WFIRM

Wake Forest Institute for Regenerative Medicine

The WFIRM Annual Undergraduate Summer Scholars Program
Introducing the 2022 Summer Scholars

Offering undergraduate students opportunities to engage in impactful, multidisciplinary regenerative medicine research at the Wake Forest Institute for Regenerative Medicine, at the interface of engineering and biology.

2022 – Scholar's Profiles

Salome Ambokadze

Vassar College

My name is Salome Ambokadze, she/her, a Junior at Vassar College in upstate NY. I am majoring in Biochemistry with a minor in Mathematics. I am an international student from Tbilisi, Georgia, so a big part of my college education has been adapting and learning to a US academic environment. Back home biomedical research of the scale and diversity of the US is still inaccessible, so it was both a challenge and a huge opportunity moving here for college and getting exposed to pioneering research both in my own institution and outside of it. Over summer of 2021, I was selected as a research fellow in Vassar's Undergraduate Research Institute (URSI), studying the evolution of the 4th chromosome in Drosophila Melanogaster, in Dr. Jennifer Kennell's lab. I still work in Dr. Kennell's lab, with a focus on the role of a family of haloacid dehalogenase phosphatases in regulating metabolism and development in Drosophila melanogaster. The main question of our lab is to find out if there's a possible ortholog of phosphoglycolate phosphatase (PGP) in Drosophila Melanogaster, and if so what its role is and if the function is conserved. PGP is of such interest to us as it is a highly conserved phosphatase that destroys toxic glycolytic side products in mammals and yeast.

I am very grateful to have had the chance to be exposed to independent research in molecular genetics as an undergraduate student at Vassar, which is why I can most definitely say that I enjoy working in molecular biology labs, with focus on molecular genetics, which I would like to pursue on graduate level. I see it as the ultimate means of understanding how specific mutations are linked to genetic conditions, which can then hopefully be applied to the search for possible treatment methods for various genetic diseases. Learning about gene expression, structure, and function has become the main focus of my research pursuits.

Outside of classes and labs, I am involved and passionate about various organizations. I am deeply appreciative of the Office of International Services at Vassar and its truly outstanding staff, that provided me and my fellow internationals with both administrative, academic, and emotional support in our transition to American college education and life. During my sophomore year I applied and was accepted to their year-long internship program, which allowed me to regularly dedicate my time and effort into building the support system that genuinely helped me survive my freshman year and navigate a completely foreign learning environment. It was my opportunity to pay back to the office that I relied on so heavily, through a formal internship. I continue to volunteer as an assistant on various events as well as during freshman orientation. I am also involved in a Neuroscience and Behavior Journal Gray Matters, serving as both outreach coordinator and author. I stand by the goals of our journal that aims to bridge the gap between lay readers and the often complicated research world of neuroscience. I also serve as a TA for the Organic Chemistry lab and Molecular Genetics class and lab. I heavily relied on the student assistant during my own lab periods, as I often find that peers are far more approachable and communicate their advice in more relatable language, so it was a great honor to be chosen for these jobs.

I am excited and grateful for the research opportunity at Wake Forest and look forward to meeting
everyone!

Bailey Brennen

Clarkson University

Hi, my name is Bailey Brennen, and I am a rising senior at Clarkson University studying Biomolecular science and Chemistry with a minor in engineering science. I fell in love with math and science at a very young age and always wanted to pursue a career in the medical field. However, it wasn't until high school that I realized my passion for research and my interest in the growing field of regenerative medicine. At Clarkson I have contributed to several different research groups including The Biochemistry and Proteomics lab under the mentorship of Dr. Costel Darie, The Smart Polymeric and

Supramolecular Systems lab under the mentorship of Dr. Xiaocun Lu, and The Biomaterials lab for stem cell engineering under the mentorship of Dr. Bethany Almeida.

Currently I have been focusing my research in the smart polymeric and supramolecular systems lab to investigate and develop a new synthetic scheme for a cyctoctatetranene (COT) molecule specifically designed for polymer mechanochemistry. This semester I also had the opportunity to begin research in the Biomaterials lab for stem cell engineering which is new to the university. In which, I am developing a biomaterial platform that can direct mesenchymal stem cell chondrogenesis for the treatment of osteoarthritis. It was through these opportunities that I was able to expand my love for research and become inspired to further my schooling in order to obtain a PhD.

Alongside my research I am currently the captain of the university's swim and dive team and an organic chemistry tutor. I am also an active member of the society of women engineers and in my free time I enjoy skiing, boating, and working out. I am extremely excited to have the opportunity to perform research at WFIRM and further my knowledge within the field of regenerative medicine this summer. I look forward to meeting everyone!

Xinyue Gu

Johns Hopkins University

Hi, I am Xinyue, a rising junior at Johns Hopkins University with majors in Applied Mathematics and Statistics & Molecular and Cellular Biology, and a minor in Computational Medicine.

I previously have had exposure to pharmacological research on metabolic diseases. It was a very rewarding, fulfilling, valuable experience, yet I also realized that more drastic approach might be necessary for fundamentally curing diseases related to the functional deficiency of organs. This weird thought, combined with information on stem cells I was learning in class, guided me to the field of regenerative medicine, even before realizing what it was.

In college, I have had the fortune of working under Dr. Peter Searson's lab, using microfluidic vessels to model the circulation of Borrelia burgdorferi, the pathogen of Lyme disease. Learning at the lab, I was introduced to the exciting field of tissue engineering and using organoids for disease modeling. Several classes at Hopkins, including seminars on stem cell fate engineering and tissue-engineered blood brain vessels, also directed me further towards regenerative medicine.

With a vague idea about the breadth of disciplines and the versatile applications that regenerative medicine has, I am really excited to come to WFIRM this summer to further

explore the field. I hope to gain closer insights into translational research and be better prepared to become a future scientist.

Katelyn Hamasaki

Amherst College

Hi, my name is Katelyn and I am from Hawaii. I am a sophomore at Amherst College and I just declared that I will be majoring in BCBP (specifically on the biochem track). I am also on the varsity volleyball team. Ever since I was younger, I have always been interested in STEM and really enjoyed my STEM classes. Although I have not had any research experience outside of normal courses, I am excited to start and to learn more. My ultimate goal is to attend medical school to become a pediatrician. However, I understand the importance of research not only in the medical field, but for STEM in general. Being part of research seems so rewarding and I cannot wait to start!

Hayden Johns

Utah State University

Hello! My name is Hayden Johns, a rising senior studying Human Biology at Utah State University, with minors in Chemistry and Behavioral Health. Outside of academia and research, I enjoy basketball, golf, backpacking, and road-tripping. After graduating, I hope to pursue an M.D./PhD and help improve medicine while still directly serving patients.

My involvement in giving end-of-life care has revealed to me the tremendous impact that improving the longevity and quality of someone's life can have. Many other patient interactions I have had while volunteering at my local hospital and shadowing physicians have impressed me, increasing my drive to become a physician.

Over the last two semesters, I have been researching in the lab of Dr. Justin Jones, analyzing the mechanical properties of hagfish slime for their use in defense and medicine. During my time in the lab, I have grown an affinity for the process of experimentation and discovering new phenomena. Information I have learned through coursework and dissecting cadavers has given me an appreciation of the complexity and organization of life itself. I am fascinated by the intricacies of biological structures and processes and their chemical backbone. The refining process of evolution that gradually improves the mechanics of cells, organs, and organisms is

astounding to me. The novel and seemingly impossible objective of replicating these complicated systems draws me toward regenerative medicine.

My initial interest in the medical field stems from my fathers' experience living with and treating multiple sclerosis. Although his treatments are helpful, their side effects have left me wondering if there could be a better solution for him and many others. I am grateful for the opportunity to connect my knowledge of the body and its functions with new technologies and techniques through innovative translational research at WFIRM.

Lucy Kamlewechi

Alabama State University

Hello! My name is Lucy Kamlewechi. I am an honors second year undergraduate student at the Alabama State University pursing a bachelor's degree in Biomedical Engineering. I am particularly interested in the application of technology in the study and research of cancer, and I look forward to further exploring this post-graduation. I have previously held two research positions focusing on cancer and tissue regeneration.

Originally from Nigeria, I am an avid traveler and I enjoy learning about new cultures. I also love to watch movies and learn new words.

Taylor LaValley

Miami University

Hello! My name is Taylor LaValley and I'm a sophomore at Miami University in Oxford Ohio, studying biomedical engineering. I'm originally from Denver, Colorado and love anything outside including hiking, skiing, and playing tennis. I have always had a passion for science and math, and the desire for a challenging and fulfilling career which is why I aspire to pursue a career in medicine. I love problem solving and innovation which led me to biomedical engineering and I have also gotten involved with research in the chemical engineering department at Miami University.

I have been working with Dr. Andrew Paluch on a project involving analyzing binary solvent mixtures to predict solubility enhancement for pharmaceuticals including acetaminophen and salicylic acid. Using Modified Separation of Cohesive Energy Density (MOSCED) parameters we

were able to predict the extremums where solubility enhancement occurs in binary solvents and we are in the process of verifying these predictions using molecular modeling techniques. This project is not yet finished, but our hope is that once predictions are verified it can open a door that allows drug companies to use MOSCED early on in their research process to determine the solubility of a pharmaceutical in biological fluids, and therefore whether it can possibly be an effective therapy or not. This research has been mostly computational based, and I'm excited to get more hands-on experience this summer in the biological science fields.

I currently don't have a ton of experience regarding regenerative medicine and am excited to learn more and dive deeper into this fascinating field. Especially, as a biomedical engineering student I'm interested in learning more about this developing area of medicine and how it has the potential to impact so many lives. I plan to graduate in 2024 with a degree in biomedical engineering and hope to attend medical school after that, and possibly obtain a MD/PhD. While research is fairly new to me, it's definitely a large interest of mine and would love the ability to discover and engineer solutions in the healthcare field while also getting to interact directly with patients.

Jenna Lee

Vanderbilt University

Hi! My name is Jenna Lee, and I am a sophomore at Vanderbilt University. I am pursing a major in Medicine, Health, and Society, and minors in Neuroscience and Biological Sciences. Currently, I serve as a site leader for Project C.U.R.E., an organization that sorts donated medical supplies to send to underdeveloped countries. I am a team leader for Vanderbilt Students Volunteer for Science, where I lead a group of five to an elementary school every week to teach the students a science lesson. Finally, I am a part of the Charles and Hacker Research Lab at Vanderbilt University Medical Center, a neurology lab investigating neurological movement disorders.

I hope to attend medical school after graduation, and from medical school, I hope to earn a M.D. degree to achieve my goal of becoming a physician or surgeon. Since I was seven years old and received my pretend play doctor's kit with a stethoscope, I have been interested in the medical field. This curiosity turned into passion in high school. I gained more insight into what doctors do through lecture series and shadowing. The complexity of life, down to the molecular level, challenged me, and the ability of physicians to assist others through manipulating and influencing the intricate machinery of a human body attracted me to take on the pre-med track in college.

Throughout my high school and college career, I have immersed myself in many fields of STEM through research including mathematics, psychology, pharmacology, and neurology. One area I have not explored yet is regenerative medicine. For this reason, WFIRM Summer Scholars Program in Regenerative Medicine caught my attention when deciding how I should utilize my summer. The intersection of engineering and biology, which I am minoring in, would expand my knowledge in an immersive, real-world way. Additionally, the field of regenerative medicine would be beneficial to my goal of becoming a physician or surgeon because one of the specialties I am interested in is trauma. Regenerative medicine and trauma are closely connected, and by researching regenerative medicine, I hope to gain hands-on experience and insight into the field, especially cellular therapy and medical devices.

My previous research experiences taught me the importance of research. It is satisfying and rewarding to be in the large network of scientists around the world who research and study to continuously improve the wellbeing of others. My goal is to become a doctor, but I will not make an impact on their lives until much later in my career. Research provides an opportunity for me to serve others through what I love: learning in an active, hands-on way.

Audrey MacDonald

Wake Forest University

Hi! I'm Audrey MacDonald, a rising senior at Wake Forest University. I'm currently working towards a B.S. in Biochemistry and Molecular Biology and a minor in English, and have greatly enjoyed seeing how these very different disciplines intersect. Since very early on in my education, I have been fascinated by the science of life and the intricacies inherent in biological systems and processes. In college, I have found a passion for molecular biology and the subtle - yet significant - ways in which different cellular components interact. This interest is what initially drew me to the world of research, and I began working in Dr. Sarah Esstman's research lab studying rotavirus the summer after my sophomore year. My specific research centers around the study of translation in the rotavirus replication cycle, and the identification of various viral proteins - and their relation to one another in physical space - in infected cells using immunofluorescence assays. I am eager to continue with this project when I return to WFU in the fall, and study the possible co-localization of key rotavirus proteins and specific proteins of the infected host cell's translation machinery.

In addition to research and the world of scientific discoveries, I have always been drawn towards medicine. Specifically, due to some incredible shadowing opportunities and the personal experiences of people close to me, I have been very inspired by the field of oncology and am hopeful I can pursue a career that will allow me to bridge my passion for research with my interest in medicine. After completing my undergraduate degree, I hope to attend either

medical school or graduate school, and I am currently strongly leaning towards pursuing an MD/PhD degree.

Having had such a positive undergraduate research experience, I was eager to apply for the WFIRM summer scholars program. I am so excited to dive into the fascinating and innovative field of regenerative medicine, as it is so different from what I have been exposed to thus far, and I look forward to developing my research skills and learning new techniques. I am grateful for the opportunity to work with WFIRM this summer, and hopeful that I can contribute something meaningful to the field of regenerative medicine and help those in need through the work I do.

Collin McGuirt

Davidson College

Hi! My name is Collin McGuirt, and I am a rising senior at Davidson College studying biology and public health. I had little exposure to research and biomedical techniques for much of my life until I came to Davidson. As a student attending a liberal arts college, I was able to experience both laboratory experiments and multifaceted viewpoints into the world around me. Since high school, I have always had an interest in the sciences and understanding the world around me. Working with and around doctors for much of my life, I have come to understand the importance of problem solving and innovation.

While COVID-19 had a major impact on my ability to participate in labs and do research for much of my time at Davidson, I have none the less been able to do many interesting experiments. My first real exposure to research was with the exploration of protein mechanisms controlling S. cerevisiae reproduction and general techniques for their growth. While this was an interesting project, I was later introduced to gene-editing techniques through a Genetics program in which CRISPR-cas9 was used in order to modify egg cells of Drosophila melanogaster to determine effects of mutations to mitochondrial development. Because of the importance of mitochondria in sperm movement, we decided to dissect and then run imaging and DNA analysis in order to understand at both the DNA and physical level what the mutations had done. While I had heard of the technology before, I did not realize the power of its applications in the biomedical world in order to help treat the many diseases that we face today.

WFIRM provides a unique opportunity to understand and even create new technology and understand the relationship between research and the clinical applications of this technology to the real world. I am very excited to apply my understanding of health discrepancies and biology this summer at WFIRM. Specifically, I am very interested in 3D printing, biomaterial science and

mechanistic research in order to improve the lives of those around me and in the world at large. After I graduate from Davidson, I hope to attend medical school and pursue a career as a physician. I want to be able to interact with my patients as much as possible, while creating an environment that fosters healing.

Jake Miller

University of Florida

Hello, my name is Jake Miller, and I am a rising sophomore and research scholar at the University of Florida. I am currently studying Microbiology and Cell Science and am hoping to gain more exposure to regenerative medicine and its relation to the medical field. My career interests involve obtaining an M.D./Ph.D. and going into the biotechnology industry.

After two of my siblings were diagnosed with Type 1 Diabetes (T1D), my interest in the field as a research topic was piqued. Due to my personal family connection to T1D, my foremost interest involves elucidating the mechanistic immunological pathways associated with beta cell destruction and death and how such a response can be initiated. As a high school student, I worked at the Diabetes Research Institute at the University of Miami where I generated pancreatic slices for histology staining of islet cells. I also had the chance to study potential pathways for beta cell proliferation and protection through genetic therapies.

In the Spring of 2022, I joined the Lab of Dr. Todd Brusko at the UF Diabetes Institute in the where my initial research focus comprised studying the immunomodulatory mechanisms of the costimulatory factor CD226 and its relationship to T1D with an emphasis on murine ex vivo experiments. I have significant experience and training for mouse models and am interested in improving translational medicine strategies to deliver therapies from “bench to bedside.”

My current research project involves utilizing vectors for the lentiviral transduction of T-cell receptors on the surface of T-regulatory cells with varying affinities for the peptide “preproinsulin” or PPI. By targeting PPI through T-cell receptor modification, I intend to identify the interaction and extent of the suppression of cytotoxic and autoreactive CD4+/CD8+ T-cells as part of my experiments. Observing PPI in its capacity to reduce the typical immune response which leads to autoimmunity, there is a possibility that T1D can be more effectively immunomodulated.

With the emergence of Regenerative Medicine as a relatively novel and exciting field of scientific and research study, I wish to learn more about its applications and role in medicine to incorporate into my own research. I am further interested in utilizing methods involving stem

cell research and regenerative medicine to develop novel approaches to mitigate or eliminate the effects of T1D onset, as well as autoimmunity.

I also enjoy hanging out with my family, sports, fishing, and the outdoors. I have also fostered a love of traveling through several trips abroad.

Lauren Morris

University of Central Florida

Hi, My name is Lauren Morris. I am a junior at the University of Central Florida (UCF). I graduated high school with my AA and I am dual majoring in Biomedical Sciences and Computer Science. I have wanted to be a scientist since I was young and thanks to my mom I was able to explore my scientific passions as I was homeschooled after first grade. I was able to do all kinds of dissections and take field trips to various science centers, planetariums, and other scientific hotspots. In high school I went back to school part time to take AP science classes and the biomedical science class at my local school. During the summer I got to do a program at University of Florida where I got to visit various labs in the STEM field. This is when I got introduced to regenerative medicine and the field of research. Since then I have been fascinated with the idea of creating organs or tissues to replace damaged ones and ease the quality of life of patients.

I am currently working in Dr. Thomas Kean's lab at UCF where we are working on 3D bioprinting of cartilage. I have gotten experience in cell culture, experiment design, and have gotten to use my computer skills in designing 3D models for the lab and programming our pipetting robot to increase the ease of making many media conditions and testing them on pellet culture. In the semesters I have worked in the lab I have learned many important skills and most importantly I learned that I really enjoy working in the laboratory setting, further cementing my dreams of working in research.

Participating in WFIRM will give me more experience in how research in a different lab works as well as further experience in a regenerative medicine lab. I am particularly interested in learning how different labs work as I hope to continue working in the lab throughout my career. After completing my degrees I hope to work towards a PhD in cell biology or bioengineering with the goal of doing research in regenerative medicine as my future career.

Kelsey Mosshart

Clemson University

Hello! My name is Kelsey Mosshart, and I am majoring in Genetics (B.S.) with minors in Biochemistry and Biological Sciences at Clemson University. I was first exposed to genetics in ninth-grade biology, and ever since then, I have become captivated by the field. I find processes such as transcription and translation, gene regulation, and epigenetics fascinating. The more I learn, the more I want to know. As I have furthered my collegiate studies, I have discovered a passion for biomedical research. I have explored this interest through undergraduate research at Clemson, as I was involved in a project that explored genome editing in mammalian cells to treat metabolic diseases. Research is crucial for advancing medicine and science, and it can provide treatments for some of the most prevalent human diseases like cancer and Alzheimer's.

My career goal is to make a meaningful and lasting impact on my community through genetics. Furthermore, I want to help improve the lives of those around me. Whether that be creating medical devices, performing genome editing to treat diseases, or working in coordination with a hospital to analyze genetic data, I want to improve the quality of life for people worldwide. I feel that genetics will provide me with a more holistic approach to modern science that will allow me to make tangible changes in my world.

I am excited to begin my work as a WFIRM Summer Scholar to use the knowledge and skills I have learned in my courses and apply them to biomedical research. My background in genetics has given me a foundation in the molecular processes of life, which provides me with a unique perspective on regenerative medicine. I am very passionate about finding ways to improve human health, and I feel that biomedical research is an excellent avenue to accomplish many goals in the medical field.

Luana Sueko Peres-Damjanovic

North Carolina Agricultural & Technical State University

My name is Luana Sueko Peres-Damjanovic, I am a Chemical Process Technologist and researcher, I currently attend North Carolina Agricultural & Technical State University, where I am a senior working towards my bachelor's degree in chemical engineering. I grew up in Brazil and earned my first degree at the Federal Institute of Education, Science and Technology of Rio de Janeiro. In Rio, I worked at the Nuclear Engineering

Institute for two years, where I began as an intern, and eventually I wrote my graduation thesis on the improvement of a patented solvent extraction process for Niobium obtainment.

I first came to the United States to study chemical engineering on a recognition scholarship. Coming to North Carolina A&T had profound impacts on my life and how I saw myself. During the exchange program I spent a summer at Columbia University researching the formation of a polymeric bound layer on a silica nanoparticle. I come from family that is in hospitality industry and I believe growing up at a hotel and being very friendly from a young age has shaped me, it helped me flourish in the US.

Most recently I have been raising my children in the Triad area, coming back to this same school has brought me a lot of happiness. I met professors that brought out the best in me, they also gave me space to hone my skills. I came to the realization that my love for mathematics is even bigger than I imagined, additionally, I noticed this time at college that there is a lot of pleasure in teaching.

I am a dedicated, mother, student, friend and employee. I love sports, I have played American football, basketball, handball and fought Taekwondo. I love travelling, cooking, building and learning. I am resilient and curious, and I cannot wait to see what we can all accomplish together.

Sam Pomper

University of North Carolina at Chapel Hill

My name is Sam Pomper and I am a rising senior at the University of North Carolina at Chapel Hill. I am majoring in biology and minoring in chemistry and history. Outside of school I enjoy hiking as well as watching and playing basketball. I am excited to be a 2022WFIRMSummer Scholar.
It has always been a goal of mine to have a career in healthcare and to conduct research in biology and health sciences. Growing up, science was always my favorite subject. My interest in healthcare however began in high school, when I had the opportunity to work in a volunteer program at Wake Forest Baptist Hospital. This program provided me an opportunity to shadow medical professionals and I saw firsthand the daily lives of these individuals within their work environments. What impressed me was their ability to effectively communicate and interact with patients to reach diagnoses and ease their concerns. At Chapel Hill, I have had the pleasure of doing research in environmental public health. I enjoy doing research in public health because the research has direct positive impacts on people's lives. Our group is studying the prevalence of soil transmitted helminth ova in the rural regions of the American South. The work that we are doing in this lab will assist these communities. Research that leads to positive change in the lives of others resonates with me and makes the time and effort even more worth it.

I am very excited for the WFIRM summer scholar program, not only for the opportunity to work in cutting edge research, but also for the new relationships I will form with my fellow scholars and faculty mentors. I am honored for the opportunity to be in this program and work with these experts. I look forward to all I will learn and experience this summer

Phoebe Rodda

University of North Carolina at Chapel Hill

Hello! I am a second-year undergraduate student at the University of North Carolina at Chapel Hill. I am pursuing a Bachelor of Science in Psychology and Medical Anthropology with a minor in Biology. I hope to study the ways in which the field of regenerative medicine can be applied to epidemiology. I am an active member of both the UNC chapter of GlobeMed and the UNC chapter of Helping Give Away Psychological Science (HGAPS), two public health non-profit organizations through which I assist in the compilation and accessible dissemination of research to the student body, both online through wikiversity editing and in person through student body presentations. I am the current vice president of UNC Students for Rare, a student-led organization dedicated to spreading awareness for rare diseases and the medical research process, through which I am assisting in organizing a speaker series on the pathology of neurodegenerative diseases. In my free time, I enjoy indoor rock climbing, backpacking, and reading.

Alex Shepard

University of Arkansas

My name is Alex Shepard, and I am a rising senior at the University of Arkansas. I am a pre-med student studying biomedical engineering. In the spring of my sophomore year, I had my first exposure to research in a semester-long program through the Biomedical Engineering Society at the U of A. I was involved with research in biophysics in a lab that sought to explain neural coding within the olfactory bulb for orthonasal and retronasal chemical stimuli. My team was responsible for editing and testing an existing code for an instrumented cage that would deliver odorized and clean air and water to rats while implanted electrodes monitored their electrophysiology throughout the experiment. Despite the challenge of working in a coding language that was unfamiliar, we were able to compile the code and begin to upload it to the cage.

After taking classes to learn more about content such as biomaterials and biomolecular engineering, I am excited to have the opportunity to apply the knowledge I have gained through this regenerative medicine program. Additionally, I am looking forward to seeing an impact on healthcare in a way that I have been less accustomed to. Shadowing physicians and volunteering in a hospital has allowed me to witness medicine from a patient care perspective, but this summer I hope to better understand the impact that technological advancements can have on this field.

After I graduate with a degree in biomedical engineering, I hope to go to medical school to become a physician. I would like to be involved in directly treating patients in such a way that allows me to discuss and navigate treatment options with them. I want to help them to be confident in their treatment plan as I walk with them through the joy of recovery as well as the difficulty of their situation.

Becky Van Kirk

University of Chicago

I am a rising senior at the University of Chicago, studying Biological Sciences with a minor in Health and Society. Growing up in State College mere minutes from Mount Nittany Medical Center with a pulmonologist as my father and a nurse practitioner as my mother, I have been surrounded by the clinical space longer than I can remember. However, it was the onset of my father's brain stem stroke and initial diagnosis of locked-in syndrome that altered my relationship with medicine and ultimately cultivated my interest in molecular mechanisms of injury and disease and passion for the utilization of regenerative medicine beginning at the stem cell level in the neurological space. This passion and interest led me to pursue research in the Marlow Lab at the University of Chicago. There, under the direction of Dr. Marlow, I am actively involved in the study of embryonic neurogenesis in order to better understand the evolution of the nervous system and neural regeneration with the goal of translatable clinical advances for patients of neurodegenerative diseases. My research focuses on the neural development of Nematostella vectensis and the identification of stem cell and progenitor cell lineages involved in nervous system regeneration. Additionally, I serve on the coordinator board as the development coordinator for Camp Kesem, an organization which provides programs, services, and other support for children and families through and beyond a parent's cancer.

The opportunity to be a WFIRM summer scholar will provide me with a greater understanding of the highly dynamic relationship between clinical application and regenerative medical laboratory research. WFIRM is a unique environment where myself and my fellow researchers are each motivated by our passions to learn, serve others, and ultimately produce

extraordinary life-saving findings. My father's stroke illustrated the impacts of trauma on the nervous system and brain and demonstrates the limitations trauma imposes on the neural recovery process. Therefore, at WFIRM, in addition to developing new research skills and learning from the extraordinary faculty, I look forward to progressing the field's knowledge of regenerative therapies with the aim of developing clinical therapies for patients for whom full recovery remains out of reach.

Following my graduation from the University of Chicago, I plan to attend medical school after utilizing a gap year. I plan to remain involved in clinical research through my gap year and further familiarize myself with the medical field before matriculating. I plan to pursue a career as a physician and while I have not refined my specialty of interest, I would like to continue with clinical research aiming to improve outcomes for the patients which I hope to serve every day.

Grayson Wagner

Yale University

Hello, my name is Grayson Wagner, and I am a rising Senior at Yale University. I am studying Biomedical and Mechanical Engineering. I am interested in the applications of 3D printing in the medical field. I am currently involved in bioprinting research at the John B. Pierce Laboratory with Dr. John Geibel. I have experience with a dual-head extrusion bioprinter and am now assisting in the development of the HP Thermal Inkjet Pipette System. I also run a student organization called Yale e-NABLE that designs free 3D printed adaptive devices for kids. We specialize in upper-limb prostheses and orthotic devices. Just this year, we completed our first project designing a fully 3D printed transradial prosthesis with a distal adaptor to hold a cello bow. Outside of the lab, I am part of the Yale Climbing Team and Outdoor Climbing at Yale. I love to take weekend climbing trips to local crags and am a fan of anything involving the mountains.

My research interests are primarily bioprinting and tissue engineering, but I am also interested in medical device design. After completing my undergraduate education, my plan is to pursue a PhD in Biomedical Engineering. I have greatly enjoyed my time in the Geibel Lab and would like to continue research after graduation. I have a specific interest in vascular biomechanics and would like to assist in developing treatments for cardiovascular diseases. In particular, I am intrigued by the use of tissue engineered vascular grafts in open heart surgeries as well as recent advances in bioprinted vessels. My hope is that by participating in the WFIRM Summer Scholars Program, I can learn more about the field of Regenerative Medicine and apply my experience to my research in bioprinting. I am very excited to spend my summer at WFIRM!

Yutong Wang

Wake Forest University

Hello! I am Yutong Wang, a rising junior at Wake Forest University. I major in Biochemistry and Molecular Biology (BMB) with a minor in Studio Art and am curious about how science and art intersect. I have loved nature and watched science documentaries since childhood. After learning molecular biology I am fascinated by the sophisticated mechanisms of organisms and want to keep exploring them. In high school, I did research studying the effects of sleep deprivation on mice's bipolar disorder-related behaviors, nervous system receptors, and neurotransmitter gene expressions. WFIRM summer research program is the first research opportunity for me in college, and I really appreciate learning more advanced techniques and practicing my research skills.

My mother as a nurse in a nephrology department triggers my interest in medicine. I am always attracted by her story about how the team solved medical issues and the medical theories behind them. The reason for studying regenerative medicine derives from my grandmother's sequelae after a teratoma surgery. Her nerves on the spine were impaired and it took her several years to recover only a part of the functions. Therefore, I am eager to learn the regeneration mechanisms as well as the newest medical technologies to treat patients. WFIRM summer research scholarship is a good opportunity for me to engage in research programs under medicine experts and see how interdisciplinary projects work. Since this is the first time I do research in college, I hope to study the whole research process, from topic choices to designing experiments as well as writing research papers. I also want to know the current essential topics about regenerative medicine. These experiences are important to my future individual research, and I plan to attend graduate school and will definitely pursue a Ph.D. degree.

Emma Warrner

University of Miami

Hi, my name is Emma Warrner, and I am a rising junior at the University of Miami studying Biomedical Engineering with a concentration in biomaterials and tissues. I have been passionate about research in the medical field since early high school when I read the gene therapy book The Forever Fix which first exposed me to how the manipulation of human biology could be used to cure disease. This initial fascination catalyzed a path that led me to Biomedical Engineering, and eventually to the field I am most interest in, regenerative medicine. My cellular engineering class allowed me to dive deep into the

biology of stem cells and their ethical implications where I developed a fascination for their use in conjunction with specifically engineered scaffolds for applications in tissue engineering. A field a hope to explore more in the future.

Outside of my studies in the classroom, I have been lucky to perform research in two previous labs. First, under the direction of Dr. Jianbo Gao studying the optical properties of atomically thin semiconductors during my REU program at Clemson University. While not directly in my field of interest, I gained an appreciation for multidisciplinary research, specifically in the realm of medical physics, which has greatly aided me in my courses since. Throughout the past school year, I have also completed various projects in Dr. Sandra Rieger's lab at the University of Miami focused upon investigating the regenerative capabilities of zebrafish. Most significantly, an imaging project to analyze the difference qualitatively and quantitatively in regeneration between wild type and genetically modified zebrafish over the course of five weeks. Additionally, I have been able to further develop lab techniques in a nontraditional lab course gaining experience in cell culture, counting, and imaging which I hope to expand upon this summer.

I am beyond excited to perform research at WFIRM this summer, further exploring a field that I have become intensely interested in while fostering new friendships with the other scholars. After the completion of the program and graduation with my degree, I hope to continue to explore the field of regenerative medicine research in a Ph.D. program.