction. Our current research coordinator is a pre-medical student and is an active participant in many of our group’s projects. She also maintains our program databases and coordinates our ICU follow-up clinics.

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00015473
* IRB Date: 2/8/2021
Faculty Proposal for MD Student Research by Galadriel Hovel-Miner

* 1. Faculty Sponsor

* Name: Galadriel Hovel-Miner
* Degrees: PhD, M. Phil., M.S.
* Title: Assistant professor
* Organization: George Washington University
* Address: 2300 Eye st
* Apt/Suite: Ross Room 522
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 202-994-2634
* Email Address: ghovel_miner@gwu.edu

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Genetic basis of drug resistance in trypanosomatids

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor’s Research Focus:
Yes - Genomics
Yes - Infectious Disease

6. Sponsor’s translational level
*(Please select ONE)*
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
Determining the functions of genes that promote anti-parasitic drug resistance will identify new drug targets and stave off issues of emerging resistance.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
Our group has identified novel drug resistance genes using our state-of-the-art forward genetics tool in the African trypanosome, Trypanosoma brucei, the causative agent of African sleeping sickness. The goal of this project is to identify the biological function of the identified genes and determine their roles in drug resistance. Objectives include - Bioinformatic analyses of genes using available online resources. - Molecular cloning of the genes of interest for overexpression studies. - RNAi knock-down of the genes of interest for functional and phenotypic studies. - Parasite growth assays and cell viability assays. - Additional cell biology analyses including: cell cycle analysis by flow-cytometry and cell morphology by microscopy.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
Genes identified from our drug resistance studies will be sub-cloned for further analysis and transfected into the T. brucei genome. T. brucei cell lines that can be induced for increased (overexpression) or decreased (RNAi) gene expression) will be evaluated for their effects on parasite cell viability and cell biology using a set of standard lab assays. Medical students will be matched with the stage of project they are most interested in each of which required about 3 months. - Stage I: Gene bioinformatic analysis. This stage involves using online tools to determine the hypothetical function of resistance genes, evaluate the predicted protein domains, and further excavation of available data. - Stage II: Molecular cloning of genes of interest and preparation for cell transfection. This stage includes PCR, agarose gel electrophoresis, molecular cloning, and plasmid DNA preparation. - Stage III: Analysis of T. brucei phenotypes. This stage involves evaluating genetically altered T. brucei cell lines (overexpression and RNAi knock-down) for their growth attributes and cell biology. Including cell counting, cell viability assays to measure drug EC50, flow-cytometry, and microscopy (both light and immunofluorescent). While each stage is designed for 3 month project intervals, should a student wish to conduct research for a full year, they have the opportunity to follow their 1-3 “pet” genes through the entire process.
* 10. Describe the student's role in the project (200 word limit)
The student would have hands on experience (bioinformatic and/or bench) in each of the methods described under the research project activities described above. Each role involves record keeping, data analysis, discussions with the lab PI (Dr. Hovel-Miner), presentation at lab meetings, and an anticipated poster at Research Days with SMHS.

* 11. Describe the mentor's role in the project. (200 word limit)
The primary mentor will be Dr. Hovel-Miner. The professor will provide hands on training for the student in all approaches (bioinformatic and bench). In addition, the mentor will educate students in data interpretation and analysis, scientific presentations and writing, and guidance in research career planning if the student desires future research opportunities.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Hovel-Miner has mentored medical students for over 20 years. During her postdoctoral fellowship at Rockefeller University, she mentored no less than 5 MD PhD students in the Tri-Institutional MD PhD program, which includes students from Weill Cornell, Sloan-Kettering, and Rockefeller. At GW, Dr. Hovel-Miner has been an instructor for the I-3 block for over 5 years but has not yet had the opportunity to mentor medical student research in SMHS. The professor has graduated 1 SMHS PhD student, 1 Public Health Master's Degree student as well as training more than 10 undergraduates and 4 research technicians.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
No human subjects.
Faculty Proposal for MD Student Research by Nobuyuki Ishibashi

* 1. Faculty Sponsor

* Name: Nobuyuki Ishibashi
* Degrees: MD
* Title: Foglia-Hills Professor
* Organization: Children's National Hospital
* Address: 111 Michigan Ave. NW
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-2388
* Email Address: nishibas@childrensnational.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)

Cell Therapy for Neuroprotection in Congenital Heart Disease (CHD)

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
Yes - Anatomy
Yes - Pediatrics
Yes - Cardiology
Yes - Neurology
Yes - Surgery

6. Sponsor's translational level
(Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
Our studies show that potential cell-based interventions for improvement of CHD-induced brain damage include: 1) promoting white matter (WM) regeneration through endogenous oligodendrocyte progenitors; 2) restoring the neurogenic potential of subventricular zone (SVZ) neural stem/progenitors; and 3) controlling CPB-induced prolonged microglia activation. Mesenchymal stem/stromal cells (MSCs) are multipotent, non-hematopoietic cells that possess both immunomodulatory and regenerative properties, and can treat a wide range of diseases including hypoxic brain injury. Various rodent studies have shown that in the brain MSCs: 1) accelerate WM remyelination through the activation of endogenous oligodendrocyte progenitors; 2) promote neurogenesis from SVZ neural stem/progenitors; and 3) regulate microglia activation after hypoxic-ischemic brain insults. Multiple clinical trials have also established the safety of MSC-based therapy. These findings have led to our principal hypothesis that: MSC delivery to the early postnatal brain at the time of corrective cardiac surgery promotes endogenous regeneration of damaged neuronal and glia cells in children with CHD.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Neonatal cardiac surgery provides a unique opportunity to control cerebral perfusion though CPB. We are proposing for the first time the use of CPB itself as a novel MSC delivery system in the CHD population. Our preliminary data demonstrates that in our piglet model: 1) CPB is an effective delivery system; 2) MSCs modulate CPB-induced systemic inflammation; and 3) MSCs reduce microglia activation in the acute period following CPB. In order to design optimal MSC-based therapies in the CHD population, overall goal of our studies is to determine the behavior of three specific stem/progenitor cell lines: i) delivered MSCs; ii) WM oligodendrocyte progenitors; and iii) SVZ neural stem/progenitors by using our unique piglet of neonatal cardiac surgery. Measureable objective for Gill summer fellow is to determine the effect of MSC treatment on CPB-induced microglia activation and maturation of neuronal and glia cells using either immunohistochemistry (IHC) or bioinformatic approach. Gill summer fellow will also contribute to our phase 1 clinical trial termed MeDCaP (Mesenchymal stromal cell Delivery thorough Cardiopulmonary bypass in Pediatric cardiac surgery) at Children's National.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Based on student’s interest and discussion with mentor team, the student will perform studies using either IHC assays or bioinformatics approach based on following time frame. Time frame is designed based on our previous experience with Gill fellows to complete the projects from the beginning. Cell population of interest in summer 2022 will be discussed and selected according to progress of ongoing studies. Sample time frame for IHC assays Week 1: Preparation: cryostat training for the large animal brain section and antibody optimization Week 2: Immunohistochemistry of the first cell population and image acquisition with a direct mentor Week 3: Data quantification using imaging software Week 4: Data analysis using statistical software and optimization for 2nd study Week 5: Immunohistochemistry of the second population based on the results of the first studies Week 6: Data quantification using imaging software Week 7: Data analysis using statistical software Week 8: Presentation at the lab meeting and development of poster draft for presentation at meetings Project with IHC assay: Determine effects of MSC treatment on differentiation/maturation of oligodendrocyte (OL) progenitor cells. To determine the effects of MSC treatment on OL differentiation/maturation, we will assess gyrencephalic WM at post-CPB week 4. OL maturation and differentiation will be defined using established cell-specific markers for OL lineage (Olig2), OPCs (PDGFRa), , and mature OLs (CC1), as we have regularly performed. Cell density in 7 WM regions will be quantified. MBP (myelin basic protein) expression is a measure of myelin level. For MBP staining, confocal epifluorescence images will be sequentially acquired. The proposed studies have the potential to identify and assess novel strategies to treat brain immaturity and brain injury, and define new standards of perinatal care in the patient with CHD.

10. Describe the student’s role in the project (200 word limit)

The program is intended to provide the highest quality experience for medical school students with a strong interest in pursuing careers as physician-scientists. To define hypoxia-induced alterations on the gyrencephalic brain and the effect of MSC delivery through CPB during CHD surgery, the student role will be focused on immunohistochemical assay of the developing brain in our clinically relevant experimental models. We offer students the opportunity to: 1) learn uniquely integrated research field in developmental neuroscience and pediatric cardiology/cardiac surgery; 2) gain experience in hands-on laboratory research; 3) interact with faculty, postdoctoral fellows, and other summer interns; 4) attend weekly luncheon/seminar presentations by members on specific research projects and cutting-edge research tools; and 5) improve presentation, writing, and communication skills. In partnership with Children’s National Heart Institute, students can participate in weekly surgery case discussions and daily Cardiac ICU rounds to learn more about congenital heart disease. Our pediatric cardiac surgery team performs hundreds of cardiac surgeries. World-renowned, pediatric cardiac surgeon Yves d’Udekem, MD, is the co-director of the Heart Institute.

11. Describe the mentor’s role in the project. (200 word limit)
The nature of Dr. Ishibashi’s training plan will entail multiple sessions, so that he/she can overcome the technical obstacles that are intrinsic to the study in the piglet brain. Daily supervisor - Drs. Leonetti, Kobayashi, Li, Saric, Shepard, Strauss (Post-doc research associates in my lab) - and he/she will meet one-on-one before each experiment in order to establish the best experimental approach to be used and to determine how to avoid any difficulties that may naturally arise with the use of different samples. The training will be provided through multiple hands-on sessions at the time of actual analysis of samples and imaging data. Once he/she has acquired data, meetings with Dr. Ishibashi will be focused on data interpretation and building hypotheses relevant to our future study.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)


* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: Pro00011914
* IRB Date: 1/16/2020
Faculty Proposal for MD Student Research by Jyoti Jaiswal

* **1. Faculty Sponsor**

* Name: Jyoti Jaiswal
* Degrees: MS, PhD
* Title: Professor
* Organization: GWU & Children's National Hospital
* Address: 111 Michigan Av NW
* Apt/Suite:
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 2024766456
* Email Address: jkjaiswal@cnmc.org

* **2. Daily Supervisor**

Name: James Novak
Degrees: PhD
Title: Assistant Professor
Organization: GWU & Children's National Hospital
Address: 111 Michigan Av NW
Apt/Suite:
City: Washington
State: DC
Zipcode: 20010
Office Phone:
Email Address:

* **3. Project Title (250 character limit)**

Analysis of cellular and molecular basis for severity of cardiomyopathy using mouse models for Duchenne Muscular Dystrophy

* **4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.**


Secreted acid sphingomyelinase as a potential gene therapy for limb girdle muscular dystrophy

* 5. Sponsor’s Research Focus:
Yes - Anatomy
Yes - Pediatrics
Yes - Cardiology

* 6. Sponsor’s translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)
Mutations in the largest gene in human genome called dystrophin leads to debilitating X-linked neuromuscular diseases called Duchenne and Becker muscular dystrophies (D/BMD). Boys and carrier females suffering from this disease develop dilated cardiomyopathy (DCM) over the course of these diseases, which along with the respiratory deficit is the leading cause of mortality among these patients. Onset and progression of DCM in these patients is variable and we still do not understand the basis for the onset and progression of this pathology in these patients. One of the key contributing factors is the cytokine TGF-ß that leads to cardiac fibrosis. We have established a DMD mouse model (D2-mdx) that exhibits high level of TGF-ß due to a genetic polymorphism that is common in the DMD patients. Using this model, we have identified a rapid and severe disease progression and have carried out RNAseq analysis to understand the basis for this early onset and faster progression of symptoms. We hypothesize that use of the DMD mouse model with severe cardiomyopathy will help understand the basis for severe cardiomyopathy in patients.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
In this project we will functionally and histopathologically analyze the cardiac tissues from 12 mice (3 mice each for young and old as well as mild and severe models) and perform bioinformatic analysis of gene expression data from RNAseq analysis. These analyses will be combined to identify the molecular and cellular pathways targeting which can reduce the severity of cardiac dysfunction in the severe model for DMD.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
The first half of the work will involve familiarizing with the animal models and the bioinformatic analysis of the RNAseq data that has been conducted. This will be followed by histopathological analysis of the targets identified based on the RNAseq-based gene expression studies to monitor inflammatory and fibrotic genes. Finally, these data will be analyzed using image analysis tools to quantitatively assess the changes in inflammatory and fibrotic markers in mild versus severe disease models. There will also be opportunity to participate in longitudinal functional assessment of the decline in cardiac function as the disease progresses these DMD mouse models.

* 10. Describe the student's role in the project (200 word limit)
The student will evaluate the banked mdx mouse cardiac tissues and through bioinformatic gene expression analysis of young and adult severe DMD mouse models. These analyses will include (but not limited) to cardiac histopathology, immunostaining and confocal microscopy, image quantification and functional assessment of in vivo heart function. Finally, the student will be engaged in writing up the findings from their work towards a publication focused on answering the hypothesis posed above.

* 11. Describe the mentor's role in the project. (200 word limit)
Regular (daily / weekly) interactions, facilitate hands on training for all the work described above, provide oversight of the pursuit of proposed work, optimize experimental workflow, interpret data, and help with preparing the work for presentations.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Work in our laboratory is focused on mechanistic and drug development efforts. Two DPT (physical therapy) trainees are pursuing their postdoctoral work have received independent funding and authored multiple publications. One of the past Gill fellows (David Yang) co-mentored in our laboratory published the research work below. Superresolution imaging of viral protein trafficking (2015), Colberg-Poley A, Patterson GH, Salka K, Bhuvanendran S, Yang D, and Jaiswal JK Med Microbiol Immunol.; 204(3): 449–460.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
This work does not involve research with human subjects.
Faculty Proposal for MD Student Research by Roxanne Jamshidi

* 1. Faculty Sponsor

* Name: Roxanne Jamshidi
* Degrees: MD, MPH
* Title: Associate Professor of Obstetrics & Gynecology | Director of the Division of General Obstetrics & Gynecology
* Organization: Obstetrics and Gynecology
* Address: 2150 Pennsylvania Avenue

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Evaluating the effect of elective abortion on anxiety levels in following pregnancies

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
Acute Care Long-Acting Reversible Contraceptive Placement: A Compare and Contrast Study Authors: Kelsey Dorwart, Michael McMullen, Noushine Sadeghi, Steven Davis, Rose Kleiman, et al.
* 5. Sponsor's Research Focus:
Yes - Obstetrics/Gynecology

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Patients who had elected to have a medical or surgical abortion in prior pregnancies have increased anxiety in following pregnancies

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
Goal: to better assess and address anxiety in pregnant patients Measurable objectives: number of patient who fill our survey ideally n=100

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

IRB Recruitment Data Collection Data analysis Writing of the manuscript and abstract 3 months of recruitment of patients to the research which includes filling out the survey 3 months for data analysis

* 10. Describe the student's role in the project (200 word limit)
Students to be present in the clinic to help recruit patients which means identifying patients who fit the inclusion criteria and offering participation in our study and the survey; followed by help with data collection. Students may participate in any part of the project as listed above as they desire with minimum commitment including the recruitment aspect of the study.

* 11. Describe the mentor's role in the project. (200 word limit)
Mentor to oversee recruitment, provide guidance in data analysis, and assist in editing manuscript/abstract

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
not applicable

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Pending)
Faculty Proposal for MD Student Research by Dr. Anitha John

* 1. Faculty Sponsor

* Name: Dr. Anitha John
* Degrees: MD, PhD.
* Title: Medical Director, Washington Adult Congenital Heart Program
* Organization: Children's National Hospital
* Address: 111 Michigan Avenue, NW
* Apt/Suite: 
* City: Washington
* State: District of Columbia
* Zipcode: 20010
* Office Phone: 202-476-2728
* Email Address: anjohn@childrensnational.org

* 2. Daily Supervisor

Name: Anita Mathews
Degrees: BS, MS
Title: Clinical Research Coordinator
Organization: Children's National Hospital
Address: 111 Michigan Avenue, NW
Apt/Suite: 
City: Washington
State: District of Columbia
Zipcode: 20010
Office Phone: 202-476-7505
Email Address: ACHDResearch@childrensnational.org

* 3. Project Title (250 character limit)
My Health, My Heart Part 2: Providing skills to congenital heart patients to transition from pediatric to adult centered care.

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Cardiology

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Congenital heart disease (CHD) remains the most common birth defect, occurring in 1% of the population. With advancements in medical and surgical treatments, survival rates have dramatically improved with over 85% of patients surviving to adulthood. It is estimated that there are 1.3 million adults with CHD in the United States, shifting prior demographics such that there are now more adults alive with CHD than children. Adults with CHD represent one of the fastest growing populations of patients living with a childhood chronic condition. Depending on the underlying condition, these patients often have long-term complications and complex medical needs, including a high rate of mood disorders and neurocognitive challenges. Unfortunately, there is a high rate of loss to follow-up in this population. Previous studies have reported anywhere from 21% to 76% of adolescents and young adults with CHD have a lapse in cardiology care. These lapses in care can lead to lack of recognition of important long-term complications which then result in poor outcomes. This pilot study will aim to identify and address individual barriers for transition from pediatric to adult cardiologist by creating a pathway to improved knowledge and confidence.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
The purpose of the program is to educate CHD patients and families regarding the need for lifelong specialized care. We would like to provide the patient and family with increased knowledge about their medical diagnosis, health system, health insurance, care coordination and mental health resources. Through this program, we would provide skills that would enable him/her to transition to adult care service. The specific objectives of the program are: (1) To identify individual barriers for a successful transition. (2) To improve knowledge and education about cardiac condition and importance of transition. (3) To establish a pathway to create effective goals for patients and their families regarding tasks needed for successful transition. Long term, we hope to evaluate rates of participants who remained in care and transferred to adult care services. Currently, we have about 55 participant records.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
• The project is likely to result in a report of interest to other scholars
• The project fulfills discovery/original research

Participants will be enrolled on a rolling basis. We are expecting to recruit approximately four participants per month. Once the referral is made to our Adult Congenital Heart Disease (ACHD) team or the patient establishes contact on their own, we will screen the participant and family to make sure that they meet eligibility criteria. We will be actively recruiting participants for 12 months. Participants will start the program at different ages but will be between 12 and 22 years old at enrollment. All participants enrolled in the study will receive the intervention (an individualized transition program education). As this is a pilot study, we hope to streamline and revise the program based on participant responses and results. All information about knowledge, data collected in surveys, and psychosocial questionnaires will be discussed with the participant and his/her family. If a participant or family member has an elevated score on anxiety, depression, or stress level screening questionnaire, our program study social worker will reach out to the family to address potential issues and follow standard hospital protocol. She would also provide referrals to therapists, psychologists, or psychiatrists in cases of moderate or severe anxiety and depression symptoms. The data obtained by assessments and during remote appointments will be documented in the patient’s medical record. All worksheets will be accessible through the patient portal as well. To assess adherence to the protocol, we will collect data about each remote appointment. After the contact with participant, the study team member will report the date, family members present and any pertinent details about the appointment, including whether all topics were addressed during the appointment. Topics to be discussed will be individualized to each participant but will stay within the following areas: medical health, mental health, care coordination. A curriculum has been established and is based on the age of participants (three age categories). This study will not be collecting any clinical laboratory data. Participants may have blood or other specimen collection done for their standard medical care and the results will be accessible by study team members; however, we will not be collecting this data as part of the study. All medical care will still be received by participant’s primary cardiologists. Participants who will not fill out baseline surveys will not be able to participate in the study. If a remote call is done outside of a window, it will be entered in the database with the date when it happened, and the following remote call will happen at the scheduled time. If an appointment/remote call is completely missed, it will be recorded as missed and that session will not be taught. If two remote appointments are missed, the participant will be taken off the study.

* 10. Describe the student's role in the project (200 word limit)
The student will participate in all activities associated with this research study including data collection, data management and data analysis. Student will also be considered for involvement in other capacities/research studies based on student’s time and interest. The student will be expected to present his/her work to the multidisciplinary research team at the conclusion of the summer and/or at the Children’s National research week. Student will also have the opportunity to join team meeting (virtually or in-person). Students will be required to complete certain research training courses e.g., CITI, REDCAP training, literature review etc. Additionally, Dr. John and her team are working on a congenital heart initiative project and student may be requested to assist with dissemination of study information as well as monitor audience engagement. Student is considered a valuable member of the team and will be expected to engage in research discussions.

* 11. Describe the mentor's role in the project. (200 word limit)
Dr. Anitha John and her team will provide ongoing supervision for the student in organizing the data and conducting analyses. She will also provide student with knowledge and context of the research project. Anita Mathews and Adebola Owolabi, the project clinical research coordinators will also be available to provide additional guidance to student. The team will be available to answer any questions that student may have.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)

Although Dr. John and her team have not had previous medical students on the team, we have had numerous residents and fellows that have done research with our team. The focus has been to generate a meaningful learning experience for all trainees in addition to generating a scientific document (such as abstract or manuscript).

* 13. Do you have or will you obtain IRB approval for this project?

Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: Pro00012842
* IRB Date: 8/10/2020
Faculty Proposal for MD Student Research by Roopa Kanakatti Shankar

* 1. Faculty Sponsor

* Name: Roopa Kanakatti Shankar
* Degrees: MBBS, MS
* Title: Endocrinologist, Associate Professor of Pediatrics
* Organization: Children's National Hospital and The George Washington University School of Medicine
* Address: 111 Michigan Ave NW
* * Name: Roopa Kanakatti Shankar
* Degrees: MBBS, MS
* Title: Endocrinologist, Associate Professor of Pediatrics
* Organization: Children's National Hospital and The George Washington University School of Medicine
* Address: 111 Michigan Ave NW
* * Office Phone: 202-476-2121
* * Email Address: roopa.shankar@childrensnational.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Clinical spectrum of patients in the Turner syndrome multidisciplinary clinic

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Endocrinology

6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
Objective To describe the clinical phenotype of patients with TS seen in a newly established TS multidisciplinary program in the first 3 years. We anticipate reviewing the data of all patients with this rare disease seen in this program in the first few years of inception in a retrospective manner as a descriptive study.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
In this retrospective study, patients with diagnoses of Turner syndrome seen in the multidisciplinary TS program on or after January 1, 2019 through October, 27, 2021 will be identified and data abstracted from the medical record. Any patients not meeting criteria of confirmed diagnosis of Turner syndrome will be excluded. We have an estimated 100 patients whose records will be analyzed and following data abstracted. Age, karyotype, demographic characteristics and list of associated diagnoses, height, weight, BMI, FSH, LH, AMH, IGF-1, AST, ALT, Lipid panel and HbA1c; and radiographic findings Descriptive and bivariate analysis of the clinical phenotype, height, and reproductive outcomes will be completed.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Turner syndrome (TS) is a genetic disorder affecting 1 in 2500 phenotypic females resulting from the absence of or structural abnormality of one X-chromosome. TS is associated with short stature, characteristic facial features, webbed neck, lymphedema, cardiac abnormalities, autoimmune conditions, neurodevelopmental issues and primary ovarian insufficiency (POI). The TS multidisciplinary clinic at Children’s National was established in January 2019 to provide multispecialty care at our institution in accordance with the most recent guidelines for TS care. We would like to review the clinical heterogeneity and hormonal profile of these individuals and report on the short term growth, fertility and transition of care outcomes for these individuals seen in the multispecialty clinic for this rare disease.

10. Describe the student's role in the project (200 word limit)
The research student on this project will complete the medical record review, data abstraction and input into the Redcap database, as well as the data analysis with supervision using descriptive statistics. We expect the student to focus on a particular aspect of TS based on their interest and may participate in other ongoing retrospective and prospective research protocols based on the TS registry at Children’s National. It is expected that the student will prepare an abstract for presentation at a national conference and take the lead in manuscript preparation for this project. The student will also participate in the monthly multidisciplinary TS clinic, present on relevant topics at the pre-clinic case conference, and interact with multiple specialists at the clinic to formulate a comprehensive care plan. This will encourage the student to gain interdisciplinary clinical knowledge on management of congenital heart disease, growth hormone therapy, primary ovarian insufficiency and hormonal induction of puberty, and counseling on fertility preservation, genetics and behavioral health screening. The student is also invited to participate in the endocrine and diabetes didactic sessions, and case presentations in the division of endocrinology at Children’s National Hospital.

* 11. Describe the mentor's role in the project. (200 word limit)
The faculty mentor (Dr. Kanakatti Shankar) will take primary responsibility for the day to day supervision. The faculty mentor will directly provide guidance and supervision for chart review, data abstraction and input into RedCap, and data analysis. The mentor will encourage and supervise the development of an abstract for conference submission and manuscript preparation. The mentor will also engage the student in all ongoing aspects of research and foster understanding of the research process, ethical and responsible conduct of research. The mentor will also facilitate clinical learning on the multi-system pathology and management of Turner syndrome in a multidisciplinary clinic and foster interdisciplinary interactions with other specialists.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Kanakatti Shankar has previously mentored several medical students, residents and pediatric endocrine fellows in both a clinical and research capacity. She has guided and supported several trainees to submit and present abstracts at national conferences. Since joining as faculty in 2018, she has mentored 2 Health Services Scholars over the past 2 consecutive years through GW.

* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
  Selected Yes

Please provide IRB number and date
* IRB Number: Pro00016829
* IRB Date: 10/29/21
Faculty Proposal for MD Student Research by Brandon Kohrt

* 1. Faculty Sponsor

* Name: Brandon Kohrt
* Degrees: MD, PhD
* Title: Charles and Sonia Akman Professor of Global Psychiatry
* Organization: George Washington University
* Address: 2120 L St NW
* Apt/Suite: 600
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 2027412896
* Email Address: bkohrt@gwu.edu

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)

There are multiple NIMH-funded projects in global mental health research available for student participation: Project 1 - RECOUP-NY - a randomized controlled trial of mental health services working community based organizations service minority populations in New York City Project 2 - RESHAPE - a randomized controlled trial to reduce stigma of mental illness in primary care services in Nepal Project 3 - STANDSTRONG - development of a passive sensing mobile app to detect and treat postpartum depression

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

*.ohrt BA, Jordans MJD, Turner EL, Rai S, Gurung D, Dhakal M, Bhardwaj A, Lamichhane J,


5. Sponsor's Research Focus:
Yes - Psychiatry

6. Sponsor's translational level
* (Please select ONE)
T4: Translation to Population Health

7. Hypotheses (200 word limit)
RESHAPE Aim – To evaluate the impact of the RESHAPE service user engagement on stigma among primary care workers. Hypothesis: Primary care workers in the RESHAPE arm will have less stigma toward persons with mental illness (measured with the Social Distance Scale) 3 months after training compared with primary care workers in the standard training. RECOUP Aim - To evaluate depression symptoms (primary outcome) and other mental health symptoms comparing CBO offices delivering services as usual (i.e., referral to specialists) vs. CBO offices with staff trained to deliver PM+. We will evaluate mechanisms of action (mediation hypothesis) including self-reported behavior change, as well as optional digital monitoring for objective behavior change. We will also evaluate the competencies of non-specialists providing mental health services (moderation hypothesis). STANDSTRONG Aim - To conduct proof-of-concept testing of the StandStrong platform to evaluate acceptability, feasibility, usage, benefit, and validity. We will iteratively test the StandStrong platform with non-depressed mothers, and then, with depressed mothers participating in a 5-week psychological intervention delivered by a non-specialist. This will establish parameters for five milestones: acceptability for mothers to participate, feasibility to collect representative passive sensing data, usage of the app by counselors, perceived benefit among mothers, and validity.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
RESHAPE - 1000 patients RECOUP - 1500 clients STANDSTRONG - 100 patients
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

RESHAPE - Involvement of mental health service users in training primary care workers may reduce stigma, and that stigma reduction may mediate improved detection of mental illness. If these findings are confirmed in an appropriately powered cRCT, this service user collaborative implementation strategy could make a major contribution to improving primary care detection in LMIC, as well as in the U.S. RECOUP - This study would be the first cRCT of PM+ delivered in US community settings. The research is innovative by addressing key scientific issues including (i) specific benefits to NIH-designated health disparity groups, (ii) safety and competency of non-specialists, (iii) cost-effectiveness, (iv) mechanisms of action for interventions delivered by non-specialists, and (v) COVID-19 public health impact. This will inform policy changes for mental health task-sharing during emergencies and for ongoing services in the U.S. STANDSTRONG - Our interdisciplinary team of experts in mHealth interventions, psychiatry, anthropology, implementation science, biostatistics, and health economics from the U.S., Nepal, and South Africa has been developing and testing a passive data collection suite and app interface for non-specialist counselors to treat adolescent mothers with depression in Nepal. Our platform, Sensing Technologies for Maternal Depression Treatment in Low Resource Settings (StandStrong), monitors geographic movement, activity levels, exposure to human speech, and mother-child proximity. Preliminary work with non-depressed and depressed adolescent and young mothers suggests that depression status may associate with less movement, less time spent with one’s infant, and less exposure to social environments.

10. Describe the student’s role in the project (200 word limit)

Students will have the opportunity to participate in project activities. Students committing at least 8 weeks of full time work and meeting ICJME criteria will have the opportunity to publish.

11. Describe the mentor’s role in the project. (200 word limit)

The mentor will train the student in relevant research, e.g., Dedoose qualitative analysis.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)

A current student is getting qualitative research training, then will go to Uganda for 3 months for a research study there working with persons with severe mental illness and their family members. Prior students have done work in Nepal, Belize, and Brazil.

13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: Multiple IRB approvals are available for each project
* IRB Date: All IRB approvals are active through summer of 2021
Faculty Proposal for MD Student Research by Anita Krishnan

* 1. Faculty Sponsor

* Name: Anita Krishnan
* Degrees: MD
* Title: Associate Director, Echocardiography
* Organization: Children's National Hospital
* Address: 111 North Michigan Avenue
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-6552
* Email Address: akrishna@childrensnational.org

* 2. Daily Supervisor

Name: Anita Krishnan
Degrees: MD
Title: Associate Director Echo
Organization: Children's National Hospital
Address: 111 N. Michigan Avenue NW
Apt/Suite: 
City: Washington
State: DC
Zipcode: 20010
Office Phone: 202-476-6552
Email Address: akrishna@childrensnational.org

* 3. Project Title (250 character limit)
Overcoming sociodemographic barriers to prenatal detection of congenital heart disease through outreach, advocacy, and tele-health

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor’s Research Focus:
Yes - Cardiology

* 6. Sponsor’s translational level
*(Please select ONE)*
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Implementation of community outreach in rural communities and areas of neighborhood deprivation by fetal tele-health will improve access to care for at risk populations identified in previous work.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
1. To compare sociodemographic characteristics of patients served by a grant funded rural tele-health clinic as compared to those of historical controls and those at the tertiary care site (anticipate 100 controls and 30-50 cases) 2. To aid in legislative advocacy work related to prenatal detection

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

The student will use a software package to identify the sociodemographic characteristics of patients served by a community based fetal tele-health clinic and calculate a socioeconomic z score. These characteristics will be compared to our baseline community outreach population identified in a prior study and to a concurrent population treated at the tertiary care site. The purpose is to identify whether a pilot study of fetal telehealth in a remote region is able to provide timeline fetal echocardiography delivery. Additionally, the student can participate in research activities related to health equity in cardiology and advocacy activities through the Children's Health Advocacy Institute.
10. Describe the student’s role in the project (200 word limit)
The student will work with Dr. Krishnan and Dr. Schwartz (cardiology fellow) to identify patients, gather data and learn basic statistical analysis (calculation of SES z score and chi square or t test to compare variables of interest). Depending on prior experience, can be involved with abstract and manuscript preparation with authorship concurrent with abilities and experience.

11. Describe the mentor’s role in the project. (200 word limit)
The mentor will supervise in data collection, statistical analysis and support, and data analysis.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I mentored Alysia Wiener, a Health Services Scholar. She completed a similar scale project, presented this work as a poster at GW and CNH research day, and was listed as a collaborator (medline searchable) on a publication in Circulation. I also provided overall career guidance, and she is currently a resident in a related field.

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
(Please select ONE)
Selected No (Pending)
Faculty Proposal for MD Student Research by John Lafleur/Tim McCaffrey

* 1. Faculty Sponsor

* Name: John Lafleur/Tim McCaffrey
* Degrees: MD, Ph.D; Ph.D
* Title: Assistant Prof. Emerg. Med; Prof. Genomics
* Organization: School of Medicine
* Address: 2300 I St.
* Apt/Suite: 203
* City: DC
* State: DC
* Zipcode: 20052
* Office Phone: 202 763 4190
* Email Address: jlafleur@mfa.gwu.edu; mcc@email.gwu.edu

* 2. Daily Supervisor

Name: Tim McCaffrey; John Lafleur
Degrees: above
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Point of care CD15 Elastase levels in infection

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
RNA Sequencing in COVID-19 patients identifies neutrophil activation biomarkers as promising diagnostic platform for infections. (Submitted PlosOne)
SARS-CoV-2 mRNA Vaccine Induces Robust Specific and Cross-reactive IgG and Unequal Strain-specific Neutralizing Antibodies in Naïve and Previously Infected Recipients (submitted Cell Press)
5. Sponsor’s Research Focus:
Yes - Genomics
Yes - Infectious Disease

6. Sponsor’s translational level
* (Please select ONE)
T2: Translation to Patients

7. Hypotheses (200 word limit)
Sepsis is an acute severe systemic host response to infection which can be difficult to diagnose, and in which the chances for survival are improved by early recognition and treatment. For this reason among emergency department patients a wide net is cast through an algorithm based on vital signs and clinical impression. It is often difficult to predict which of the patients identified in this way will develop sepsis and require intensive resuscitative measures/interventions/treatments--frequently provided in an ICU setting. The purpose of this study is to evaluate an assay which measures leukocyte activation and may contribute to more accurate identification of those at risk for decompensation and the development of full-blown sepsis. At the same time samples will be collected from subjects for traditional mRNA expression analysis. Granulocytes, most of them neutrophils form an arm of the innate immune system which responds early and non-specifically to infecting pathogens. Granulocytes undergo a predictable series of cellular events when activated by pathogen-related antigens. The intensity of this response is mirrored in the production of elastase which is an enzyme that degrades the cell-wall component, elastin.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Research question: Can we identify an easily measured analyte that can improve identification among those meeting SIRS (systemic inflammatory response) criteria that will go on to decompensate and develop sepsis? Research hypothesis Levels of elastase production by isolated leukocytes displaying CD15 antigens mirror the strength and acuity of the innate immune response in early infection and will provide means to stratify those at greater risk for decompensation and sepsis About 200 Subjects will be enrolled in the ED. Eligibility will consist of a presentation consistent with SIRS/sepsis, or selection as a control subject. There will be three groups of patients: 1) a control group of non-infected subjects matched for demographics with SIRS/sepsis study enrollees; 2) subjects that are admitted to the ICU with sepsis; 3) subjects that meet SIRS/sepsis criteria but are subsequently admitted to the hospital floor (not intensive care), or are sent home. Those in group 2 will continue in the study, and their CD15 granulocyte elastase levels will be measured on a daily basis while in the ICU.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
Potential participants will be screened from larger pool of ED patients meeting SIRS criteria. Eligible subjects will be approached by study personnel in the ED or on the hospital wards/intensive care units to discuss details of the study and be offered the opportunity to participate. For those patients in the ED are not able to provide consent, consent will be sought from the patient's previously identified surrogate for making medical decisions. Study personnel will obtain informed consent from interested, eligible subjects. Each enrolled subject will receive a copy of their signed informed consent form. In the event that consent is obtained remotely from a surrogate, properly executed consent will be placed in the chart. Hospital staff will draw blood samples required for the study. Typically, this will occur at the same venipuncture for blood that is obtained for clinical care. Blood will be drawn into coded tubes by peripheral venipuncture. It is possible that a separate venipuncture may be necessary, but this will be avoided to the extent possible. Collection: 3 tubes of blood. Total blood draw: 24 mL blood. In the ED after the first blood-draw of 2 tubes, a second blood draw will occur at the three hour mark, the purpose of this is to assess if sepsis markers, particularly elastase, targeted in this study are changing rapidly in the course of the ED stay. Some blood samples will be processed immediately, other blood samples will be placed by study personnel for storage in -70 degree freezer in department of genomic medicine collaborators. Downstream the blood sample will be analysed for the levels of specific blood chemicals and subtypes of circulating leukocytes. In addition genetic testing may be done on some blood samples. Some blood samples will be processed immediately while others are not because this is a study of a point of care device (POC)—samples are run immediately on the POC device, other samples are sent to the lab to validate the results of the POC device. Routine clinical data (age, gender, family history, past medical history, vital signs, laboratory testing, medications) are entered into a coded research database (redCAP). Research staff will conduct a second chart review at 30 days to confirm clinical diagnosis in all patients enrolled in the study. Those that are admitted to the hospital ICU will be followed closely by study personnel for the duration of the time they are in the ICU. Related research has resulted in publications in peer reviewed journals; we are currently awaiting review of a recently submitted ms. This project represents an important effort to identify factors that can predict decompensation in sepsis—a very pressing question in acute care medicine.

* 10. Describe the student’s role in the project (200 word limit)
Selected student will participate in all phases of the research as possible. Primary function will include lab-based research. As possible students may also be based in ED for patient enrollment and point of care testing

* 11. Describe the mentor’s role in the project. (200 word limit)
Mentors are hands on in this project Drs. McCaffrey/Lafleur will provide day-to-day oversight and training as needed

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Multiple Health service scholars over the years.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes
Please provide IRB number and date

* IRB Number: tba
* IRB Date: tba
Faculty Proposal for MD Student Research by Marc Levitt

1. Faculty Sponsor

* Name: Marc Levitt
* Degrees: MD
* Title: Chief, Division of Colorectal & Pelvic Reconstruction
* Organization: Children's National Medical Center
* Address: 111 Michigan Ave NW
* Apt/Suite: 4 Main
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-2656
* Email Address: mlevitt@childrensnational.org

2. Daily Supervisor

Name: Teresa Russell
Degrees: MS
Title: Senior Clinical Research Coordinator (Colorectal & Pelvic Reconstruction and Urology)
Organization: Children's National Medical Center
Address: 111 Michigan Ave NW
Apt/Suite: 4 Main
City: Washington
State: DC
Zipcode: 20010
Office Phone: 2024765024
Email Address: tlrussell@childrensnational.org

3. Project Title (250 character limit)
Continence Outcomes in Colorectal Patients

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor’s Research Focus:
Yes - Pediatrics
Yes - Surgery

* 6. Sponsor’s translational level
* (Please select ONE)
T4: Translation to Population Health

* 7. Hypotheses (200 word limit)
The number of patients who have achieved continence at 1 year post-surgically will be higher in medical centers with dedicated colorectal surgery and bowel management programs. This study will evaluate best-practices, institutional outcomes, and generate standards for continence in colorectal patients.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
1. To assess the continence of all patients seen in the colorectal program at CNMC between 2019-present.
2. To contextualize continence using bowel management and surgical/procedural history.
3. Compare with internal data before the establishment of the dedicated colorectal program at CNMC.
4. Compare continence metrics with other sites in the Pediatric Colorectal and Pelvic Learning Consortium and the Eastern Pediatric Surgical Network.
5. Compare with outcomes published in large national datasets such as the National Surgical Quality Improvement Program.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

1. Targeted chart review of approximately 900 patients seen by the collaborative colorectal program since its inception in 2019.
2. Publish comparison of data between CNMC and other centers within surgery-specific national networks and databases.
4. Publish colorectal sub-population-specific (HD, ARM, cloaca, functional constipation, spinal dysraphism) outcomes and expectations.
5. Publish continence measures and standards for sites to measure their performance against. Robust outcomes data and standards for continence of colorectal patients.
post-treatment have not been previously published.

* 10. Describe the student's role in the project (200 word limit)
Multiple students will have the opportunity to collect data for this study (through chart review and patient conversations). They will then have the opportunity to be involved in analysis and publication of subsequent results through conference abstracts and manuscripts. Students will also get a copy of a medical student book with relevant information for students interested in Pediatric Surgery with a colorectal focus.

* 11. Describe the mentor's role in the project. (200 word limit)
With Dr. Levitt, students will have the opportunity to attend clinic, shadow in the operating room, attend educational presentations, take part in collaborative clinical discussions, learn in oral board preparation sessions with the fellows, and be involved in other ancillary projects during their time in the colorectal program.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Levitt has a large amount of past and current experience in the training of medical students. He mentored 8 medical students per summer for 4 summers at Ohio state between 2015-2019. In total, he has mentored 50 students total, almost 50 nurses and APNs, 8 junior faculty, 13 research fellows, 23 pediatrics colorectal surgery fellows, and 24 pediatric surgery fellows. He is also currently the coordinator for the Medical Student Surgery Rotation at CNMC and a guest lecturer for the Surgery Clerkship for Howard University.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Pending)
*1. Faculty Sponsor*

* Name: Wei Li
* Degrees: Ph.D.
* Title: Assistant Professor
* Organization: Children's National Hospital
* Address: 111 Michigan Ave NW
* Apt/Suite:  
* City: Washington 
* State: DC 
* Zipcode: 20010 
* Office Phone: 2024764986 
* Email Address: wli2@childrensnational.org 

*2. Daily Supervisor*

Name:  
Degrees:  
Title:  
Organization:  
Address:  
Apt/Suite:  
City:  
State:  
Zipcode:  
Office Phone:  
Email Address:  

*3. Project Title (250 character limit)*

Modeling Gene-Drug Interactions using Large-scale CRISPR/Cas9 Screening Datasets

*4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.*


*5. Sponsor's Research Focus:*


Yes - Genomics
Yes - Cancer

6. Sponsor’s translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
The overall goal of this computational project is to identify novel drug targets and associations with drug responses from large-scale functional genetic screening and drug response datasets. Screening technology is a high-throughput functional assay based on the latest CRISPR/Cas9 genome engineering system, and has been widely used to study various cancer types. By collecting and analyzing public available screening data on over hundreds of cell lines, genes that are critical for cancer cell proliferation and response to drugs can be systematically identified. These findings have the potential to discover (1) biomarkers that are indicative of drug response, and (2) possible drug targets to treat certain types of pediatric cancer. Our group has the track record for the computational and experimental aspects of CRISPR-Cas9/Cas13/base editing screens. We already developed algorithms including MAGeCK algorithm that has 1,000 citations and >80,000 downloads. We identified possible mechanisms and potential drug targets for endocrine resistance in ER+ breast cancer, ER- mutant breast cancer, primary and castration-resistant prostate cancer, and HIV latency reversal, published in PNAS and Cancer Cell.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
This pure computational biology project will process and analyze the screening data of over hundreds of cancer cells. The objectives are to (1) collect public available datasets and evaluate the quality of these datasets in the public domain, (2) use machine learning approaches to build predictive models for drug response, (3) identify the functions of top genes that are biologically meaningful, and (4) if possible, develop a program or pipeline to standardize and visualize the results above.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Week 1-3: preparation, including R/Python learning, reading relevant papers, installing and testing necessary softwares, running demos on Linux/Mac. Week 2-4: get familiar with cancer genomics, process screening datasets using existing pipeline, and CRISP-view DepMap datasets (CRISPR screening, drug repurposing) Week 4-10: test machine learning models, performance evaluation, data interpretation, discussion. Week 10-12: wrap up and prepare for the final presentation.

10. Describe the student’s role in the project (200 word limit)
The student is responsible for (1) getting familiar with the computational tools our group previously developed, (2) collecting and processing public screening data, and (3) performing machine learning and prediction analysis based on the proposed research aims. In addition, the student will interact frequently with the PI (1-3 meetings/week), collaborators across the country, and other members of the lab/department.

* 11. Describe the mentor’s role in the project. (200 word limit)
The PI (Wei Li) will oversee the whole project: he will provide instructions for all the resources needed to perform the aims, and guide the student in all aspects (data collection, programming, biological interpretation, etc.). Furthermore, the PI will create a vibrant, interactive environment to support the career development of the student, including but not limited to (1) sharing experience on research, skill development, communication, presentation, etc.; (2) encouraging discussion with other faculty and members of the department that has a variety of scientists working on different disease problems; (3) providing opportunities to connect to collaborator laboratories and industrial partners.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
The PI has joined CNMC since 2018 and supervised 1 medical student, 1 pre-med student and several GWU master and Ph.D. students. 1 medical student received Gill Fellowship in 2019.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
This is an informatics project that involves only public data and does not require IRB.
Faculty Proposal for MD Student Research by Hayley Loblein

1. Faculty Sponsor

<table>
<thead>
<tr>
<th>Name</th>
<th>Hayley Loblein</th>
</tr>
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<tbody>
<tr>
<td>Degrees</td>
<td>PhD</td>
</tr>
<tr>
<td>Title</td>
<td>Pediatric Neuropsychologist</td>
</tr>
<tr>
<td>Organization</td>
<td>Children's National Hospital</td>
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<tr>
<td>Address</td>
<td>111 Michigan Avenue NW</td>
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<td>Zipcode</td>
<td>20010</td>
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<tr>
<td>Office Phone</td>
<td>301-765-5429</td>
</tr>
<tr>
<td>Email Address</td>
<td><a href="mailto:hloblein@childrensnational.org">hloblein@childrensnational.org</a></td>
</tr>
</tbody>
</table>

2. Daily Supervisor

Name: Madison Berl

Degrees: PhD

Title: Director of Research for Neuropsychology

Organization: Children's National Hospital

3. Project Title (250 character limit)

Impact of Social Determinants of Health on Post-surgical Outcomes in Pediatric Epilepsy

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Psychiatry
Yes - Neurology

6. Sponsor's translational level
(Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
We hypothesize that Social Determinants of Health (SDOH) factors (e.g., health care access, socioeconomic status, neighborhood, education, social support, distance from hospital) may impact access to surgery (e.g., access to/time until followed by neurologist/epileptologist; access to/time until surgery). We expect that some SDOH factors may also account for different surgical outcomes for pediatric epilepsy patients (e.g., cognitive, psychosocial, quality of life).

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
We plan to use regression analyses using a large surgical epilepsy database with >500 patients. We will assess which SDOH factors impact surgical access and outcome. This analysis will be done using an existing database. Additional factors may be collected through medical record review as needed.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This is a secondary analysis of a prospectively collected clinical database. The surgical outcome data is already entered which makes the likelihood of completion very high. Given our large sample size, the power to define a question of relevance to the literature is also high. SDOH contribute to health disparities and inequities, and is an overarching priority across governmental agencies. Although much of the data is already collected, we have not systematically collected SDOH variables which we want to include in our analyses. We need to conduct record review to enter missing SDOH information.

10. Describe the student's role in the project (200 word limit)
The student will conduct a literature review based on their interest and will decide which cognitive outcome following surgical intervention they would like to research (e.g., memory, language, executive functioning, mood/anxiety). This will prepare them to develop hypotheses. It will be helpful to have some understanding of statistical analyses but we are able to teach more complex approaches as needed, such as geomapping. The student will verify the accuracy of the data and complete data entry for variables relevant to their project. The student will conduct analyses, interpret results, and provide a write up of the project suitable for publication. The student will be
able to attend lab meetings and other didactic sessions. All activities can be completed virtually as needed.

* 11. Describe the mentor’s role in the project. (200 word limit)
The mentor will provide guidance and relevant background as needed to develop the project. The mentor will advise on selecting a topic relevant to their future goals. Technical expertise will be provided by the lab. The mentor will provide input at all stages of the project including weekly meetings. Our team is multidisciplinary including neurology, neuropsychology, and computational science.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
We have had Gill Fellows for over 15 years as well as trainees and summer students from other disciplines and at various levels of training and experience.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: 1320
* IRB Date: since 2014
Faculty Proposal for MD Student Research by Rebecca Lynch

* 1. Faculty Sponsor

* Name: Rebecca Lynch
* Degrees: PhD
* Title: Assistant Professor
* Organization: George Washington University
* Address: 2300 I St. NW
* Apt/Suite: Ross Hall 622
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 2029942193
* Email Address: rmlynch@gwu.edu

* 2. Daily Supervisor

Name: Michelle Papa
Degrees: PhD
Title: Postdoctoral Fellow
Organization: George Washington University
Address: 2300 I St. NW
Apt/Suite: Ross Hall 611A
City: Washington
State: DC
Zipcode: 20037
Office Phone: Email Address: michelle.papa@gwu.edu

* 3. Project Title (250 character limit)

Investigating

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


IMMUNE RESPONSES to SARS-COV-2 VACCINATION IN PEOPLE WITH PRIMARY IMMUNODEFICIENCIES. Michelle Papa1*, Marta Sanz Perez1*, Richard Amdur2, Daniel Ein3 Jamie A. Rosenthal3, Anjeni Keswani3, Rebecca Lynch1, Natalia Soriano-Sarabia1 Manuscript in preparation.

* 5. Sponsor's Research Focus:
Yes - Infectious Disease

* 6. Sponsor's translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)
Our central hypothesis is that people with musculoskeletal phenotype Long COVID will have antibody abnormalities compared to COVID-recovered people or healthy controls.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
The goal of this project is to identify 5-10 people in the COVID recovery clinic who are clinically diagnosed with musculoskeletal phenotype Long COVID and identify 5-10 age/sex matched controls in our COVID recovered and healthy control sample banks. We will measure total antibody isotype repertoire as well as antigen specific antibody responses, and compare these between groups.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This project will require running binding ELISAs or luminex-based binding assays on up to 30 samples testing for total and antigen specific, IgM, IgA, IgG1-4. Training will take 2 weeks, then 4 weeks for acquiring binding data, then 2 weeks for data analysis and re-running any needed assays. In parallel, the post-doc will run neutralization assays with all samples, and possibly B cell phenotyping flow cytometry.

* 10. Describe the student's role in the project (200 word limit)
The students part of the project will be defining the circulating antibody repertoire. The student will accomplish this by running all the binding assays described above (about twelve) on up to 30 clinical samples. The student will then aid in data analysis, statistical analysis as well as data interpretation and presentation.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will oversee the project by defining the hypothesis and goals. The mentor will coordinate training in the lab and teach the student how to interpret the data.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
We have had a previous Gill Fellow in our lab whose work culminated in the William Beaumont Research Award.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
The samples are de-identified.
Faculty Proposal for MD Student Research by Maureen E. Lyon

* 1. Faculty Sponsor

* Name: Maureen E. Lyon
* Degrees: PhD, FABPP Clinical Psychologist, Board Certified in Health Psychology
* Title: Professor of Pediatrics
* Organization: Children's National Hospital
* Address: 111 Michigan Avenue, NW
* Apt/Suite: 
* City: Washington
* State: District of Columbia
* Zipcode: 20010-2970
* Office Phone: 703-346-2873
* Email Address: mlyon@childrensnational.org

* 2. Daily Supervisor

Name: Same
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)
Qualitative and Quantitative Mixed Methods of Data from the FAmily Centered pediatric Advance Care Planning Trial for Teens with Cancer (FACE-TC)

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Cancer
Yes - Psychiatry

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
1. Based on our trial findings that congruence in end of life-treatment preferences varied by combinations of gender/poverty and race, we hypothesize that congruence was influenced (1) by length of time adolescent/family dyad was engaged in conversation; (2) by disagreement about treatment choices between the adolescent and family; and (3) by facilitator fidelity to the study protocol for facilitating conversations. 2. We hypothesize that nonverbal behaviors were associated with congruence outcomes. 3. We hypothesize that adolescents were competent to participate in shared decision making about end of life care with their families meeting all 4 competency criteria 85% of the time.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
Specific Aim 1: To inductively assess verbatim transcripts of patients’ presentation of illness and goals of care conversations, using descriptive semantic content analysis at the level of the patient and family member. This analysis will provide context to the adolescents’ choices in the 4 cancer-specific scenarios and congruence with the family choices. Specific Aim 2: To identify and code nonverbal indicators of anxiety (e.g. fidgeting), engagement (e.g. turning towards), and emotions (e.g. crying), we will use event sampling of easily observable nonverbal behaviors during the interview. Then we will assess associations between nonverbal behaviors and a) adolescents’ treatment preferences in 4 scenarios; and b) congruence in treatment preferences for the 4 scenarios. Exploratory Aim. To estimate the competency of adolescents with cancer to contribute to their EOL decisions, we will rate as present or absent or unsure 4 well-established criteria for competency in medical decision-making: (1) understanding of choice, (2) making a choice, (3) ability to weigh benefits and burdens, and (4) understanding consequences, using observed verbal and nonverbal adolescent behaviors.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
40 videotapes are recorded and stored of the adolescent-family conversations about end of life treatment preferences. There are scant data describing these conversations and great interest in this area. This research will help to fill the gap in our understanding with the largest sample of families and adolescents to date. This is original research. Timeline is as follows: IRB approval for adding mentee to research team after completion of Human Subjects Protection requirements and Conflict of Interest. Quantitative data are in the REDCap data base. Mentee will learn how to use REDCap data base. Most of the videos have already been transcribed. Data coding and data cleaning will take most of the time using NVIVO software. Analysis will take the most time. Dissemination may extend beyond the study period, if the mentee wants to publish or present at professional meetings.

* 10. Describe the student's role in the project (200 word limit)
Transcribe videos, enter qualitative data into NVIVO software, integrate qualitative and quantitative data to answer research questions, as described in the specific aims. Disseminate findings.

* 11. Describe the mentor's role in the project. (200 word limit)
Supervise mentee. Identify two others to help with creating a code book and coding of the data, so there can be reliability checks. Weekly supervision meetings which will be done remotely through Zoom. Prefer someone with experience analyzing qualitative data or eager to learn.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I was the mentor for Kate Schreiner. Based on her work with these videotapes the following publication and international professional presentation were accomplished with Dr. Schreiner as the first author. --Schreiner, K., Grossoehme, D.H., Friebert, S., Baker, J.N., Needle, J., & Lyon, M.E. "Living as if I never had cancer": A study of the meaning of living well in adolescents and young adults who have experienced cancer. Pediatric Blood & Cancer. First published: 19 July 2020. 2020;67(10):1-8. PubMedID: 32918519. https://doi.org/10.1002/pbc.28599 Volume67, Issue10 October 2020 e28599 - Schreiner KL, Daniel H. Grossoehme DH, Baker JN, Needle JS, Friebert S, Lyon ME. IOB2-4. "Being healthy and living life as if I never had cancer": the meaning of "living well" from adolescents with cancer. IPOS 2021 Abstracts Booklet, Journal of Psychosocial Oncology Research and Practice: June 2021;3(S1):30. e054 doi: 10.1097/OR9.0000000000000054

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: 5648
* IRB Date: 4/15/2015 EXP 8/17/2022
Faculty Proposal for MD Student Research by Andrew Madisoff

* 1. Faculty Sponsor

* Name: Andrew Madisoff
* Degrees: MD
* Title: Pediatric Cardiac Anesthesiologist
* Organization: Children's National Hospital
* Address: 111 Michigan Ave
* Apt/Suite:
* City: Washington
* State: DC
* Zipcode: 20011
* Office Phone: 202-476-5391
* Email Address: AMatisof@childrensnational.org

* 2. Daily Supervisor

Name: Christine Riley
Degrees: MSN, APRN
Title: Lead Advanced Practice Provider Cardiac Intensive Care
Organization: Children's National Hospital
Address: 111 Michigan Ave
Apt/Suite:
City: Washington
State: DC
Zipcode: 20011
Office Phone: 301-938-6407
Email Address: cmriley1@gwu.edu

* 3. Project Title (250 character limit)
Risk Factors for Early Versus Late Cardiac Arrest in Children Following Cardiac Surgery

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Pediatrics

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Infants and children who are hospitalized in the cardiac ICU are more likely to experience a cardiac arrest than any other patient population in a pediatric hospital. Patients that undergo an operation to repair or palliate congenital or acquired heart disease have approximately a 2-6% chance of experiencing a cardiac arrest. Approximately 50% of those that experience a cardiac arrest do not survive to hospital discharge. Of those that do, a significant number suffer a neurological insult. Prior studies have been valuable in identifying patients at higher risk for cardiac arrest, but have failed to identify potentially modifiable risk factors or when to anticipate cardiac arrest in the post-operative period. 1. Compare patients that experience cardiac arrest less than 24 hours after cardiac surgery to patients who suffered cardiac arrest greater than 24 hours after cardiac surgery 2. Identify potentially modifiable risk factors associated with the development of cardiac arrest with early in the postoperative period.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
Collect data from currently maintain data registries and the EHR to allow for care-matching controls to answer research aims. Data will be deidentified, cleaned, and analyzed. We expect this project result in 2 district publications with the potential to generate more.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

Design: 2:1 case matched control Relevance to the field: very high, no existing publications of this design in multiple centers; will likely to result in multiple publications

* 10. Describe the student's role in the project (200 word limit)

* 11. Describe the mentor's role in the project. (200 word limit)
To facilitate training in the clinical research. Assist student in broadening mentorship networks. Connect student to local interdisciplinary scholars.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Recently worked with 2 medical students on projects which resulted in publication: 1. Brenna Moore- effect of exogenous iNO on lung and renal outcomes after CPB 2. Jasree Iyer- impact of dedicated cardiac anesthesia team on outcomes in children with congenital heart disease following cardiac surgery

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Pending)
Faculty Proposal for MD Student Research by Brynn Marks

* 1. Faculty Sponsor

* Name: Brynn Marks
* Degrees: MD, MSHPEd
* Title: Assistant Professor of Pediatrics
* Organization: Children's National Hospital, Division of Endocrinology
* Address: 111 Michigan Ave
* Apt/Suite: Floor 3.5, Suite 200
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 202-476-2121
* Email Address: bmarks@childrensnational.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Use of a Hybrid Closed Loop Insulin Delivery System in a High Risk Type 1 Diabetes Population

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Endocrinology

6. Sponsor's translational level
* (Please select ONE)
T2: Translation to Patients

7. Hypotheses (200 word limit)
The use of insulin pumps and continuous glucose monitors (CGM) for type 1 diabetes (T1D) has been shown to improve glycemic control while also decreasing the risk for acute and chronic complications. Recently, input from CGM has been used to guide automated insulin delivery through insulin pumps in what is referred to as hybrid closed loop (HCL) insulin delivery. Unfortunately, there are vast socioeconomic and racial/ethnic disparities in access to these technologies; non-Hispanic Black youth with public healthcare insurance are the least likely to have access to these technologies. We are conducting a non-randomized interrupted time series study to assess the impact of HCL insulin delivery in underserved youth with suboptimally controlled T1D. We hypothesize that the use of HCL insulin therapy with the Control IQ system will lead to improvements in glycemic control as measured by time in range (TIR) and A1c, well-being, and overall treatment satisfaction in underserved youths with suboptimally controlled T1D.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
We have recruited 9 of 30 non-Hispanic Black, publicly insured youth with suboptimally controlled T1D ages 6-21 to participate in this 7-month non-randomized study. After completing standard CGM and insulin pump education with a diabetes educator, participants will return for standard follow-up 3 and 6-months later. Our team is collecting data exploring glycemic control (CGM measures and A1c), healthcare utilization (episodes of diabetic ketoacidosis and severe hypoglycemia, ED visits, hospital admissions), and patient and caregiver reported outcomes. After completion of the study, semi-structured interviews will be conducted with youth and caregivers to gain insight into their experiences with the HCL system, barriers to use, and strategies to improve equitable access to this technology.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
In this single-center open-label pilot study, we will use a non-randomized prospective interrupted time series study to investigate the effect of HCL insulin delivery on glycemic control, well-being, and overall treatment satisfaction in underserved adolescents with poorly controlled T1D. All patients scheduled for routine clinical diabetes appointments are being screened for participation using chart review. Inclusion criteria include: > 1 year of T1D, self-identification as non-Hispanic Black, publicly insured, ages 6-21, and 1 A1c >10% in the past 2-years and a second >10% at enrollment. Those meeting inclusion criteria are discussed with their provider to assess confidence that the potential participant can successfully operate all study devices and is capable of adhering to the protocol to ensure participant safety given that inappropriate insulin pump use leads to diabetic ketoacidosis, which is life threatening. After enrolling in the study, participants join an education session focused on CGM use, carbohydrate counting, and the basics of insulin pump therapy (Visit 1) with a diabetes educator. They return within 1-month to complete insulin pump education and begin using the Control IQ system (Visit 2). Participants then return for 3-month and 6-month follow-ups. These study visits are identical to those used for routine clinical care. Data will be collected from routine clinical care, including height, weight, BMI, and A1c. A battery of validated survey measures exploring diabetes-specific quality of life will be completed by the parent and child, including: Type 1 Diabetes and Life (T1DAL), Problem Areas in Diabetes (PAID), Insulin delivery Systems: Perceptions, Ideas, Reflections and Expectations (INSPIRE), Diabetes Management Questionnaire (DMQ), and Diabetes Technology Attitudes Survey (DTAS). The primary study outcome measure is CGM measured TIR (70-180 mg/dL) at baseline as compared to 6-months after HCL initiation. Secondary outcome measures include changes from baseline to 6-months after HCL initiation with regard to the following variables: 1) additional CGM measures of glycemic control, 2) A1c, 3) incidence of DKA in the 6-months prior to study enrollment as compared to the 6-months during the study, 4) incidence of severe hypoglycemia in the 6-months prior to study enrollment as compared to the 6-months during the study, 5) ED visits and hospital admissions in the 6-months prior to study enrollment as compared to the 6-months during the study, and 6) changes in participant and caregiver well-being as measured with the following validated questionnaires (T1DAL, PAID, INSPIRE, DMQ, DTAS).

* 10. Describe the student's role in the project (200 word limit)
Our research team is seeking a student to conduct semi-structured interviews with participants and caregivers. In addition to receiving training on how to conduct these interviews, the student will have the opportunity to work closely with Dr. Marks on analyzing this qualitative data. The student will have the opportunity to join weekly lab meetings. Although the qualitative data is the primary focus for this project, the student will also have the opportunity to participate in quantitative data analysis if so desired. Analysis of this data is expected to result in abstracts and manuscripts for publication.

* 11. Describe the mentor's role in the project. (200 word limit)
Dr. Marks will serve as the primary mentor for this project. She is closely involved with all parts of this study, including HCL initiation, participant follow-up and insulin dose adjustments, semi-structured interviews, and data analysis. The research team also includes Dr. Randi Streisand, the Chief of the Division of Psychology & Behavioral Health and a national expert in behavioral T1D research. Dr. Marks will directly oversee the student's training in conducting interviews and analyzing data.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Marks previously mentored Aneka Khilnani on the analysis of data exploring changes in the incidence and severity of presentation of new-onset type 1 and type 2 diabetes during the COVID-19 pandemic. This resulted in 2 abstracts (poster presentation at Advanced Technologies and Therapeutics for Diabetes, oral presentation at American Diabetes Association Scientific Sessions) and a manuscript recently published in Hormone Research in Pediatrics. Dr. Marks also mentored Shelly Mishra and Erika McCormick through the George Washington University School of Medicine and Health Sciences Virtual Shadowing Program for 16 clinical sessions during the summer of 2020. The students prepared and submitted a case report for Index of Suspicion in Pediatrics in Review that was accepted for publication (in press). Dr. Marks also serves as the primary mentor for Dr. Jody Grundman's ongoing research related to disparities in T1D care and outcomes. Dr. Grundman has had one abstract accepted for publication and recently served as first author for a review article. She was awarded the American Diabetes Association Health Disparities and Diabetes Research Postdoctoral Fellowship Award in July 2021 for her project exploring the use of Shared Medical Appointments to increase CGM uptake and sustained use in underserved youth.

* 13. Do you have or will you obtain IRB approval for this project?
* Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: Pro00013963
* IRB Date: 12/15/2020
Faculty Proposal for MD Student Research by Andrew Meltzer

* 1. Faculty Sponsor

* Name: Andrew Meltzer
* Degrees: MD, MS
* Title: Associate Professor; Chief, Section of Clinical Research
* Organization: GW MFA
* Address: 2120 L Street NW
* Apt/Suite: Suite 450
* City: Washington DC
* State: DC
* Zipcode: 20037
* Office Phone: 202-741-2952
* Email Address: ameltzer@mfa.gwu.edu

* 2. Daily Supervisor

Name: Nicole Hall
Degrees: MS
Title: Clinical Research Supervisor
Organization: GW MFA
Address: 2120 L Street NW
Apt/Suite: Suite 450
City: Washington DC
State: DC
Zipcode: 20037
Office Phone: 202-741-2917
Email Address: nihall@mfa.gwu.edu

* 3. Project Title (250 character limit)
Enhancing U.S. Surveillance of Laboratory Confirmed SARS-CoV-2, Influenza, and other Respiratory Viruses through a Network of Emergency Departments

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

* 5. Sponsor's Research Focus:
Yes - Emergency Medicine

* 6. Sponsor's translational level
* (Please select ONE)
T4: Translation to Population Health

* 7. Hypotheses (200 word limit)
The GWU Department of Emergency Medicine is collaborating with Wayne State University to create a surveillance network comprising 24 emergency departments across the US of all the potential and confirmed COVID-19, Influenza, and other Respiratory Virus patients being seen at the GWU Hospital. This would be a registry which would only look at patients' symptoms, medical histories, and dispositions. This objective will be accomplished by a rolling weekly query of administrative databases for all patients in the site emergency department who had a test order/charge procedure terminology codes related to viral panels, influenza and SARS-CoV-2, entered during a stay in the ED.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Goal 1: Use clinician driven testing to determine the percentage of patients with various symptom presentation(s) that are positive for SARS-CoV-2, influenza, and other respiratory viruses. Goal 2: Estimate rates of outpatient illness by combining number of patients presenting with specific symptoms/syndromes and percent positivity with estimates of population served. Goal 3: Obtain information about ED disposition to fill a current gap and allow for more accurate use of virologic testing results in burden of disease estimates since testing practices likely vary based on disease severity/admission status. Goal 4: Ensure specimens are submitted to public health laboratories in compliance with jurisdiction specific specimen submission protocols. Goal 5: Explore the feasibility of providing data for the estimation of effectiveness of COVID-19 and influenza vaccines in preventing ED visits and hospital admission.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
The student will have access to data from a national surveillance effort of emergency medicine departments across the USA. This study and its associated objectives will be accomplished by a rolling weekly query of administrative databases for all patients in the site emergency department who had a test order/charge procedure terminology codes related to viral panels, influenza and SARS-CoV-2, entered during a stay in the ED. The query will allow identification of all patients tested for these viruses, including both those who have positive and negative results. For all
patients tested, regardless of test result, symptom presentation will be populated with the use of an application programming interface (API) to extract the field-coded reason for visit and/or chief complaint. For the purpose of scientific publications, additional information will include vital sign data, past medical history, medications, laboratory and radiological results, hospitalization status and location at admission.

* **10. Describe the student's role in the project (200 word limit)**

The student will serve as the research assistant for this project. Study team will perform weekly chart reviews of our Cerner system for patients who had a test order/charge procedure terminology codes related to viral panels, influenza and SARS-CoV-2 entered during a stay in the ED. The student will gain experience in data analysis and preparing a publication. The student will also participate / exposed to the other emergency medicine research projects in the Department and other related educational activities such as journal club, shadowing, and learning about activities in the department.

* **11. Describe the mentor's role in the project. (200 word limit)**

Dr. Andrew Meltzer is the section head for Emergency Medicine's clinical research section. He is a co-PI on this NIMH funded study and will mentor the student in all aspects of the research process. We will work with a statistician in public health to complete the data analysis. Nicole Hall is the Research Coordinator for the study and works on the day to day operations of the project from a workflow perspective.

* **12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)**

The mentor team has enjoyed working with numerous Gill and HSP students in the last few years. Each student has had significant hands on exposure on the research process and has received significant mentorship and professional development. All scholars have submitted abstracts to national conferences and/or publications to leading research journals. Recent Gill Fellows include Tristan Jordan and Michael Makutonin.

* **13. Do you have or will you obtain IRB approval for this project?**

*Please note: Students cannot begin a human subjects project without IRB approval.*

* **(Please select ONE)**

Selected Yes

Please provide IRB number and date

* IRB Number: NCR213802
* IRB Date: 11.01.2021
Faculty Proposal for MD Student Research by Shilpa Patel

* 1. Faculty Sponsor

* Name: Shilpa Patel
* Degrees: MD MPH
* Title: Associate Professor of Emergency Medicine and Pediatrics
* Organization: Children's National Hospital
* Address: 111 Michigan Avenue
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20010
* Office Phone: 2024764177
* Email Address: spatel@childrensnational.org

* 2. Daily Supervisor

Name: Same as Faculty Sponsor - Shilpa Patel

* Degrees: 
* Title: 
* Organization: 
* Address: 
* Apt/Suite: 
* City: 
* State: 
* Zipcode: 
* Office Phone: 
* Email Address: 

* 3. Project Title (250 character limit)

Overall Project Title: OBJECTIVE HOME MANAGEMENT OF PEDIATRIC ASTHMA EXACERBATION USING MOBILE TECHNOLOGY AND MACHINE LEARNING (has NIH funding) SubProject for Student: CONCORDANCE BETWEEN REAL-TIME AND ASYNCHRONOUS WHEEZE CLASSIFICATION BY PROVIDERS

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Pediatrics
Yes - Pulmonology
Yes - Emergency Medicine

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
The overall goal of this project is to empower parents to initiate timely therapy for acute asthma by supplementing their subjective assessment with an objective measure of acute asthma severity. The mobile technology we propose to develop, test and deploy toward this goal will use digital signal processing (DSP) and machine learning (ML) to determine 3 distinct severity zones (corresponding to the green, yellow and red zones on the asthma action plan) allowing parents to follow asthma action plans accurately. The resulting improved and timely home-based management of childhood asthma should reduce current excessive ED utilization and unacceptably high rates of morbidity and mortality. We are currently on aim 1: building a lung sound library. During lung sound collection, a provider is not always present to provide ground truth regarding classification of wheeze. The specific role for the student would be to evaluate how real-time 'ground truth' classification (done by a provider in the ED at the time of data collection) of wheeze compares to asynchronous classification (done by a physician purely by listening to the recorded lung sounds outside of the clinical encounter. We hypothesize that there will be strong agreement (kappa>.8) between these groups.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
We plan to build a database of lung sound recordings, speech, oxygen saturation data, and retractions (i.e., work of breathing). By summer of 2022 we will have a lung sound library and preliminary machine learning algorithms based on 600 sets of lung exams. Thus far we have collected 100 exams or 1000 lung sound recordings (as each exam consists of 10 different lung sound recordings in separate locations - anterior upper right chest, anterior upper left chest, etc). 30/100 exams have real time provider exams. Kappa scores will be calculated for each site. Assuming the same ratio persists (30% of 6000 recordings will have a real-time provider exam) we expect a sample size of about 1800 recordings for the concordance analysis, providing ample power.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This NIH funded initiative is a partnership between Children’s National Medical Center (CNMC) and AusculTech Dx, a CNMC startup company with expertise in computerized auscultation and machine learning. In the proposed Phase I project, the 2 institutions will begin converting patent-pending lung sound analysis research to a mature technology, which will comprise a medical mobile application (app) communicating with 2 peripheral wireless devices: a pulse oximeter and a digital stethoscope (developed under NIH grant R42HL131081). We intend that parents will use the app and peripheral devices to record lung sounds, speech and oxygen saturation data. Novel DSP and ML algorithms embedded in the app will make PASS (known asthma score in clinical use) type clinical measurements and, based on them, determine the severity zone (green, yellow or red). The app will also generate PASS to enable precise communication of acute asthma severity with a physician. The focus of the Phase I project is data acquisition and technical development, to be accomplished through the following aims. Aim 1: (ongoing with completion in July 2022): Build a pediatric asthma database with ground-truth clinical findings. CNMC sees a high volume of asthma patients, and our milestone is a database comprising recordings of at least 600 lung exams. We started collection in October and have collected 100 sets of exams. Aim 2: (start preliminary analysis with 6 months of data in March 2022 with completion in Fall 2022) Develop and validate DSP and ML algorithms for automated assessment of acute asthma severity. SubAim for Aim 2 (for this student project) -- Calculate concordance between wheeze classification done in real time (as a part the clinical encounter) to an asynchronous classification done after the fact (using only the lung sound recording).

10. Describe the student's role in the project (200 word limit)

The student will work with the team (ML engineers, Dr. Patel and Dr. Raj Shekar - engineer at BearInstitute) on Sub Aim of Aim 2. The student will be involved in data entry and data clean-up/validation and calculating concordance in ground truth acquisition of wheeze classification between real-time and asynchronous.

11. Describe the mentor's role in the project. (200 word limit)

The mentorship team consists of Dr. Shilpa Patel (Emergency Medicine and Medical Director of the IMPACT DC asthma clinic) who will serve as the primary mentor, Dr. Raj Shekhar (Engineer at the Sheikh Zaid Institute and developer of StethAid for heart murmurs, machine learning expert) and Dr. Dinesh Pillai (Pulmonologist and Director of the Severe Asthma Clinic). The student will help with help with lung sound collection (clinical mentoring around auscultation with Drs. Patel and Pillai) and learn basics of machine learning (Dr. Raj Shekar). Their primary work will involve data management of ground truth and calculation of concordance between real-time and asynchronous wheeze classification of lung sound data.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Dr. Patel mentored a Health Services Scholar last summer on a different project. Dr. Patel has mentored other medical students (Clinical Health Scholars Project and Public Health literature review). Dr. Shekhar had a Gill Student a few years ago who worked on the original StethAid for murmurs project. He is now a practicing internist in Rhode Island. Dr. Pillai (Pulmonologist on the team) has also had a Gill Student.

* 13. Do you have or will you obtain IRB approval for this project?  
   Please note: Students cannot begin a human subjects project without IRB approval.
   * (Please select ONE)
   Selected Yes

Please provide IRB number and date
   * IRB Number: Pro00011198
   * IRB Date: 8/2/2021
Faculty Proposal for MD Student Research by Weiqun Peng

* 1. Faculty Sponsor

* Name: Weiqun Peng
* Degrees: PHD
* Title: Professor
* Organization: Professor of Physics Adjunct Professor of Anatomy and Cell Biology
* Address: SEH 4790
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20052
* Office Phone: 2029940129
* Email Address: wpeng@gwu.edu

* 2. Daily Supervisor

Name: 
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)
Understanding the role of chromatin interactions in gene regulation

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

Tcf1 and Lef1 provide constant supervision to mature CD8+ T cell identity and function by organizing genomic architecture Q Shan, X Li, X Chen, Z Zeng, S Zhu, K Gai, W Peng, HH Xue Nature Communications 12 (1), 1-20

Transcriptome-wide stability analysis uncovers LARP4-mediated NFκB1 mRNA stabilization during T cell activation Y Tian, Z Zeng, X Li, Y Wang, R Chen, S Mattijssen, S Gaidamakov, Y Wu, ... Nucleic Acids Research 48 (15), 8724-8739

Predicting CTCF-mediated chromatin interactions by integrating genomic and epigenomic features Y Kai, J Andricovich, Z Zeng, J Zhu, A Tzatsos, W Peng Nature Communications 9 (1), 4221
5. Sponsor's Research Focus:
Yes - Genomics

6. Sponsor’s translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
If interested, please contact me for details.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
If interested, please contact me for details.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

If interested, please contact me for details.

10. Describe the student's role in the project (200 word limit)
Looking for student who is proficient with programming and interested in training/research in computational biology and bioinformatics.

11. Describe the mentor's role in the project. (200 word limit)
If interested, please contact me for details.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
NA

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
Basic science research
Faculty Proposal for MD Student Research by Kenna D. Peusner

* **1. Faculty Sponsor**

* Name: Kenna D. Peusner
* Degrees: PhD
* Title: Professor of Neurology
* Organization: George Washington School of Medicine and Health Sciences
* Address: 2300 I Street NW
* Apt/Suite: 209 Ross Hall
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 202-994-3489
* Email Address: peusnerk@gwu.edu

* **2. Daily Supervisor**

Name: same as above

* **3. Project Title (250 character limit)**

The Peripheral Vestibular System in Congenital Vestibular Disorders

* **4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.**


5. Sponsor’s Research Focus:
Yes - Anatomy
Yes - Neurology

6. Sponsor’s translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
Children with congenital vestibular disorders (CVDs) show delayed motor development and challenges in maintaining posture and balance, indicating that the vestibular neural circuitry is affected. Computed tomography shows that CVD children commonly form a sac-like inner ear with the semicircular canals missing or truncated. It is not known how the vestibular connectivity is altered. We hypothesize that the sac-like inner ear results in reduced vestibular ganglion cell number forming fewer primary vestibular synapses on vestibular nuclei neurons centrally, leading to underconnectivity. We further hypothesize that there is abnormal convergence of canal and otolith fibers onto vestibular nuclei neurons, or anomalous connectivity, contributing to abnormal signaling. Our lab has implemented a new chick embryo model by surgically rotating the developing inner ear or “otocyst” in two-day old chick embryos. The procedure involves Anterior-posterior axis Rotation of the Otocyst to produce a Sac-like inner ear, so the model is called the ARO/s chick. The inner ear of ARO/s chicks resembles the inner ear in CVD children. To understand the consequences of the sac-like inner ear, we will determine whether vestibular nuclei neurons acquire the orderly inputs from canal and otolith fibers and normal synapse numbers like normal control chicks.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Biocytin-labeled, primary vestibular fibers in brainstem vestibular nuclei: Primary vestibular fibers are labeled with biocytin alexa fluor by placing the dye on peripheral processes of vestibular ganglion cells near the innervated vestibular sensory organs in the inner ear in a brainstem chunk in vitro. Biocytin is transported through the ganglion cell bodies and central axons into the vestibular nuclei. The brainstem and vestibular ganglion are fixed in the same chunk, but the ganglion is dissected out for whole-mount imaging, while the brainstem is vibratome-sectioned into 50 µm serial sections. Data analysis: Data collection follows protocols for normal chicks (Popratiloff and Peusner, 2007). Imaging fiber pathways and counting terminals in the vestibular nucleus are made on sections labeled for biocytin, MAP2 for neuron cell bodies, and DAPI for labeling cell nuclei. Biocytin-labeled terminals are bulbous enlargements along or at the ends of labeled fibers and are confirmed as terminals by synaptotagmin labeling. To count terminals, adjacent confocal stacks are stitched into large volumes of the vestibular nucleus at high power. We will not count all labeled terminals, but relative terminal density in regions containing high density of labeled fibers. We will use IMARIS computer program to provide good terminal segmentation.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

The experiments in this proposal are included in Specific Aim 2 of a five-year NIH grant, funded by NIDCD on April 1, 2021. The timeline for the experiment indicates performance during the first year and scientific meeting presentations and writing the experiments for journal publication during the second year. The experiments will follow protocols established in the lab to determine the brainstem pathways for otolith fibers and to count the otolith terminals in vestibular nuclei (Popratiloff and Peusner, 2007), so we anticipate no major technical problems. Children with congenital vestibular disorders (CVDs) experience delayed motor development and challenges in maintaining posture and balance that never achieve normal adult levels. Due to the central role that the vestibular system plays in daily living, vestibular symptoms can impose life-altering disabilities that become a major healthcare burden. CVD children experience disorientation, confusion, and fatigue while performing daily tasks, and face severe challenges in eye-hand coordination, eye tracking, reading, and language. Computed tomography (CT) reveals that children with CVDs most commonly form a sac-like inner ear with the semicircular canals missing or truncated. It is not known how vestibular connectivity is altered by the pathology. We hypothesize that formation of a sac-like inner ear during early gestation results in a reduced number of vestibular ganglion cells forming fewer primary vestibular synapses on vestibular nuclei neurons centrally, leading to underconnectivity in the central vestibular system. We further hypothesize that the sac-like inner ear pathology results in abnormal convergence of canal and otolith fibers onto vestibular nuclei neurons, or anomalous connectivity, contributing to abnormal signal processing in vestibular nuclei neurons. The proposed work will establish a framework to test the overarching hypothesis that formation of a congenitally-malformed, sac-like inner ear alters the central vestibular neural circuitry. At present, physical therapy is the major treatment for CVDs, although it is only mildly effective in treating bilateral vestibular disorders like CVDs. Due to lack of basic science research on CVDs, the primary target of the sac-like inner ear pathology is unknown. The outcomes of the experiments in this proposal will offer novel insights into the consequences of CVDs on development, maintenance, and plasticity in the vestibular neural circuitry that may modify our thinking on how to treat the disorders. We expect that these experiments will provide basic science underpinnings to modify our thinking on how to treat CVDs.

10. Describe the student's role in the project (200 word limit)

Many chick embryos with labeled primary vestibular fibers will be available from related studies on the vestibular ganglion, so the student will proceed with using IMARIS imaging program to determine fiber topography in the brainstem and to count terminals in the vestibular nuclei. The student will be the primary researcher performing these analyses. It is likely that additional preparations will be required and the student will participate with the PI to label the primary vestibular fibers, vibratome section the brainstem, immunolabel the brainstem, confocal imaging of the brainstem, and data analysis using IMARIS computer program.

11. Describe the mentor's role in the project. (200 word limit)
Dr. Kenna Peusner will be present every day in the lab to work with and oversee the student in all aspects of the project. Also, confocal imaging and imaging analysis will be performed and directed by Dr. Anastas Popratiloff, Director of the SEH Imaging Center, who is a Co-Investigator on this NIH grant.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)


* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)

Selected No (Not Required)

Please specify why it is not required.

No human subjects are involved in this research.
Faculty Proposal for MD Student Research by Maura Polansky

* 1. Faculty Sponsor

* Name: Maura Polansky
* Degrees: MS, MHPE, PhD(c)
* Title: Associate Professor; Director of Research
* Organization: GWU
* Address: 2600 Virginia Ave NW
* Apt/Suite:
* City: WASHINGTON
* State: DC
* Zipcode: 20037
* Office Phone: 2029943403
* Email Address: mpolansky@gwu.edu

* 2. Daily Supervisor

Name: same
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Integrated clinical educational programs: a novel model for interprofessional learning

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
Which learning activities support an “interprofessional identity”? A Scoping Review (in development)
5. Sponsor's Research Focus:

6. Sponsor's translational level
   *(Please select ONE)*
   T3: Translation to Practice

7. Hypotheses (200 word limit)
   Study Aim: What are the organizational influences on an integrated interprofessional clinical training program and how can these programs impact the organization? Sub-questions will include: What was the impetus for program development? What challenges were noted in the development and implementation of the program? What is the perceived impact of the program on the organization?

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
   The study will explore the impact of an integrated interprofessional clinical training program on the academic health setting where the program resides. While there are a number of integrated IP programs in existence that involve physicians, physician assistants, nurse practitioners and other health professions, there is a limited body of research around these programs. As an educational model that could be applied to other health professions programs, this study will explore fully integrated PA/NP postgraduate clinical training programs. There are approximately 150 programs that exist in the US. This study protocol has not been finalized but is anticipated to include surveying.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
   Selection criteria include:
   - The project design makes it likely that the objectives will be achieved
   - The project is likely to result in a report of interest to other scholars
   - The project fulfills discovery/original research
   As an educational model that could be applied to other health professions programs, this study will explore fully integrated PA/NP postgraduate clinical training programs. There are approximately 150 programs that exist in the US. This study protocol has not been finalized but is anticipated to include: surveying program directors for all known programs in the US conducting semi-structured interviews and/or focus groups with 15-20 program directors and other organizational faculty and clinical leaders.

10. Describe the student's role in the project (200 word limit)
    This project is recommended for MD students interested in educational research, clinical education or interprofessional clinical practice. While the focus of the study is integrated training of PAs and NPs, the research aims and methods are relevant to medical education. Students considering a career in academia will be introduced to emerging field of interprofessional learning and practice. Over the 8-week research period, the student will be involved in data collection and/or analysis that may include performing descriptive statistics of survey results; qualitative analysis of qualitative data from surveys and interviews. The student may also be involved in the
preparation for a related study anticipated to being in summer 2022 that will involve collecting qualitative data from trainees within integrated interprofessional programs. The student may also be involved in conducting a literature review to identify additional articles relevant to the research study.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor is the primary investigator for the study and therefore will be responsible for daily oversight of all aspects of the study.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
This is a new study and prior medical students have not been involved. The faculty mentor has collaborated with physician co-investigators in prior research studies.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Pending)
Faculty Proposal for MD Student Research by Brian Reilly

1. Faculty Sponsor

* Name: Brian Reilly
* Degrees: MD
* Title: MD
* Organization: Children's National Hospital
* Address: 111 Michigan Ave
* Apt/Suite:  
* City: Washington
* State: DC
* Zipcode: 10010
* Office Phone: 202-476-
* Email Address: breilly@childrensnational.org

2. Daily Supervisor

Name: Brian Reilly
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite:  
City:  
State:  
Zipcode:  
Office Phone:  
Email Address:  

3. Project Title (250 character limit)
Noise impact of surgical tools in ENT ORs

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.
5. Sponsor’s Research Focus:
Yes - Pediatrics
Yes - Infectious Disease
Yes - Surgery

6. Sponsor's translational level
(Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
Operating rooms (OR) are full of various sounds that can range in decibels from people speaking to use of devices/tools. ENT surgical procedures tend to rely on louder tools, such as drills and debriders, which can easily surpass safe and normal thresholds.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Monitoring of noises during these procedures can help determine more approximate levels and lead to identification and implementation of safety measures during these cases. The study’s PI is a member of a CNH surgical committee regarding noise exposure control.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
Noises will be recorded via decibel monitor/apple watch during procedures while the tools are being utilized for future analysis and improvement measures during variety of cases.

10. Describe the student's role in the project (200 word limit)
Student will be responsible for wearing device during case for full recording accuracy.

11. Describe the mentor's role in the project. (200 word limit)
Mentor will be present for all cases for which recordings are taking place. Mentor will also be providing exposure to variety of otolaryngologic cases leading to real-time teaching and learning opportunities for students.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
Mentor has long standing history (10+ years) of working with Gill Fellow in various otolaryngology fields such as Cochlear Implants.
* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: 16008
* IRB Date: 4/26/21
**1. Faculty Sponsor**

* Name: Arnold Sansevere
* Degrees: MD
* Title: Assistant Professor of Neurology
* Organization: Children's National Hospital
* Address: 111 Michigan Ave NW
* Office Phone: 2024764657
* Email Address: asansevere@childrensnational.org

**2. Daily Supervisor**

Name: Dana Harrar
Degrees: MD
Title: Assistant Professor of Neurology
Organization: Children's National Hospital
Address: 111 Michigan Ave NW
City: Washington
State: District of Columbia
Zipcode: 20003-4992
Office Phone: 2024764657
Email Address: dharrar@childrensnational.org

**3. Project Title (250 character limit)**

Clinical predictors of increased intracranial pressure in pediatric arteriovenous malformations

**4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.**


Arteriovenous malformations are the most common cause of intracranial hemorrhage in the pediatric intensive care unit. A subset of children have elevations in intracranial pressure despite the use of an external ventricular drain (EVD) and require further neuroprotective measures such as a pentobarbital infusion. Early identification of patients at highest risk for hard to control intracranial pressure may prevent worsening of cerebral injury which may directly improve the morbidity associated with pediatric intracranial hemorrhage. Risk factors for elevated intracranial pressure have not been systematically studied. We hypothesize that the risk of elevated intracranial pressure will be associated with the following clinical features: 1) location of AVM/hemorrhage 2) size of AVM/hemorrhage 3) age of presentation 4) electrographic seizures 5) focal EEG background attenuation.

The overall goal of this project is to identify clinical features associated with increased intracranial pressure in pediatric intracranial hemorrhage from AVM rupture. We have identified 150 pediatric patients presenting to the pediatric intensive care unit with intracranial hemorrhage secondary to AVMs from 2016 through 2021. Demographic and clinical features to be identified include age, sex, location of AVM (i.e. cortical, subcortical, cerebellar), the presence or absence of intraventricular extension, development of seizures, and presence or absence of EEG background asymmetry. The main outcome measure will be the development of refractory increased intracranial pressure which will be defined as elevated ICP despite EVD placement.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
This will be a retrospective study of deidentified patients identified as part of a pre-existing IRB approved study assessing critically ill children. Inclusion criteria consists of 1) patients from 44 weeks gestation to 21 years of age 2) patients presenting with intracranial hemorrhage secondary to suspected or confirmed AVM. We will exclude neonates. Students will collect demographic, clinical, neuroimaging, and electroencephalography variables to be entered into a pre-existing red cap database. They will be introduced to basic statistical analysis which will include descriptive statistics focused on proportions, medians, and interquartile ranges in addition to a univariate analysis which will include odds ratio evaluations. Once the information is collected and analysis complete, students will prepare relevant tables and figures and be guided through the early stages of manuscript preparation. Timeline: Week 1: Gain familiarity with the research question through assigned background reading and introduction to basic neuroanatomy and electroencephalography. Opportunity to shadow the project mentor will be provided based on student interest. Week 2-5: Chart abstraction into REDCap database. Meet with supervisor daily during weeks 2-3 to address questions that arise during chart review and at least twice weekly, more often as needed during weeks 4-6 to address questions that arise during chart review. Students will attend lab meetings weekly on Friday afternoons. Week 6-8: Basic data analysis with supervision by project supervisor and mentor. Figure and table preparation followed by abstract and poster preparation, basics of manuscript writing, table preparation followed by abstract and poster preparation, basics of manuscript writing.

* 10. Describe the student's role in the project (200 word limit)
The student will review the medical records of pediatric patients presenting with ICH after AVM. This will involve the abstraction of clinical data into a REDCap database. Variables will include demographics (age, sex), location of neurologic injury, presence or absence of seizures, level of increased ICP, duration of intubation, length of ICU stay, and mortality. The student will then organize the data for statistical analysis and draft a manuscript for peer review publication based on the results of this analysis. Students will be encouraged to present their work at a national meeting.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will oversee all aspects of the project. Institutional review board approval has already been obtained. A REDCap database is under construction, and this will be ready for data entry by the spring of 2022. A cohort of 150 patients who underwent EEG in the CICU has been identified. The mentor will meet with the student daily to review basic neuroanatomy and EEG principles. Ten patients will be reviewed together prior to the student entering clinical variables. After this there will be daily and then twice weekly meetings to discuss questions related to data entry, statistical analysis, figure and table preparation, abstract and poster presentations and manuscript preparation. The mentor will provide opportunities for the students to be exposed to clinical interactions based on interest.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
We have mentored 1 to 2 students yearly starting in 2016. This has included students from George Washington and Harvard Medical School.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date

* IRB Number: Pro00015473
* IRB Date: 2/8/2021
Faculty Proposal for MD Student Research by Neal Sikka

* 1. Faculty Sponsor

* Name: Neal Sikka
* Degrees: MD
* Title: Chief, Section of Innovative Practice and Telehealth/ Professor of Emergency Medicine
* Organization: GW MFA
* Address: 2120 L St NW
* Apt/Suite: 530
* City: Washington DC
* State: DC
* Zipcode: 20037
* Office Phone: 202-741-2911
* Email Address: nsikka@mfa.gwu.edu

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)

Augmenting Remote Medical Procedure Training and Assistance with Spatial Computing and Volumetric Capture

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


5. Sponsor's Research Focus:
Yes - Emergency Medicine

6. Sponsor’s translational level
* (Please select ONE)
T3: Translation to Practice

7. Hypotheses (200 word limit)
This National Science Foundation-funded project seeks to augment the way medical personnel communicate and collaborate across the distance by allowing for real-time exchange of three-dimensional information that is missing in current videoconferencing telehealth. The project hopes to identify technology and educational principles for remote mentoring that result in more equitable access to healthcare; improved success for medical procedures that require the assistance of a remote expert; more cost-effective distribution of healthcare skills and training; and higher quality expert medical advice from a distance. We are building and testing a mixed reality head set system to aid the remote provider perform US guided Central Line placement.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).
i) The main goals of years 2 and 3 of this study are to gain insights into the application of mixed-reality volumetric representation and transmission in remote healthcare settings; ii) designing guidelines for a mixed-reality volumetric communication system that simulates the physical presence of the patient at the location of the remote expert; iii) evaluating the utility of 3D spatial information in remote medical procedures assistance; and iv) performing user studies examining the efficacy of spatially-enhanced communication in remote medical training and guidance.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

We will recruit instructors and trainees to participate in videotaped US CVC training. The trainee will participate in either 1) in person or 2) via videoconferencing software such as zoom, teams, or Webex, or 3) via a 3D video (volumetric video) communication system. They will receive pre-training, be video/audio recorded, and debriefed. The instructors will be required to teach one session of each arm (1 in person, 1 via videoconferencing software, and 1 via 3D video). We plan on approximately 50 learners per group, with a total of 300 participants. The 3D video (volumetric video) communication system uses Hololens 2, a consumer market augmented reality glasses. For the video training group, the trainee will present to the GWU CLASS center and be placed in a room with videoconferencing setup, as well as the US CVC model and kit. The instructor will be
in a separate room or remote location with the same conferencing software. The entire training session will take place via video (using videoconferencing software such as Zoom and Teams), and be recorded. Augmented reality learners will present to the GWU CLASS Center and receive instruction from a remotely located experienced operator observing the procedure via our mixed-reality communication system and providing both verbal and visual feedback. In this Group, both instructor and learner will also wear a mixed reality headset. In addition to independent videotaping of instructor and learner, the data feeds of the augmented reality system describing hand and body position of the instructor and learner will also be saved. To better understand the effect of 3D volumetric video and AR assistance on remote training, we plan a qualitative analysis of verbal communications between mentor and learner in the different learning conditions, to better understand the topics and characteristics of communication between the dyad. We will review the videos to determine types of communications used in each environment. This is an ongoing NSF-funded 3-year project. Results are being published and presented as we advance with the software development, analysis of gestures between instructors and trainees, and development of tools to measure cognitive load.

* 10. Describe the student's role in the project (200 word limit)
The student will serve as the research assistant for this project. She/he will assist with recruitment, consent, questionnaire application, data analysis, and preparing publications and conference abstracts. The student will also participate/be exposed to the other health technology projects in the Department and other telehealth-related educational activities such as journal club, shadowing, and learning about activities in the department. The student will be immersed in an interdisciplinary environment containing physicians, software engineers, and educators from GW and American University.

* 11. Describe the mentor's role in the project. (200 word limit)
Dr. Sikka, leads telehealth and Innovation efforts at MFA. He will mentor the student on health innovation, technology implementation, operations, and telehealth. He is also the leader PI on this NSF-funded study and will mentor the student in all aspects of the recruitment, transcriptions, and study activities.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
The mentor team has enjoyed working with numerous Gill and HSP students in the last few years. Each student has had significant hands-on exposure to telehealth or technology-related project and mentoring. Students with interest in technology, health disparities, health access, telehealth, virtual reality, and other innovative solutions at the cross of clinical care and population health will enjoy working with our team and have a high likelihood of having an abstract selected for a regional or national meeting as well as peer-reviewed publications. Recent students working on this project include Rohan Patil and Conor Schulte who were both very helpful for the study and got to explore and contribute new angles to this research.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number:  CR202767
* IRB Date:  12/03/2020
1. Faculty Sponsor

Name: Sean Tabaie
Degrees: MS, MD
Title: Pediatric Orthopaedic Surgeon
Organization: Children's National Hospital
Address: 111 Michigan Ave NW
Office Phone: 2024762609
Email Address: stabaie@childrensnational.org

2. Daily Supervisor

Name: Same as above
Degrees: 
Title: 
Organization: 
Address: 
Apt/Suite: 
City: Washington
State: DC
Zipcode: 20010
Office Phone: 2024762609
Email Address: 

3. Project Title (250 character limit)

Novel Surgical Techniques for the Management of Pediatric Foot Deformities

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

Association of Bleeding Disorders and Risk of Complications Following Open Reduction and Internal Fixation of the Ankle.[Accepted for publication, 2021 Oct 9]. Foot Ankle Int. 2021.

5. Sponsor's Research Focus:
7. Hypotheses (200 word limit)

We purpose to conduct a multi-center study to retrospectively evaluate pediatric patients who have undergone MIS for correction of foot deformities with respect to clinical, radiological, and functional outcomes. We also aim to compare the clinical, radiological, and functional outcomes following MIS and the traditional open approaches. We hypothesize that children who had MIS will have smaller scars, fewer complications, lesser postoperative pain, rapid recovery and return to baseline activities, and hence better clinical, radiological, and functional outcomes as compared to the patients who have had open approach foot surgeries.

8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).

1. To study the clinical, radiological, and functional outcomes following MIS for the correction of foot deformities in children 18 years and younger. 2. To study the clinical, radiological, and functional outcomes following open approach for the correction of foot deformities in children 18 years and younger. 3. To compare clinical, radiological, and functional outcomes following MIS and open approach for the correction of foot deformities in children 18 years and younger.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

In this retrospective review study, we propose to compare the clinical, radiological, and functional outcomes following MIS and open approach for the correction of foot deformities in children 18 years and younger. Since pediatric foot deformities encompass a wide variety of conditions, a large sample size is required to ensure adequate representation of each type of deformity and also for appropriate comparison between the 2 cohorts (MIS versus open approach).

10. Describe the student's role in the project (200 word limit)

Data collection, data analysis, statistical analysis, manuscript development

11. Describe the mentor's role in the project. (200 word limit)

Supervision of research team, statistical analysis, manuscript development

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I've worked with 2 students in the past Aribah Shah (Gill fellow) and Kevin Cho (HSS), both did one project each and have presented their work and multiple conferences and received multiple awards. Their manuscripts are currently under review for publication.

* 13. Do you have or will you obtain IRB approval for this project?  
Please note: Students cannot begin a human subjects project without IRB approval.  
* (Please select ONE)  
Selected Yes

Please provide IRB number and date

* IRB Number: Pro00016677
* IRB Date: 10/4/2021
Faculty Proposal for MD Student Research by Laura L Tosi

* 1. Faculty Sponsor

* Name: Laura L Tosi  
* Degrees: MD  
* Title: Orthopaedic Surgeon, Associate Professor Pediatrics & Orthopaedics  
* Organization: Children's National  
* Address: 111 Michigan Ave NW  
* Apt/Suite: Suite 400 West Wing Floor 1.5  
* City: Washington  
* State: DC  
* Zipcode: 20010  
* Office Phone: 2024764063  
* Email Address: ltosi@childrensnational.org

* 2. Daily Supervisor

Name: Susan Knoblach  
Degrees: PhD  
Title: Associate Professor Pediatrics, Integrative Systems Biology  
Organization: Children's National  
Address: 111 Michigan Ave NW  
Apt/Suite:  
City: Washington  
State: DC  
Zipcode: 20010  
Office Phone: 2024766094  
Email Address: SKnoblach@childrensnational.org

* 3. Project Title (250 character limit)

Expansion of Musculoskeletal Phenotypes Tested for Genetic Variants in WNT 16 Previously Associated with Bone Mineral Density

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor’s Research Focus:  
Yes - Genomics  
Yes - Pediatrics  
Yes - Surgery

* 6. Sponsor’s translational level  
* (Please select ONE)  
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)  
This is a validation study and not a hypothesis-driven study. A recent study by Yau et al. in Journal of Bone and Mineral Research “A Meta-Analysis of the Transferability of Bone Mineral Density Genetic Loci Associations From European to African Ancestry Populations” highlighted the association of single nucleotide polymorphisms (SNPs) in WNT16 (part of the Wnt/beta-catenin signaling pathway) on bone mineral density (BMD) and whether associations persisted across cohorts of different ancestry. Our project will perform genotyping of two cohorts of healthy young adults for LRP5 variants identified by Yau and others, and then use statistical methods to assess whether study variants are associated with other markers of musculoskeletal health, particularly those associated with peak bone mass. Our cohorts have phenotypic data related to muscle strength and size, as well as bone parameters including cortical marrow and total bone volume. We predict that variants in WNT16 will also be associated with these additional phenotypes and demonstrate sexually dimorphic results. Osteoporosis (and fragility fractures) are thought to be part of a continuum that begins early in life. Our study seeks to identify predictors of musculoskeletal health across the lifespan.

* 8. Project goals and measureable objectives (e.g. number of patient records, assays completed) (200 word limit).  
The goal of this project is to determine whether the genetic variants identified by Wang et al. in the study “A Meta-Analysis of the Transferability of Bone Mineral Density Genetic Loci Associations From European to African Ancestry Populations” are also associated with variation in bone quality and muscle strength phenotypes in our 2 study cohorts of young adults. The project’s research goals are to: 1) genotype the DNA samples for the two cohorts the Bone Health Program maintains at Children’s National and 2) conduct statistical analyses to test for associations with various phenotypes that were collected for these cohorts, and then 3) to translate these findings into an abstract for submission to George Washington University Research Day, Children’s National Research Week and the Orthopaedic Research Society. Genotype/phenotype associations for the study variants will be identified using Applied Biosystems Taqman Allelic Discrimination Assays and the Applied Biosystems QuantStudio 7 Flex Real-Time PCR System under the supervision of Dr. Susan Knoblach. The student who undertakes this project will be expected to set up and run DNA assays for the approximately 600 de-identified participants in our study cohorts. Once completed, results will be analyzed in partnership with our statistician, Heather Gordish-Dressman PhD.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This research project is designed to be a guided exploration of the genetic underpinnings of musculoskeletal growth and development, and is intended to cover a wide variety of musculoskeletal health topics ranging from basic bench science to clinical expertise and surgical management. Training will include hands-on instruction from the lab team about proper lab practices, the best ways to handle DNA for optimal results, and general guidelines for bench research. After completing our orientation program, the student’s time will be divided equally between 1) performing DNA genotyping, organizing and doing back-end research on the genes we are interested in, and 2) shadowing Dr. Tosi, her Bone Health team, and her orthopaedic colleagues in the clinic and operating room, as allowed by COVID restrictions, and at the very least via telemedicine. The student will be expected to attend all genetic research conferences held over the summer at Children’s. The current system we use for PCR analysis only allows for one plate to be run at a time and involves significant prep and scheduling. These lab tasks will require the student to be organized and diligent about their lab work to make sure all samples can be run during our 8-week program. A smaller portion of time will be devoted to organizing and analyzing the resulting data. There will also be time set aside for the student to perform database searches to look for relevant work relating to his/her genes of interest. Additional time will be devoted to shadowing in the Children’s National Orthopaedic Clinic and operating room, so the student can interact with patients followed in our Bone Health Program as well as other orthopaedic specialties. This clinical and OR exposure is designed to assist the student in making a well thought out career decision about whether to pursue orthopaedics. The student will be expected to attend all Orthopaedic teaching conferences as well as the weekly case conference. The student is required to write an abstract summarizing their work for the Orthopaedic Research Society annual meeting, GW Research Week, and Children’s National Research Week.

10. Describe the student's role in the project (200 word limit)

As described throughout this proposal, the student will receive significant guidance and mentoring throughout the project, however the student is expected to take charge of the project and make sure that they complete all necessary steps. The student will learn the basics of performing genotyping. The student will perform genotyping with Realtime PCR and then work with our statistician to explore Hardy-Weinberg Equilibrium, data stratification, and analysis of covariance (ANCOVA) as part of the data analysis plan. The student will attend all research conferences held in the Research Center for Genetic Medicine. Dr. Susan Knoblach, PhD will oversee supervision and training in the laboratory. The student will be required to attend Dr. Tosi’s weekly Orthopaedic Bone Health Clinic so that they can develop a better appreciation of the clinical impact of genetic variation on skeletal health and disease. The student may have the opportunity to observe in the Orthopaedic Operating Room, depending on COVID regulations next summer. The student will be required to submit an abstract to the Orthopaedic Research Society, GW Research Day and Children’s National Research Week and prepare a poster or podium presentation if accepted. This project is supported by the Bone Health Program Research Fund.

11. Describe the mentor's role in the project. (200 word limit)
During the course of the project, Dr. Tosi and Dr. Knoblach will be available to guide the student and answer questions regarding the purpose of the research and proper conduct of laboratory work. Dr. Tosi will guide the brainstorming and initial planning phases of the investigation and Dr. Knoblach and her laboratory staff will provide hands on training and guidance on the use of the sequencing technologies and other equipment used. Dr. Heather Gordish-Dressman (Statistics) maintains the phenotype data for our study cohorts and will assist in data analysis. Dr. Tosi and Dr. Knoblach, as well as their research teams, will assist in drafting the project abstract, poster, and hopefully manuscript for publication. For the clinical and OR shadowing component of the program, Dr. Tosi’s Bone Health team will ensure that the student is introduced to experiences that emphasize the role of genetic variation and bone metabolism on musculoskeletal health.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)

The summer of 2022 will mark the 18th anniversary of our Children’s National Bone Health Summer Research Program. We have hosted at least one Gill Fellow every year, as well as numerous Health Service Scholars. We have provided an intensive lab experience focused on exploring genetic markers of musculoskeletal health, while also providing exposure to orthopaedic clinical and surgical practice, particularly in the areas of rare bone disease and metabolic bone disease. In 2020, we continued to provide a summer research program for students by switching to a virtual program, involving additional lectures, conferences, and trainings in genetics and orthopaedics. Students participated in TeleECHO programs along with daily genetics lectures, exploring the crossover of genetics and orthopaedics through osteoporosis, skeletal dysplasias, and genetic testing. While we were not able to provide in-person lab and clinical shadowing experience, students were able to observe the lab process, listen in to morning rounds, and shadow doctors for telemedicine clinic. Our 18 years of experience make our program flexible and adaptable to the challenges of medical education in 2020, and we will continue to provide opportunities for young medical students eager to participate in research and to try on an orthopaedic surgeon’s shoes.

* 13. Do you have or will you obtain IRB approval for this project? Please note: Students cannot begin a human subjects project without IRB approval.

* (Please select ONE)

Selected Yes

Please provide IRB number and date

* IRB Number: Pro00006645
* IRB Date: 9/6/2022
* 1. Faculty Sponsor

* Name: Jason Triplett
* Degrees: PhD
* Title: Associate Professor
* Organization: Children's National Research Institute
* Address: 111 Michigan Ave, NW
* Apt/Suite: Center for Neuroscience Research
* City: Washington
* State: DC
* Zipcode: 20009
* Office Phone: 2024763985
* Email Address: jtriplett@childrensnational.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)

Rescuing sensory circuit disruption in fragile X syndrome

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

Johnson KO, Smith NA, Goldstein EZ, Gallo V, Triplett JW. NMDA receptor expression by retinal ganglion cells is not required for retinofugal map formation nor eye-specific segregation in the mouse. eNeuro 2021 Jul 16;8(4):ENEURO.115-20.2021. PMID: 34193509


* 5. Sponsor's Research Focus:
Yes - Ophthalmology
Yes - Pediatrics
Yes - Neurology

* 6. Sponsor's translational level
* (Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

* 7. Hypotheses (200 word limit)
Sensory dysfunction is a common co-morbid condition with many neurodevelopmental disorders (NDDs), presenting an attractive therapeutic target that could have reverberating impacts on many aspects NDDs. However, there is a significant gap in our understanding of the etiology of sensory dysfunction in NDDs, precluding the development of effective therapies. To bridge this gap, we previously investigated visual circuit organization and function in a model of fragile X syndrome (FXS). We found sub-circuit-specific deficits in visual function in the superior colliculus (SC), a critical midbrain nucleus. Intriguingly, our preliminary data suggests that inputs to the SC from the primary visual cortex (V1) develop normally in FXS mice but then degrade after the onset of visual experience. These data raise the exciting possibility that sensory experience is required for the maintenance of circuitry and could also be exploited to rescue deficits observed in FXS mice. To test this possibility, we will subject FXS mice to environmental enrichment and observe impacts on SC circuitry using a combination of anatomical tracing and in vivo electrophysiological approaches.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Goal: To determine the impact of environmental enrichment on SC circuit organization and function in control and FXS mice. Objectives: 1) Utilize anterograde and retrograde tracing paradigms to assess the organization of visual circuits. 2) Utilize computer-assisted receptive field mapping to determine the function of visual neurons in the SC. In order to achieve statistical confidence, retino- and cortico-collicular projections will be traced in at least 8 animals from each experimental condition and at least 70 visually-responsive neurons from at least 10 mice in each group will be characterized. Importantly, the collection of these data is feasible in the time frame proposed and would represent a complete publishable unit of potentially high impact.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
These experiments will leverage techniques and analyses that are well-established in the Triplett lab and, thus, have a high probability of success. Briefly, for Objective (1), retino- and cortico-collricular projections will be labeled with Dil, a robust lipophilic tracer, via pressure injection into the eye or visual cortex. One week later brains will be processed and imaged on an epifluorescent microscope to visualize the terminal domains of labeled neurons. For Objective (2), high density silicon multi-electrodes will be placed in the SC and neuronal signals acquired while a battery of visual stimuli is presented. Receptive field properties will be determined post hoc using custom software. Importantly, all mouse lines and reagents are present in the laboratory, reducing any potential delays in the performance of experiments. These experiments represent original, cutting-edge investigations and are likely to yield high-impact results that will be of broad interest to the neuroscience community. Timeline: After a brief period of training to master the techniques (2-3 weeks), we expect that the experiments outlined will take approximately 2 months to complete, including the collection and analyses of all data. The preparation of a manuscript is expected to take another month.

* 10. Describe the student's role in the project (200 word limit)
Student will perform all experimental techniques, collect and analyze data, interpret results in collaboration with mentor, and present the findings in written/oral/poster format as appropriate.

* 11. Describe the mentor's role in the project. (200 word limit)
The mentor or oversee the training of the student in experimental techniques, meet regularly with the student to discuss results and troubleshoot experiments, and aid in the preparation of data for dissemination to the community as a paper, talk, and/or poster. Importantly, the Triplett lab is relatively small, allowing for frequent interactions between the mentor and all members of the lab.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I have previously mentored one Gill fellow in the lab (Mohib Khan).

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
No human subjects research involved.
*1. Faculty Sponsor*

- **Name:** Susma Vaidya  
- **Degrees:** MD, MPH  
- **Title:** Pediatrician  
- **Organization:** Children's National Health  
- **Address:** 7125 13th Place, NW  
- **City:** Washington  
- **State:** DC  
- **Zipcode:** 20012  
- **Office Phone:** 202-545-2900  
- **Email Address:** svaidya@cnmc.org

*2. Daily Supervisor*

Name: Susma Vaidya  

*3. Project Title (250 character limit)*

In a recent retrospective study of patient encounters to two busy pediatric weight management programs, 53% of children returned for a follow up visit after their initial encounter and only 29% of children returned after the second visit. Logistical obstacles such as difficulty with the time commitment required by the program, absence from school and work, parking expenses, and travel distance are cited as common reasons for noncompliance. Data suggests that the frequency of visits with a dietician is more closely associated with successful BMI reduction than a specific dietary intervention. Telemedicine holds great promise as a tool to overcome many of the obstacles to the effective delivery of pediatric obesity care. Additionally, telemedicine transcends geographical limits to care in regions of the country where weight management centers are not available. With the COVID pandemic, telemedicine became the primary mode of health care delivery to patients in the IDEAL Clinic. We need to evaluate attrition and patient engagement in telemedicine compared with in person visits. This would enable providers to have better information on the characteristics of the effective use of telemedicine in pediatric obesity care.
* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Pediatrics

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Telemedicine can be carefully incorporated into a pediatric weight management program to improve patient engagement and reduce attrition. Additionally, telemedicine may contribute to improved success in BMI reduction.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Data from patient visits during the time when only telemedicine was offered will be compared with patient visits prior to the pandemic. Characteristics including insurance, age, comorbidities, and BMI will be examined.

* 9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This project is a retrospective analysis of patient visits that have already occurred. I have data on visits before the pandemic. I need to extract data on new patient visits during the pandemic which were done by telemedicine. Besides patient specific characteristics, I would like to look at number of follow up visits and whether these were telemedicine visits to see if there is better compliance with visits.

* 10. Describe the student’s role in the project (200 word limit)
The student will be involved in a retrospective data extraction. The student will also work with me and a statistician to review and analyze the data once it is in the correct format.

* 11. Describe the mentor’s role in the project. (200 word limit)
I will supervise and ensure active participation in this project. I would like the student to participate in the IDEAL Clinic and our continuum of care conferences as well as our educational conference. The goal would be a poster and a presentation to the group at the end of the summer.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
I have has a Gill Fellow and 2 Health Services Scholars work with me in the past. All there have had publications from their work in IDEAL.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00012111
* IRB Date: 10/28/2021
Faculty Proposal for MD Student Research by Briony Varda

* 1. Faculty Sponsor

* Name: Briony Varda
* Degrees: MD, MPH
* Title: Pediatric Urologist
* Organization: Children's National Medical Center
* Address: 111 Michigan Ave NW
* Apt/Suite: 
* City: Washington
* State: D.C.
* Zipcode: 20012
* Office Phone: 6125789877
* Email Address: bvarda@childrensnational.org

* 2. Daily Supervisor

Name: Teresa Russell
Degrees: MS
Title: Senior research coordinator
Organization: CNMC
Address: 
Apt/Suite: 
City: 
State: 
Zipcode: 
Office Phone: 
Email Address: 

* 3. Project Title (250 character limit)
Unplanned healthcare utilization and missed healthcare opportunities among children with Spina Bifida: a mixed methods, Health Services Research approach focused on improving care models for these children with special healthcare needs (CSHCN).

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.

* 5. Sponsor's Research Focus:
6. Sponsor’s translational level
(Please select ONE)
T4: Translation to Population Health

7. Hypotheses (200 word limit)
Unplanned healthcare utilization and missed healthcare opportunities appear to be more prevalent among children with Spina Bifida. We hypothesize that in our community and region, these patterns are present and are related to a multi-dimensional interplay between condition complexity, social determinants of health and healthcare system deficits.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
Understand patterns of and reasons for unplanned healthcare use among children with spina bifida with a particular focus on the preventable ED visits. Define the rate of and factors associated with missed care opportunities among children with spina bifida with a focus on virtual visits and surgical interventions for improving quality of life.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:
- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research
This is a multi-faceted research thrust that include several projects using common health services research methods that are both qualitative and quantitative in natures. For example: interviews with qualitative analysis versus analysis of large administrative datasets. Students would be supported in applying for Summer research funding, which occurs in the late Fall and early Winter prior to the Summer. In so doing, they will define what project and research methodology they are most interested in participating. Depending on the individual interests they may learn how to handle and analyze large datasets, conduct participant interviews, and/or write abstracts and manuscripts. Over the course of the summer they will be involved in data handling and analysis with the aim to have an abstract (at minimum) produced by early Fall.

10. Describe the student's role in the project (200 word limit)
Any of the following depending on the students' interests: - Data collection via chart review and data entry, basic data analysis in excel - Participation in the analysis of qualitative interview data via research team discussions - Organization and cleaning of administrative data use R-studio - Literature reviews - Writing of abstracts and manuscripts - Oral presentations if desired We have a specific interest in taking on a student motivated to learn the basics of R studio (an open source computing platform for data handling and statistical analysis). He or she would develop an INVALUABLE skill set that can be applied over and over again throughout his/her career - a gift that would keep on giving. We would be able to provide the student with the opportunity to work with large administrative data within R studio and perform basic statistics. We have a
biostatistician on our team, with R expertise who could support. Dr. Varda would also support with her programming & design experience.

* 11. Describe the mentor’s role in the project. (200 word limit)
Will provide the infrastructure and project design with approved IRBs so that the student may hit the ground running on a project. Provide some education sessions on topics in health services research and provide tips & tricks sessions for designing and conducting research. Provide templates for conducting each piece of research project that they can use in the future. Provide the 30-foot view of research through mentorship and discuss career-goals with the students. If the student choose to pursue learning R studio, will provide basic teaching and links to relevant learning modules. Will trouble shoot. Will help student work with our biostatistician to approve data handling.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
4 students last summer, 3 received HSR and/or Gill support. Thus, far Two abstract submission complete from this work with more on the horizon this Fall. Anticipate manuscripts will be submitted by the end of this academic year. With enough lead time, student could also apply for the AUA (American Urologic Association) summer student research support.

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected Yes

Please provide IRB number and date
* IRB Number: Pro00015735
* IRB Date: 5/20/21
Faculty Proposal for MD Student Research by Michael J. Whalen

1. Faculty Sponsor

* Name: Michael J. Whalen
* Degrees: MD
* Title: Associate Professor of Urology
* Organization: GW MFA
* Address: 2150 PENNSYLVANIA AVE NW
* Apt/Suite: SUITE 3-417
* City: Washington
* State: DC
* Zipcode: 20037
* Office Phone: 2027413121
* Email Address: mwhalen@mfa.gwu.edu

2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

3. Project Title (250 character limit)

Clinical Outcomes Research in Urologic Oncology & Robotic Surgery (Prostate Cancer research using the National Cancer Database)

4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


* 5. Sponsor's Research Focus:
Yes - Cancer
Yes - Surgery

* 6. Sponsor's translational level
* (Please select ONE)
T3: Translation to Practice

* 7. Hypotheses (200 word limit)
Prostate cancer is the most common non-skin malignancy in men and is the second leading cause of cancer mortality in the US. There has been downward stage migration since the introduction of PSA screening in the early 1990s. Still, about 5% of cases are found to be metastatic at presentation, which represents an incurable disease. There have been many advances in therapeutic treatment options for metastatic prostate cancer, including more potent androgen deprivation medications. Another parallel treatment approach to systemic medications is the use of definitive local treatment to the prostate via pelvic radiotherapy or even "cytoreductive" prostatectomy in the oligometastatic setting. Although historically thought to have little impact on overall survival, this approach is currently under investigation in several clinical trials and has garnered contemporary attention with the release of the STAMPEDE trial data in 2018. This project will utilize data from the National Cancer Database (NCDB) to explore the rates of definitive local treatment (i.e. radiation vs. radical prostatectomy) for patients with cM1 (i.e. metastatic) prostate cancer from 2006-2017, prior to release of the STAMPEDE data.

* 8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
We have access to the National Cancer Database through GW University Hospital. This is a large national database with access to over 100,000 individual, de-identified patient records. The database will be queried for metastatic prostate cancer patients to assess treatment patterns: androgen deprivation therapy alone vs. rates of concomitant surgery (radical prostatectomy) and rates of radiation from 2006-2017. The outcomes of interest will be overall survival, as well as examining trends over time and correlation with the rates of definitive local treatment (i.e. surgery or radiation). Based on the student's growing proficiency/literacy with prostate cancer research, he/she may modify or propose additional projects using the NCDB data. The tangible goal will be drafting one or two abstracts for submission to the Society of Urologic Oncology annual meeting, the American Urological Association annual meeting, and the American Society of Clinical Oncology Genitourinary Cancer Symposium. These abstracts will culminate in manuscripts to be submitted for publication.
9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.

Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

This research project is designed to provide exposure to clinical outcomes research within the field of Urology and Urologic Oncology. The student will engage in critical reading/analysis of published journal articles in the domain of prostate cancer. The research experience will teach the student how patient clinico-pathologic variables can be assessed with basic statistical methods to derive correlations with multiple clinically relevant study endpoints. The student will gain exposure to these statistical methods as well as work closely the Medical Faculty Associates biostatistician, Richard Amdur. The student will work closely with a resident mentor to provide clinical context and relevance for the research hypotheses. Further projects using these databases will be possible based on the student’s own intellectual curiosity and motivation to develop original ideas/hypotheses for investigation. There will also be opportunity and expectation to contribute to the growing IRB-approved Retrospective and Longitudinal Database of Genitourinary Cancer, as well as the prostate cancer MRI database and bladder cancer "Bluelight cystoscopy database" based on the clinical and surgical experience of the GW Urology physicians. These databases may be queried to answer many clinically relevant and potentially practice-changing questions using data extracted from real patient encounters in the Urology department at GW. One project currently undergoing development is to examine the role of prostate inflammation ("prostatitis") on the accuracy of established multi-parametric MRI (mpMRI) risk categories and the diagnostic accuracy of prostate MRI-transrectal ultrasound fusion biopsy. Depending on the student's interests, time will be spent performing literature review and drafting the introduction and discussion of the manuscript. He/She will also spend time with data entry to input information from the electronic medical record into the database. This work will be supplemented by weekly meetings for troubleshooting and discussion of interesting aspects of prostate cancer diagnosis and treatment. The expectation will be that one or more abstracts are generated to be submitted to our national Urologic Oncology meetings (Society of Urologic Oncology, Genitourinary American Society of Clinical Oncology, American Urological Association). The deadline for the initial submission is late summer 2022. The project will last for the summer, with opportunity to extend participation during the academic year.

10. Describe the student's role in the project (200 word limit)

The student will take the lead with literature search and drafting the project manuscript with the guidance of the Urology residents and attending supervisor. He/She will be responsible for coordination with the biostatistician and assist with interpretation of the statistical results. The goal of the project is for the student not only to learn about outcomes research, but to make a meaningful contribution to the field of Urologic Oncology. He/She will also be responsible for populating the growing prostate MRI database using the REDCap interface. There will be opportunity for statistical analysis of the data alongside the MFA professional statisticians as well. The student will work closely with the biostatisticians to understand the NCDB dataset, including organization, statistical analysis, analysis of outcomes of interest (i.e. surgical complications and success rates) and presentation of data in a clear, concise, and meaningful format. There will be ample opportunity for shadowing experiences in the outpatient clinic and the operating room to gain further exposure to clinical Urology. The student will also participate in weekly Urology Grand Rounds and resident didactic sessions to supplement their growing Urologic fund of knowledge.
11. Describe the mentor's role in the project. (200 word limit)
The mentor will provide ample opportunity for discussion of the rationale for the project and the potential ideas for publication arising from the database. The mentor will schedule regular weekly research meetings to assess the student's progress and troubleshoot any questions. The mentor will also invite the student to participate in clinical patient care. One half-day per week will be spent shadowing in the Urology clinic and another day will be spent in the operating room. These mentorship experiences will provide student exposure to the field of Urology and to provide clinical context for the database work. The mentor will also attend regular meetings between the student and the statisticians. The mentor has significant experience in outcomes research as well as basic statistical methods, so is well-equipped to be able to guide the student's interest and success with the project.

12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
-I have worked with many medical students and Urology residents since 2018. Medical students have been involved with published manuscripts in peer-reviewed journals, as well as authorship of review articles and book chapters. I serve as Research Coordinator for the Urology Department. I was awarded the “Outstanding Clinical Instruction” award (“Teacher of the Year”) by the Urology residents in June, 2019. -Summer 2021: Christian Farag (Health Services Scholarship), bladder cancer and nutrition project, submitted to AUA 2022 meeting; Jennica Egan (Jean L. Fourcroy Research Award), NCDB project and GW Hospital Cancer Committee Quality Improvement Project for prostate cancer active surveillance -Summer 2020: Michael Wynne, (Summer Research Fellowship award); Cyrus Adams-Mardi, MS, current 3rd year GW medical student and recipient of Jean L. Fourcroy Research Award 8/2020; Melinda Fu, current 4th year GW medical student, whose project was selected to be presented at the annual Society of Urologic Oncology conference 12/2020; Summer 2019: Akshay Reddy (Gill Fellow), NCDB project, three abstracts, one presented at the GU ASCO meeting in San Francisco in February 2020. Awarded the William Beaumont Research Award in 2020; multiple publications. Summer 2018: Christina Darwish (Gill Fellow); NCDB project, published in Urology journal.

13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
*(Please select ONE)*

Selected Yes

Please provide IRB number and date
* IRB Number: 041723
* IRB Date: exp 7/19/2022
Faculty Proposal for MD Student Research by Irene Zohn

* 1. Faculty Sponsor

* Name: Irene Zohn
* Degrees: PhD
* Title: Associate Professor
* Organization: Children's National Hospital
* Address: 110 Michigan AVE NW
* Apt/Suite: 
* City: Washington
* State: DC
* Zipcode: 20016
* Office Phone: 202-476-2106
* Email Address: izohn@cnmc.org

* 2. Daily Supervisor

Name:
Degrees:
Title:
Organization:
Address:
Apt/Suite:
City:
State:
Zipcode:
Office Phone:
Email Address:

* 3. Project Title (250 character limit)
Complex genetics of congenital heart defects

* 4. Up to three faculty publications (within the last three years). Projects without recent publications are unlikely to be filled.


Sugrue KF, Zohn IE. (2019) Reduced maternal Vitamin A Status Increases the Incidence of Normal Aortic Arch Variants. Genesis. 57(7-8):e23326, PMID:31299141

5. Sponsor’s Research Focus:
Yes - Pediatrics
Yes - Cardiology

6. Sponsor’s translational level
(Please select ONE)
T0/T1: Basic Science Discovery and Initial Translation to Humans

7. Hypotheses (200 word limit)
Genetic deficits in miRNA processing render embryos with 22q11.2 deletion syndrome (22q11DS) unable to buffer environmental insults such as alterations in the Vitamin A content of the maternal diet, predisposing mutant embryos to congenital heart defects (CHDs). We propose that this is due to disruption of negative feedback mechanisms that disrupt signaling networks that pattern cardiac progenitors. We propose that in 22q11DS negative feedback regulation focuses on down regulating Raldh2, an enzyme critical for metabolism of dietary vitamin A to retinoid acid, the biologically active intermediate.

8. Project goals and measurable objectives (e.g. number of patient records, assays completed) (200 word limit).
The goal of this project is to characterize congenital heart defects in a mouse model of 22q11DS, exposed to increased maternal Vitamin A with and without haploinsufficiency of Raldh2 is reduced. We expect, congenital heart defects will be rescued with reduced gene dosage of Raldh2. This experiment will lay the ground work for analysis of miRNA mediated gene regulatory networks that buffer environmental insults in 22q11DS.

9. Overall design of the research project (500 word limit). Please describe time frame and breakdown of activities.
Selection criteria include:

- The project design makes it likely that the objectives will be achieved
- The project is likely to result in a report of interest to other scholars
- The project fulfills discovery/original research

22q11DS embryos from dams fed a control or slightly higher Vitamin A content will be harvested. Half of these embryos will have reduced Raldh2 gene dosage. Analysis of aortic arch organization in embryos will be done following intracardiac ink injection to visualize the aortic arch revealing interrupted aortic arch and aberrant right subclavian artery phenotypes. Visualization of the aortic and pulmonary vessels in dissected hearts in whole mount will reveal overriding aorta and double outlet right ventricle phenotypes. Histological analysis will also identify overriding aorta and double outlet right ventricle phenotypes as well as ventricular septal defects. Phenotypes will be documented by taking pictures under a microscope. Incidence of defects will be tabulated and significance calculated by Chi2 analysis.

10. Describe the student’s role in the project (200 word limit)
The student will help with dissections of embryos, learn how to analyze phenotypes and then perform analysis, documentation, statistical analysis and generation of figures.
* 11. Describe the mentor's role in the project. (200 word limit)
The mentor will oversee the project and train the student in how to perform the dissections and analysis as well as data analysis.

* 12. Describe the current and previous medical student training by your mentor team. Indicate any Gill Fellows or Health Services Scholars. (200 word limit)
My laboratory has trained 4 medical fellows over the years Kevin McFadgen - Meharry Medical College Omowunmi Oluwo - GWU Health Service Scholar Julie Sabatino - Philadelphia College of Osteopathic Medicine Gelila Yitsege - Duke University Medical School

* 13. Do you have or will you obtain IRB approval for this project?
Please note: Students cannot begin a human subjects project without IRB approval.
* (Please select ONE)
Selected No (Not Required)

Please specify why it is not required.
not human subjects. We have IACUC approval for animal work