

2022

Collegiate Science & Technology Entry Program (CSTEP)



2022 CSTEP Research Interns on UB North Campus

**SUMMER RESEARCH PROGRAM
RESEARCH SYMPOSIUM & LUNCHEON**



Thursday, July 22, 2021
11:00 am – 1:30 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/Senior Executive Director/Unit Diversity Officer
Student Success and Academic Support

LUNCHEON & SLIDESHOW NARRATIVE

MALENA ALLBRIGHT
Graduate Assistant

STUDENT PERSPECTIVES

MALISAH AMOAKO, Biomedical Sciences (Cohort Leader)
DANNY RUANO, Exercise Science (Cohort Leader)
MUHSINAH HOWLADER, Neuroscience
CRISTIAN POMPEY, Computer Engineering

POSTER COMPETITION & JUDGES PRESENTATION

LAVONE RODOLPH
Doctoral Student, 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 16th 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 scholarly 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 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 and research methods seminar instructor which number 50 – thank you for your time, and expertise. We could not successfully execute the summer research program and create community among this 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.

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 Scholar to continue taking advantage of the resources, opportunities, and services offered by CSTEP to make your UB experience more personal. We hope you found the support, guidance, and nurturing environment we provided to be beneficial. Also, remember the CSTEP motto: "To whom much is given, much is required." It is a pleasure to work with you.

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 12 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 28 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 Project 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.

HABITAT FOR HUMANITY AND EIGHT DAYS OF HOPE

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 interns volunteered for Eight Days of Hope to engage in neighborhood revitalization projects in the Fillmore District on Buffalo's East Side.

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 meet-ings 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	Alumni Insights: Licensure in Engineering
Preparing for Graduate School	Level Up: Resume Review
Alumni Insights: Overcoming Procrastination	Alumni Insights: Debt Free Like Me
Pathways to Pharmacy School	Diverse Women Alumni in STEM
Rx for Success (Medical School)	Medical School Mock Interview Day
Insights for Engineering: Panel of Engineers	Statewide Student Conference
What's Next: Gap Year Pathways	Student Recognition Dinner
Avenues for Allied Health Professionals	Student Research Luncheons
Alumni Insights: Demystifying Military Medicine	
Law School for a Day	

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 of all CSTEP Students possess overall GPA's above 3.0.
- Our current enrollment is **380** students.
- Since the program's inception, UB CSTEP has awarded over **210** CSTEP/Kaplan scholarships to students in preparation for standardized graduate school exams (PCAT, MCAT, GMAT, LSAT, and GRE).
- This year, **40** CSTEP students were placed in funded research internships and completed over **9,600** hours.
- To help provide service to our students, CSTEP has hired, since the late 90's, a cadre of approximately **115** 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 2022 Summer Research Cohort

Research exists in many forms. Whether it is a child turning over rocks to look for bugs, or a NASA scientist combing the night sky in search of extraterrestrial life, research and understanding are integral facets of human behavior. For many students, it is an essential part of the undergraduate experience. The Collegiate Science and Technology Entry Program (CSTEP) Summer Research Program is a comprehensive experience that aims to present students with an opportunity to learn from experts in their fields. For eight weeks, we worked closely under the guidance of a faculty mentor while also receiving interpersonal enrichment and professional development. The program prepares students for the laboratory environment and serves as a catalyst for their future endeavors.

Students of the CSTEP Summer Research Program engaged in research for a medley of reasons. Many saw it as an invaluable learning experience that provided the opportunity to co-create knowledge and the nesting ground of innovation. **Nicole Agbo**, a senior majoring in Neuroscience, indicated, "I believe students should engage in research during the summer because it allows you to be fully immersed in the program. Research is honestly an experience that is different for everyone and it allows you to be in a different environment outside of a classroom. Usually, we are learning about it but to be hands-on with the devices and seeing real-time results is exciting, challenging, and new." For **Olayinka Ogunye**, a senior Biological Sciences major, "Research broadens your understanding, and it allows you to incorporate what you know. This is maximized during the summer because you have come from a full year of learning new things. The knowledge continues to grow." **Devonte Tolliver**, a senior majoring in Neuroscience, sees research as a way of contributing new knowledge. He writes, "By conducting research, you join a group of academic professionals who continue to contribute new knowledge into the world. This new knowledge can have pro-founding impacts such as bettering the lives of living beings." **Joel Muhigirwa**, a junior majoring in Electrical Engineering, acknowledges the time and patience required in conducting research. He indicated that research "expands the knowledge of your education into something requiring time and patience". For **Riess Lessey**, a freshman in the Electrical Engineering program, this learning experience would allow him "To develop critical thinking, work on networking, and gain experience."

The immersion of students in research has provided an opportunity for students 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. **Jasmine Edmonds**, a junior majoring in Nursing, indicated, "Research is the perfect opportunity to learn more about your field without the pressure of maintaining your GPA. Being a part of research helped me understand principal concepts I would not have been able to understand as clearly had I not done it during the summer. It is a great way to see the "behind the scenes" of your particular field." **Rafael Ortiz**, a freshman in Neuroscience, echoes similar perspectives and writes, "By using a time that most think of as a vacation, those students who participate in research are gaining experience in their field."

Networking and collaboration remain critical across disciplines. The ability to engage in research this summer for many of the students meant building connections with mentors and experts in their disciplines. **Malisah Amoako**, a senior majoring in Biomedical Sciences, indicated, "Research gives you the opportunity to not only gain experience in the field you are performing research in but also allows you to network and build connections with a variety of mentors and individuals. Partaking in summer research is even more beneficial because you have less responsibilities and distractions from the outside world, and you can fully direct your attention to your given tasks."

In addition to students being able to apply classroom knowledge to research, they are inspired by the ability to make an impact in the world through their work, while expanding on their critical thinking skills. **Kayla Rue**, a senior majoring in Biological Sciences, indicated, "It is an experience that will change the trajectory of your thinking. Doing research is not only beneficial in obtaining career-related goals, but it allows for the development of new skills that are beneficial to other areas of life as well. Undergraduate research is challenging, and it is better to see how the applications learned in the classrooms are utilized in the real world."

Our research interns would like undergraduates to know that taking on research opportunities is an opportunity like no other and provides critical transferable skills. **Danielle Hurtado**, a senior majoring in Biomedical Sciences, well articulates this, when she states, "The skills from research are transferable to all fields. In other words, having to think both critically and systematically, is very useful. Also, having to consistently think ten steps ahead to try to predict an outcome is valuable in all aspects in life. Having a plan after possible failure gives scientists/researchers the confidence to try out an idea in the first place. Ultimately through research, one learns a lot about a specific field/issue, and additionally benefits, as all of the skills acquired can be used in future endeavors (research-oriented or not)." Another intern, **Daniel Ruano**, a junior majoring in Exercise Science mentions: "Doing research and being a part of a research team can really open your eyes to the vast opportunities that academia has. Unless you've done one before, give a research program a chance, let the experience mold you, and you will walk out with more knowledge than you had going in!"

Each student has their own reasons for conducting research. For some, it presents an opportunity to gain invaluable career experience. Others see it as a chance to gain recognition as innovators. Nonetheless, research is an integral part of the undergraduate experience. Through the enrichment of the CSTEP Summer Research Program, our students learn the importance of research and gain invaluable skills to use in education, the workforce, and beyond. **-2022 CSTEP Summer Research Cohort**



Nicole Agbo

HOMETOWN: Warwick, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Behavioral Neuroendocrinology Lab, Department of Psychology

SUMMER MENTOR: Dr. Matthew Paul

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Psychology

SUMMER PROJECT: *The effect of estradiol on estrogen receptors on female juvenile siberian hamsters*

ABSTRACT: Previously, the overwhelming majority of research on gonadal hormones mostly focused on perinatal, pubertal, and adult life stages. The juvenile stage was thought to be a time of gonadal quiescence. Counter to this belief, however, recent findings in Siberian hamsters suggest that the juvenile ovary influences the amount of social play and exploratory behavior. Here we test whether the ovary and the gonadal steroid, estradiol, influence the brain during the juvenile period. In adult rodents, removal of the ovary (ovariectomy) increases estrogen receptors in several brain regions, whereas subsequent estradiol replacement decreases estrogen receptors. The present experiment tests our hypothesis that ovariectomy and estradiol replacement have the same effects in juveniles. We compare the density of cells expressing the estrogen receptor in 3 groups of female juvenile Siberian hamsters: 1) sham-operated and implanted with a blank capsule (intact gonadal controls), 2) ovariectomized and implanted with a blank capsule (ovariectomized group), and 3) ovariectomized and implanted with an estradiol capsule (estradiol replacement group). If our hypothesis is supported, it will demonstrate that the brain is affected by gonadal hormones during the juvenile stage. This would raise the possibility that gonadal hormones can impact mental health prior to puberty.

ACADEMIC AND CAREER GOALS: My goal is to obtain an MPH and an MD after I graduate from UB. I also have some ideas of opening a skin care business but that will be in the future!

WORDS TO LIVE BY: "Keep praying and keep expecting."



Malisah Amoako

HOMETOWN: Bronx, NY

MAJOR: Biomedical Sciences

INTERNSHIP PLACEMENT: Jacobs School of Medicine and Biomedical Sciences

SUMMER MENTOR: Dr. Joshua Jianxin Wang

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Ophthalmology

SUMMER PROJECT: *Role of X-Box Binding Protein 1 in Photoreceptor function & Diabetic Retinopathy*

ABSTRACT: Diabetes has various detrimental effects on the organs of individuals living with the disease. One significant effect of diabetes is diabetic retinopathy (vision loss), experienced by patients. Under chronic conditions like diabetes and aging, cellular homeostasis maintenance may be interrupted, causing stress in the endoplasmic reticulum (ER), leading to cell death and dysfunction. X-box binding protein 1 (XBP1) is a crucial transcription factor in controlling the unfolded protein response (UPR) in charge of maintaining the protein homeostasis of cells under ER stress. XBP1 is expressed ubiquitously and known to affect the regulation of genes related to cellular homeostasis maintenance. Previous studies primarily focused on adipose tissue, the liver, and the brain; however, our study focuses on the retina. We hypothesize that XBP1 deficiency in rod photoreceptors will lead to an accelerated retinal dysfunction under diabetic conditions. We seek to determine how XBP1 plays a role in maintaining retinal structure. We will be using a mouse model with XBP1 deficient rod photoreceptors. Furthermore, using histologically stained retinal sections, we will measure the thickness of the whole retina, outer nuclear layer, and inner/outer segments using image J. Through immunohistochemistry we use retinal markers to quantify the cell population in the retina.

ACADEMIC AND CAREER GOALS: To obtain an MD and become an ophthalmologist or neurosurgeon, practicing both in Ghana and the United States.

WORDS TO LIVE BY: "I can do all things through Christ which strengtheneth me." - Philippians 4:3



Cedric Bone

HOMETOWN: Williamsville, NY

MAJOR: Computer Science

INTERNSHIP PLACEMENT: Decision, Risk & Data Laboratory

SUMMER MENTOR: Dr. Jun Zhuang

SUMMER MENTOR TITLE: Morton C. Frank Professor

DEPARTMENT: Industrial and Systems Engineering

SUMMER PROJECT: *Quantifying the Differences in Participant Responses to a 2D and VR Red-Teaming Survey*

ABSTRACT: Since September 11, 2001, homeland security has spent billions of dollars in expenditures trying to visually deter potential attackers. Although much money has been invested into deterring potential attackers, not much research has been done into their efficacy. Red teaming, defined as any activity involving the simulation of adversary decision, can be used to expand the amount of data on how different security layers can deter or change, someone's behavior. Since red teaming simulates an adversary, participant immersion is important. Our study aims to investigate participants' immersion through virtual reality (VR), and its impact on their survey responses. In order to test this, a VR experimental game was created. Participants were assigned the role of an adversary and given the "mission" to carry a hidden IED (Improvised Explosion Device) through screening. During this "mission" participants responded to a survey in two sections. One section was conducted with 2D pictures of a virtual screening area, and the other while immersed in VR. Participant responses to the two sections will be compared to see if there are any significant differences. Finding effective ways to collect data on defensive layers is essential to strategically allocating the U.S.'s defensive resources.

ACADEMIC AND CAREER GOALS: To obtain a PhD in computer science and study decentralized systems.

WORDS TO LIVE BY: "Take chances, make mistakes, and get messy." - Ms. Frizzle



Andrea Botchway

HOMETOWN: Bronx, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Department of Pathology and Anatomical Sciences

SUMMER MENTOR: Dr. Tracey Ignatowski

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Pathology and Anatomical Sciences

SUMMER PROJECT: *Neurotransmitter Regulation of Tumor Necrosis Factor from RAW Cells*

ABSTRACT: Approximately 16 million people suffer from chronic neuropathic pain in the US. Neuropathic pain (NP), due to injury or disease of the nervous system, is an underestimated issue that can cause disability. Previous studies using NP models showed that levels of pro-inflammatory tumor necrosis factor (TNF) are elevated, and macrophages, inflammatory/immune cells, function abnormally in their regulation of TNF production by activation of adrenergic receptors (ARs). Since it is unknown why this occurs, a macrophage cell line, RAW cells, were used to assess neurotransmitter regulation of TNF production. We hypothesize that pre-exposure of macrophages to TNF alters the ability of the alpha2-AR to enhance lipopolysaccharide (LPS)-stimulated TNF production. A chronic pain environment, or inflammatory condition, was generated by pretreating RAW cells with TNF for various times. Cells were then washed, stimulated with LPS, and exposed to an alpha2-AR agonist +/- and antagonist to assess regulation of LPS-stimulated TNF production. We predict that pre-exposing RAW cells to TNF alters alpha2-AR responsiveness such that its activation no longer enhances TNF production, similar to as observed during NP. These findings help to explain the neuroplasticity that may contribute to ongoing pain in NP conditions and identify a mechanism that may be targeted to reduce this hard-to-treat type of pain.

ACADEMIC AND CAREER GOALS: To obtain my masters in biomedical sciences and attend medical school to become a neurologist.

WORDS TO LIVE BY: "Believe you can and you're halfway there." ~Theodore Roosevelt



Thamarah Bouaz

HOMETOWN: Long Island, NY

MAJOR: Psychology

INTERNSHIP PLACEMENT: NeuroEndocrinology Lab

SUMMER MENTOR: Dr. Matthew Paul

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Psychology

SUMMER PROJECT: *Effects of Gonads on Anxiety- and Depressive-like Behaviors and Cognitive Performance in Juvenile Siberian Hamsters*

ABSTRACT: Gonadal hormones significantly impact mental health, including anxiety disorders, depression, and cognitive function. Most of this research has focused on the role of the gonads during puberty and adulthood. The juvenile period is often overlooked because the gonads are assumed to be quiescent prior to puberty. However, recent findings in our lab, however, have found that removal of the ovaries (ovariectomy) decreases anxiety-like behavior of juvenile Siberian hamsters in the light/dark box test. This finding demonstrates that the ovaries can impact behavior during the juvenile stage, at least in one test of anxiety-like behavior. The present study aims to determine the extent to which the ovaries impact juvenile behaviors. Specifically, we test the hypotheses that prepubertal gonadectomy decreases 1) anxiety-like behavior in the open field test, 2) depressive-like behavior in the sucrose preference test, and 3) cognitive performance in the novel object recognition test in both male and female juvenile Siberian hamsters. This experiment will determine the extent to which the gonads impact affective and cognitive behaviors during the juvenile stage. If our hypothesis is supported, it will raise the possibility that the gonads influence the mental health of pre-pubertal children.

ACADEMIC AND CAREER GOALS: To obtain an MD in neurology and become a neurologist.

WORDS TO LIVE BY: "Even if you are not ready for the day, I can't always be night"



Ryan Dewan

HOMETOWN: Liverpool, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Biomedical Research Building

SUMMER MENTOR: Dr. Stewart Clark

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Pharmacology and Toxicology

SUMMER PROJECT: *Advancement Towards a Preclinical Model of Progressive Supranuclear Palsy*

ABSTRACT: Progressive Supranuclear Palsy (PSP) is an atypical form of Parkinsonism having symptoms such as, motor function impairment and dysexecutive symptoms. PSP is characterized by hyperphosphorylation and aggregation of tau creating neurofibrillary tangles that occur mainly in neurons and glia. While loss of dopaminergic neuron loss in the Substantia Nigra occurs in both PSP and Parkinson's Disease, patients that are diagnosed with PSP also exhibit loss of cholinergic neurons in the pedunculo-pontine tegmentum (PPTg). The discovery of pharmaceutical treatments for PSP have not progressed due to lack of an animal model. It has been hypothesized that aggregation of tau in cholinergic neurons within the PPTg leads to PSP-like symptomatology and pathology. In our animal model, ChAT-CRE rats and CRE-dependent AAV vectors were used to express 1N4R isoform of human wildtype tau within cholinergic PPTg neurons. Using different behavioral paradigms such as acoustic startle reflex, hindlimb clasp, horizontal ladder, and marble burying, the rats with overexpressed tau will be compared to the control to determine presence of PSP-like symptomatology. The ultimate goal of our research is to validate a comprehensive animal model of PSP model, symptomatology and pathology, which would help in the progression of pharmacological treatments for this disease.

ACADEMIC AND CAREER GOALS: To acquire a MD and become a licensed physician.

WORDS TO LIVE BY: "I always tell myself it's not if I am able achieve my dreams and aspirations, it is when will I be able to achieve and see them come true."



Jasmine Edmonds

HOMETOWN: Albany, NY

MAJOR: Nursing

INTERNSHIP PLACEMENT: Department of Psychiatry, Jacobs School of Medicine and Biomedical Sciences

SUMMER MENTOR: Dr. Barry S. Willer

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Psychiatry

SUMMER PROJECT: *Sex Differences in Adolescent Athletes During Concussion Recovery*

ABSTRACT: Although concussion is a major health concern, there is limited research regarding sex differences and the effect of the menstrual cycle on concussion recovery. We aimed to investigate sex differences and the effect of the menstrual cycle throughout concussion recovery in adolescent athletes. The study was a cohort study/case series. Concussed adolescent athletes ($n=8$, 16.25 ± 1.3 y/o, 63% male) and healthy controls ($n=7$, 16 ± 2.1 y/o, 29% male) were included. Three concussed females (17 ± 1.6 y/o) were included in the case series. Participants completed a concussion-specific physical examination, a treadmill test, and a 2-week exercise intervention. Initial exercise intolerance, symptom severity, and adherence rates were examined. There were no significant differences in adherence rates ($p < 0.191$) between the male and female participants. Concussed patients had higher adherence rates than healthy participants ($p < 0.035$). Within our case study, the participant in the Follicular phase had the longest recovery time (90 days). Our case series suggests that the menstrual cycle phase may play a role in concussion recovery. Further research on sex differences and the role of the menstrual cycle on concussion recovery is needed.

ACADEMIC AND CAREER GOALS: To obtain a Doctorate of Nursing Practice and become a Family Nurse Practitioner, specializing in Dermatology

WORDS TO LIVE BY: "Forgive yourself for not knowing what you didn't know before you learned it." - Maya Angelou



Fatou Gueye

HOMETOWN: Senegal, Kaolack

MAJOR: Mechanical & Aerospace Engineering

INTERNSHIP PLACEMENT: Sounds and Vibrations Laboratory

SUMMER MENTOR: Dr. Mostafa Nouh

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Mechanical and Aerospace Engineering

SUMMER PROJECT: *Design of a 2D mechanical wave splitter using acoustic metamaterial cells*

ABSTRACT: Metamaterials exhibit unique wave dispersion properties that prohibit wave propagation within specific frequency ranges or bandgaps. Bandgaps in metamaterials stem from resonance scattering or impedance mismatches at the interface between different materials. Phononic metamaterials contain dual-material unit cells arranged in a periodic array. This work creates a two-dimensional solid structure from metamaterial and uniform cells. It's designed to enable smart wave guidance toward a prescribed path. The desired path is intended to create a mechanical wave splitter, analogous to electric current splitters in circuits, which: 1) Localizes incident waves into a single narrow lane, 2) splits the waves into two distinct channels, and 3) collects them at the exit port. The forbidden frequency range of the bandgap is modeled using the dispersion diagram of a unit cell and is used to tune the frequency of the input displacement. The ability to accurately guide mechanical waves, as presented in this work, has broad applications in automotive and aerospace structures and robotics. In such systems, sensitive payloads and vulnerable components are prone to vibrational fatigue, which, in time, can be detrimental to structural health and functional ability. Metamaterials allow susceptible structures to be continuously shielded from heavy external excitations to avoid damage.

ACADEMIC AND CAREER GOALS: My goal now is to get my BS in Mechanical and Aerospace Engineering. After that I would like to get my PhD.

WORDS TO LIVE BY: "Keep going everything you need will come to you at the perfect time."



Muhsinah Howlader

HOMETOWN: Buffalo, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Nutrition & Health

SUMMER MENTOR: Dr. Jennifer Temple

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Exercise and Nutrition Sciences

SUMMER PROJECT: *Food Insecurity and its Relationship to Perceived Stress and zBMI Among Adolescents*

ABSTRACT: Overweight and obesity are major public health concerns that impact individuals among different populations, especially from lower-income backgrounds. Food insecurity and associated stress have been shown to affect weight gain. While prior studies have shown a positive association between childhood cumulative stress and BMI, there have not been adequate studies focused on how food insecurity relates to perceived stress and weight gain. Adolescence is a critical time for establishing weight-related behaviors that track to adulthood. Therefore, it is essential to understand factors that contribute to these relationships to identify potential intervention targets. Our lab conducted a two-year study on 201 boys and girls between 12 and 14. Participants completed five visits where they consumed high-energy and low-energy-density foods for two weeks. Their height and weight and assessments such as the perceived stress questionnaire were taken at follow-up visits and the baseline. Thus far, we found that higher perceived stress is correlated to an increase in weight gain. We also found that an increase in food insecurity is linked to more perceived stress. Future studies should explore how adolescents from low to moderate-income households impact these variables.

ACADEMIC AND CAREER GOALS: To obtain an MD, serving marginalized communities

WORDS TO LIVE BY: "Well, well, well. How the turn tables..."



Danielle Hurtado

HOMETOWN: Buffalo, NY

MAJOR: Biomedical Sciences

INTERNSHIP PLACEMENT: The Institute for Myelin and Glia Exploration

SUMMER MENTOR: Dr. Bogdan Beirrowski

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Biochemistry

SUMMER PROJECT: *Defective Injury Sensing in Mouse Mutants with Delayed Wallerian Degeneration*

ABSTRACT: A neuron is the cell that constitutes the peripheral and central nervous systems (PNS and CNS, respectively). Our lab focuses on a portion of the neuron known as the axon. A main function of the axon is to transmit information to other neurons, muscles, and glands via electrical nerve impulses. An unfortunate but needed component of the axonal design is the incredible length (some can extend to be a meter long). This poses a high risk for damage, as many axons' length are spread across a large portion of the human body. A pathological feature of many neurodegenerative diseases (NDD), including Alzheimer's dementia and peripheral neuropathies, is the demise of axons known as axon degeneration (pAxD). This process is self-destructive as the axon is extremely fragile and has a high (and difficult to maintain) metabolic demand. Our attention is primarily on the protective processes involving the interactions between axons and Schwann cells (SCs). We have defined a significant protective mechanism using mouse mutants with delayed Wallerian degeneration (Wld). Wld is a destructive process driven by an axonal death program that, in our studies, occurs quite quickly after injury to distal nerve segments. Axoglial metabolic coupling (AMC) is a protective mechanism that prevents axon death via bioenergetic support. The initiators of AMC are not well defined. Therefore, in the future we aim to elucidate potential inductors of AMC in the effort to further clarify this critical support process. Current and past efforts aim to discover information that will benefit the medical community and potentially lead to the development of novel therapies for various NDD.

ACADEMIC AND CAREER GOALS: To obtain an MD and become a physician in emergency medicine, OB/GYN, or a surgical specialty.

WORDS TO LIVE BY: "Never let your fears decide your future, and to always give everything that matters to you, your all."



Opeyemi Ibitayo

HOMETOWN: Long Island, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Department of Pediatrics

SUMMER MENTOR: Dr. Stephanie Anzman-Frasca

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Pediatrics

SUMMER PROJECT: *Examining Parent Feeding Styles Among Low-Income and Minority Families in Home and Social Settings: A Literature Review*

ABSTRACT: Feeding style refers to the approach parents use to feed their child and the emotional climate created during eating. Feeding styles (e.g., indulgent styles characterized by low structure/high responsiveness) have been linked to child obesity risk with previous work focused on at-home settings. More research on feeding styles outside the home is needed, particularly among understudied populations. This review summarized literature examining feeding styles among low-income or minority parents in-home or out-of-home contexts. A literature search was conducted in June 2022 using Google Scholar and PubMed. Key words were: feeding styles, minority, low-income, and restaurants. Publication years were from 2005 and on. Abstracts were collected and screened for inclusion, with 21 identified and included. Of the 22 articles, 14 included African-American parents, 16 included Hispanic, and 16 included low-income. 13 examined feeding styles in-home, and 8 out-of-home. In at-home investigations, Hispanic parents were commonly authoritative. Among articles investigating out-of-home contexts, indulgent feeding styles were prevalent and correlated with increased child weight. Prior work has shown a disproportionate favorability for investigating feeding styles in-home compared to out-of-home settings. More work is needed to understand better differences in feeding styles across racial/socioeconomic groups, especially within out-of-home contexts, like restaurants.

ACADEMIC AND CAREER GOALS: To obtain a PhD in Neuroscience and work in industry or academia.

WORDS TO LIVE BY: "When you undervalue what you do, the world will undervalue who you are." - Oprah Winfrey



Haley Kennedy

HOMETOWN: Irving, NY

MAJOR: Psychology

INTERNSHIP PLACEMENT: Department of Indigenous Studies

SUMMER MENTOR: Dr. Mia McKie

SUMMER MENTOR TITLE: Clinical Assistant Professor

DEPARTMENT: Indigenous Studies

SUMMER PROJECT: *A Literature Review of Missing and Murdered Indigenous Women*

ABSTRACT: Our research delved into Missing and Murdered Indigenous Women (MMIW) and the current laws and policies in place to address MMIW. Underreporting and inaccurate statistics make this crisis hidden. While reviewing documents we found a lack of awareness for the Haudenosaunee or Six Nations. Accurate statistics can result in increased funding for MMIW, as well as enhanced awareness, better policies, and legal changes. Indigenous women who are missing or murdered are invisible because their cases fall into jurisdictional cracks. There is no recourse for their families to follow for justice. This is where we believe changes in policies and laws could help the MMIW crisis. In 2016, the Urban Indian Health Institute completed its landmark survey, reporting 5,712 missing Alaska Native and American Indian women and girls, compared to only 116 that were registered in the Department of Justice database. This literature review can inform future research on laws and policies for accurate reporting and the impact of laws on MMIW.

ACADEMIC AND CAREER GOALS: To obtain a JD and practice law.

WORDS TO LIVE BY: "God gives his strongest soldiers the hardest battles, but sometimes even the strongest soldiers question the meaning of a war."



Riess Lessey

HOMETOWN: Deer Park, NY

MAJOR: Electrical Engineering

INTERNSHIP PLACEMENT: Department of Electrical Engineering

SUMMER MENTOR: Dr. Barnard Onyenucheya

SUMMER MENTOR TITLE: Post-Doctoral Researcher

DEPARTMENT: Electrical Engineering

SUMMER PROJECT: *Dielectric Elastomer Actuator Rotary Motor*

ABSTRACT: Researchers are looking at dielectric elastomers and the possibility to use them as motors. A dielectric elastomer is a malleable incompressible material that deforms when a voltage is being applied. The dielectric elastomer is sandwiched in between two compliant electrodes. An applied voltage causes the opposite charges in the electrodes to have an attractive electric force while similar charges result in a repelling force. This results in the decrease in thickness of the dielectric elastomer, while increasing the area. The deformation of the dielectric elastomer is what allows it to have the properties of a transducer. Other motors such as AC and DC motors are the same type of transducers. The motors that are currently being used are very bulky and contain a lot of parts. The dielectric elastomer is lighter, malleable, quiet, and requires a lot less parts to transduce energy. We will investigate what happens to the center block by changing the angles of the segments and the number of the segments of a dielectric elastomer actuator.

ACADEMIC AND CAREER GOALS: To obtain a Masters in Electrical Engineering.

WORDS TO LIVE BY: "It's good to know others."



Joel Muhigirwa

HOMETOWN: Buffalo, 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: *Low-Energy laminated metal contact for 2d nanoelectronics*

ABSTRACT: Metal-semiconductor interfacial junctions play a critical role in charge carrier transport for nanoelectronics, especially for miniaturized nanometer-scale devices with emerging 2D materials. However, the conventional "high-energy" metallization approaches, such as electron beam or thermal evaporation and sputtering, will introduce inevitable chemical disorder (defects, diffusion, strain, or chemical bonds) and consequently Fermi-level pinning, and significantly impact the charge carrier transport to deviate from the Schottky-Mott rule. Here we investigate a "low-energy" metallization technique in which prefabricated thin metal films are laminated onto 2D semiconductor surfaces. The metal-semiconductor interface can be maintained atomically sharp which is dominated by weak van Der Waals interactions without the formation of any direct chemical bonding. In this way, the ideal metal-semiconductor interface can be achieved, which will facilitate the charge carrier transport for next-generation, high-performance, and energy-efficient nano-electronics such as diodes and transistors.

ACADEMIC AND CAREER GOALS: To obtain a PhD. To work, save money and help my family and my country.

WORDS TO LIVE BY: "Always be ready to learn something new."



Olayinka Ogunye

HOMETOWN: Brooklyn, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Nutrition and Health Research Laboratory

SUMMER MENTOR: Dr. Jennifer Temple

SUMMER MENTOR TITLE: Professor

DEPARTMENT: Exercise and Nutrition Sciences

SUMMER PROJECT: *The Relationship Between Adolescent Self-Efficacy for Healthy Eating, Adolescent zBMI Change, and Parent BMI.*

ABSTRACT: Obesity is a major public health concern. Determining which factors play a role in this will be crucial to understanding how to combat this issue. The purpose of the study was to examine the relationships among parent BMI, adolescent zBMI change, and child self-efficacy for healthy eating (SEHE). A two-year study was conducted with 201 boys and girls, whose zBMI average was 0.4, and were between 12 to 14 years old. There were 8 overall visits, in which adolescents completed self-efficacy questionnaires at the first 7 visits, and adolescent zBMI and Parent BMI were recorded at visits 1, 6, 7, and 8. We found that parent BMI is not correlated with adolescent zBMI change over time ($R = 0.027$). Self-Efficacy is not correlated with adolescent zBMI change over time ($R = 0.158$). Self-efficacy for healthy eating moderates the relationship between parent BMI and adolescent zBMI change ($R = 0.338$). Self-Efficacy for healthy eating is one of many predictors that can be assessed to determine the possibility of obesity in adulthood. Eventually we'll develop a list of major predictors of obesity, to help develop specified approaches to target onset obesity in underrepresented adolescents.

ACADEMIC AND CAREER GOALS: To become a Registered Nurse, do travel nursing and then obtain my DNP.

WORDS TO LIVE BY: "If you have no confidence in self, you are twice defeated in the race of life." – Marcus Garvey



Rafael Ortiz

HOMETOWN: Rochester, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Jacobs School of Medicine & Biomedical Sciences, Pharmacology

SUMMER MENTOR: Dr. Arin Bhattacharjee

SUMMER MENTOR TITLE: Associate Professor

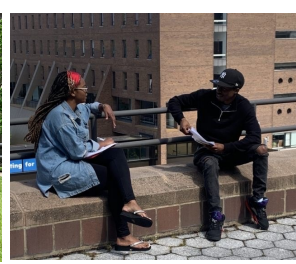
DEPARTMENT: Pharmacology

SUMMER PROJECT: *Characterization of Scaffold Protein Magi-1 in Joint Nerve Fibers and its Role on Osteoarthritis Pain*

ABSTRACT: Chronic pain is the most important symptom and the main cause of disability in osteoarthritis (OA) patients. Current approaches to treat osteoarthritis (OA)-related pain include anti-inflammatory drugs to reduce pain sensation, however, these analgesics have been associated with multiple side effects, and lack of efficacy after long-term use. Due to the heterogeneity of OA pain mechanisms, developing novel efficient pain medications requires the identification of specific targets at joint nociceptors. Previous studies have identified the PDZ and WW domain-containing protein Magi-1 as a key scaffold for voltage-gated ion channels in dorsal root ganglion neurons. Data from such studies have shown that Magi-1 modulates Nav1.8 channel stability at the plasma membrane, affecting sensory neuronal excitability. Here we aim to characterize the effects of OA pain induction on Magi-1 and ion channels expression in joint afferent neurons. To achieve this, Knee joint samples from mice were collected 28 days post chemically-induced OA. Immunohistochemistry and western blotting were performed to evaluate the expression of Magi-1, as well as nociception-related ion channels. Preliminary results have indicated that Magi-1 and Nav1.8 channel are expressed in subchondral bone nociceptors. Altogether, this study seeks to identify novel analgesic targets to efficiently modulate OA pain sensitivit

ACADEMIC AND CAREER GOALS: To obtain a MD and practice Neurosurgery in my hometown of Rochester, NY.

WORDS TO LIVE BY: "The only person you should compete with is the person who you were yesterday."







Peterson Pierre

HOMETOWN: Rochester, NY

MAJOR: Chemistry

INTERNSHIP PLACEMENT: National Science Complex

SUMMER MENTOR: Dr. Janet Morrow

SUMMER MENTOR TITLE: Distinguished Professor

DEPARTMENT: Chemistry

SUMMER PROJECT: *Microfluidics with the application of alternative MRI contrast reagents*

ABSTRACT: In recent events, the use of Gadolinium-Based-Contrast-Agents (GBCAs) for Magnetic Resonance Imaging (MRI) processes has resulted in Gadolinium deposition in patients and Gadolinium pollution worldwide. In this experiment, MRI contrast alternatives were synthesized to reduce the use of GBCAs. For the development of alternative (MRI) contrast agents, paramagnetic cobalt and iron complexes were manipulated and incorporated into liposomes. The excess exchangeable protons present in Co (II) complexes were used to produce Chemical Exchange Saturation Transfer (CEST) upon radiofrequency pulse excitation. Lipid-based nanoparticles (50-55 nm) were used in the encapsulation of paramagnetic Fe(III) and Co(II) complexes, which were prepared by using 3D microfluidic hydrodynamic flow focusing (MHF) to induce cellular uptake into cancerous cells. By utilizing channels within the flow-focusing device the inertial force exerted on flowing fluids was limited, maximizing the viscous forces of fluids, which allowed for the self-assembly of liposomes with a narrow-sized distribution. Afterward, relaxivity rates and data were collected and analyzed using Nuclear Magnetic Resonance (NMR) for the Fe(III) based liposomes.

ACADEMIC AND CAREER GOALS: To obtain a Doctorate and establish myself as a leading Scientist Physician in the field of Orthopedics. I want to use my capital leverage to educate the Rochester, NY community on the importance of applications of financial literacy.

WORDS TO LIVE BY: "Advice is one thing that is freely given away, but watch that you only take what is worth having."



Cristian Pompey

HOMETOWN: Buffalo, NY

MAJOR: Computer Engineering

INTERNSHIP PLACEMENT: School of Engineering and Applied Sciences

SUMMER MENTOR: Dr. Wenyao Xu

SUMMER MENTOR TITLE: Associate Professor

DEPARTMENT: Computer Science

SUMMER PROJECT: *Digital Twin Systems for Advanced Manufacturing*

ABSTRACT: The concept of an interconnected cyber-physical production system allows for low-level production process information and control to be shared across multiple levels of production and the internet. These can include a network of many individual automated processes, a logistics network of production systems, and a cloud server for display and feedback to the end-user. The outcome is an integrated smart manufacturing system that can optimize itself for performance based on the constantly changing needs of the end-user and manufacturing system environment. However, this concept is lacking real-world implementations because of the lack of standardization in information exchange among different device vendors, which is a problem affecting the entire industry 4.0. As a contribution to this field and proof of concept of smart manufacturing systems, we implemented a prototype of a smart manufacturing architecture for the 3d printing unit. Using additional local sensors, edge computing devices, and cloud computing we were able to create a Digital Twin of the 3d printer that can be used to control, access, and display information from the physical 3d printer onto a webpage that is accessible from anywhere in the world. We also leverage the abundance of data that is now made available with a Digital-Twin to potentially feed machine learning algorithms that will have the Ender-3 optimize itself for performance and anomaly detection.

ACADEMIC AND CAREER GOALS: To obtain my bachelor of computer engineering, work in space exploration systems, and eventually pursue my own tech start-up.

WORDS TO LIVE BY: "If you cant fly then run. If you cant run then walk... But by all means, keep moving (forward)."- Martin Luther King Jr.



Daniel Ruano

HOMETOWN: Valley Stream, NY

MAJOR: Exercise Science

INTERNSHIP PLACEMENT: Hydration, Exercise and Thermoregulation Lab, Center for Research and Education in Special Environments (CRESE)

SUMMER MENTOR: Dr. Riana R. Pryor.

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Exercise and Nutrition Sciences

SUMMER PROJECT: *Perceptions during Consecutive Days of Simulated Fire Suppression*

ABSTRACT: Workers including firefighters commonly participate in consecutive days of work in terribly hot environmental conditions which increases the risk of developing heat illness. In this study we aimed to discern the differences between perceptions of work in the heat between two consecutive days of simulated fire suppression work. We completed a repeated measures laboratory study, where participants came in for four total visits. The first two visits collected screening and baseline data. The final two visits were on consecutive days and simulated fire suppression work in a hot environment. Throughout these visits, various vital signs including heart rate and core temperature as well as urine-specific gravity (USG) and perceptions of work including thirst, thermal sensation, sweat, fatigue and rate of perceived exertion (RPE) were recorded. Data from the first six participants was analyzed using two-way repeated measures analysis of variance (ANOVA) with post-hoc dependent t-tests. We're expecting to see a substantive increase in most perceptual markers on the second day of work compared to the first day of work. This study expands on past studies concerning heat loss/gain during physical activity and work, specifically regarding consecutive days of fire suppression.

ACADEMIC AND CAREER GOALS: To obtain a Masters Degree in Clinical Nutrition and then become a Certified Sports Dietitian for Olympic/Professional athletes.

WORDS TO LIVE BY: "Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. And the only way to do great work is to love what you do. If you haven't found it yet, keep looking. Don't settle. As with all matters of the heart, you'll know when you find it." — Steve Jobs



Kayla Rue

HOMETOWN: Bronx, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Department of Oral Biology, Biomedical Research Building

SUMMER MENTOR: Dr. Kathryn Kauffman

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Department of Oral Biology, School of Dental Medicine

SUMMER PROJECT: *Investigating oral inducers effects on Porphyromonas gingivalis prophages*

ABSTRACT: Viruses influence ecology and evolution of bacterial species. In the oral microbiome, viruses infecting bacteria ("phages") are highly abundant; many existing as symbionts in bacterial genomes (as "prophages"). Despite their abundance, not much is known about oral phages and their impacts on bacteria and human health. Here, we investigate potential effects of phages on the growth of a key oral pathogen, *Porphyromonas gingivalis* (Pg). Our lab recently discovered that some strains of Pg encode prophages. However, what activates Pg prophages is unknown. To address this, our research investigates potential activators: a common activator, Mitomycin C, as well as clinically relevant activators, 3% hydrogen peroxide and Tom's Mouthwash. Testing two Pg strains, one encoded with a phage and one without, we determine their growth profiles to optimize conditions for introduction of activators. It was found that the strain encoding a prophage grows to a higher turbidity than the strain without. Although the different activators cause different effects, both strains exhibit similar responses to each other. Preliminary findings suggest that the activators possibly kill the bacteria and it is unknown whether a phage is produced or not. Results indicate that further studies are needed to infer distinct phage responses to these activators.

ACADEMIC AND CAREER GOALS: To pursue my masters in biomedical sciences and become a doctor, opening my own practice.

WORDS TO LIVE BY: "Be a leader and always be yourself."



Devonte Tolliver

HOMETOWN: Queens, NY

MAJOR: Neuroscience

INTERNSHIP PLACEMENT: Department of Biological Sciences

SUMMER MENTOR: Dr. Derek Daniels

SUMMER MENTOR TITLE: Professor and Chair

DEPARTMENT: Department of Biological Sciences

SUMMER PROJECT: *Effects of a High-fat Diet on Water Intake and Drinking Microstructure*

ABSTRACT: The American diet, high in caloric and fat content, contributes to obesity—especially when combined with a reduced active lifestyle. Relatedly, dehydration is common among individuals with high BMI. The mechanism behind dehydration in individuals with obesity is largely unknown. In this study, we are examining the effects of a high-fat diet (HFD) on water intake and drinking microstructure in rats. We are maintaining rats on either a HFD or low-fat diet (LFD) for six weeks. Rats will be isolated in wire cages allowing for precise measures of licking. In a counterbalanced design, water intake and drinking microstructure will be separately evaluated after water deprivation, oral gavage of hypertonic saline, and subcutaneous injection of hypertonic saline. It is hypothesized that HFD rats will drink less water than LFD rats throughout the three tests and drinking microstructure (number and duration of licks of water) in HFD rats will be different from what's observed in LFD rats. This study will provide clarity on the drinking-related behaviors of rats on a HFD that cause these rats to take in less water and, consequently, have poor hydration. These behaviors can give insight into how individuals with obesity can combat inadequate hydration to live a healthier lifestyle.

ACADEMIC AND CAREER GOALS: To become an MD or DO specializing in Emergency Medicine and Neurology.

WORDS TO LIVE BY: "Successful people studied to gain knowledge, not to gain grades."



Jamel Usen

HOMETOWN: Cornwall, NY

MAJOR: Electrical Engineering,

INTERNSHIP PLACEMENT: Department of Electrical Engineering

SUMMER MENTOR: Dr. Nicholas Mastronarde

SUMMER MENTOR TITLE: Assistant Professor

DEPARTMENT: Electrical Engineering

SUMMER PROJECT: *Analysis on Passive Remote Sensing System*

ABSTRACT: Passive remote sensing services are imperative to modern society. For example, NASA's Soil Moisture Active Passive (SMAP) remote sensing satellite measures soil moisture as it orbits around the earth, providing information for agricultural management, weather forecasting, flood and drought prediction, and climate modeling. At the same time, modern society is dependent on active wireless systems, such as 5G mobile networks. However, as active wireless systems increase, there is a rise in radio frequency interference at the passive sensors, which can corrupt their scientific measurements. This motivates research on how passive remote sensing and active wireless systems can coexist in the same frequency bands. This is necessary in gaining an understanding on the amount of interference between opposing instruments. This report will develop a model for assessing the interference that active wireless systems created at SMAP. This will be done through a MATLAB-based software simulation to visualize the satellite and ground station and model the strength of the radio frequency interference from the active wireless system to the SMAPs passive sensor. The proposed model will include details about the satellite's orbit, the orientation and propagation patterns of the ground stations and remote sensor's antennas, and the free-space path loss between them.

ACADEMIC AND CAREER GOALS: To obtain a PhD in Electrical Engineering and pursue many jobs opportunities.

WORDS TO LIVE BY: "Your need for acceptance can make you invisible in this world. Don't let anything stand in the way of the light that shines through this form.

Risk being seen in all of your glory." — Jim Carrey



Martiza Ventura

HOMETOWN: Levittown, NY

MAJOR: Biological Sciences

INTERNSHIP PLACEMENT: Department of Microbiology and Immunology

SUMMER MENTOR: Dr. John C. Panepinto

SUMMER MENTOR TITLE: Professor, Director of Recruiting and Admissions, Ph.D. Program in Biomedical Sciences (PPBS)

DEPARTMENT: Microbiology and Immunology

SUMMER PROJECT: *The role of post-transcriptional regulation in cryptococcal susceptibility to antifungals*

ABSTRACT: Although most fungi are not able to adapt to the mammalian host, *Cryptococcus neoformans* is an opportunistic fungal pathogen and significant cause of mortality in people who are immunocompromised. The disease burden of this fungus is amplified by the limited efficacy of antifungal medication during cryptococcal meningitis. We investigated the role of post-transcriptional regulation in relation to antifungal susceptibility. In mutants lacking the deadenylases Ccr4 and Pan2 we observed sensitivity to both azole antifungals and to Amphotericin B by spot plate analysis. This suggested to us that ergosterol biosynthesis was dysregulated in these strains. Ongoing investigations will determine whether ergosterol biosynthesis transcripts are dysregulated in these strains by quantitative reverse transcription polymerase chain reaction (RT-qPCR) as well as whether these phenotypes are associated with cell wall and mitochondrial defects. Overall, our data suggests that post-transcriptional regulation plays a significant role in antifungal susceptibility that warrants further investigation. These proteins could be appropriate targets for antifungals to improve the efficacy of antifungal therapy.

ACADEMIC AND CAREER GOALS: To obtain a PhD in microbiology and Immunology and continue doing important research.

WORDS TO LIVE BY: "The most certain way to succeed is always to try just one more time."

The 2022 CSTEP Summer Research Program expresses thanks & appreciation to the following workshop & tour facilitators for their contributions & support:

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DIRECTOR,
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UB CAREER DESIGN CENTER

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OF MEDICINE AND
BIOMEDICAL SCIENCES

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ASSISTANT PROFESSOR, OF
PSYCHOLOGY

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SENIOR COUNSELOR, CAREER
DESIGN CENTER

VINCENT RICE
DOCTORAL STUDENT,
ORGANIZATION AND HUMAN
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MANAGEMENT

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UB GRADUATE SCHOOL
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UB INTERCULTURAL
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THANK YOU to our 2022 CSTEP Summer Symposium Judges!

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DR. BOGDAN BIEROWSKI	Institute for Myelin and Glia Exploration
DR. ELSA BOU GHANEM	Dept. of Microbiology and Immunology
DR. SHERRY SHEMLAR	Dept. of Chemistry
DR. STEWART CLARK	Dept. of Pharmacology and Toxicology
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DR. MACKENZIE FERRANTE	Dept. of Pediatrics
DR. STEVEN FLIESLER	Depts. of Ophthalmology, Biochemistry & Neuroscience
DR. ALAA ELDEEN HASSAN ALI	Dept. of Mechanical and Aerospace Engineering
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DR. HILLIARD KUTSCHER	Dept. of Medicine
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DR. ALBERT TITUS	Dept. of Biochemical Engineering
DR. SARAH WALKER	Dept. of Biological Sciences
DR. HEATHER WILLIAMS	Dept. of Biological Sciences & Environment/Sustainability
DR. JENNIFER WINIKUS	Dept. of Computer Science and Engineering
DR. FEI YAO	Dept. of Materials Design and Innovation
DR. MICHAEL YU	Dept. of Biological Sciences
DR. SARAH ZHANG	Dept. of Ophthalmology

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
Frank	Acheampong	2007	Pharmacy	UMass Memorial Medical Center	Clinical Pharmacist - Informatics
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	Univera Healthcare	Business Process Intelligence Analyst
Dr. Richard	Linares	2007	Mechanical & Aerospace Engineering	MIT	Boeing Assistant Professor
David	Louis	2007	Psychology	Canarsie Recovery Coalition	Project Director
Shiny	Thomas	2007	Pharmacy	CVS Pharmacy; Touro College	PharmD
Kevin	Bryant	2008	Electrical Engineering	Bechtel Plant Machinery, Inc	Electrical Engineering Project Manager
Toni-Shay	Chandon	2008	Pharmacy		PharmD
Dr. Daivon	Garrick	2008	Pharmacology & Toxicology	M&T Bank	VP Credit Risk Analyst
Marda	Hailu	2008	Biological Sciences	Western New England University College of Pharmacy	
Dr. Jessica	Isaac	2008	Pharmacy		PharmD
Dr. Aggrey	Jacobs	2008		UB school of engineering	Doctoral Student
Anthony	Jones	2008	Biomedical Sciences	UB Jacobs School of Medicine and Biomedical Science	Doctoral Student
Micah	McCurty	2008	Exercise Science	Owner, Therapy Unlimited	DPT
Hieu	Nguyen	2008	Biochemistry	UB Dental School	Dental Student
Wilberforce	Osei	2008	Chemistry/ Pharmacology	Bowie, Maryland	PharmD
Francis	Perez	2008	Chemical & Biological Engineering	Completed MS in Chemical Engineering from SUNY at Buffalo	Chemical Engineer
Souleymane	Sow	2008	Aerospace Engineering	Completed 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
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
Ron	Heichman	2010	Engineering	University at Buffalo	Mechanical & Aerospace Engineering PhD Student
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	
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	Completed University at Buffalo School of Pharmacy	Pharmacy Student
Michael	Singletary	2013	Electrical Engineering (Mathematics-minor)	United States Army	Officer/ Helicopter Pilot
Alexandria	Trujillo	2013	Biological Sciences	University at Buffalo	PhD Student - Pharmacology & Toxicology
Dr. Uzoamaka	Aniagba	2014	Biological Sciences	Indiana University School of Medicine	Medical Resident
Warren	Barrett	2014	Chemistry	D'Youville School of Pharmacy	PharmD Candidate
Leatrice	Bennett	2014	Biological Sciences	Swedish Neuroscience Institute	Program Coordinator
David	Bratton	2014	Biological Sciences	Jacobs School of Medicine & Biomedical School	Medical Student
Kevin	Carpio	2014	Mechanical & Aero-space Engineering	Northrop Grumman (California)	Aerospace Engineer (Palmdale, California)
Kemji	Eke	2014	Biology	Huron	Salesforce Consultant
Robert	Ferguson	2014	Biology	University at Buffalo Dental School	Dental Student
Akunne	Kanu	2014	Public Health	Bartow Ophthalmology, LLC	Assistant & Technician
Jacob	Milling	2014	Biology	UB Jacobs School of Medicine & Biomedical Science	Medical Student
Abas	Omar	2014	Biology	UBMD Orthopaedics & Sports Medicine	Hand & Upper Extremity PA
Austin	Price	2014	Biology	UB Jacobs School of Medicine & Biomedical Science	Medical Student
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
Christina	Aponte	2015	Biomedical Sciences	Meharry Medical College School of Dentistry	DDS Candidate
Kwame	Boakye-Yiadom	2015	Biological Sciences	Eli Lilly and Company	Safety Manager
Kelly	Boamah	2015	Pharmacology & Toxicology	D'Youville School of Pharmacy	Pharmacy Student
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
Shawn	Gibson	2015	Biomedical Sciences	UB Jacobs School of Medicine and Biomedical Science	MD Candidate
Hoda	Moussa	2015	Biological Sciences	University at Buffalo Law School	Law Student
Peter	Okorozo	2015	Pharmaceutical Sciences	PRMA Consulting Ltd	Senior Analyst
Folake	Olaleye	2015	Biological Sciences	D'Youville School of Pharmacy	PharmD Student
Oluwatosin	Oniyide	2015	Biological Sciences	Albert Einstein College of Medicine	Medical Student
Rasheen	Powell	2015	Pharmacology & Toxicology	Boston Children's Hospital	Post-Doc Researcher
Valeria	Prieto	2015	Civil Engineering	Gilsanz Murray Steficek	Engineer
Zakiya	Rhodie	2015	Pharmacology & Toxicology	UB School of Pharmacy	Doctor of Pharmacy
I'Yanna	Scott	2015	Biological Sciences	Chatham University	Graduated 2019
Naza	Abdelrahman	2016	Biomedical Sciences	CITYMD	Medical Scribe
Ali	Al Qaraghuli	2016	Electrical Engineering	Northeastern University	PhD Student
Andrew	Alegria	2016	Mechanical Engineering	University of Minnesota Mechanical Engineering	PhD Student
Barituziga	Banuna	2016	Chemical Engineering	Chemical Engineering at Cornell University	PhD Student
Emmanuel	Cott	2016	Computer Sciences	Huron	Salesforce Developer
Abdul-Malik	Davies	2016	Chemical Engineering		
Tanahiry	Escamilla	2016	Chemical Engineering	3M	Operations Engineer
Alejandro	Falca	2016	Medicinal Chemistry	UB Jacobs School of Medicine	Medical Student
Jarrett	Franklin	2016	Electrical Engineering	Moog Space and Defense Group	Design Engineer

Chris	Gnam	2016	Mechanical Engineering	NASA Goddard Space Center	NASA ProjectTrainee
Dominique	Hickson	2016	Computer Engineering	UB MS Computer Science & Engineering	Graduated 2019
Anna	Huang	2016	Social Sciences Interdisciplinary	Jenkins Neurospine	Surgical Coordinator
Mohammed	Karim	2016	Biomedical Sciences	Jacobs School of Medicine & Biomedical Sciences	Medical Student
Jalisa	Kelly	2016	Biomedical Sciences	East Carolina University	Psychiatry Resident
Kaytlan	LoCicero	2016	Social Sciences Interdisciplinary	Osmose	Project Coordinator
Anthony	Lopez	2016	Biological Sciences	University at Buffalo Dept. of Biological Sciences	Graduate Student
Jillian	Naylor	2016	Biological Sciences	New York City	Dental Student
Aaron	Nimako	2016	Biomedical Sciences	Empire MG Inc	President
Lee-Mary	Njoku	2016	Biomedical Sciences		
Ndidiamaka	Okoroza	2016	Biomedical Sciences	Drexel University	Medical Student
Iyamu	Osazuwa	2016	Electrical Engineering	UB School of Engineering & Applied Sciences	Engineer
Lucas	Rugar	2016	Civil Engineering	Completed Columbia University's Master of Management Science and Engineering program	Graduate Student
Diamile	Tavarez	2016	Biology/Biological Sciences	Weill Cornell Medicine	Research Technician
Douglas	Tsahey	2016	Biomedical Sciences	Jacobs School of Medicine	Medical Student
Marcus	Ashford	2017	Electrical Engineering	Calspan Corporation	Electrical Engineer
Leon	Butcher IV	2017	Psychology	University of Maryland	Dental Student
Kennedy	Colon	2017	Civil, Structural & Environmental Engineering	Flatiron Construction	Field Engineer III
Leonardo	Gobbato	2017	Chemical Engineering	Dimien	Chemical Engineer
Blessing	Hunsu	2017	Chemistry	Binghamton University School of Pharmacy	Pharmacist
Starr	Johnson	2017	Pharmacology & Toxicology	Sogang Language Program, South Korea	ESL Teacher
Coral	Lopez-Jimenez	2017	Chemistry	Buffalo, NY	STEM Educator
Neneyo	Mate-Kole	2017	Pharmacology & Toxicology	Howard University Hospital -Internal Medicine	Medical Resident
Lawrence	Owusu	2017	Industrial Engineering	University at Buffalo	Graduated 2020

Ariana	Roman	2017	Psychology	Norton & Elaine Sarnoff Center	Health Educator
Godfrey	Sakyi	2017	Electrical Engineering	Naval Sea Systems Command	Systems Engineer
Sameer	Shakur	2017	Electrical Engineering	University at Buffalo	Graduated 2019
Tyree	Singleton	2017	Industrial Engineering	The Perduco Group	Operations Researcher
Ashley	Solomon	2017	Nursing	Sabon NYC	Cosmetics Professional
Cassandra	Ware	2017	Computer Science & Engineering	New Era Cap	E-Commerce Developer
Makayla	Watson-Wales	2017	Speech & Hearing Science	UB Masters Speech Language Pathology	Speech Language Pathologist
Annakay	Adamson	2018	Biological Sciences	UBMD Emergency Medicine	Research Coordinator
Gregory	Adams, Jr.	2018	Psychology	Brookfield Properties	Systems Engineer
Abshiro	Ali	2018	Biology/Biological Sciences	Community Health Center of Buffalo, Inc.	Medical Assistant
Deborah	Amponsah	2018	Pre-Law/Philosophy	Hurwitz & Fine	Law Clerk
Michael	Banjoko	2018	Biomedical Engineering	Prevail Therapeutics	Associate Researcher
Gerardo	Barrera Giron	2018	Environmental Engineering	BASF	Process Safety Engineer
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	Roswell Park Cancer Center	Research Apprentice
Chimaobi	Ezeilo	2018	Computer Sciences	University at Buffalo	Graduated 2021
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	Monroe College MPH	Graduate Student
Shelbi	Molin	2018	Political Sciences	UB Law School	Law Student
Keiona	Nance	2018	Exercise Science	UB School of Public Health/ MS Athletic Training Program	Graduated 2021

Nailah	Oronde	2018	Public Health	University at Buffalo	Graduated 2019
Priya	Persaud	2018	Aerospace Engineering	Lockheed Martin	Design Engineer
William	Phillips	2018	Computer Sciences	L3Harris Technologies	Software Engineer
Elizabeth	Quaye	2018	Pharmacology & Toxicology	UB Jacobs School of Medicine & Biomedical Sciences	Medical Student
Aliaya	Williams	2018	Biological Sciences	Buffalo Medical Group	Medical Assistant
Marvellous	Adegoke	2019	Pharmacy	UB School of Pharmacy and Pharmaceutical Sciences	PharmD Candidate
Abdulelah	Ahmed	2019	Biomedical Sciences	Jacobs School of Medicine & Biomedical Sciences	Medical Student
Taylor	Campbell	2019	Biomedical Sciences	UB Obstetrics and Gynecology	Staff Assistant
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	UB MD	Medical Scribe
Ronique	Fletcher	2019	Biological Sciences		
Allea	Frazier	2019	Psychology	Yale University School of Medicine	Post-Doctoral Researcher
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	Master's Student
Isabelle	Linares	2019	Biomedical Engineering	University of Rochester	PhD Student Biomedical Engineering
Julius	Mark	2019	Mathematics/Actuarial Sciences (Statistics minor)	SUNY Downstate	MPH Student
Ricardo	Martinez	2019	Mechanical Engineering	EB Mechanical LCC.	Mechanical Engineer
Marcellus	Midyette	2019	Biological Sciences	Church of Jesus Christ of Latter Day Saints	Missionary
Chidubem	Okoroza	2019	Chemical Engineering	University at Buffalo, MS Data Science & Applications	Graduate student
Kyle	Pierre	2019	Electrical Engineering	Ford Motor Company	Product Development Engineer
Adegboyega	Thompson	2019	Chemistry	UB MD	Medical Scribe
Lesly	Villanueva	2019	Environmental Engineering	Mott MacDonald	Civil Engineer 1- Water

Mohammed	Abbadi	2020	Biology/Biological Sciences	University at Buffalo	Graduated 2021
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	UB School of Public Health and Health Professions	Graduate Student
Moyofoluwa Rachel	Aguda	2020	Biochemistry	University at Buffalo	Undergraduate Student
Mirka	Arevalo	2020	Aerospace & Mechanical Engineering	Team Real Talk/UB School of Engineering and Applied Sciences	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	DevOps	Software Engineer
Evelyne	Kouya	2020	Biomedical Sciences	Your Family Fertility PLLC	Fertility Care Coordinator/Medical Scribe
Chukwudi	Nwoke	2020	Aerospace Engineering	UB Aerospace Engineering	Undergraduate Student
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	UB School of Engineering and Applied Sciences	Graduate Student (Mechanical Engineering)

Emmanuel	Agyenim Boateng	2021	Biomedical Sciences	Univeristy at Buffalo	Continuing Student
Chidera	Anameze	2021	Biomedical Sciences	Univeristy at Buffalo	Continuing Student
Chidalu	Anameze	2021	Biomedical Sciences	Univeristy at Buffalo	Continuing Student
Lillian	Baker	2021	Environmental Engineer- ing	D&B Engineers and Architects	Water Supply Engineer
Jose	Carrasco Ramon	2021	Civil Engineering	Graduated May 2021	Applying to engineering jobs
Jeremiah	Chapman	2021	Biochemistry	University at Buffalo	Continuing Student
Sara	Cruz	2021	Psychology	University at Buffalo	Continuing Student
Iyobosa	Ekhator	2021	Public Health	University at Buffalo Master's in Biological Sciences	Graduate Student
Bradley	Givens	2021	Computer Sciences	University at Buffalo	Continuing Student
Danielle	Haynes	2021	Psychology	UBMD Family Medicine	Medical Scribe/ Will be applying to PA school
Amarachi	Kanu	2021	Biology/Biological Sci- ences	UB School of Pharmacy and Pharmaceutical Sciences	PharmD Student
Justin	Kellier	2021	Biology/Biological Sci- ences	University at Buffalo Master's in Biological Sciences	Graduate Student
Tyree	Langley	2021	Psychology	Graduated May 2021	Will be applying to graduate school
Marcos	Lopez	2021	Biology/Biological Sci- ences	University at Buffalo	Continuing Student
Jenny	Moya	2021	Biomedical Engineering	University at Buffalo Engineer- ing/Industrial Management	Graduate Student
Marieross	Navarro	2021	Mechanical Engineering	University at Buffalo	Continuing Student
Ngowari	Opuso-Jama	2021	Biochemistry	University at Buffalo Master's in Biological Sciences	Graduate Student
Maisha	Rahman	2021	Public Health	UB School of Public Health/ MPH	Graduate student
Breanna	Roper	2021	Biotechnology	University at Buffalo	Continuing student
Dania	Salah	2021	Biomedical Sciences	University at Buffalo	Continuing student
Holliday	Sims	2021	Computer Sciences	University at Buffalo	Continuing student
Sergio	Smith	2021	Mathematics	University at Buffalo	Continuing student
Melina	Villa	2021	Biomedical Sciences	Graduated May 2021	Will be applying to medi- cal school

CSTEP 2022 SUMMER RESEARCH PROGRAM STAFF



CSTEP Director

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CSTEP Administrative Assistant

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Poster Competition Coordinator

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Post-Doctoral Research Associate

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Graduate Assistants

Gloria Aidoo-Frimpong, PhD

Malena Allbright

Claudia Flores-Monetesinos, JD

Shelbi Molin

Student Assistant

Danielle Haynes

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2022 CSTEP SUMMER RESEARCH INTERNS



2022 CSTEP Research Interns at the Hauptman-Woodward Institute