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# CADSTI-NE

## Newsletter

'Promoting science and technology for Caribbean youth'

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November 2019

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## President's Message



**Dinah Sah - President**

**Dear Friends and Supporters of CADSTI-NE,**

It's truly a pleasure to share with you the highlights of the 2019 CADSTI-NE summer internship program which was a great success! We organized eight student internships in biotech, high tech and other areas for our SPISE graduates from the Caribbean, hosted by six companies in Massachusetts,

Barbados and the UK. In total, CADSTI-NE has now organized 44 internships for Caribbean youth! The CADSTI-NE organizing committee worked tirelessly throughout the year, meeting nearly every Sunday morning to raise funds, to plan, coordinate and implement this program. We could not have done any of this without your support, and the support of the host companies. A highlight of 2019 was CADSTI-NE's Caribbean dinner event in September where we celebrated our summer interns and SPISE graduates with approximately 100 friends, colleagues, family and other supporters. A very heartfelt thank you for sharing in our vision to provide these amazing opportunities in science, engineering and math for our very gifted Caribbean students!

Sincerely yours,

*Dinah Sah*

Dinah Sah, PhD, President, CADSTI-New England, Inc.

## About CADSTI-NE

Caribbean Diaspora for Science Technology & Innovation - New England (CADSTI-NE) is a non-profit 501(c)(3) organization whose mission is to promote science and technology for Caribbean youth.

Our main focus is the student internship program which was launched in 2014 and provides opportunities for graduates of the Student Program for Innovation in Science and Engineering (SPISE) to experience first-hand the application of STEM to research and development within biotech, high tech and other organizations in the USA, Canada, UK and Caribbean.

SPISE is an annual intensive residential summer program launched in 2012 for gifted Caribbean high-school students 16-17 years of age who are interested in studying and exploring careers in science and engineering.

### CADSTI-NE Leadership Team

Karen-Leigh Edwards, PhD, MBA

Richard Fauconier, PhD

Lori Fitz, PhD

George Marecheau

Paul McLean, PhD

Dinah Sah, PhD

Joshua Sheldon, MBA

Cardinal Warde, PhD

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# Biotechnology



**Terrikia Benjamin**  
(Antigua and Barbuda)

- **Fourth year Biochemistry major at University of Rochester | NY, USA**
- **CAMP4 Therapeutics, Cambridge MA, USA**

CAMP4 Therapeutics is focused on better understanding how genes are controlled by signaling pathways in specific disease states through their unique Gene Circuitry Platform™ to improve therapeutic predictability. Terrikia's summer internship at CAMP4 Therapeutics was a memorable experience filled with many opportunities for learning and professional development. She worked with the translational team and enjoyed seeing the application of biochemical pathways that she learned about in class and the rationale behind targeting specific enzymes.

Learning about CAMP4's different disease programs also enabled her to learn more about liver diseases.

Terrikia also acquired and refined many lab techniques such as RNA extraction, cDNA generation, qPCR and Western Blots. The process of analyzing her results and trouble-shooting experiments helped her to improve her critical thinking and problem-solving skills. She also received numerous opportunities to present her results to different groups within the company which was good practice for giving a talk in a scientific setting. Terrikia especially enjoyed CAMP4's warm culture and small size along with the weekly activities and frequent celebrations that gave her the opportunity to get to know everyone, whether they were a Scientist or worked in Business Development or HR. These conversations helped her to gain perspective on different career paths she can pursue after graduation.



# Biotechnology



**Tracey Moyston (St. Lucia)**

- ***Second year Biomedical Engineering major at University of Rochester | NY, USA***
- ***Cogen Immune Medicine (formerly Cogen Therapeutics), Cambridge MA, USA***

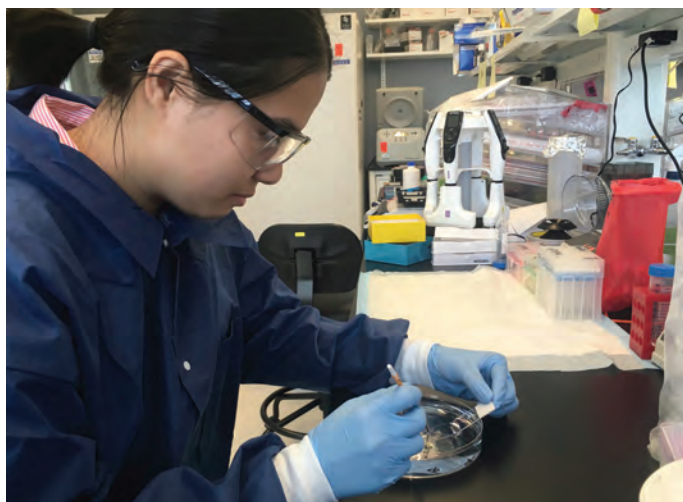
Cogen Immune Medicine is developing a platform for the purpose of improving clinical decision making and overall health. This multi-component process integrates state-of-the-art technologies from synthetic biology, protein engineering, micro-fluidics, biomaterials, single-cell sequencing and machine learning to investigate antigen libraries and their binding to T cell receptors. Tracey was keen to gain work experience in a biotech company to increase her knowledge of the immune system and to see first-hand how experimentation at the laboratory

bench contributes to a start-up company's progress towards its goals. She gained valuable hands-on experience working with primary immune cells in culture, gene expression analysis using polymerase chain reaction (PCR) and next generation sequencing (NGS).

Through the process of her own experiments and in discussions with her colleagues, she learned a great deal about 'out-of-the-box' thinking that is needed in science when investigating and developing new ideas. She also learned the value of thoughtful experimental design and troubleshooting in order to reach solid conclusions that are the basis of future project directions. Being at a very small company, Tracey met and had opportunities during her tenure to talk with everyone from her fellow interns, colleagues in other roles and the CEO. She gained valuable feedback and advice, not only on her role and responsibilities for the internship, but also more broadly on what it takes to be successful in science.



# Biotechnology



**Min Wen Gong (Guyana)**

- **Second year Biochemistry major at McMaster University / ON, Canada**
- **Voyager Therapeutics, Cambridge MA, USA**

Voyager Therapeutics is developing gene therapies for the treatment of severe neurological disorders. Min Wen's three-month internship at Voyager Therapeutics was in her words, 'an overall incredible experience'. She learned and became proficient at several useful laboratory research techniques such as running ELISA assays and performing immunohistochemistry staining. She also learned in vivo techniques such as intravenous and intraperitoneal injections. Throughout the internship, she learned about the science behind the progression of neurological diseases and how gene therapy can be used to potentially treat these diseases.

Other than learning and developing these useful techniques which she will undoubtedly utilize in her future career, she also had opportunities to attend the weekly neuroscience meetings, tau team meetings, and journal clubs. From these meetings, she learned more about current research in the field and how this new information may be used to advance the development of gene therapy techniques.

This internship solidified Min Wen's goal of wanting to pursue research as a career, and potentially play a role in changing the lives of patients, especially those living with severe neurological diseases. She was inspired through the many first-hand opportunities she had to interact with and learn from the innovative scientists at Voyager. Through this internship, she also observed clearly how important it is to be passionate and innovative to succeed in the biotechnology field.





# Biotechnology

- **Third year Neuroscience and Theater dual major at Wesleyan University | CT, USA**
- **Voyager Therapeutics, Cambridge MA, USA**

Voyager Therapeutics is developing gene therapies for the treatment of severe neurological disorders. Fitzroy states that he really could not have asked for a better internship than the Voyager experience he had over the summer. He found it to be such a wholesome experience that offered the perfect combination of learning, working and fun! It is not an exaggeration when he says that Voyager treated him no differently from any of their full-time employees- and he believes he speaks on behalf of the other interns who were with him this summer.

His expectations going into his summer 2019 internship was that he would spend the next 10 weeks following scientists around, doing any menial tasks asked of him. So in his words, he received a pleasant shock when he discovered that he would be given my own personal project to work on during his time there! He was excited and up for the challenge.



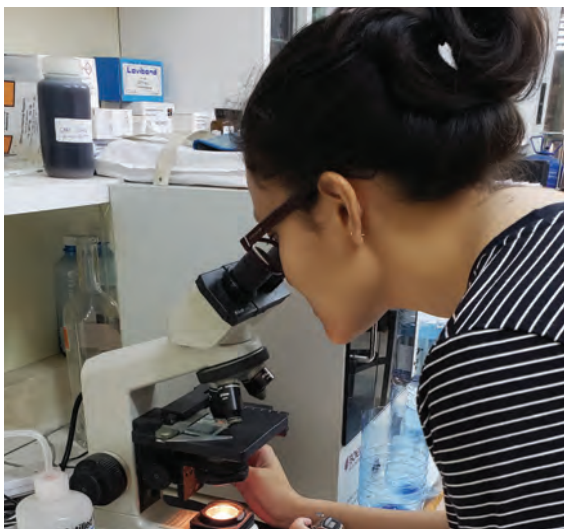
**Fitzroy Wickham (Jamaica)**

The Tau team at Voyager took Fitzroy under their wings and made a scientist of him. He spent the first couple of weeks being trained in several biochemical and in vivo procedures. Such techniques included ELISAs and protein assays, intravenous injections, intraperitoneal injections, tissue harvesting and brain dissections. He also took the opportunity to sit in on various company meetings, participate in company outings and meet patients for whom Voyager is trying to find a cure. He enjoyed my internship immensely- so much so that he extended it for an additional two weeks. At the end of the internship he had the privilege of giving a presentation to some of the company scientists about his research.

Fitzroy says that he will never forget the many wonderful scientists he met at Voyager. He learned a lot and got invaluable hands-on experience. He also got the chance to explore the Boston-Cambridge area and fell in love with the two cities. He states that he is forever grateful to CADSTI-NE for making this all possible!



# Chemical Engineering



**Farah Chin (Guyana)**

- **First year undeclared major (interest in Life Sciences) at McMaster University | ON, Canada**
- **Foursquare Rum Distillery, Barbados**

Foursquare Rum Distillery manufactures rum with state-of-the-art equipment and systems. Farah completed a four-week internship at the distillery. The internship focused on the analytical aspects of rum production (a critical component of a controlled manufacturing process) and also encompassed dry ice production and observing the bottling water plant within the factory. She learned new analytical procedures such as pH titration, carbon dioxide purity test, total dissolved solid measurement, and conductivity assessment, among others.

Other duties included preparation of cane juice and molasses for measurement of alcohol content. For this, she calibrated and operated an alcolyzer, in order to determine the alcohol content of samples. She also took dilute samples of fermenting molasses from which she prepared microscope slides to count yeast and lactobacillus. She learned first-hand about the processes behind distillation, and how to operate unfamiliar machinery (such as a centrifuge). Her experience also encompassed the automated shaping, filling, capping and packaging of water bottles. Overall, she “experienced firsthand what it would be like to work in an analysis lab and gained further insight into this career path through conversations with other workers.”

- **Graduate of T.A. Marryshow Community College | Grenada**
- **Foursquare Rum Distillery, Barbados**

Foursquare Rum Distillery manufactures rum with state-of-the-art equipment and systems. Joshua spent four weeks at the distillery. After his first week, Joshua conducted microbe checks frequently and without supervision; this was his “first delegated responsibility” and he states that he held it with pride! When he was not busy, he took opportunities in his free time to shadow other coworkers, allowing him to learn about other aspects of the processes in the distillery. He was responsible for measuring total dissolved solids, conductivity and pH of out-take and waste valves to ensure the still was working within a target range. He also had the opportunity to visit the bottling department and observed the operation of the other quality control lab. Joshua stated that this gave him a clearer understanding of the plant’s operation as a business entity. In summarizing his internship, Joshua states, “I can also say I understand the detail-oriented nature of a manufacturing plant more than before. It was truly a worthwhile opportunity that I am immeasurably grateful for.”



**Joshua Francis (Grenada)**

# Energy Industry

- **Third year Physics major at Grinnell College | IA, USA**
- **Emera Caribbean, Barbados**

Emera Caribbean is the sole provider of electricity in Barbados and includes Barbados Light and Power Co. (BLPC) and Emera Caribbean Renewables Ltd. (ECRL). Avery's internship allowed her to spend time in multiple projects at both of these organizations. She rotated among four different departments, spending 2 weeks at each site. First, she was placed at the Generation Plant at Spring Garden where she was exposed to the operations and maintenance units, as well as the mechanisms of the engines. Avery was able to tour the gas turbines at Seawell and learn about control of the engines in the control room and the different issues that may arise. She observed site visits at ECRL and was able to get insight into the installation and maintenance of solar panels. In addition, she participated in many visits to the 10 MW Solar Farm at Trens, St. Lucy, and had the opportunity to assist in the Hurricane Resiliency Project.



**Avery Barnett (Jamaica)**

Next, Avery was sent to Distribution where she worked alongside the substation technicians and the linesmen. She had, in her own words, 'the awesome opportunity to attempt pole climbing and being able to ride in a bucket'. Additionally, she got the opportunity to understand the technicalities of breakers and transformers. With the linesmen, she saw how power lines are installed. Her last stop was in the Asset Management department, where she conducted her own research project to analyze if there is enough land potential for Barbados to achieve its 2030 goal of 100% renewable electricity. Additionally, she helped with updating the Barbadian grid code to encompass micro-grids, and alongside her co-intern, worked with the engineers to map out a possible plan for implementing the 2030 goal.

Overall, Avery found the internship to be an amazing experience and would do it again if given the chance. She enjoyed being able to work in such a dynamic and diverse job and learn so much throughout the 2 months. Armed with her newfound knowledge, she is ready to take on the future!



# Computer and Data Sciences

- ***Master of Science in Informatics at University of Edinburgh | Scotland, UK***
- ***GE United Kingdom***

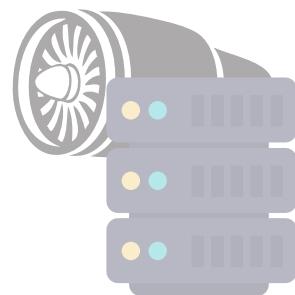
GE United Kingdom is the UK arm of a multinational conglomerate involved in power turbines, aviation engines, artificial intelligence and digital twinning, renewable energy, smart lighting and transportation, among other products and services. Cecil spent the summer interning at GE Aviation's Eastleigh office in England, working as a data science trainee. During his time there, he worked primarily on text analytics, exploring patterns in the words used in technical reports across different sectors of GE's Aviation division. The Data Science department was small to medium-sized.



**Cecil Cox (Guyana)**

During his time there, he was assigned two projects, working closely with two supervisors on each of them, and coordinating with his line manager. In his first project, he attempted to apply predictive modelling to aircraft engine events, using text to classify various engine alerts, faults and issues. He experimented with a variety of text processing approaches and datasets, and during the course of his internship found himself not only deploying standard machine learning tools, but also employing techniques from library science and traditional natural language processing. One of Cecil's main takeaways on this project was the need to incorporate domain-specific knowledge when attempting to understand technical data.

The second project involved analyzing data from aircraft propeller shop reports. He employed similar techniques to model repair costs, and developed tools to explore the semantic relationships between technical terms used in the aviation industry. He was able to explore the ways in which shorthand, synonyms and jargon were employed in the aviation industry and worked on techniques to automatically identify these. Overall, Cecil summarized his internship as a highly educative experience and stated that 'the knowledge and skills I gained there will serve me well in the future'.





# SPISE Summer Program



Group shot of SPISE 2019 students

The **Student Program for Innovation in Science and Engineering (SPISE)** is an annual 4-week summer residential program in Barbados for Caribbean high-school students who are gifted in Science, Technology, Engineering and Mathematics (STEM), and interested in studying and exploring careers in these disciplines. SPISE is modeled after the well-known and highly successful MITES program at MIT for which Professor Cardinal Warde also serves as the Faculty Director. SPISE students are totally immersed (24/7) in university-level calculus, physics, biochemistry, entrepreneurship, one-Caribbean studies, and hands-on projects in robotics or renewable energy, and computer programming. The SPISE environment discourages rote learning and teaches students how to focus on understanding and applying the fundamentals so as to achieve mastery of the material, and thus be able to solve complex problems. The value of teamwork (learned in the hands-on projects) is yet another essential skill that is emphasized, along with proactive time-management skills. Instructors in the SPISE include university professors from the Caribbean and the Diaspora (including MIT), and senior management professionals from leading biotechnology and pharmaceutical companies in the Diaspora. The program culminates with student project competitions in which each team first gives an oral presentation of their hands-on project before demonstrating the workings of their project to the public.

To date, SPISE has served 152 students from 16 Caribbean countries. SPISE graduates from the 2012-2018 classes are now enrolled at the world's top science and engineering universities including MIT, Stanford, Harvard, Princeton, Yale, Columbia, Dartmouth, U Penn and UWI. Most of these students have substantial financial aid packages, and some have full scholarships. Further details can be found at:

<http://caribbeanscience.org/projects/spise.php>.

# CADSTI-NE Annual Dinner









The **CADSTI-NE annual dinner** was held in September 2019. We heard about the history of CADSTI-NE with an example of how some guidance and an opportunity at a critical juncture in a young person's life can change the entire course of their future. This is what motivates us at CADSTI-NE!

We heard from two of the SPISE graduates, now undergraduates at MIT, who participated in the CADSTI-New England summer internship program, and how SPISE and their internships provided them with important experiences that have contributed to their growth, and furthered their academic and career paths. Their speeches are posted at [this link on the CADSTI-NE Facebook page](#). We heard perspectives from a host organization – a mentor/supervisor and the head of Human Resources – and how the internships provided highly positive experiences for them and their organizations.

We could not have done any of this without your support and participation, and your offers of further assistance have been inspirational to us! Any and all help is tremendously appreciated – please contact Dinah Sah at [dsah@cadsti-ne.org](mailto:dsah@cadsti-ne.org) to explore how we can do more together. We are tremendously grateful to you for joining us in our effort to groom the next generation of Caribbean science, engineering and business leaders.

# 2019 Internship Hosts and Sponsors

Sincere thanks to our partner organizations, who devoted time and resources to plan for, on-board and mentor the student interns.

Internship Host Organization	Location	Company Focus	Student Intern
	Cambridge MA, USA	Small biotech company addressing the fundamental cause of disease by controlling the output of genes central to disease.	Terrikia Benjamin
	Cambridge MA, USA	Small biotech company pioneering antigen-specific immune control. Harnessing the Precise Curative Power of the Immune System.	Tracey Moyston
	Barbados	Energy company providing electrical power for several Caribbean islands, including renewable energy.	Avery Barnett
	Barbados	Small company manufacturing rum with state-of-the-art equipment and systems.	Farah Chin Joshua Francis
	UK	GE United Kingdom is the UK arm of a multinational conglomerate involved in power turbines, aviation engines, artificial intelligence and digital twinning, renewable energy, smart lighting and transportation, among other products and services.	Cecil Cox
	Cambridge MA, USA	Small biotech company developing life-changing gene therapies for people living with severe neurological diseases.	Min Wen Gong Fitzroy Wickham

*We also thank our numerous individual and corporate donors who made these internships possible.*

## SUPPORT CADSTI-NEW ENGLAND!

To make a U.S. tax-deductible donation to CADSTI-NE, please go to:  
<https://cadsti-ne.org/donations.html>



# Caribbean Diaspora for Science Technology & Innovation New England



Promoting science and technology for Caribbean youth

## Thank You!

### CADSTI-NE Leadership Team



Karen-Leigh Edwards, PhD, MBA



Richard Fauconier, PhD



Lori Fitz, PhD



George Marecheau



Paul McLean, PhD



Dinah Sah, PhD



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