

2024

Collegiate Science & Technology Entry Program (CSTEP)



2024 CSTEP Research Interns at University at Buffalo- School of Management

SUMMER RESEARCH PROGRAM

RESEARCH SYMPOSIUM & LUNCHEON



Thursday, July 25, 2024
1:00 – 3:30 pm
University at Buffalo
Jacobs School of Medicine
& Biomedical Sciences

PROGRAM ORDER



WELCOME

SHANNA CRUMP-OWENS
Director, Collegiate Science & Technology Entry Program (CSTEP)

OPENING REMARKS

JACQUELINE HOLLINS
Associate Vice Provost for Inclusion and Student Success

LUNCHEON & SLIDESHOW NARRATIVE

NELSON RIVERA
CSTEP Alumni

STUDENT PERSPECTIVES

Student Speakers

POSTER COMPETITION & JUDGES PRESENTATION

DR. LAVONE RODOLPH
Post-Doctoral Researcher, Computer Science & Engineering

FACULTY MENTOR & STUDENT AWARD PRESENTATION

SHANNA CRUMP-OWENS
Director, Collegiate Science & Technology Entry Program (CSTEP)

CLOSING REMARKS

SHANNA CRUMP-OWENS
Director, Collegiate Science & Technology Entry Program (CSTEP)



University at Buffalo

Collegiate Science and
Technology Entry Program

Undergraduate Education

CSTEP MOTTO: "TO WHOM MUCH IS GIVEN, MUCH IS EXPECTED"

CSTEP DIRECTOR'S MESSAGE



Welcome to the **18th Annual CSTEP Summer Research Symposium!** Our 8.5-week Summer Research Program enhances the competitiveness of talented underrepresented students pursuing STEM and the allied health professions. I congratulate their dedication to excellence and research. They are exemplars among their peers. Today, we celebrate the fruition of their hard work as they present their research to peers, faculty and staff; they can look back on their efforts with pride.

Our goal was to structure a holistic, engaging, and transformative experience which provided our students with a fundamental understanding of how research plays an important role in tackling complex societal challenges. I am confident that the structure and support of our program deepened their understanding of research and how much their respective fields will gain from their knowledge, skills, and experiences.

A significant and effective tool in increasing the enrollment of underrepresented students in graduate programs is to provide them with opportunities to conduct research

early in their undergraduate careers. Our research interns have broadened their

knowledge and gained insight into critical issues, while developing analytic, leadership, and problem solving skills. In addition, this summer experience allowed them to gain a better perspective of research and its role in society. They also learned the value of teamwork and collaboration which are both essential in today's research and work environments.

To our faculty research mentors, workshop facilitators, judges, alumni and research methods seminar instructor and staff which number 75 - thank you for your time, and expertise. We could not successfully create community, to challenge, stretch diverse group of talented students without the contributions from UB faculty and staff. We value our collaborations with you and look forward to continued collaborations.

To our interns, having you here with us this summer was important. Thank you for saying yes to this opportunity, planned with you in mind, to maximize your potential.

We are confident that the research experience, research methods course, seminars, and fieldtrips fostered a sense of community while enhancing undergraduate experiences. I encourage each CSTEP Intern to continue taking advantage of the resources, opportunities, and services offered by the CSTEP community to make your UB experience more robust. We hope you found the support, guidance, and nurturing environment we provided to be beneficial. Also, remember the to embody the CSTEP motto: *"To whom much is given, much is required."* It has been a pleasure to work with you and I look forward to continuing to work with you during the academic year.

SHANNA CRUMP-OWENS
CSTEP Director

WHAT'S IN IT FOR ME? THE PERKS OF JOINING UB CSTEP

CSTEP offers valuable tools: advisement, tutoring, paid research internships, scholarships, service learning, specialized courses and travel to conferences and workshops, which empower students to become successful in their chosen profession. Our alumni have made major contributions in both their careers and communities. Many of these same graduates report that CSTEP played a key role in helping to develop the confidence and skills necessary to navigate through their college years and into the profession of their dreams.

UB CSTEP offers the following programs and services for our students:

PAID RESEARCH & INTERNSHIP OPPORTUNITIES

Paid research and internships are an integral part of CSTEP - to introduce talented underrepresented students to the culture of research, provide insight related to their major and expose students to the rigors of graduate study. The CSTEP Research Internship Program exposes selected students to research and career opportunities in their major. CSTEP works with students to identify faculty research mentors or internship supervisors.

ACADEMIC YEAR RESEARCH/INTERNSHIP PROGRAM

During the academic year, interns work for 10 weeks per semester under the guidance of a research mentor or internship supervisor. Students are assigned a research project for up to 10 hours per week, at the discretion of the research or internship supervisor. Students are awarded a research stipend from CSTEP during their research or internship experience.

SUMMER RESEARCH PROGRAM

The CSTEP Summer Research Program is an intensive 8.5-week program designed to enhance the competitiveness of talented underrepresented students pursuing STEM and the allied health professions. The program strengthens participants' research skills and exposes them to the rigors of graduate study. Students are matched with faculty to conduct research for 30 hours per week. In addition to gaining research experience, students participate in a research methods course, seminars, and field trips. As a capstone, at the end of the program, students present their research to their peers, faculty and the University community during our Annual Research Symposium. The summer program takes place from the beginning of June through the end of July. Applications are due in March of each year.

ALUMNI CONNECTIONS

CSTEP students have access to a network of engaged alumni through CSTEP Connect and our Alumni Insights Series. CSTEP Connect occurs during UB's winter session and CSTEP students can connect with CSTEP alumni who have committed their support in the following areas: career advice, mock interviews, resume review, job shadowing and help with applying to graduate or professional school. CSTEP Alumni Insights is a monthly series for our CSTEP alumni to connect with and empower our CSTEP students at their alma mater. Alumni are invited to share insights with CSTEP students during a 1-hour workshop inspired by their careers, personal journeys, and expertise.

FUNDING OPPORTUNITIES FOR CONFERENCES

CSTEP covers travel expenses for selected academic, career, and graduate school conferences and enrichment programs. These opportunities boost students' leadership skills, while building their resumes.

GRADUATE SCHOOL PREPARATION

CSTEP awards scholarships to students for Kaplan Review Courses, which provide preparation for standardized graduate entrance exams, including the GRE, MCAT, LSAT, GMAT, and PCAT exams. Our staff also assists with personal statement preparation and review, and provides mock interviews for students applying to graduate/professional schools. CSTEP also offers a Graduate School Fee Waiver for current CSTEP students applying to graduate or professional school. More details can be found on our website: <https://www.buffalo.edu/cpmc/cstep/signature-offerings/graduate-school-preparation/fee-waivers.html>

SERVICE LEARNING CLASS

A cohort of 20-25 students is selected to engage in a semester-long structured service learning project, becoming a Campus Health Educator (CHE). The goal of CHE is to increase the number of individuals participating with the organ donor registry. This goal is achieved by engaging students pursuing allied health majors in service learning, and training them to conduct educational workshops for UB students, and facilitating a campus-wide organ donor registry drive. Our partner for the CHE Service Learning Class is ConnectLife.

CSTEP SHADOW DAY

CSTEP students serve as mentors to high school students enrolled in the Science Technology Entry Program (STEP). As mentors, CSTEP students allow STEP students to “shadow” them by attending classes with them to get a glimpse of what college classes are like.

CSTEP DAY OF SERVICE

CSTEP students visit local high schools in the Buffalo Public School System to share their collegiate experiences with students in their classrooms. This serves as a vehicle to give students from targeted high schools “college knowledge” while also introducing them to STEM fields and the licensed professions. This year we visited Health Sciences Charter School.

HABITAT FOR HUMANITY AND BLACK MUSIC CONFERENCE AWARDS

CSTEP students team up with Habitat for Humanity Buffalo, a non-profit charitable organization seeking to alleviate the shortage of affordable housing both within the U.S. and abroad. Through volunteer labor and donations, Habitat for Humanity Buffalo has built and rehabilitated over 225 homes for families who have difficulty obtaining a home through other means. This year the 2024 Summer Research Program interns volunteered with the Tool Library and Bailey Avenue Business Association to engage in gardening and cleanup at the Bailey-Dartmouth Community Garden.

SUPPORT FROM THE CSTEP NETWORK OF STAFF, STUDENTS, AND ALUMNI

We offer academic, career, and personal counseling to assist students in overcoming difficulties, finding solutions, and establishing their priorities. The CSTEP Billboard, website, and Student Recognition Dinner recognize the achievements of our students and help build the camaraderie that our students have come to rely on.

MONTHLY EVENTS, WORKSHOPS, AND ENRICHMENT ACTIVITIES

Monthly meetings help build the community our students have come to rely upon. Students who attend our monthly meetings gain invaluable advice as they have the opportunity to learn from each other’s experiences and receive professional advice from alumni and guest speakers. Below is a list of several of this year’s workshops and enrichment activities:

CSTEP Welcome Back BBQ	A Level Up: Resume Review
Preparing for Graduate School	Research Career Paths for Women in STEM
Personal Branding	Law School for a Day
Pathways to Pharmacy School	Shadow Day
Rx for Success (Medical School)	Day of Service
Insights for Engineering: Panel of Engineers	Medical School Mock Interview Day
Pathways to Public Health	Student Recognition Dinner
Explore Law Panel	Student Research Luncheons

CSTEP CAREERS

Architect • Audiologist • Biologist • Dietitian • Certified Public Accountant • Chemist • Chiropractor • Computer Scientist • Dentist • Geologist • Engineer • Lawyer • Mathematician • Medical Doctor • Midwife • Nurse Practitioner • Occupational Therapist • Occupational Therapy Assistant • Optometrist • Pharmacist • Physical Therapist • Physicist • Podiatrist • Psychologist • Physician Assistant • Registered Nurse • Respiratory Therapist • Social Worker • Speech-Language Pathologist • Veterinarian

MAKING A DIFFERENCE IN WNY: UB CSTEP HIGHLIGHTS

CSTEP addresses the shortages of underrepresented students both in the Science, Technology, Engineering, Mathematics (STEM) and the licensed professions. Resources available to CSTEP students include: paid research with faculty, internships, graduate school preparation, scholarships, standardized test preparation, application fee waivers and academic and career guidance, monthly seminars, travel to professional conferences, and a support network to assist promising students in achieving their academic and professional goals.

During a previous grant cycle, CSTEP received the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM). This award, administered by the National Science Foundation, recognizes individuals and organizations that have demonstrated a commitment to mentoring students and increasing the participation of minorities and women in Science, Technology, Engineering, and Mathematics (STEM). Awardees serve as exemplars to their colleagues in the national effort to develop the nation's human resources in the STEM professions.

Did You Know...?

- More than **90%** of UB CSTEP students have entered into the CSTEP targeted professions or attended graduate school after obtaining their bachelor's degree.
- More than half, **60%** of all CSTEP Students possess overall GPA's above 3.0.
- Our current enrollment is **440** students.
- Since the program's inception, UB CSTEP has awarded over **194** CSTEP/Kaplan scholarships to students in preparation for standardized graduate school exams (PCAT, MCAT, GMAT, LSAT, and GRE).
- This year, **44** CSTEP students were placed in funded research internships and completed over **18,000** hours.
- To help provide service to our students, CSTEP has hired, since the late 90's, a cadre of approximately **180** Graduate and Student Assistants to work within our office. This provides funding for the staff during their time as graduate and undergraduate students at UB.

WHY DO RESEARCH? STUDENT PERSPECTIVES

Written by the 2024 Summer Research Cohort

Research exists in many forms. For many students, it is an essential part of the undergraduate experience. The Collegiate Science and Technology Entry Program (CSTEP) Summer Research Program (SRP) is a comprehensive, immersive experience that provides students with an opportunity to learn from experts in their fields. For 8.5 weeks, we worked closely under the mentorship of a faculty mentor while also engaging in professional development. The experience prepares students for the laboratory environment and serves as a catalyst to reach future goals.

Our summer cohort is driven by diverse aspirations, and united by a common belief in research as the peak of learning and innovation. **Lior Adjadanpor**, a senior in Electrical Engineering views research as a pathway to future career clarity and a means to enhance critical thinking. "Engaging in undergraduate research is overall a great learning experience. It is a good way to figure out what work field you would like to be a part of in the future. Plus, research helps enhance students' critical thinking along with making connections in your respected field."

For **Wisdom Akinyele**, a sophomore Psychology major, research is a horizon-broadening experience. "Undergraduate research is a wonderful opportunity to expand your horizons and learn how to network within a professional setting. Additionally, it allows you to apply concepts learned in classes to the field, exercising your critical thinking skills."

Sabrina Johnson, a senior in Computer Science, sees research as a way of enhancing creativity. She writes, "Undergraduate research gives students the freedom to explore and tinker. I believe students should engage in this activity because it enhances their critical thinking skills and imagination. Being a creative thinker is imperative to being a game-changer in your work environment and an innovator in your desired field."

The pursuit of research propels students to the forefront of global advancements in science, technology, medicine, and beyond. **Eghosa Oshodin**, a sophomore in Public Health, shares, "Students should love to engage in undergraduate research because it expands their knowledge of the world today. There are still many facts that are not only unsolved but also thought to be true at first, but because of research our perspective on the information has fully changed. Also, think of having the groundbreaking opportunity to bring on a huge shift to the world and know that you were one of those individuals involved in making that huge change!"

The immersion of students in research has provided an opportunity to catch a glimpse of the day-to-day workings of experts in their fields and provided insights into their desired field and career pathways. **Precious Alamu**, a junior in Neuroscience and Linguistics, acknowledged that "Undergraduate research is a window into the practicalities and application of what we learn in class. It also offers the opportunity to explore one of the career paths our undergraduate degree may lead us on. One lasting benefit of undergraduate research is the grit and strength character that we get to build. This benefit is applicable in all realms of life."

Networking and collaboration fuel creativity and new ideas. This summer's research journey has created strong connections with mentors and leading figures in our fields. **Kellyann Cleary**, a senior in Medical Laboratory Science and Biological Sciences, indicated, "Undergraduate research is an essential experience for students to learn and understand the practical applications of their coursework. Research helps to develop the necessary skills to succeed in your field such as critical thinking and interpersonal skills." Similarly, **Donaldine Boukari**, a senior Biological Sciences major noted, "We do research to deepen our understanding of topics that captivate us. Undergraduate research is crucial in a way that it gives us hands-on experience and networks within our fields of interest. Furthermore, research also introduces us to our respective field, offering insights into the current world and shape our future interests."

The impact of research extends beyond academia; it empowers students to shape the world. **Marvin Petion**, a freshman majoring in Biomedical Sciences indicated, "Engaging in undergraduate research is crucial because it empowers students to directly influence the world around them. Each day, new discoveries are made, and it's imperative that we have a fresh influx of students to unearth these findings. By participating in research, students contribute to expanding knowledge and cultivate skills that are invaluable for their personal and professional growth."

Our research interns would like undergraduates to know that taking research opportunities is an opportunity like no other and provides critical transferable skills. **Li Yi, Hu**, a junior studying Chemistry, articulates this by stating, "Students should engage in research because it'll force you to think critically and to push the bounds of knowledge. It will test your resilience and teach you to become a more curious student too. Undergraduate research is also rewarding to know you are helping in groundbreaking discoveries and give you something to be passionate about." Another intern, **Andrea Calderon**, a junior majoring in Biomedical Sciences mentions, "Students should engage in undergraduate research for a multitude of reasons. One of the main reasons students should engage in research is because of the lack of research in minority communities. A majority of research has been observed in middle and upper class white families, which leads to disparities. Another reason undergraduate research is important because it allows students to engage with experts in their fields to foster more of an interest in learning."

Every student embarks on research for personal reasons. Some seek it for the vital career experience it offers, while others aim to be acknowledged as pioneers. Yet, all agree that research is a crucial element of undergraduate learning. The CSTEP Summer Research Program enlightens our students about the significance of research and equips them with essential skills that are beneficial in academia, their future careers, and beyond.

-2024 CSTEP Summer Research Cohort



Lior Adjudanpor

HOMETOWN: Port Washington, NY

MAJOR: Electrical Engineering

INTERNSHIP PLACEMENT: Department of Electrical Engineering

SUMMER MENTOR: Dr. Huamin Li

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Electrical Engineering

SUMMER PROJECT: *2D Field-Effect Transistors Photogating Effects*

ABSTRACT: Two dimensional materials can be used to create electronic components such as field-effect transistors (FETs). FETs are a type of transistor, a semiconductor device that controls electric current flow. Monolayered 2D materials are superior to silicon as transistors sub 5nm. In this research MoTe2H (semiconductor) is combined with MoTe1T (semimetal) interlayer contacts through dry transfer. Dry transfer is a technique used to create heterostructures and devices. Small flakes of 2D materials are transferred from one substrate to the desired substrate and are held together through Van der Waals. Electron beam lithography (EBL) and metal deposition are used to fabricate these devices. Red, Green, Blue (RGB) lasers, up to 130 mW, are used to characterize the devices created demonstrating superior photo response in phototransistors and photodiode configurations. MoTe2H has an n-type photogating effect with ambipolar charge transport, allowing for superior photodetection. Using the measured electrical properties, it was observed that as the output power increases drain source current (IDS) increases. This research will help optimize the methods used to create high performance 2D material-based transistors from MoTe2.

ACADEMIC AND CAREER GOALS: To obtain a Master's Degree in electrical engineer and become a successful owner of my own engineering firm to give back to underrepresented communities.

WORDS TO LIVE BY: "Nothing is timeless, everything dies, even stars. It is a fundamental portion of anything's existence. If it is given the opportunity to exist, then it must have a point where it can no longer exist. Everything comes and goes. It is life. Know that and cherish what you have in the moment, but don't be afraid to lose it because it is inevitable. -Myles Pauquette



Akosua Adu

HOMETOWN: Bronx, NY

MAJOR: Engineering Science

INTERNSHIP PLACEMENT: Department of Engineering Education

SUMMER MENTOR: Dr. Monica L. Miles

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Engineering Education

SUMMER PROJECT: *The Effects of using the BLKSE model on Black children in elementary school*

ABSTRACT: Black Liberation in K-12 science education (BLKSE) is an educational model that addresses the challenges Black students face in Eurocentric learning settings by providing a framework for teaching science that affirms their identities. BLKSE is based on culturally relevant science education curriculum aimed to emphasize prominent Black excellence history figures. The model aims to identify and counter implicit biases and anti-Black practices to create a safer learning environment. We conducted a case study which analyzes the impact of BLKSE informed lessons on 80 fourth grade students at a charter school in the Great Buffalo Niagara Region, with a primarily Black and/or Brown population. Our data analysis revealed that students exposed to BLKSE showed increased openness to science learning compared to those in traditional academic settings. We believe that introducing BLKSE in elementary grades will enhance literacy which increases comfort in science learning, potentially fostering long term interest in STEM fields among black students. This research will further our understanding of how to effectively incorporate BLKSE into science curricula, promoting inclusive science learning environments that support educational developments of Black students.

ACADEMIC AND CAREER GOALS: To obtain a Bachelor's in Engineering Science with a focus in Biomedical Engineering. Subsequently, I plan to transition into the industry to develop and create medical devices.

WORDS TO LIVE BY: "Nothing can dim the light which shines from within." Maya Angelou



Funmilayo Ajani

HOMETOWN: Bronx, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Department of Ingestive Behavior/ Neuroendocrine

SUMMER MENTOR: Dr. Derek Daniels

SUMMER MENTOR TITLE: Professor and Chair

DEPARTMENT: Biological Sciences

SUMMER PROJECT: *Vasopressin deficiency enhances central GLP-1-mediated suppression of fluid intake in the Brattleboro rat*

ABSTRACT: Food and fluid intake are closely related, making it difficult to isolate mechanisms that control fluid intake

Thirst and hunger share neural, chemical, and behavioral elements such as GLP-1, a neuropeptide that controls food and fluid intake. GLP-1 suppresses thirst in laboratory animals and humans. Understanding GLP-1's role in fluid intake is crucial for treating disorders like diabetes and obesity, where fluid balance is often disrupted. However, the mechanisms and locations of GLP-1's regulation of fluid intake remain unclear. This research examines the effects of a GLP-1 agonist on Brattleboro rats. These rats have diabetes insipidus (DI), a condition characterized by a lack of vasopressin, leading to excessive fluid intake and frequent urination. Brattleboro rats exhibit greater than normal suppression of water intake after GLP-1 receptor agonist treatment, but food intake suppression remains normal. This suggests a difference in the GLP-1 system's regulation of drinking versus eating behaviors in these rats. The study provides insights into the GLP-1 system's role in ingestive behaviors and highlights the potential to separate its effects on food and fluid intake, aiding in managing fluid imbalance in clinical conditions.

ACADEMIC AND CAREER GOALS: To obtain a Doctorate of Medicine and become a Travel Surgeon.

WORDS TO LIVE BY: "Don't be motivated by the fear of failure be motivated by the possibility of success" - Unknown



Iyitunde Akinsola

HOMETOWN: Livermore, CA/Deer Park, NY

MAJOR: Aerospace Engineering

INTERNSHIP PLACEMENT: Department of Mechanical and Aerospace Engineering Sound & Vibrations Laboratory

SUMMER MENTOR: Dr. Mostafa Nouh

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Mechanical and Aerospace Engineering

SUMMER PROJECT: *Noise-immune Mechanical Wave Computing via Metamaterials*

ABSTRACT: Mechanical Computers (MCs) have historically been employed for tasks such as astronomical calculations, tide height estimation, and economic modeling. With the rise of digital electronics and owing to their fast-computing speed, MCs became obsolete. However, there is still a critical need for mechanical systems to maintain intelligence and information processing capabilities in remote locations, elevated temperatures, and ionizing radiation where digital computing is infeasible. Mechanical wave-based computing harnesses acoustic wave properties such as amplitude, frequency, and phase to encode and process information, providing a path for computing in extreme environments. Yet, these waves are vulnerable to disturbances that can interfere with and distort signals, limiting computational capabilities. Metamaterials, which are artificially engineered structures, exhibit unique mechanical properties like vibration absorption and tunable band gaps. This research investigates the immunity of metamaterial-based MCs to external noise. By analyzing individual unit cells of the metamaterial incorporating local resonators, wave propagation and dispersion curves can be predicted. This approach also reveals band gap characteristics that can be optimized by fine-tuning the geometry of the unit cell to filter out undesirable noise. Our findings demonstrate the capability to perform computational tasks without noise interference, offering a significant computational advantage in challenging conditions.

ACADEMIC AND CAREER GOALS: To obtain a master's degree in Aerospace Engineering, followed by an MBA. My career goals include working in the industry to develop efficient propulsion systems that run on renewable fuels and eventually starting my own business. Additionally, I aspire to advocate for students majoring in STEM fields in Nigeria.

WORDS TO LIVE BY: "Struggle and criticisms are prerequisites for greatness. That is the law of this universe and no one escapes it. Because pain is life but you can choose what type: Either the pain on the road to success. Or the pain of being haunted with regret." - Prince Ea

CSTEP SUMMER 2024

RESEARCH INTERNSHIP SCHOLARS



E. Wisdom Akinyele

HOMETOWN: Buffalo, NY

MAJOR: Psychology

INTERNSHIP PLACEMENT: Meyer Laboratory of Motivation and Addiction, Department of Psychology, Behavioral Neuroscience

SUMMER MENTOR: Dr. Paul J. Meyer

SUMMER MENTOR TITLE: Associate Professor

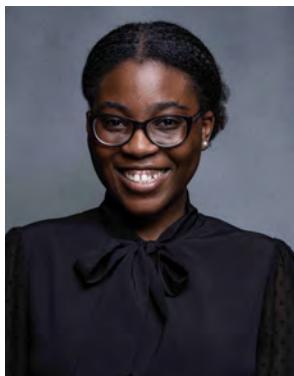
DEPARTMENT: Psychology

SUMMER PROJECT: *The Effects Of Psilocybin On Social Self-Administration In Rats*

ABSTRACT: Nicotine causes relapse even after long abstinence periods. Previously, the psychedelic drug psilocybin promoted cessation from smoking in humans¹. However, in rat studies, psilocybin increased nicotine consumption², perhaps due to the lack of immediate negative consequence to nicotine consumption in rats. Thus, we sought to develop a rat paradigm in which nicotine consumption competes with social interaction, a beneficial reinforcer³. However, few studies have examined psilocybin's effects on social reinforcement. Thus, in this initial experiment, we determined whether psilocybin would increase social self-administration. Rats were injected with saline or one of two psilocybin doses forty-eight hours before being allowed to respond for contact with another rat. Psilocybin-induced locomotor depression and responding for the social reinforcer were the primary measures. Our ongoing studies suggest no alteration of responding despite the expected locomotor depression. Currently, rats receive additional psilocybin injections to determine whether repeated injections increase social reinforcement. This experiment will establish the foundation for a translationally relevant choice paradigm in which we hypothesize psilocybin will increase social interaction at the expense of nicotine self-administration. In turn, this will enable future studies to determine the effects of set, setting, and other influences on psychedelic-assisted therapy.

ACADEMIC AND CAREER GOALS: To obtain a Bachelor's in Psychology and Minors in Pharmacology and Toxicology and Biological Sciences and proceed onto to professional school obtaining an MD and becoming a surgeon.

WORDS TO LIVE BY: "If you can't fly, then run, if you can't run then walk, if you can't walk then crawl, but whatever you do, you have to keep moving forward." - Martin Luther King, Jr.



Precious Alamu

HOMETOWN: Lagos, Nigeria/ Brooklyn, NY

MAJOR: Neuroscience; Linguistics

INTERNSHIP PLACEMENT: UB Behavioral Neuroendocrinology Lab

SUMMER MENTOR: Dr. Matthew Paul

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Psychology

SUMMER PROJECT: *The Role of Estradiol in the Development of Parvalbumin in the Prefrontal Cortex*

ABSTRACT: Adolescence is a critical period marked by significant neural development, especially in the prefrontal cortex (PFC) which is crucial for social, emotional, and cognitive development. Deficits in PFC development can result in mental health disorders. During adolescence, there is an increase in parvalbumin (PV), a protein vital for PFC microcircuitry development and function. Increased gonadal hormones at puberty coincide with adolescence and are thought to influence PFC development. Furthermore, PV cells contain estrogen receptors, suggesting estradiol might facilitate adolescent increases in PFC PV. The present research tests this hypothesis: estradiol increases parvalbumin. Juvenile female Siberian hamsters were divided into three groups: ovariectomized and treated with estradiol, ovariectomized and given a vehicle capsule, and sham-operated and given a vehicle capsule (control animals). Two weeks later, hamsters were sacrificed, and brains were processed using immunohistochemistry to quantify PV in the PFC. It is predicted that estradiol treatment will increase PV, whereas ovariectomy will decrease PV, compared to controls. Determining estradiol's role in PV development will advance our understanding of PFC maturation and the potential impact of estrogen-disrupting chemicals on its development. This research is crucial for uncovering factors contributing to psychological and mood disorders that emerge during adolescence.

ACADEMIC AND CAREER GOALS: I aim to become a physician-scientist in neurology and neurosurgery, applying innovative discoveries to patient care and addressing current critical questions, while serving my family and community with dedication.

WORDS TO LIVE BY: "Trust in the Lord with all your heart; do not depend on your own understanding. Seek his will in all you do, and he will show you which path to take." Proverbs 3:5-6



Oluwayemisi Babalola

HOMETOWN: Queens, NY

MAJOR: Computer Science

INTERNSHIP PLACEMENT: School of Engineering and Applied Sciences

SUMMER MENTOR: Dr. Arri Rudra

SUMMER MENTOR TITLE: Professor and Katherine Johnson Chair in Artificial Intelligence

DEPARTMENT: Theory Lab

SUMMER PROJECT: *Fast Fourier Transform on Structured Matrices*

ABSTRACT: The Fourier Transform is a mathematical tool used to break down signals into their sinusoidal components. Similarly, the Discrete Fourier Transform (DFT) analyzes signals and decomposes discrete and finite signals into complex numbers. A more efficient way to compute the DFT is through the Fast Fourier Transform (FFT). The FFT reduces computation time from $O(n^2)$ to $O(n \log n)$ by employing a divide-and-conquer strategy. This method recursively breaks down the problem into smaller subproblems until it reaches a base case of one, then combines the results to produce the final output. This survey explores efficient algorithms for computing the FFT and their applications in deep learning. FFT's result is often represented as a structured matrices family, butterfly matrix, known for its predefined diagonal structure. The size of the matrix must be a power of two, and its values are arbitrary. By leveraging the properties of structured matrices like the butterfly matrix, the FFT can efficiently handle large datasets, making it a crucial tool in various computational applications. This robust algorithm is widely used in signal processing, imaging processing, and other fields requiring frequency analysis of signals. The structured approach of the FFT allows for faster and more efficient computations.

ACADEMIC AND CAREER GOALS: To enter the corporate world after obtaining my BS in computer science.

WORDS TO LIVE BY: "Well done is better than well said."



Donaldine Boukari

HOMETOWN: New York City, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Department of Biological Sciences

SUMMER MENTOR: Dr. Shermali Gunawardena

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Biological Sciences

SUMMER PROJECT: *Behavioral Aspects of Larvae expressing human alpha-synuclein*

ABSTRACT: Parkinson's disease is a neurodegenerative disease characterized by loss of motor function, uncontrollable movements as well as balance and coordination. Previously we showed that *Drosophila* larvae overexpressing human Alpha-Synuclein which is a protein found in Parkinson's disease Lewy bodies play a role in motor protein defects which lead to axonal blockages, transport defects as well as synaptic dysfunction. Alpha-Synuclein makes up 1% of protein found in our brain and seems to play a critical role in neurotransmitter release. We also show that the NAC domain in alpha-synuclein plays a significant role in the protein aggregation and knockout of this protein leads to cell rescues. However, it remains unclear how Alpha-Synuclein protein functions. Here, we test the hypothesis that larvae overexpressing human Alpha-Synuclein protein will show motor and sensory dysfunction and chemosensory/mechanosensory defects. To test our hypothesis six genotypes (wild type, alpha-syn Wild type, alpha-syn-NAC, alpha-syn 1-120, alpha-syn A30P/ A53T) were tested for larval behaviors such as crawling velocities and contractions, response to attractants/repellents and heat. We expect larvae overexpressing human Alpha-Syn to react differently compared to the wild type. All these behaviors will be considered to identify what potential sensory pathway might be affected by human Alpha-Synuclein protein.

ACADEMIC AND CAREER GOALS: To obtain an MD degree and open my own hospital in underdeveloped country.

WORDS TO LIVE BY: "If the why doesn't make you cry the price of commitment will always be high."

CSTEP SUMMER 2024

RESEARCH INTERNSHIP SCHOLARS



Zara Braimah

HOMETOWN: Baldwin, NY

MAJOR: Chemistry

INTERNSHIP PLACEMENT: The Jacobs School of Medicine and Biomedical Sciences

SUMMER MENTOR: Dr. Arin Bhattacharjee

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Pharmacology and Toxicology

SUMMER PROJECT: *Localizing Scaffold Protein Magi-3 in CGRP-Expressing Nociceptors*

ABSTRACT: About 20.9% of Americans have incurable chronic pain. Common treatments like NSAIDs can cause kidney damage, while opioids can lead to drug dependency. Chronic pain is associated with CGRP-expressing nociceptive neurons. Generally, the NGF/TrkA pathway promotes neuronal growth, protection and repair. However, excess production of nerve growth factor (NGF) can cause chronic unresponsive pain. In a previous study of the MAGUK kinase scaffold protein family, Magi-1 was found to regulate the pain pathway of nociceptive neurons. But the role of Magi-3 in nociceptive neurons is unknown. Our research aims to determine the role of Magi-3 in pain signaling via interaction with NGF receptor TrkA. This experiment seeks to elucidate the current knowledge on pain pathways, identify novel targets to treat chronic pain, and illuminate therapeutic alternatives. By using CGRP as a marker of nociceptors an immunohistochemistry assay was performed using mice skin to observe Magi-3, CGRP, and TrkA protein expression and colocalization. Magi-3 is expected to overlap with CGRP and TrkA, indicating Magi-3's significant role in pain signaling and as a regulator of the NGF/TrkA pain pathway. This experiment could guide future evaluations of Magi-3's pain alleviating properties for non-addictive chronic pain therapies as alternatives to opioids and NSAIDs.

ACADEMIC AND CAREER GOALS: To obtain a medical degree.

WORDS TO LIVE BY: "Anyone who has never made a mistake has never tried anything new." - Albert Einstein



Andrea Calderon

HOMETOWN: Long Island, NY

MAJOR: Biomedical Sciences

INTERNSHIP PLACEMENT: Department of Pediatrics at Jacobs School of Medicine

SUMMER MENTOR: Dr. Stephanie Anzman-Frasca

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Pediatrics

SUMMER PROJECT: *Exploring the Link Between Preschoolers' Negative Affectivity & Parental Feeding Styles*

ABSTRACT: Negative affectivity refers to children's predisposition for mood variability and negative affect. Greater negative affectivity has been linked with increased weight and caregivers' use of indulgent feeding styles (i.e., low demandingness/high responsiveness). However, less is known regarding the relationship between these variables among more sociodemographically diverse families. This study examined the relationship between negative affectivity and parent feeding dimensions (responsiveness/demandingness) and styles among participants from a prior randomized controlled trial (n=50). Families were invited to complete a follow-up survey in Summer 2024. 44 parents (M=34.0 years, 97% mothers, 38.6% <\$49,999 annual household income) completed the survey about their preschooler (M= 4.2 years, 52.3% girls). Parents reported on demographics, their feeding style (Caregiver's Feeding Styles Questionnaire), and their child's temperament (Child Behavior Questionnaire-Very Short Form). Linear regression and ANCOVA examined links between negative affectivity and parent feeding dimensions and style, respectively. Child negative affectivity was positively associated with parents' demandingness in feeding ($t= 2.44$, $p= 0.02$). Negative affectivity was not significantly associated with parent responsiveness ($t= -1.76$, $p= 0.09$) or feeding style ($p= 0.15$). Findings differed from prior literature, suggesting the need for continued work among sociodemographically diverse families and longitudinal studies examining links with weight outcomes within these populations.

ACADEMIC AND CAREER GOALS: To obtain a medical degree to focus on spinal and nerve surgery and to open clinics in Ecuador to advance the medical community overseas.

WORDS TO LIVE BY: "Comparison is the thief of joy." - Theodore Roosevelt



Kellyann Cleary

HOMETOWN: Middletown, NY

MAJOR: Medical Laboratory Science

INTERNSHIP PLACEMENT: Jacobs School of Medicine and Biomedical Sciences

SUMMER MENTOR: Dr. Ira Blader

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Microbiology and Immunology

SUMMER PROJECT: *The Role of PhyA Deletion on Toxoplasma Gondii Replication*

ABSTRACT: *Toxoplasma gondii* is an obligate intracellular parasite that infects a third of the world's population. It causes a disease called toxoplasmosis and can be fatal in immunocompromised individuals and fetuses. Transmission occurs through feline oocytes, contaminated meats, and soil. *Toxoplasma gondii* is an ideal organism to study because the genome is sequenced and can be grown in vitro. The ability to disseminate from the small intestine to other organs depends on survival in recruited immune cells. In previous experiments with mice, the PhyA strain attenuates virulence and reduces cyst formation. The protein PhyA is important in sensing low-oxygen environments and evading the immune response. Interferon-gamma is a cytokine that degrades tryptophan, a nutrient necessary for the parasite's survival. Previous data showed that when interferon-treated cells are supplemented with tryptophan, *Toxoplasma* can replicate but not the PhyA mutant. We studied where in endodyogeny, the cells arrest with pre-treatment of tryptophan and interferon-gamma in the PhyA strain. Using immunofluorescence assays, human fibroblast cells were pre-treated with interferon-gamma and tryptophan 24 hours before infection. Cells were grown at 21% oxygen. Results show that PhyA replication is blocked when treated with interferon. Understanding how *Toxoplasma* replicates is important in developing future targeted treatments.

ACADEMIC AND CAREER GOALS: To become a licensed medical laboratory scientist.

WORDS TO LIVE BY: "Hold fast to dreams, for if dreams die, life is a broken-winged bird that cannot fly." - Langston Hughes



Kymani Getfield

HOMETOWN: Utica, NY

MAJOR: Nuclear Medicine Technology

INTERNSHIP PLACEMENT: Jacobs School of Medicine and Biomedical Sciences

SUMMER MENTOR: Dr. Stewart Clark

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Pharmacology and Toxicology

SUMMER PROJECT: *Evaluating the Midbrain-to-Pons Ratio in hTau Rats as a Potential Early Biomarker for Progressive Supranuclear Palsy-Richardson's Syndrome*

ABSTRACT: Progressive Supranuclear Palsy Richardson's Syndrome (PSP-RS) is a rare neurodegenerative disorder. PSP-RS exhibits similar symptomology to Parkinson's disease, such as motor function impairment, resulting in frequent misdiagnosis. Unlike Parkinson's disease, PSP-RS displays abnormal tau protein aggregation that causes atrophy in the pedunculopontine tegmentum (PPT) and the midbrain. In PSP-RS patients, midbrain atrophy with no pons atrophy is identified as the "hummingbird sign" through Magnetic Resonance Imaging (MRI). This hallmark pathology differentiates PSP-RS from Parkinson's disease. Using an animal model, AAV8 viral vectors were used to express wild-type human tau (hTau) specifically in the cholinergic neurons of the PPT. MRI brain scans of hTau rats were compared to our controls eGFP and Null. Analyze 14.0 software was used to measure the midbrain-to-pons size ratio. We hypothesize that a decrease in the size of the midbrain-to-pons ratio in hTau rats over 7, 12, and 17 months will correlate with PSP-like pathology and early symptoms. The results from the midbrain-to-pons ratio in hTau rats may be used as a comparable measure for tracking the progression of PSP-RS in humans. This research hopes to aid in future longitudinal studies that target the development of treatments for PSP-RS in humans well before symptoms appear.

ACADEMIC AND CAREER GOALS: To obtain a Bachelor of Science degree in Nuclear Medicine Technology and become an Interventional Radiologist.

WORDS TO LIVE BY: "The heights by great men reached and kept were not attained by sudden flight, but they, while their companions slept, were toiling upward in the night." - Henry Wadsworth Longfellow



Li Yi Hu

HOMETOWN: Brooklyn, NY

MAJOR: Biochemistry

INTERNSHIP PLACEMENT: Chemler Lab

SUMMER MENTOR: Dr. Sherry R. Chemler

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Chemistry

SUMMER PROJECT: *The Synthesis of Anti-Cancer Compound, α -Tocosprio C*

ABSTRACT: Colon cancer is the second deadliest cancer in the United States, with the American Cancer Society estimating 50,000 deaths out of the 150,000 diagnosed annually. However, early detection, surgical intervention, and use of chemotherapy can make it treatable. *Cirsium Setosum*, used in folk medicine for generations for its hepatoprotective and antioxidant effects, contains α -tocosprio C, which links to the anti-colon cancer properties with an IC_{50} (HCT-8) = 0.03 μ M. Our objective is to derive a novel synthesis route to α -tocosprio C using abundant commercially available materials utilizing established reactions notably Grignard, ring-closing metathesis, deprotection, and oxidation. The Chemler lab is developing a new, enantioselective alkene iodoetherification reaction that will be applied to the synthesis of α -tocosprio C. To obtain α -tocosprio C as the final product, the racemic intermediate is tested in the Suzuki cross-coupling reaction and evaluated for efficiency. Subsequently, the resulting product undergoes testing to confirm allylic oxidation is viable, ultimately producing α -tocosprio C. Once successful, the enantioselective iodoetherification will be applied for the enantioselective total synthesis of α -tocosprio C. With the natural product in hand, we will collaborate with cancer biologists to further investigate the therapeutic potential of α -tocosprio C for the treatment of colon cancer.

ACADEMIC AND CAREER GOALS: To obtain an MD/PhD and become a dermatologist, or work in research and development in cosmetic chemistry for a beauty company.

WORDS TO LIVE BY: "Life is a journey to be experienced, not a problem to be solved." - Winnie the Pooh



Sabrina Johnson

HOMETOWN: Long Island, NY

MAJOR: Computer Science

INTERNSHIP PLACEMENT: Dept. of Mechanical and Aerospace Engineering

SUMMER MENTOR: Dr. Ehsan Esfahani

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Mechanical and Aerospace Engineering

SUMMER PROJECT: *Detecting Patient Engagement in Robotic Rehabilitation Using IMU and sEMG Signals*

ABSTRACT: In the United States, 795,000 people suffer from stroke annually, with approximately 80% sustaining motor impairments. Traditional physiotherapy has drawbacks such as intensity and uncertainty, leading to inadequate patient participation and inconsistent progress evaluation. Rehabilitation robotics has proven more effective in patient recovery. However, interfaces between users and robots are not intuitive due to the nature of human motion. We aim to use a classifier that detects patient engagement in physical therapy activities using IMU and sEMG signals. This information will be used to adjust the force exerted by a rehabilitation robot. The robot should provide more force when the patient is engaged but unable to move the robot's end-effector, and less force when the patient's engagement is passive or their force is adequate. The force parameter can be tuned in real time using the developed classifier, optimizing the patient's effort during therapy tasks and accelerating recovery time. This research is a starting point for machine learning in rehabilitation robotics using IMU and sEMG signals. The developed algorithm could serve as a foundation for more complex and intuitive computer-human interaction detection.

ACADEMIC AND CAREER GOALS: To obtain a Bachelor's in Computer Science and become a Distributed Systems Engineer.

WORDS TO LIVE BY: "Your new life is going to cost you your old one. It's going to cost you your comfort zone and your sense of direction." - Brianna Wiest



Avein Joseph

HOMETOWN: Brooklyn, NY

MAJOR: Electrical Engineering

INTERNSHIP PLACEMENT: School of Engineering and Applied Sciences

SUMMER MENTOR: Dr. Nicholas Mastronarde

SUMMER MENTOR TITLE: Associate Professor, Co-director of Undergraduate Studies

DEPARTMENT: Electrical Engineering

SUMMER PROJECT: *Design and implementation of Python-based control software for wirelessly networked autonomous unmanned aerial vehicles (UAVs)*

ABSTRACT: Unmanned aircraft vehicles (UAV) swarms have a plethora of practical uses within distribution, surveillance, and emergency services industries. However, FAA rules limit the number of drones per operator due to collision concerns. Therefore, control software paired with UAV simulators are a simple way to test multi-UAV experiments. A new control software is needed at UB since the original control software (UBANC) was not properly documented. This research aims to develop and implement a new control software using Python's state machine, pymavlink and socket programming libraries for UAV control and communication. The control software written will be visualized using UB's UAV simulator (UBANC G2). The system will be well-documented and written in Python to enhance accessibility and enable future multi-drone experiment advancements at UB.

ACADEMIC AND CAREER GOALS: To obtain my masters in electrical engineering and to work in industry as a power engineer or project manager. To develop my own patent in a future electrical device e.g energy system or devices.

WORDS TO LIVE BY: "Nothing in this world can take the place of persistence. Talent will not: nothing is more common than unsuccessful men with talent. - Calvin Coolidge



Doaa Kanan

HOMETOWN: Schenectady, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Gates Vascular Institute

SUMMER MENTOR: Dr. Jessy J Alexander

SUMMER MENTOR TITLE: Research Professor

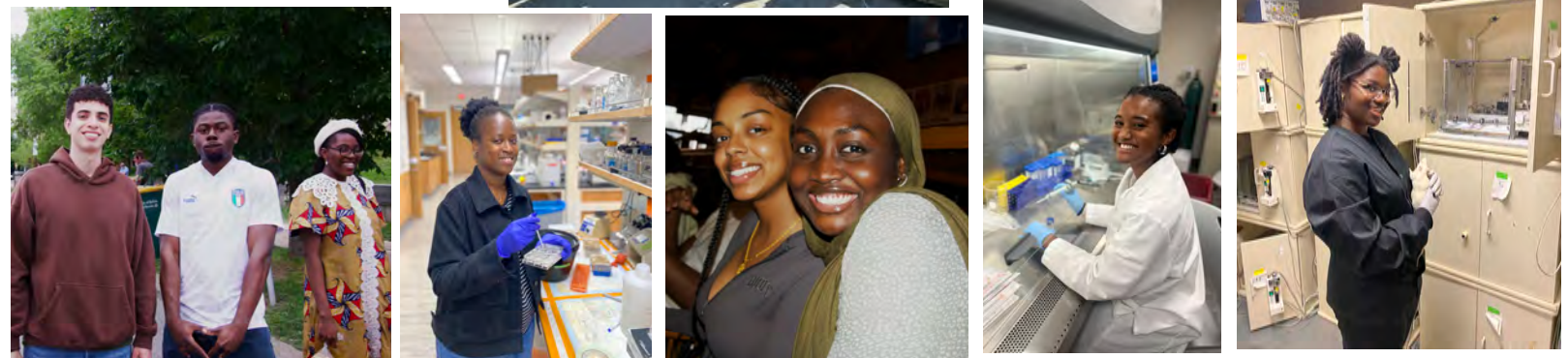
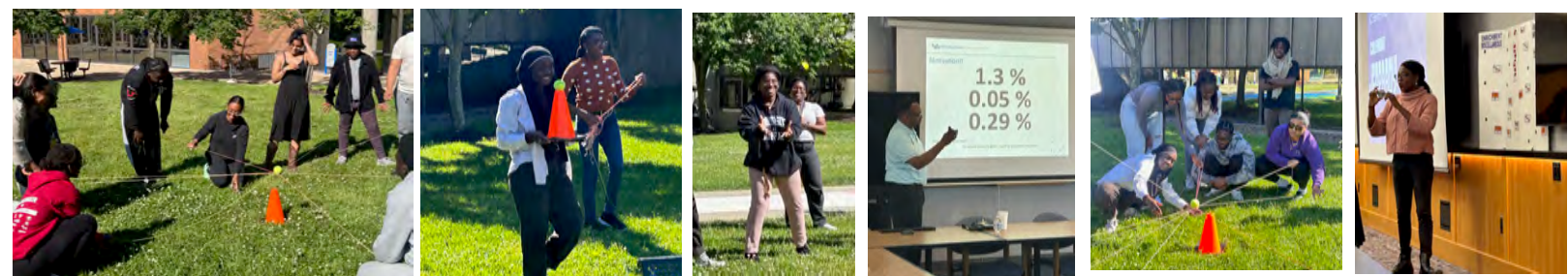
DEPARTMENT: Medicine

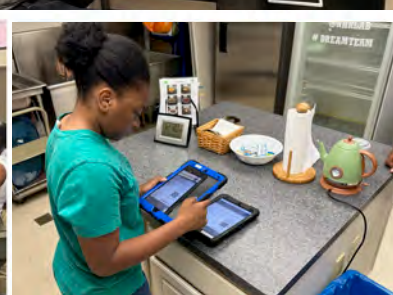
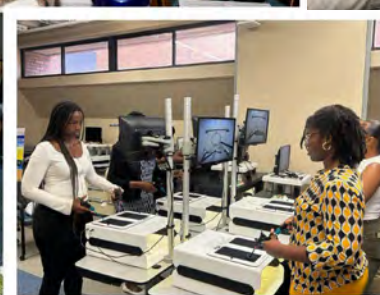
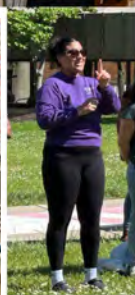
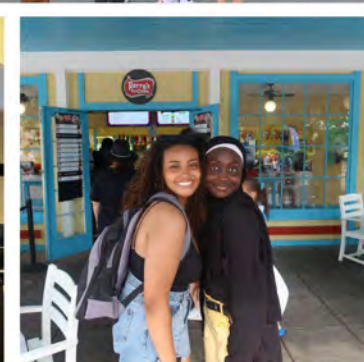
SUMMER PROJECT: *Role of Factor H on Kidney Disease*

ABSTRACT: The complement system is a crucial part of the immune system, enhancing the ability of antibodies to clear foreign pathogens. Complement component 3 (C3) is a key protein in this system. Factor H (FH) regulates C3 in the alternative pathway, the deficiency of FH can lead to uncontrolled complement activation resulting in an autoimmune response. Deficiency of FH results in diseases such as Dense Deposit Disease, Age-related Macular Degeneration, and Paroxysmal Nocturnal Hemoglobinuria. Our research investigates if FH modulates blood flow and C3 deposition in the kidneys. To understand the role of FH, we used different mouse models. We ensured the genotype of the mice by PCR, with C57BL6 as our WT, FH as our knockout, FH/C3KO, and FH/C3aRKO as our double knockouts. We analyzed kidney blood flow using transmissive-detected laser speckle and immunofluorescence to detect C3. Our findings demonstrated no change in blood flow, and deficiency of FH causes C3 deposition in the kidneys. This is significant because C3 breakdown occurs in the absence of FH, generating anaphylotoxins that attract immune cells by chemotaxis and not by increased blood perfusion. This opens new avenues for investigating how FH deficiency contributes to kidney damage and impaired kidney function.

ACADEMIC AND CAREER GOALS: To attend medical school, obtain a MD and become a pediatrician.

WORDS TO LIVE BY: "The future belongs to those who believe in the beauty of their dreams." - Eleanor Roosevelt







Andrea Kyaw

HOMETOWN: Buffalo, NY

MAJOR: Computer Science

INTERNSHIP PLACEMENT: Computation and Equity Lab

SUMMER MENTOR: Dr. Kenneth Joseph

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Computer Science

SUMMER PROJECT: *Understanding Demographics and Attitudes Toward Race and Gender: A Twitter-Based Analysis*

ABSTRACT: This study explores the demographics of political elites who expressed attitudes about race and gender on Twitter from 2014-2022. Understanding these expressions gives insight into the prevalence of different racial ideologies, i.e. about different understandings of the role that race plays in American society, and how the prevalence of different racial ideologies shifted over time. The research objective of my summer project is to develop a method to help differentiate tweets that are relevant to expressions about racial ideology, versus those that are not. More specifically, my goal is to develop a machine learning model to accomplish this task. To do so, use a large language model (e.g. ChatGPT) and hand labeling to develop and evaluate our method. Using the method I will develop; our research team will be able to better focus on tweets relevant to our overall goal using more in-depth qualitative analysis. Once complete, our work will help show how different kinds of people and political elites express attitudes towards race online and how those changed over time in response to salient political events, and ultimately will contribute to a better understanding of social dynamics and inequalities.

ACADEMIC AND CAREER GOALS: To obtain a Master's degree in Computer Science.

WORDS TO LIVE BY: "What you do makes a difference, and you have to decide what kind of difference you want to make." - Jane Goodall



Aisha Makama

HOMETOWN: Niagara Falls, NY

MAJOR: Biochemistry

INTERNSHIP PLACEMENT: Roswell Park Comprehensive Cancer Center

SUMMER MENTOR: Dr. Michael E. Feigin

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Pharmacology and Therapeutics

SUMMER PROJECT: *Analyzing the Effects of Therapeutics on CAFs Using a Reporter-Based Assay*

ABSTRACT: Cancer is a disease that occurs due to uncontrollable cell growth. Pancreatic cancer is the third deadliest cancer type. Pancreatic cancer has a five-year survival rate of 12.8 percent due to its low detection rate and dense tumor microenvironment (TME) composed of Cancer-associated fibroblasts (CAFs). These CAFs can either promote or restrain tumorigenic activity. CAFs can be divided into 2 major sub-types - the more tumorigenic inflammatory CAFs (iCAFs) and the tumor-restraining myofibroblastic (myCAFs). My goal this summer is to create a reporter tool that will allow us to test the effect of different compounds on their ability to modify CAF fate. The cell line will express the myCAF-specific marker α -SMA and the iCAF-specific marker IL-6 with a fluorescent readout that can be visualized microscopically. This will allow us to simultaneously screen multiple types of drugs, at various concentrations and at different time points. Understanding how these compounds affect CAF fate will allow us to predict their impact on tumors in mice better. This will facilitate the development of targeted therapies that progress to preclinical trials in mouse models.

ACADEMIC AND CAREER GOALS: To obtain an MD-PhD in cancer biology and become a Physician Scientist.

WORDS TO LIVE BY: "My mother said I could be anything I wanted." — Ocean Vuong



Taona Maphosa

HOMETOWN: Coming, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: School of Dental Medicine

SUMMER MENTOR: Dr. Rosemary Dziak

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Oral Biology

SUMMER PROJECT: *Effects of (1, 4 DPCA) on human osteoblastic cells*

ABSTRACT: When there is a disease such as periodontal disease or osteoporosis that leads to bone loss, osteoblastic cells need to be activated to support bone healing and restoration. There are many factors involved in the regulation of osteoblasts and drugs such as 1,4-dihydrophenonhthrolin-4-one-3-carboxylic acid (1, 4 DPCA) have been shown to have potential for regeneration. However, more research is needed for effective administration of the drug to sites where tissue restoration is needed. The focus here is on the use of hydrogels, as a carrier for the drug and strontium ions and a scaffold for improved osteoblastic cellular metabolism and function. Human osteoblastic cells obtained from a commercial supplier were cultured. An MTT assay was used to measure cellular activity. Experimental groups were made with different combinations of 1,4 DPCA, strontium citrate, and appropriate control solvents. A sample size of 4 was used for each group. Data, spectrophotometric absorbance readings, were statistically analyzed by ANOVA. The group with all additions (cells, drug, and strontium) should have the largest increase in cell activity. 1,4 DPCA, in a hydrogel scaffold with strontium added as a promoter for cell activity could have potential as a tissue regenerative device.

ACADEMIC AND CAREER GOALS: To pursue a career in biomedicine, possibly through an MD/PhD Program.

WORDS TO LIVE BY: "I'm just doing me, and to me, that's what got me this far."



Ugonna Ofurum

HOMETOWN: Rochester, NY

MAJOR: Computer Science

INTERNSHIP PLACEMENT: DRONES Lab

SUMMER MENTOR: Dr. Karthik Dantu

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Computer Science

SUMMER PROJECT: *Generalized Efficient Autonomous Off-Road Navigation*

ABSTRACT: Autonomous off-road navigation is crucial for applications like search and rescue, off-road missions, and payload delivery. Legged robots, which can handle uneven terrain better than wheeled robots, face significant challenges in reliably and efficiently traversing diverse terrains such as grass, gravel, sand, and mud. Our study aims to address these challenges by focusing on failures between the gait cycles of a legged robot across various planned paths and terrain types, using the data from the robot's sensors, including LiDAR and IMU. This analysis will help the development of improved path-planning algorithms and obstacle detection methods, enhancing the robot's autonomous navigation capabilities. Additionally, the study will create a comprehensive dataset combining visual and proprioceptive sensing, facilitating efficient planning for varying terrains. By understanding and mitigating the causes of mobility inefficiencies, we aim to reduce the time and human intervention required for legged autonomy. Our findings are expected to significantly advance the field of autonomous robotics, improving the safety and effectiveness of robots in real-world, uncertain environments.

ACADEMIC AND CAREER GOALS: To become proficient in IT and become a solutions architect.

WORDS TO LIVE BY: "A chapter in today's book is a page in tomorrow's story."



Eghosa Oshodin

HOMETOWN: New York, NY

MAJOR: Public Health

INTERNSHIP PLACEMENT: UB EATS

SUMMER MENTOR: Dr. Jennifer Temple

SUMMER MENTOR TITLE: Professor and Chair

DEPARTMENT: Exercise and Nutrition Sciences

SUMMER PROJECT: *IHousehold Food Environment and Adolescent Obesity*

Sensitization: RRV Task

ABSTRACT: Many factors contribute to young adults becoming obese and understanding several factors can lead to interventions. This could be the variety of food their exposed to within their household and the amount they consume throughout their life. This can correlate to an individual's determination through a relative reinforcing value of food (RRV) task or hands-on activity. This leads to us predicting that adolescents who are exposed to these varieties of foods at home specifically high-energy-dense will show less determination when it comes to RRV for food that is similar compared to those who may have a lower inventory of food at home. In this study, individuals between ages 11-14 undergo RRV of food or physical activity. Surveys will be given to the participant's parents to determine the food inventory within their household. We hypothesize that the results will show that those with a greater food inventory related to the study will have a lower RRV result than those with a lower food inventory. Our predicted results will support our hypothesis that household food inventory significantly influences the study of determining if an individual is sensitized or stationed, helping to understand the factors that contribute to obesity at a young age.

ACADEMIC AND CAREER GOALS: To become a plastic surgeon and establish my own clinic to help individuals overcome insecurities and improve their confidence.

WORDS TO LIVE BY: "If you can't fly, then run. If you can't run, then walk. If you can't walk, then crawl, but whatever you do, you have to keep moving." - Martin Luther King Jr.



Sebastian Pardo

HOMETOWN: Queens, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: School of Dental Medicine

SUMMER MENTOR: Dr. Laertis Ikononou

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Oral Biology

SUMMER PROJECT: *Verifying the function of a human iPSC reporter line for marking*

PITX2 expression during development

ABSTRACT: The PITX2 homeobox domain gene is the first transcriptional marker of dental epithelium, and is essential for transferring odonto-potential from dental epithelium to mesenchyme (EMT)— a necessary step in early tooth development. The many mechanisms in which the PITX2 gene does this are still not fully understood. A functional reporter line for PITX2 will be useful for investigating these mechanisms by visibly marking PITX2 expression with fluorescence. A proposed PITX2 human induced pluripotent stem cell (iPSC) reporter line will be grown in cultures and directly differentiated into anterior foregut endoderm (AFE). The reporter line differentiated into AFE is known to express PITX2 and is expected to express a fluorescent reporter protein. Expression will be analyzed using fluorescence microscopy and qRT-PCR. If the reporter is absent in differentiated AFE, the proposed reporter line is not functional for marking PITX2 expression, research should focus on developing a new reporter line for PITX2 expression. If the reporter is present after differentiation, the reporter line functions to mark PITX2 expression. The proposed PITX2 reporter line with verified function can be used in future research to study the mechanisms of the PITX2 gene during development. Understanding these mechanisms can be useful to investigate bioengineering teeth.

ACADEMIC AND CAREER GOALS: To become a dentist and open my own practice, doing community work along my journey.

WORDS TO LIVE BY: "Rest at the end not in the middle!"—Kobe Bryant's English Professor



Marvin Petion

HOMETOWN: Brooklyn, NY

MAJOR: Biomedical Sciences

INTERNSHIP PLACEMENT: Clinical and Translational Research Center

SUMMER MENTOR: Dr. Mark D. Hicar

SUMMER MENTOR TITLE: Associate Professor

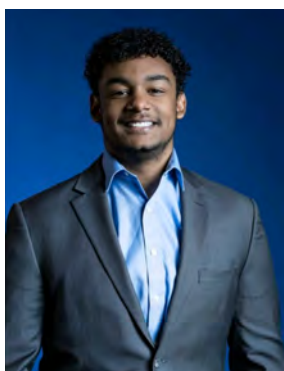
DEPARTMENT: Pediatrics

SUMMER PROJECT: *Preclinical murine vaccine study based on broadly reactive human immunodeficiency virus gp41 epitope previously identified by 2C6 antibody*

ABSTRACT: Since the Human Immunodeficiency Virus (HIV) pandemic began, roughly 80 million people have been infected, resulting in over 40 million deaths. HIV is a blood-borne disease that causes immunodeficiency by targeting CD4 T-cells. To date, there has not been a successful vaccine against HIV. Dr. Hicar's lab discovered the 2C6 antibody that functionally restricts HIV and recognizes the trimeric HIV envelope protein, specifically targeting gp41. Hicar's lab is attempting to create a vaccine that raises 2C6-like antibodies. A 25-amino acid peptide replicating the 2C6 epitope was injected in mice with multiple different adjuvants. The Cobalt-Porphyrin-Phospholipid (CoPoP) formulation showed the highest titers in prior Enzyme-Linked Immunosorbent Assays (ELISA) using the peptide. The current study aims to determine whether we can replicate HIV envelope trimer recognition with a peptide-based vaccine. We used an HIV trimer ELISA and interrogated different serums from prior murine vaccine samples. The results show that our vaccine can induce an immune response that replicates trimer binding, with Porphyrin-Phospholipids and Saponin-derived adjuvants being the best formulations. Future studies will advance to larger animal models once assays confirm 2C6-specific epitope targeting and 2C6-like functioning of vaccine-induced antibodies.

ACADEMIC AND CAREER GOALS: To obtain a MD and become a Physician, Godwilling!

WORDS TO LIVE BY: "Work hard in silence, and let success be the noise."



Diego Sanchez

HOMETOWN: Haverstraw, NY

MAJOR: Mathematical Physics

INTERNSHIP PLACEMENT: High Energy Lab

SUMMER MENTOR: Dr. Salvatore Rappoccio

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Physics

SUMMER PROJECT: *Correcting Detector Effects on Hadronic Jet Mass Measurements Using Machine Learning*

ABSTRACT: Hadronic jets are sprays of particles emerging in high-energy collisions, deriving from the strong force. The strong force, is one of the four fundamental forces in nature. It holds nuclei together, giving immense strength but acting solely at very short distances. The radiation patterns from these collisions can be measured using the mass of the hadronic jets. Our goal is to correct for the effects of the Compact Muon Solenoid (CMS) detector on reconstructed hadronic jet mass from proton-proton collisions at the LHC to recover a measurement of the true jet mass. We use machine learning to create a transfer function that approximates the response of the CMS detector using simulation. The software package Omnifold is used to create and invert this transfer function and apply it to measured data from the LHC. Our task involves adding information about the content of the jet, in addition to the kinematics that are already implemented. This should help correct the detector's effects on the true distribution of the mass of hadronic jets. The hope is for a better understanding of the strong force, fundamental processes in high-energy collisions, and improvements in measuring the mass of hadronic jets.

ACADEMIC AND CAREER GOALS: To obtain a PhD in particle physics and become a researcher working in a well-known particle physics lab.

WORDS TO LIVE BY: "Choose a job you love, and you will never have to work a day in your life." — Confucius



Gabriella Santos

HOMETOWN: Nanuet, NY

MAJOR: Biomedical Engineering

INTERNSHIP PLACEMENT: Center for Research in Cardiovascular Medicine

SUMMER MENTOR: Dr. B. Rita Alevriadou

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Biomedical Engineering

SUMMER PROJECT: *Application of Mechanical Forces in Vascular Endothelial Cells*

ABSTRACT: Heart disease is the number one leading cause of death for adults in the U.S. and has been for the past 100 years. Vascular endothelial cells (ECs) play a crucial role in maintaining vascular homeostasis, and their dysfunction often precedes cardiovascular disease or atherosclerosis. ECs respond dynamically to mechanical forces, which are shear stress (SS) and mechanical stretch, in their natural environment within blood vessels. SS is a frictional force exerted on ECs by blood flow, while mechanical stretch is blood pressure exerted on ECs that leads to a strain on blood vessel walls. Understanding EC responses to these forces is essential for interpreting causes of cardiovascular diseases and developing therapeutic strategies. In our study, human umbilical vein endothelial cells (HUVECs) were cultured under controlled conditions. SS was applied using an orbital shaker with cyclical changes, while mechanical stretch was simulated using a Flexcell tension system. Data collection is ongoing, but we expect SS and mechanical stretch to induce inflammation or dysfunction in ECs. We plan to analyze mRNA levels for inflammatory genes in ECs subjected to mechanical forces. Once we acknowledge the problem of inflammation we will begin to analyze ways in which to develop novel therapeutic strategies.

ACADEMIC AND CAREER GOALS: To obtain a Masters in engineering and become a clinical researcher for cardiovascular health.

WORDS TO LIVE BY: "The first step in solving a problem is to acknowledge that there is a problem to begin with."



Shadine Stoney

HOMETOWN: Brooklyn, NY

MAJOR: Public Health

INTERNSHIP PLACEMENT: UB EATS (Eating Among Teens Study) in the Nutrition and Health Research Laboratory

SUMMER MENTOR: Dr. Jennifer Temple

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Exercise and Nutrition Sciences

SUMMER PROJECT: *The Effects of Food Insecurity on Adolescent Eating Behaviors*

ABSTRACT: Adolescence is a critical stage where individuals develop their eating patterns (Stok et al., 2018). Factors such as income, education, ethnicity, and location can impact access to adequate food. Food insecurity, defined as the persistent concern about access to sufficient and affordable food, can lead to stress (Kakaei et al., 2022). This stress affects adolescents' psychology, influencing impulsivity and motivation to eat. It is hypothesized that parents and adolescents facing food insecurity will experience greater perceived stress about their food intake and cravings, leading to a higher relative reinforcing value (RRV) and delay discounting (DD). This study involves adolescents in Buffalo, NY, aged 11 to 14, from low to moderate-income households (at or below 250% of the federal poverty line). In this longitudinal study, participants will take surveys, eat snack foods, and play computer games over six visits across two years. Our results indicated a positive relationship between household food insecurity and the proportion of total responses made for food. The study aims to provide insights into how food insecurity influences adolescents' eating behaviors and psychological stress, contributing to the broader understanding of public health and nutrition.

ACADEMIC AND CAREER GOALS: To obtain a Master's of Public Health and become an epidemiologist. I am interested in applying my epidemiological skills to researching reproductive disorders.

WORDS TO LIVE BY: "Life is about not knowing, having to change, taking the moment and making the best of it, without knowing what's going to happen next" - Gilda Radner



Ruth Tefera

HOMETOWN: Buffalo, NY

MAJOR: Law

INTERNSHIP PLACEMENT: Volunteer Lawyers Project

SUMMER MENTOR: Charles Case & Natalie Behm

SUMMER MENTOR TITLE: Staff Attorneys

DEPARTMENT: Positive Families

SUMMER PROJECT: *A New Aid for Attorneys: Creating a Searchable Document Containing 500+ Cases*

ACADEMIC AND CAREER GOALS: I hope to attend law school and obtain a J.D. to become a practicing attorney.

WORDS TO LIVE BY: "Attitude is a little thing that makes a big difference." — Winston Churchill



Kayla Yan

HOMETOWN: Mamaroneck, NY

MAJOR: Computer Sciences

INTERNSHIP PLACEMENT: Cybersecurity and Forensic Lab (CactiLab)

SUMMER MENTOR: Dr. Ziming Zhao

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Computer Science and Engineering

SUMMER PROJECT: *Supporting Diversified Software Cybersecurity Education at University at Buffalo*

ABSTRACT: The increasing prevalence of internet-driven cyberattacks underscores a growing need for cybersecurity professionals, yet the field suffers from low diversity, hindering insight into emerging cyber-attack strategies. This issue starts in undergraduate studies, where high dropout rates and dissatisfaction, especially among underrepresented groups, perpetuate a white, male-dominated environment. Backgrounds with prior exposure to technology and resources, often linked to "material wealth," enhance success rates, exacerbating disparities. To address these issues, universities are adopting Capture the Flag (CTF) challenges like the Software Cybersecurity course CSE410. This course equips students with a solid understanding of how software and systems can be both hacked (broken into) and hardened (protected), improving computer security and job-related skills. Additionally, it fosters self-efficacy among students, encouraging perseverance in exploring cybersecurity domains. Using the CSE 410 IoT CTF Platform, students engage with diverse hardware architectures (x86/64) and confront challenges that highlight software vulnerabilities exploited by attackers, equipping them with effective defense strategies. Our study employs qualitative and quantitative methods to analyze student experiences, identify barriers, and refine educational approaches. Leveraging CTF challenges aims to enhance retention rates and support underrepresented students in cybersecurity, promoting inclusivity and cultivating a diverse workforce to meet industry demands.

ACADEMIC AND CAREER GOALS: My goal is to earn a PhD or master's degree in computer science and pursue a leadership role in the emerging fields of cybersecurity or hardware technology.

WORDS TO LIVE BY: "When we set an Intention, Somehow The World Seems To Magically Come To Meet Us." - Midnight Gospel

The 2024 CSTEP Summer Research Program expresses thanks & appreciation to the following workshop & tour facilitators for their contributions & support:

DR. JESSY ALEXANDER

Professor,
Jacobs School of Medicine &
Biomedical Sciences

DR. HANS BOATENG

Investment 101, Tutor

HADAR BORDEN

Director, Startup & Innovation
Collaboratory

ED BRODKA

Career Counselor,
UB Career Design Center

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Associate Dean for Student Affairs,
School of Engineering & Applied
Sciences, Associate Professor of
Teaching, Electrical Engineering

DR. JUDE BUTCH

Senior Associate Director, Student
Engagement

DR. DURELL CALLIER

Visiting Professor, Distinguished
Visiting Scholars Program

DR. SHERRY CHEMLER

Professor of Chemistry

DIANNA CIHOCKI

Clinical Associate Professor, School of
Management

DR. STEWART CLARK

Associate Professor, Pharmacology &
Toxicology

DR. PAUL CULLEN

Professor, Biological Sciences

JAMIL CREWS

Digital Communications Manager, Say
Yes Buffalo

JESSICA DRISCOLL

Innovation Sprints Coordinator,
Startup & Innovation Collaboratory

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Associate Professor, Biomedical
Engineering, San Jose State University

DR. THOMAS FEELEY

Professor, Department of
Communication

DAVE FERRIS

Career Design Consultant, Career
Design Center

JASMINE FOSTER

Career Design Consultant, Career
Design Center

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Professor, Civil, Structural and
Environmental Engineering

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Assistant Dean for Student
Development and Academic
Enhancement

DR. ADAM KISAILIS

Associate Dean, Division of
Educational Affairs, Roswell Park
Comprehensive Cancer Center

FRANKIE KRAFT

Senior Counselor, Counseling Services

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Clinical Associate Professor,
Psychology

LESA LORITTS,

Talent Manager, INROADS Inc.

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Post-Doctoral Research Fellow, John
Hopkins University, Whiting School of
Engineering

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Associate Professor, Chemistry, Stony
Brook University

TOM MURDOCK, MBA

Clinical Assistant Professor, School of
Management

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Associate Professor, Mechanical &
Aerospace Engineering

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LEAD Coordinator, Leadership
Education, Office of Student
Engagement

SUSAN O'ROURKE

Assistant Director, Mentorship
Initiatives

DR. MATTHEW PAUL

Associate Professor of Psychology

DR. JAMES RAMSEY

Director, AJR Services

NELSON RIVERA

Elementary School Teacher at
Frank A. Sedita Academy

Dr. LAVONE RODOLPH

Post-Doctoral Researcher,
Department of Computer Sciences

DR. KEBA ROGERS

Psychologist, Mental Health
Counselor at Grace, Growth and
Greatness Psychological Services

ERIN ROWLEY

Head Librarian, Science and
Engineering Library Services/
Engineering Library

EDUVIJEZ SANCHEZ

Assistant Director of Graduate
Recruitment, Graduate School of
Education

DR. VICKI SAPP

Chief Diversity, Equity & Inclusion
Officer, SUNY Fredonia

DOMINIC M. SELLITTO

Clinical Assistant Professor,
Management Science & Systems

CAROL SCHMEIDLER

Manager of Safety & IH,
Environmental Health & Safety

DR. DOROTHY SIAW- ASAMOAH

Clinical Assistant Professor,
Organization and Human
Resources Department, School of
Management

DR. CHAVIS STACKHOUSE

Post-Doctoral Scholar, Chemistry, Texas
A&M University

MEGAN STEWART

Director, Office of Fellowships and
Scholarships

JOCELYN SWICK-JEMISON

Senior Assistant Librarian, Research,
Collections & Outreach Wide

NEHA TAMHANE

Staff Psychologist, Counseling Services

DR. CHRISTINE TINNESZ

Clinical Assistant Professor, Department
of Communication

TOM VANE

Assistant Director, Student Engagement
for Student Governance & Organizations

KELSEY WAGNER

Entrepreneurial Training Coordinator,
Startup & Innovation Collaboratory

OLIVIA WEST

Founder & Educational Instructor, West
Advisory Group, and Acting Executive
Director of Champions of Change

ALLEN C. WILLIAMS

Assistant Director for Retention Initiatives,
Intercultural Diversity Center

THANK YOU to our 2024 CSTEP Summer Symposium Judges!

<u>NAME</u>	<u>DEPARTMENT</u>
DR. GLORIA AIDOO-FRIMPONG	Epidemiology and Environmental Health
DR. RAMKUMAR ANNAMALAI	Biomedical Engineering
DR. ROSHAN AYYALASOMAYAJULA	Computer Science and Engineering
MS. AMY BAIRD	Engineering Education
DR. SUSAN BAKER	Pediatrics
DR. JAMES BERRY	Biological Sciences
DR. ANN BISANTZ	Dean, Undergraduate Education
DR. KEVIN BURKE	Associate Dean for Student Affairs, SEAS
DR. HYEONGYUN CHA	Mechanical and Aerospace Engineering
DR. REBEKAH CHARNEY	Biochemistry
DR. SHERRY CHEMLER	Chemistry
DR. SAM CRICKENBERGER	Biological Sciences
DR. DEREK DANIELS	Biological Sciences
DR. MEG DEANGELIS	Ophthalmology
DR. ALEXANDER DIEHL	Biomedical Informatics
DR. MICHAEL DWYER	Neurology / Biomedical Informatics
DR. ZACKARY FALLS	Biomedical Informatics
DR. MARINA FEILER	Epidemiology and Environmental Health
DR. MICHAEL GARRICK	Biochemistry
DR. ALAA ELDEEN HASSAN ALI	Mechanical and Aerospace Engineering
DR. ADEDLOYIN INAOLAJI	Electrical Engineering
DR. JOB AIDUR KHAN	Mechanical and Aerospace Engineering
DR. ANN KUHN	Exercise & Nutrition Sciences
DR. LAUREN KURYLOSKI	Engineering Education
DR. JOYCE LACY	Psychology
DR. MICHELE LAURIA	Clinical Informatics and Maternal Fetal Medicine
DR. SUZANNE LAYCHOCK	Pharmacology & Toxicology
DR. KENNETH LEONARD	Psychiatry and Research Institute on Addictions
DR. NICOLE LOWMAN	Engineering Education
DR. CECILIA MARTINEZ	Industrial and Systems Engineering
DR. PAUL MEYER	Psychology
DR. ELIZABETH MIETLICKI-BAASE	Exercise and Nutrition Sciences
DR. CAROLYN MONTGOMERY	Nursing
DR. AANUOLUWAPO OJELADE	Industrial and Systems Engineering
DR. SHAMSAD PARVIN	Computer Science and Engineering
DR. RICHARD RABIN	Pharmacology and Toxicology

THANK YOU to our 2024 CSTEP Summer Symposium Judges!

<u>NAME</u>	<u>DEPARTMENT</u>
DR. BINA RAMAMURTHY	Computer Science and Engineering
DR. DIANA RAMIREZ-RIOS	Industrial and Systems Engineering
DR. ATRI RUDRA	Computer Science and Engineering
DR. BIBHUDATTA SAHOO	Electrical Engineering
DR. PRASHANT SANKARAN	Industrial and Systems Engineering
DR. CHRISTINE SCHANER TOOLEY	Biochemistry
MS. DIANE SCHWARTZ	Biomedical Informatics
MRS. SABRINA SCHWARTZ	School of Nursing
DR. ROH-YU SHEN	Pharmacology and Toxicology
DR. SPYRIDON STAVROU	Microbiology and Immunology
DR. JACK SULLIVAN	Ophthalmology
DR. MARK SWIHART	Chemical and Biological Engineering
DR. CARLEARA WEISS	School of Nursing
DR. HEATHER WILLIAMS	Biological Sciences
DR. JUNGEUN WON	Biomedical Engineering
DR. JENNIFER ZIRNHELD	Electrical Engineering

WHERE ARE THEY NOW?

An Update On Previous CSTEP Summer Research Interns

First Name	Last Name	Summer Research Program Year	UB Major(s)	Where are they now?	What's their title?
Brianna	Acheampong	2007	Electrical Engineering	City of Monroe (North Carolina)	Engineer
Dr. Frank	Acheampong	2007	Pharmacy	National Institutes of Health	Clinical Pharmacist - Informatics
Dr. Geraldene	Agbasionwe	2007	Pre-Pharmacy	Live Good Pharmacy INC	Supervising Pharmacist
Ernestine	Brown	2007	Nursing	University of Rochester Medical Center	Nurse Practitioner
Dr. Corie	Ellison	2007	Pharmacology & Toxicology	Procter & Gamble	Toxicologist
Moses	Farley	2007		PPL Corporation	Engineer
Mark	Glasgow	2007	Biotechnology	Citi	VP, Digital Solutions
Dr. Richard	Linares	2007	Mechanical & Aerospace Engineering	MIT	Boeing Assistant Professor
David	Louis	2007	Psychology	Canarsie Recovery Coalition	Project Director
Dr. Shiny	Thomas	2007	Pharmacy	CVS Pharmacy; Touro College	PharmD
Kevin	Bryant	2008	Electrical Engineering	Bechtel Plant Machinery, Inc	Electrical Engineering Project Manager
Dr. Toni-Shay	Chandon	2008	Pharmacy		PharmD
Dr. Daivon	Garrick	2008	Pharmacology & Toxicology	M&T Bank	VP Credit Risk Analyst
Dr. Marda	Hailu	2008	Biological Sciences	Western New England University College of Pharmacy	PharmD
Dr. Jessica	Isaac	2008	Pharmacy		PharmD
Dr. Aggrey	Jacobs	2008		UB school of engineering	Doctoral Student
Dr. Anthony	Jones	2008	Biomedical Sciences	Environmental Protection Agency	Life Scientist
Dr. Micah	McCurty	2008	Exercise Science	Owner, Therapy Unlimited	DPT
Dr. Hieu	Nguyen	2008	Biochemistry	University of Washington	Resident Pediatric Dentist
Dr. Wilberforce	Osei	2008	Chemistry/ Pharmacology	Bowie, Maryland	PharmD
Francis	Perez	2008	Chemical & Biological Engineering	MS Chemical Engineering from SUNY at Buffalo	Chemical Engineer
Souleymane	Sow	2008	Aerospace Engineering	MS in Aerospace Engineering from Purdue University	Aerospace Engineer

Dr. Franklin	Yeboah	2008	Medical Technology	Massachusetts College of Pharmacy and Health Sciences	PharmD
Dr. Hans	Boateng	2009	Biomedical Sciences	The Investing Tutor	PharmD/MBA
Corinna	Joseph	2009	Engineering	Bechtel Marine Propulsion Corporation (Bechtel Plant Machinery Inc.)	Engineer
Dr. Jean	Mandat	2009	Psychology	New York College of Osteopathic Medicine	Medical Doctor
Dr. Jasmine	May	2009	Biological Sciences	Completed MD/PhD at Northwestern University	Medical Student
Christopher	Williams	2009	Engineering	Lam Research Corp./ IBM Corp.	Field Service Engineer II, (FSE)
Bruck	Adam	2010	Mathematics	IPRO, NYS Department of Health, Office of Quality and Patient Safety, Bureau of Health Informatics	Data Analyst
Dr. Priscilla	Adjei-Baffour	2010	Pharmacy	Marshall University School of Pharmacy	PharmD
Dr. Chiamaka	Agbasionwe	2010	Biological Sciences	Biological Department	PharmD
Derek	Brim	2010	Engineering	NRD, LLC	Electrical Engineer
Joseph	Diehl	2010	Civil Engineering	MS Department of Civil, Structural, and Environmental Engineering, SUNY at Buffalo	Engineer
Ian	Duncan	2010	Mechanical Engineering	Suspension & Steering Dynamics at Honda R&D	Engineer
Christina	Garcia	2010	Biomedical Sciences	Ross University	Medical Student
David	Molina	2010	Finance, Cell and Gene Therapy	Catalent Pharma Solutions	Associate Director
Thao	Nguyen	2010	Engineering	University of Rochester	Engineer with Panasonic
Dr. Adonis	Pimienta-Penalver	2010	Aerospace Engineering	Completed doctoral studies at UB	Doctoral Student
Antonio	Upia	2010	Completed MS Engineering	Mass Electric Construction Co.	Electrical Field Engineer
Keelan	Chu For	2011	Mechanical and Aerospace Engineering	University at Buffalo	Engineer with Moog
Hector	Coco	2011	Mathematics	City of Buffalo Police Dept., JetBlue	Police Officer, Engineer
Belle	Cunningham	2011	Engineering	Pepsi	Project Supervisor
Jonathan	Feliciano	2011	Psychology	NBC Universal, Inc.	Research Analyst
Dr. Tavia	Garvey	2011	Pharmacy	Wegman Food Market	PharmD
Paul	Glenn	2011	Physics	Brooklyn Technical High School	Physics Teacher

Isabel	Gonzalez	2011	Civil Engineering	Completed MS Engineering	Civil Engineer
Dr. Richard	Hunte	2011	Biomedical Sciences	Regeneron	Scientist
Jordan	Jorgensen	2011	Engineering	Knightvest Management	Leasing Professional
Gael	Lamothe	2011	Engineering	SCCS Group	Senior Project Manager
Millicent	Nwankwo	2011	Biological Sciences	Shire Pharmaceuticals	R&D Global Health Economic, Outcomes Research, Epidemiology
Damian	Ogbonna	2011	Computer Engineering	Utilant	Web App Developer
Gino	An	2012	Biological Sciences	UB Dental School	DDS Student
Barinaepkee	Banuna	2012	Pre-Med/Biomedical Sciences	Hofstra Medical School	Medical Student
Sharece	Blake	2012	Electrical Engineering	Catalyst Fitness	Personal Trainer
Nuris	De La Cruz	2012	Completed MS program	Columbia Presbyterian	Psychological Counseling
Dr. Keith	Dolcy	2012	Pharmacy	UNC/Nuventra Pharma Sciences Innovation	Fellow
Brandon	Durant	2012	Engineering	University at Buffalo	Graduate Student
Dr. Ashley	Narain	2012	Biological Sciences	University of Bridgeport College of Chiropractic	Doctor of Chiropractic
Dr. Khalif	Osson	2012	Pharmacy	CVS Pharmacy	Clinical Pharmacy Specialist
Frank	Segui	2012	Engineering	Western Michigan University	Graduate Student, Electrical Engineering
Theresa	Yera	2012	Anthropology, Pre-Med	Liberty Resources	Electronic Records Specialist
Yun	Zheng	2012	Biological Sciences	Bristol Myers Squibb	Senior Associate Scientist
Jonathan	Ahmedu	2013	Mechanical & Aero-space Engineering	Momentive Technologies	Senior Process Engineer
Dr. Summar	Amin	2013	Biomedical Sciences	Anaheim Hills Dental Group and Orthodontics	General Dentist
John	Brito	2013	Biological Sciences	BioReference Laboratories	Medical Technologist
Dr. Nicholas	Costable	2013	Biological Sciences	Montefiore Medical Center	Gastroenterology Fellow
Akeem	Francis	2013	Electrical Engineering	MAHLE	Project Engineer

Johnathan	Goodrum	2013	Electrical Engineering	Google	Software Engineer
John	Habert	2013	Biological Sciences	United States Marine Corps	Company Commander
Dr. Christ Ange	Katche	2013	Pharmacy/MBA	Cambridge Health Alliance	Pharmacy Resident
Muhammad	Khan	2013	Mechanical & Aero-space Engineering	Northrop Grumman	Reliability Engineer (Florida)
James	Lopez	2013	Psychology	Power U Center for Social Change (Miami, Fla)	Executive Director
Dr. Ayo	McKenzie	2013	Chemistry	Temple University	PharmD
Dr. Andrews	Obeng-Ayarkwah	2013	Pharmaceutical Sciences	University at Buffalo School of Pharmacy	PharmD
Michael	Singletary	2013	Electrical Engineering (Mathematics-minor)	United States Army	Officer/ Helicopter Pilot
Dr. Alexandria	Trujillo	2013	Biological Sciences	HR Policy Association	PharmD, Strategic Analyst
Dr. Uzoamaka	Aniagba	2014	Biological Sciences	Indiana University School of Medicine	Medical Doctor
Dr. Warren	Barrett	2014	Chemistry	Riverview Professional Pharmacy	Pharmacy Technician
Leatrice	Bennett	2014	Biological Sciences	Swedish Neuroscience Institute	Coordinator, MPH
Dr. David	Bratton	2014	Biological Sciences	Jacobs School of Medicine & Biomedical School	Medical Doctor
Kevin	Carpio	2014	Mechanical & Aero-space Engineering	Northrop Grumman (California)	Aerospace Engineer (Palmdale, California)
Kemji	Eke	2014	Biology	Huron	Salesforce Consultant
Dr. Robert	Ferguson	2014	Biology	University at Buffalo Dental School	Dentist
Akunne	Kanu	2014	Public Health	Bartow Ophthalmology, LLC	Assistant & Technician
Dr. Jacob	Milling	2014	Biology	University of Florida, Emergency Medicine	Medical Resident
Abas	Omar	2014	Biology	MedFirst Primary Urgent Care	Physician Assistant
Dr. Austin	Price	2014	Biology	UB Jacobs School of Medicine & Biomedical Science	Medical Doctor
Timothy	Semon	2014	Anthropology	Marquette University	Doctor of Dental Surgery
Hamlet	Spencer	2014	Mechanical Engineering	Ingersoll Rand	Design Engineer

Bethany	Walton	2014	English	ECMC Hospital	Social Worker
Dr. Christina	Aponte	2015	Biomedical Sciences	BronxCare Health Syetm	Orthodontic Resident
Dr. Kwame	Boakye-Yiadom	2015	Biological Sciences	Eli Lilly and Company	PharmD, Safety Manager
Kelly	Boamah	2015	Pharmacology & Toxicology	D'Youville School of Pharmacy	PharmD
Joaquin	Canay	2015	Biotechnology	Thermo Fisher Scientific	Biotechnologist
Jennifer Lynn	Donato	2015	Biotechnology	Lake Erie College	Medical Student
Mark	Estudillo	2015	Mechanical Engineering	Meta	Software Engineer
Dr. Shawn	Gibson	2015	Biomedical Sciences	Kings County SUNY Downstate	Emergency Medical Resident
Hoda	Moussa	2015	Biological Sciences	University at Buffalo Law School	Lawyer
Dr. Peter	Okoroza	2015	Pharmaceutical Sciences	PRMA Consulting Ltd	PharmD, Senior Analyst
Folake	Olaleye	2015	Biological Sciences	D'Youville School of Pharmacy	PharmD
Oluwatosin	Oniyide	2015	Biological Sciences	Albert Einstein College of Medicine	Medical Student
Dr. Rasheen	Powell	2015	Pharmacology & Toxicology	Boston Children's Hospital	Post-Doc Researcher
Valeria	Prieto	2015	Civil Engineering	Gilsanz Murray Steficek	Engineer
Dr. Zakiya	Rhodie	2015	Pharmacology & Toxicology	CVS Pharmacy	Pharmacist
I'Yanna	Scott	2015	Biological Sciences	Jacobs School of Medicine	Medical Student
Naza	Abdelrahman	2016	Biomedical Sciences	CITYMD	Medical Scribe
Dr. Ali	Al Qaraghuli	2016	Electrical Engineering	NASA Jet Propulsion Lab	Systems Engineer
Dr. Andrew	Alegria	2016	Mechanical Engineering	Objective Biotechnology	VP of Robotics
Dr. Barituziga	Banuna	2016	Chemical Engineering	Chemical Engineering at Cornell University	Researcher
Emmanuel	Cott	2016	Computer Sciences	Huron	Salesforce Developer
Abdul-Malik	Davies	2016	Chemical Engineering		
Tanahiry	Escamilla	2016	Chemical Engineering	3M	Manufacturing Engineer
Alejandro	Falca	2016	Medicinal Chemistry	UB Jacobs School of Medicine	Medical Student
Jarrett	Franklin	2016	Electrical Engineering	Moog Space and Defense Group	FPGA Design Engineer

Chris	Gnam	2016	Mechanical Engineering	NASA Goddard Space Center	NASA ProjectTrainee
Dominique	Hickson	2016	Computer Engineering	University at Buffalo	MS Computer Science & Engineering
Anna	Huang	2016	Social Sciences Interdisciplinary	Orthofix	Territory Manager
Mohammed	Karim	2016	Biomedical Sciences	US Air Force/UNLV School of Medicine	MD, Resident Physician
Dr. Jalisa	Kelly	2016	Biomedical Sciences	East Carolina University	MD, Psychiatry Resident
Kaytlan	LoCicero	2016	Social Sciences Interdisciplinary	Osmose	MPH, Project Coordinator
Anthony	Lopez	2016	Biological Sciences	SUNY Upstate Medical University	Medical Student
Jillian	Naylor	2016	Biological Sciences	New York City	Dental Student
Aaron	Nimako	2016	Biomedical Sciences	Empire MG Inc	CEO/President
Lee-Mary	Njoku	2016	Biomedical Sciences	Urban Health Plan, Inc.	Physician Assistant
Ndidiamaka	Okoroza	2016	Biomedical Sciences	Drexel University	MD, Cardiologist
Iyamu	Osazuwa	2016	Electrical Engineering	UB School of Engineering & Applied Sciences	Engineer
Lucas	Rugar	2016	Civil, Structural & Environmental Engineering	FreeWheel, Columbia University MS Management Science & Engineering	Senior Manager Analytics
Diamile	Tavarez	2016	Biology/Biological Sciences	Regeneron	Senior Assc. Scientist
Dr. Douglas	Tsahey	2016	Biomedical Sciences	Jacobs School of Medicine	Medical Doctor
Marcus	Ashford	2017	Electrical Engineering	General Motors	Controls Engineer
Dr. Leon	Butcher IV	2017	Psychology	Upstate University Hospital	Dentist
Kennedy	Colon	2017	Civil, Structural & Environmental Engineering	Flatiron Construction	Field Engineer III
Leonardo	Gobbato	2017	Chemical Engineering	Dimien Inc.	VP of Engineering
Dr. Blessing	Hunsu	2017	Chemistry	Caguya Medical Center,	Inpatient Pharmacist
Starr	Johnson	2017	Pharmacology & Toxicology	Aspire of WNY	Team Coordinator
Coral	Lopez-Jimenez	2017	Chemistry	Odoo	Technical Project Mngr
Dr. Neneyo	Mate-Kole	2017	Pharmacology & Toxicology	Schwab Rehabilitation Hospital/University of Chicago	MD, Resident Physician
Lawrence	Owusu	2017	Industrial Engineering	University at Buffalo	MS Industrial Engineering

Ariana	Roman	2017	Psychology	Susan G. Komen Foundation	Program Evaluator
Godfrey	Sakyi	2017	Electrical Engineering	Naval Sea Systems Command	Systems Engineer
Sameer	Shakur	2017	Electrical Engineering	Sunrun	PV System Designer
Tyree	Singleton	2017	Industrial Engineering	United Airlines	Senior Analyst
Ashley	Solomon	2017	Nursing	Sabon NYC	Senior Sales Associate
Cassandra	Ware	2017	Computer Science & Engineering	New Era Cap	Senior Developer
Makayla	Watson-Wales	2017	Speech & Hearing Science	Connected Collaborations	Speech Language Pathologist
Annakay	Adamson	2018	Biological Sciences	UB Jacobs School of Medicine	Medical Student
Gregory	Adams, Jr.	2018	Psychology	Brookfield Properties	Operating Engineer
Abshiro	Ali	2018	Biology/Biological Sciences	UB Jacobs School of Medicine	Post-Bacc Student
Deborah	Amponsah	2018	Pre-Law/Philosophy	Martin Clearwater & Bell LLP	Associate Attorney
Michael	Banjoko	2018	Biomedical Engineering	Prevail Therapeutics	Senior Scientist
Gerardo	Barrera Giron	2018	Environmental Engineering	AECOM	Enviornmental Engineer II
Kwaku	Bonsu	2018	Biological Sciences	UB Jacobs School of Medicine & Biomedical Sciences	Medical Student
Tanzania	Bussey	2018	Pharmacology & Toxicology	UB MS Biomedical Sciences	Graduate Student
Edgar	Claudio	2018	Pharmacology & Toxicology	UB School of Pharmacy	Pharmacy Student
Temara	Cross	2018	Biomedical Sciences	UB Jacobs School of Medicine	Medical Student
Chimaobi	Ezeilo	2018	Computer Sciences	University of Texas at Austin	MS in Computer Science
Jhanna	Flora	2018	Biological Sciences	University at Buffalo MS Biotechnology	Graduated 2021
Steven	Herrera	2018	Mechanical Engineering	University at Buffalo MS Mechanical Engineering	Graduated 2021
Charitie	Hill	2018	Chemistry	Q ² Solutions	Laboratory Project Coordinator
Nasiah	Johnson	2018	Electrical Engineering	Lockheed Martin	Systems Engineer
Brianna	Kinley	2018	Psychology	UB Jacobs School of Medicine and Biomedical Sciences	Medical Student
Jessica	Maxwell	2018	Biochemistry	Geisinger Commonwealth SOM	MBS 2024, Researcher
Shelbi	Molin	2018	Political Sciences	Office of NYS Attorney General	Attorney General Fellow
Keiona	Nance	2018	Exercise Science	Jamestown Public Schools	Certified Athletic Trainer

Nailah	Oronde	2018	Public Health	University at Buffalo	Graduated 2019
Priya	Persaud	2018	Aerospace Engineering	Lockheed Martin	Design Engineer
William	Phillips	2018	Computer Sciences	Sabre Systems Inc.	Software Dev. Engineer
Elizabeth	Quaye	2018	Pharmacology & Toxicology	UB Jacobs School of Medicine & Biomedical Sciences	Researcher
Aliaya	Williams	2018	Biological Sciences	Jacobs School of Medicine	Medical Student
Dr. Marvellous	Adegoke	2019	Pharmacy	UB School of Pharmacy and Pharmaceutical Sciences	PharmD Graduate 2024
Abdulelah	Ahmed	2019	Biomedical Sciences	Fresenius Kabi	Associate Scientist
Taylor	Campbell	2019	Biomedical Sciences	Jacobs School of Medicine	Medical Student
Julie	Campbell	2019	Public Health	University of Pittsburgh	MPH Student
Heather	Evangelista	2019	Environmental Engineering	H2M Architects & Engineers	Water Resources Staff Engineer
Florencia	Fils-Aime	2019	Computer Sciences	General Motors	Software Developer
Triniti	Fitts	2019	Biological Sciences	Jacobs School of Medicine	Medical Student
Ronique	Fletcher	2019	Biological Sciences	NYU School of Public Health	Graduate Student
Allea	Frazier	2019	Psychology	John Hopkins School of Public Health	Bloomberg Fellow
Muhammed	Ibrahim	2019	Computer Science & Mathematics	Boeing	Software Engineer
Ayesha	Ismail	2019	Computer Science	Foxtrot Division	Developer
Arsh	Issany	2019	Biomedical Sciences	Jacobs School of Medicine & Biomedical Sciences	Medical Student
K'Von	Jones	2019	Biological Sciences	Illustrations by K'Von	Illustrator/Artist
Charles	Lafargue	2019	Pharmacology & Toxicology	Jacobs School of Medicine & Biomedical Sciences	Medical Student
Tamijah	Lawton-Stone	2019	Psychology/Sociology	University at Buffalo	Residence Hall Director
Isabelle	Linares	2019	Biomedical Engineering	University of Rochester	PhD Student Biomedical Engineering
Julius	Mark	2019	Mathematics/Actuary Sciences (Statistics minor)	Helpline Coordinator	Community Service Society of NY
Ricardo	Martinez	2019	Mechanical Engineering	EB Mechanical LCC.	Mechanical Engineer
Marcellus	Midyette	2019	Biological Sciences	Inter-mountain Health	Patient Care Technician
Chidubem	Okoroza	2019	Chemical Engineering	University at Buffalo, MS Data Science & Applications	Graduated 2022
Kyle	Pierre	2019	Electrical Engineering	Ford Motor Company	Ford Bronco Systems Engineer
Adegboyega	Thompson	2019	Chemistry	Rush University Medical College	Medical Student
Lesly	Villanueva	2019	Environmental Engineering	Mott MacDonald	Engineer III

Mohammed	Abbadi	2020	Biology/Biological Sciences	DuPont	Lab Analyst
Omolara	Adeyemi	2020	Biology/Biological Sciences	University at Buffalo	Graduated 2022
Isaac	Asante	2020	Public Health	University at Buffalo	Graduated 2021
Jordan	Brathwaite	2020	Biomedical Engineering	NYU Tandon	Graduate Student
Paula	Costa	2020	Neuroscience	University of Pennsylvania	PhD Student Pharmacology
Waldine	Edouard	2020	Chemistry	University at Buffalo	Graduated 2021
Ahamed	Fofana	2020	Computer Sciences	University at Buffalo	Graduated 2022
Sonjii	Parris	2020	Industrial Engineering	Binghamton University	Graduate Student
Brittany	Richardson	2020	Psychology	UB Clinical and Research Institute on Addictions	Research Assistant
Samantha	Watts	2020	Biomedical Sciences	UB Clinical and Research Institute on Addictions	Research Assistant
Malaike	Addo	2020	Public Health	US Army, Defense Intelligence Agency	Finance Liason
Moyofoluwa Rachel	Aguda	2020	Biochemistry	National Institute of Health	Research Trainee
Mirka	Arevalo	2020	Aerospace & Mechanical Engineering	University at Buffalo MBA Program	UX Designer/Graduate Student
Mahanaz	Chowdhury	2020	Civil Engineering	University at Buffalo	Continuing Student
Adwoa	Dadzie	2020	Biology/Biological Sciences	Penn State University	Research Technologist
Michael	Edovia Osagiede	2020	Public Health	Pace University	Nursing Student
Jerry	Ingram	2020	Biology/Biological Sciences	University at Buffalo BS Computer Science	Subsequent Degree Continuing Student
Evelyne	Kouya	2020	Biomedical Sciences	Canisius University	PA Student
Chukwudi	Nwoke	2020	Aerospace Engineering	Grow Brooklyn, Inc.	Environmental Engineer
Ugonna	Okafor	2020	Chemistry	Notre Dame University	Graduate Student (Pharmaceutical Sciences)
Elijah	Panayoty	2020	Electrical Engineering	UB School of Engineering and Applied Sciences/ Raytheon Intelligence & Space	Undergraduate Student
Ophelia	Phillips	2020	Biology/Biological Sciences	CITYMD	Medical Scribe
Nigel	Smith Ordain	2020	Public Health	RTI International	Public Health Analyst III
Dorien	Thompson	2020	Biology/Biological Sciences	Erie Community College	Preparing for Nursing/ PA
Ean	Weise	2020	Mechanical Engineering	Silfex	Mechanical Engineer

Emmanuel	Agyenim Boateng	2021	Biomedical Sciences	CVS	Pharmacy Technician
Chidera	Anameze	2021	Biomedical Sciences	Jacobs School of Medicine	Medical Student
Chidalu	Anameze	2021	Biomedical Sciences	Jacobs School of Medicine	Medical Student
Lillian	Baker	2021	Environmental Engineering	M & J Engineering Inc.	Special Inspector
Jose	Carrasco Ramon	2021	Civil Engineering	Assoc. Concrete Construction	Building Inspector
Jeremiah	Chapman	2021	Biochemistry	Jacobs School of Medicine	Medical Student
Sara	Cruz	2021	Neuroscience	Jacobs School of Medicine	Graduate Student
Iyobosa	Ekhator	2021	Public Health	University at Buffalo Master's in Biological Sciences	Applying to medical school
Bradley	Givens	2021	Computer Sciences	University at Buffalo	Data Engineer
Danielle	Haynes	2021	Psychology	Canisius University	PA Student
Amarachi	Kanu	2021	Biology/Biological Sciences	UB School of Pharmacy and Pharmaceutical Sciences	PharmD Student
Justin	Kellier	2021	Biology/Biological Sciences	University at Buffalo Biological Sciences	MS Microbiology
Tyree	Langley	2021	Psychology	University of Pittsburgh	Post-Bacc Student
Marcos	Lopez	2021	Biology/Biological Sciences	University at Buffalo	Continuing Student
Jenny	Moya	2021	Biomedical Engineering	Norvatis	Engineer
Marieross	Navarro	2021	Mechanical Engineering	General Mills	Engineer
Ngowari	Opuso-Jama	2021	Biochemistry	Jacobs School of Medicine	Medical Student
Maisha	Rahman	2021	Public Health	Graduated MPH 2023	Doula at Jericho Road
Breanna	Roper	2021	Biotechnology	Graduated May 2023	Applying to MD/PhD
Dania	Salah	2021	Biomedical Sciences	SUNY Upstate Medical	Medical Student
Holliday	Sims	2021	Computer Sciences	University at Buffalo	PhD Engineering Ed
Sergio	Smith	2021	Mathematics	University at Buffalo	Continuing student
Melina	Villa	2021	Biomedical Sciences	Jacobs School of Medicine	Medical Student

CSTEP 2024 SUMMER RESEARCH PROGRAM STAFF



CSTEP Director

Shanna Crump-Owens

CSTEP Administrative Assistant (Retired)

Patricia "Tia" Greer

CSTEP Post-Doctoral Research Associate

Rebecca Borowski, PhD

Research Methods Course Instructor

Barnard Onyenucheya, PhD

Poster Competition Coordinator

Lavone Rodolph, PhD

Graduate Assistants

Andrea Botchway

Justin Nyantakyi

Holliday Sims

Medical School Graduate Assistants

Chidalu Anameze

Chidera Anameze

Muhsinah Howlader

Dorcas Nsumbu

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2024 CSTEP SUMMER RESEARCH INTERNS



2024 CSTEP Research Interns at Roswell Park Comprehensive Cancer Center- Education Building

