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CADSTI-NE Newsletter

'Promoting science and technology for Caribbean youth'

November 2018

IF EVERYONE MOVES FORWARD TO CETHER, SUCCESS TAKES CARE OF ITS

President's Message



Dear Friends and Supporters of CADSTI-NE,

It's truly a pleasure to share with you the highlights of the 2018 CADSTI-NE summer internship program which was a great success! We organized 10 student internships in biotech, high tech and other areas for our SPISE graduates from the Caribbean, hosted by 6 companies in Massachusetts, Connecticut, Barbados, Trinidad and Jamaica. The CADSTI-NE

Dinah Sah - President

organizing committee worked tirelessly throughout the year, meeting nearly every Sunday morning to raise funds for, plan, coordinate and implement this program. We could not have done any of this without your support, and the support of the host companies. CADSTI-NE will be holding a Caribbean dinner event in 2019 where we plan to celebrate the SPISE graduates in the Boston area and the summer interns. We hope to see you there in person, so please stay tuned for further details. 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,

Dinal Sah

Dinah Sah, PhD, CADSTI-NE President

CADSTI-NE Leadership Team

Karen-Leigh Edwards, PhD, MBATony Rossomando, PhDRichard Fauconier, PhDDinah Sah, PhDLori Fitz, PhDJoshua Sheldon, MBAPaul McLean, PhDCardinal Warde, PhD

About CADSTI-NE

The Caribbean Diaspora for Science, Technology and Innovation - New England (CADSTI-NE) is a non-profit 501(c)(3) organization focused on promoting science and technology for Caribbean youth.

Our overall mission is to assist in diversifying the economies of the Caribbean by harnessing science and technology for economic development, and in doing so help raise the region's standard of living. CADSTI-NE's major projects are to:

(1) Organize and sponsor internships for Caribbean students at biotech and high technology companies in the U.S. and the Caribbean, and (2) Support the Student Program for Innovation, Science and Engineering (SPISE), an intensive four-week enrichment residential summer program for gifted Caribbean high school students.

These projects are made possible through generous donations from organizations and individuals in the Diaspora and the Caribbean, and through partnerships with US, Canadian and Caribbean companies. ■

2018 Internship Program

CADSTI-NE created internship opportunities for 10 students from the Caribbean, who are studying STEM subjects ranging from biochemistry, chemistry, applied math, computer science, and biomedical, electrical and mechanical engineering to physics. These opportunities were made possible due to generous donations from supporters in the Diaspora and Caribbean, and partnerships with US, Canadian and Caribbean companies.

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Biotechnology and Chemical Engineering

Biochemistry major at University of Rochester, USA / Voyager Therapeutics, Cambridge, Massachusetts, USA

A major goal for Terrikia in her internship at Voyager was to explore her career interests in science. At Voyager, Terrikia not only learned new laboratory skills such as culturing cells, detecting and quantifying RNA and protein, and collecting and processing specific tissues, especially from the central nervous system, but also was a fully integrated team member. She attended research and project team meetings where experimental goals, rationale, and data interpretation were discussed in the context of the overall project. All of this gave her a close-up view as to how decisions are made in the drug discovery process. The discussions with her colleagues helped her to see how the novel class of gene therapy drugs being developed at Voyager will be valuable for the treatment of neurodegenerative diseases. The company culture of close collaboration, frequent celebrations and numerous discussions with colleagues, which leads to happy and motivated employees



Terrikia Benjamin (Antigua)

made a positive impression on Terrikia. The summer internship exceeded her expectations and helped increase her confidence in her ability to pursue a successful career in science. Terrikia noted, "I am more sure that I want to be a scientist and my experience at Voyager has increased my interest in neuroscience and motivated me to take more related courses".

Chemical and Biological Engineering major at MIT, USA | Voyager Therapeutics, Cambridge, Massachusetts, USA



Desmond's internship at Voyager Therapeutics served multiple purposes in furthering his interest in the biotechnology industry, including: (1) exposure to the drug discovery process, (2) gaining familiarity with gene therapy, (3) learning standard molecular and cellular biology techniques, and (4) developing his network with industry professionals. Through participation in a major program at Voyager as well as rotations through different departments, Desmond was able to observe and learn many new techniques under the close guidance of his supervisor, such as DNA extraction and droplet digital PCR, RNA extraction, collection of biological tissue and fluid samples from preclinical in vivo studies, and immunohistochemistry.

In addition to his experimental work in the laboratory, Desmond attended neuroscience group meetings, program team meetings, seminars, journal clubs and the company's summer outing. The diverse hands-on experience, techniques and meetings have given Desmond valuable first-hand experience in working at a fast-paced small biotech company where all staff passionately share the goal to discover a transformative therapy to treat human disease. In summing up his internship, Desmond stated, 'Overall, this internship experience was amazing in every fashion... this internship facilitated

immense intellectual, technical, personal, and interpersonal development for me'.

Biotechnology and Chemical Engineering

Graduate of Trent University, Canada, B.S. in Biochemistry & Molecular Biology | Vape Manufacturing Laboratories, Branford, Connecticut, USA

While an intern at Vape Manufacturing laboratories, Shamone learned about the processes and activities relevant to the production and manufacturing of E-liquids, to ensure that the end-products are compliant with federal regulations. At this state-of-the-art manufacturing facility, she was able to work in a fully GMP-compliant environment and learned the routine procedures required to achieve consistency between different batch productions. The importance of SOPs - both writing them and documenting the protocols to fulfill the company's requirements - was also a highlight of her tenure. Through her participation in a recent change made by the FDA for the labeling requirements of E-liquids, Shamone achieved a good understanding of the importance of complying with the standards set by the FDA. Overall, Shamone believes that the concepts she has learned at Vape Manufacturing Laboratories are valuable and applicable to the pharmaceutical industry especially in the Chemistry, Manufacturing and Controls aspect of drug production and quality control for clinical trials.



Engineering major at Lehigh University, Bethlehem, Pennsylvania, USA | Foursquare Rum Distillery, Barbados



Matthew Clarke (Barbados)

Matthew's internship at Foursquare Rum Distillery gave him an opportunity to gain a foundation in understanding how the rum production Throughout his internship, Matthew's knowledge, process works. responsibilities and independence expanded as he went from learning the process and tasks to becoming independently responsible for steps in rum production such as "taking the samples and testing the alcohol strength periodically to ensure that the mash (molasses, water and yeast mixture) is being fermented as desired and also that the alcohol being distilled is pure and suitable for use in the finished product." Matthew had the opportunity to work with apparatuses such as an ebulliometer to measure alcohol content and a refractometer to test the brix or sugar content of the rum. In his final week, he was involved in the cleaning process of the distillery which involved working safely with materials such as "caustic soda and sulfamic acid to clean and remove scale on the equipment."

Matthew stated that he "gained invaluable experience in handling thousands of gallons of high value product for extended periods with limited assistance and also how rigorous industrial cleaning can be."

Biotechnology and Chemical Engineering

Chemical Engineering major at University of the West Indies - St. Augustine, Trinidad | Foursquare Rum Distillery, Barbados

During Laura's internship at Foursquare Rum Distillery, she observed and participated in the rum production process including prepping the barrels, testing water quality, monitoring rum quality and cleaning the equipment. Importantly, Laura saw how chemistry is integral throughout the entire process of creating the final product of bottled rum. She even had the opportunity to observe the processing of byproducts to minimize the company's environmental footprint, such as converting the CO_2 produced from the fermentation process into dry ice. Laura also saw how precision permeates the entire rum production process to ensure a high level of quality even in parts of the process that one might not think of, such as the boring of holes in the barrels and the fit of the corresponding stoppers.

Laura remarked, "The job allowed me to test my abilities of adapting to a new working environment and being as productive as possible." Due to the flexibility in her schedule and the freedom to explore the areas that were accessible to her, she got to "make links between the importance of each step in the overall process."



Laura Garavito Martinez (Trinidad and Tobago)

Energy Industry

Graduate of University of the West Indies - St. Augustine, Trinidad, B.S. in Mechanical Engineering | Emera Barbados



Josh Henry (Grenada)

Josh's internship at Emera Barbados focused on energy generation, energy distribution, alternative sources of energy, and administration of energy services in the Caribbean region. Josh observed first-hand the application of engineering principles to the real world and had the opportunity to expand his network while experiencing the Caribbean engineering work environment within a large regional company.

Josh rotated through various divisions within Emera, including (A) the solar renewable energy division, (B) operations related to energy generation and distribution (including plant procedures, systems configuration), and (C) asset management which included participating in the project review and approval process, assessing the impact of large projects on the energy system, and observing the proposal process for future capital projects. He got hands-on experience installing solar panels including considerations specific to the site for wind and direction, whereas in operations related to energy generation,

he learned about similarities and differences between steam and diesel system controls.

In his own words: "I loved the experience of working at the Barbados Light and Power Company with Emera Caribbean thoroughly. I learned a great deal, not just about ... the field of power generation and distribution, but I also learned about the complex relationship between large organizations, the government and the people and how each needs the other to survive. ... I would recommend this opportunity to any other SPISE alumni."



Computer and Data Sciences

Graduate of University of the West Indies - St. Augustine, Trinidad, B.S. in Mechanical Engineering | Trinidad Systems Limited, Trinidad



David Serrant (Trinidad)

David's internship at Trinidad Systems Limited (TSL) enabled him to gain hands-on experience in applications of both mechanical and electrical engineering. Through troubleshooting and repairing a variety of older (Xerox ColorQube) and newer (Work Centre) machines, as well as installing and programming refurbished or new machines, David was able to fully test his knowledge accumulated during the 6 weeks of his internship. In addition to honing his engineering skills, David gained a strong appreciation of how customer relationship and service skills impact both the quality of the job performed as well as continued business for the company. David immensely enjoyed his internship at TSL and recommends the experience to any young engineer interested in gaining hands-on experience.

Mathematics, Physics and Chemistry major at Dominica State College, Dominica | Sagicor Life Insurance, Trinidad

At Sagicor, Inoela worked in the Methods and Operations department where she learned the Visio software to create cross-functional flowcharts. She then used this software tool to contribute to the department goal of optimizing business processes across functional groups. In carrying out her work, Inoela learned about the roles of other departments and the inter-dependence of departments and groups in achieving company goals. As part of Sagicor's corporate responsibility project, she also volunteered at the Asa Wright Nature Center in Trinidad where she assisted in identifying and recording the location of plants on which an endemic bird, the Trinidad Piping-Guan (Pawi) feeds.



Inoela Vital (Dominica)

Actuarial Sciences

Actuarial Science major at University of the West Indies - St. Augustine, Trinidad | Sagicor Life Insurance, Barbados

The internship at Sagicor Life Insurance acquainted Lauren with several areas of life insurance, from customer service to actuarial science. Lauren worked in the Actuarial Department, but also learned to resolve customer service requests, and she used computer software such as Microsoft Excel, CAPSIL and GIAS to complete her assignments. Additionally, she learned to do PPM (Policy Premium Method) derivations, adjust Ultimate Reserve Rates (URRs) and analyze changes to Present Value Asset and Liabilities Cash Flows. While at Sagicor, Lauren participated in its Green Leaders program; this required partaking in multiple workshops, as well as planning and conducting community outreach activities. In addition to the Green Leaders workshops, Lauren also took part in several others, such as the Insurance 101 Professional workshop. Lauren concludes that some of the most valuable knowledge she gained was acquired by talking to as many knowledgeable people as she could. These included other interns who were further along in their actuarial science academic programs, as well as managers with the Associate and Fellow designations in the Society of Actuaries.



Lauren James (Trinidad and Tobago)

SPISE Summer Program



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 understanding focus on 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 the Diaspora (including MIT), and senior and

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 131 students from 16 Caribbean countries. SPISE graduates from the 2012-2017 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.

Since its inception, the CADSTI-NE summer internship program has provided a total of 38 internships for SPISE graduates, including 4 student interns in 2014, 3 in 2015, 6 in 2016, 15 in 2017 and 10 in 2018.

2018 Internship Hosts and Sponsors

Sincere thanks to our partner organizations, who devoted time and resources to planning for, on-boarding and mentoring the student interns.

Internship Hos	st Organization	Company/Program Focus	Student Interns
Emera	Emera Caribbean Barbados	Energy company providing electrical power for several Caribbean islands, including renewable energy.	Josh Henry
FOURSQUARE	Foursquare Rum Distillery Barbados	Manufacturing rum with state-of- the-art equipment.	Matthew Clarke Laura Garavito Martinez
Sagicor	Sagicor Life Insurance Barbados, Jamaica, Trinidad	Providing multiple products to improve the lives of its customers.	Lauren James Tyler Neath Inoela Vital
	Trinidad Systems Limited Trinidad	Providing end to end solutions in all fields of Information and Communi- cation Technology.	David Serrant
	Vape Manufacturing Laboratories Branford, CT, USA	Applying high manufacturing quality standards to e-liquids.	Shamone Fine
	Voyager Therapeutics Cambridge, MA, USA	Developing life-changing gene therapies for people living with severe neurological diseases.	Terrikia Benjamin Desmond Edwards

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



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