

THE BIOTECHNOLOGY CENTRE



Professor Helen Asemota, BSc, *Univ. of Benin, Nigeria*, MSc, *Ahmadu Bello University, Nigeria*, PhD, *Univ. of Benin/Frankfurt, Germany*
Director

INTRODUCTION

The year in question started with international outreach showcasing the Centre's key efforts at producing the distinctive student and becoming more world-acclaimed, by reaching more communities internationally and locally, with our research and outcomes. Hence, the year under review was started by the joint conveying of the IMEKO TC19 International Symposium at the Panam University in Aguascalientes, Mexico, from August 2–4, 2017, at which the Director of the Centre, Prof. Asemota (IMEKO Rep. in Jamaica) served as the General Co-chair. Both Staff and PG Students from UWI were among the selected presenters and speakers, and the students gained tremendous experience from this.

The Centre also conducted a special local outreach by joining efforts with the Chairman of the Jamaica National Commission for UNESCO, under the UNESCO MAN & THE BIOSPHERE programme, with the

Trelawny Municipal Corporation, the Member of Parliament, Southern Trelawny, and the RADA, as well as local yam farmers, in the planning and staging of the first ‘Training and Awareness Event’ re the Proposed Cockpit Country Biosphere Reserve & the Development of a Yam Industry in Trelawny, at Albert Town, Southern Trelawny, on May 14, 2018.

At the end of the year, from July 12–25, 2018, the Centre effected a collaborative exchange visit to SUNY Binghamton under the USA National Science Foundation (NSF)-funded BREAD Pheno Yam Project titled “Development and Field Testing of Paper-based Biosensors to Increase Productivity of Smallholder Agriculture in Developing Countries” involving PG students and Staff in presentations and Research planning meetings and discussions – enhancing their experience

The Centre also started High School Students’ Summer Internship Programme in Bio-based Technologies, with desiring PG students’ involvement.

BIOTECHNOLOGY CENTRE STAFF

The Academic Staff at the Centre are Professor Helen Asemota (Director, also Professor of Biochemistry and Molecular Biology at the Basic Medical Sciences, Department of the Faculty of Medical Sciences, also the UWI Yam Research Group Leader); Professor Paula Tennant, also Professor of Virology at the Life Sciences Department of the Faculty of Science & Technology, Molecular Virology Research Group Leader; Prof. Marcia Roye FST (Associate Dean of Graduate Studies, Geminivirus Research Group Leader; Dr. Sylvia Mitchell, Senior Lecturer, Medicinal Plants Research Group Leader; and Prof. Nouredine Benkeblia, also Professor at the Life Sciences Department of FST, Tree Crops & Metabolomics Research Group Leader. All of the Centre’s Academics teach courses at the Basic Medical Sciences or Life Sciences Departments or within the Faculty of Science and Technology Foundation programmes.

The Support Staff of the Centre in the period were: Mrs. Shivanjali Dondapati (Research Assistant to Prof. Asemota), Ms. Deiondra Robinson

(Research Assistant to Professor Roye), Mr. Carlton Barrows (Senior Laboratory Technologist), Mrs. Karen Stewart (Senior Administrative Assistant II), Ms. Elizabeth Mills (NSF BREAD Yam Project Field Assistant), Mr. Roy Dwyer (Handyman), Ms. Shernette Banks-Ashman (Laboratory Attendant) and Mr. Antoni Comrie (postgraduate student) who assisted with the operations of the tissue culture lab.

TEACHING & RESEARCH

Postgraduate Students

Twenty seven (27) post-graduate students were trained at the Centre. The Centre also catered for some students registered in other Departments but conducted all or aspects of their research at the Centre. The students were attached to various research groups of the Centre depending on their research supervisors/co-supervisors.

Post Graduate Programmes/Research Areas

The Centre runs MPhil and PhD degree programmes in Biotechnology. Recently, an MSc degree programme was also approved for the Centre. The MPhil and PhD programmes are coordinated by Prof. Asemota, while Dr. S. Mitchell, facilitated by Prof. M. Roye, coordinates the MSc. Programme, which for certain reasons has not been able to take off. More efforts is being put for the coming year.

The research areas for the MPhil and PhD degrees, in the period under review, were mainly of agro-, medicinal plants, viruses, and biomedical research focus.

TEACHING

In addition to the research and supervision of post graduate research students, the academic members of the Centre during this period were involved in teaching at both undergraduate and postgraduate levels at other departments and/or in the Faculty (FST) Foundation programmes.

OTHER ACTIVITIES OF THE CENTRE:

Bio-Skills Training

In addition to the regular teaching and research training of both postgraduate and interested undergraduate students, the Centre also effects bio-skills training and bioservices as part of its agenda.

Three students, Tasha Breezie, Tudi-Ann Noble and Glenise Mullings-Chung, from the Northern Caribbean University in Manchester were trained at the Biotechnology Centre for two weeks during April 18 to 27, 2018. Training was done on DNA Fingerprinting of Ginger by Prof Helen Asemota and Mrs Shivanjali Dondapati.

Students from the Wolmer's Boys High School Six Form, were hosted at the Biotechnology Centre in February 2018 for a workshop on "Concepts in Genetic Engineering". Professor Roye and her team organized, presented lectures and laboratory sessions. The young men were introduced to recombinant DNA technology experiments. The experiments included extraction of DNA, DNA restriction analyses and gel electrophoresis. The results of the experiments were used as a laboratory write-up for the students.

The Gemini virus research group of Prof. Marcia Roye hosted a volunteer undergraduate student for Semester 1, Mr. Travis Garnett. He was trained in the following techniques: DNA extraction (plasmid miniprep and plant DNA extraction), Rolling circle amplification; pour and streak plates (for bacteria), Agarose Gel electrophoresis.

Organized Tours To The Centre

There were several organized tours in the year

On October 27, 2017 a total of 45 students from the 'Biotechnology I Course visited the Biotechnology Centre for a tour, demonstration and lecture. Miss Deiondra Robinson, Research Assistant, gave the first lecture to the students in Lab 1 on molecular geminivirus work at the Centre and the publications that came out of these work and the significance of them in the 21st century. The students toured the tissue

culture lab where Mr. Antoine Comrie showed them the methods used to carryout tissue culture in the labs from the initial stage to the final stage. Mr. Lowen William and Mr. Nikolai Lutas, gave a presentation on their research which involves anti-diabetes synthetic chemicals and bio-testing in rat model of diabetes & molecular analyses of coffee leaf rust disease, respectively, as well as on other current work of lab 4 researchers.

A total of 10 students from the University of Technology, Jamaica visited the Biotechnology Centre for a tour on February 21, 2018. Mr. Carlton Barrows, Senior Laboratory Technologist gave students an overview of the research being done in each lab and the equipment used. Miss Deiondra Robinson, Research Assistant, gave a talk to the visiting students on molecular geminivirus work at the Centre, the publications that came out of these work and the significance of them in the 21st century. Students toured all five labs at the Centre. The Centre was also toured by the Shortwood Teachers College and Wolmers High School

VOLUNTEERISM AND INTERNSHIPS AT THE CENTRE:

Interns at the Centre in the year were Mr. Randy Clarke (Caribbean Maritime University), Mr. Mike Dwyer (Papine High School), Roxanne Kerr (Campion College), Brianna Brown (Campion College) and Athena Pagon (Immaculate Conception High).

Ms Lasherac Turner, Undergraduate student from the Bio-chemistry Department, UWI Mona volunteered for five weeks in March to April 2018 at the Biotechnology Centre in the Yam Research Group.

Interns, Samantha Kelly (student), Richard Stone (UWI graduate student) and Antoni Comrie (under the bamboo project) were also facilitated by the Medicinal Plant Biotechnology Research Group. These students braved the heat to help and were much appreciated. They helped to Tissue Culture make media, growth room activities, and assisted PG research students with DNA extraction demonstration in field activities at Clapham and Peckham under the Bamboo Project.

This year, the Biotechnology Centre started High School Internships in Biotechnology. There were four candidates in the Summer of 2018.

OUTREACH ACTIVITIES

UNESCO MAN & The Biosphere Programme-UWI Workshop in South Trelawny

The MAB Committee of the Jamaica National Commission for UNESCO partnered with the Biotechnology Centre to promote research and development for the economic base of the proposed Biosphere Reserve, into a full fledged 'Yam industry'. This is essential for the development and sustainable management of the Biosphere Reserve given the fact that the Government of Jamaica has made the decision not to permit mining in the cockpit country. This means that agriculture may remain the dominant land use in Southern Trelawny, the home of highest Jamaican Yam producers. In order to ensure this for the future, it is critical that the country builds on the existing cultural and economic potential of Yam Industry in the area, hence this important collaboration engagement. Apart from regular RADA-supervised visits to local farmers in the area, in collaboration with NCU and STEA, the collaboration with UNESCO MAB led to the public event on May 14, 2018 at Albert Town, Southern Trelawny.

UWI Mona Research Days 2018

The Biotechnology Centre participated in UWI Research Days-2018 with activities involving staff and students. The Centre attracted students and visitors by performing the following activities at both Research village and the Centre.

Centre tour and lab demonstrations:

The Biotechnology Centre conducted tours of the facility with special talks and lab experiments to visitors and students from various schools. Staff members and students from the Biotechnology Centre demonstrated the following lab activities – Simple DNA extractions, tissue culture and products development, Visitors were led on a tour of the botanical garden and shown various medicinal plants.

Jamaican Yam Taxonomy/Biodiversity Quiz:

Professor Asemota and her Research Group students also conducted a Yam Taxonomy/Biodiversity Quiz at the main tent and presented certificates to eighty (80) participants. This activity was a means of highlighting the extensive research being conducted on yams by the Yam Research group at the Biotechnology Centre. The yam taxonomy Quiz facilitated interaction with many primary, secondary and tertiary level students, as well as individuals from the secular and public sectors, as well as some farmers and market women. The interests it sparked can be considered significant in consideration of the principal goal for the research and outreach at the Biotechnology Centre. Success in the Quiz was based on knowing the local varieties of Yams. There are 26–28 local varieties of Yams in Jamaica.

Products Displays & Sampling:

The Biotechnology Centre displayed finished products at the booth in the Main Exhibition Tent. The Centre rolled out a wide array of products that were designed to accommodate the current global trend of going more natural. There were a variety of products from the various research groups. Products included candles, soaps, organic pesticides prepared by former Lab Technologist, Merline Randle.

Yam-based Food Products displays were by postgraduate students, Research Assistant/Yam Project Field Assistant working with Professor Asemota in the UWI Yam Biotechnology Research Team led by her. The Yam-based Products displayed were – Yam Cookies (E. Mills), Yam Biscuits – Chin Chin (S. Dondapati), Yam Spread (N.Scott), Yam pudding (O. Byfield), and Moringa Bites & Bars (R. Williams). There were also Displays of various types of Yams being researched at the Biotechnology Centre, including a two piece LARGE YELLOW YAM built as a support by the Event Organizers, for which the Centre is still very grateful.

There were also displays of various Wines made from local fruits by the current Lab Technologist (Carlton Barrows).

Dr. Mitchell's Research Group displayed various oils (by Mrs. Chenielle Delahaye-McKenzie, PhD student of Dr. Mitchell). She displayed the various oils made from local herbs such as lemon grass and neem among other plants and crops. There was also a display of activities under the Bamboo project including potted bamboo plants, and tissue culture plantlets.

CONFERENCES/WORKSHOPS/EVENTS ATTENDED BY BIOTECH STAFF/STUDENTS

The Centre joined forces with other organizations working with the UNESCO MAN & the Biosphere programme to stage a training and farmers awareness workshop on May 14, 2018 at Albert Town, South Trelawny. The event was nicknamed by the Centre as “Transforming Trelawny into the Yam/Biosports Foods Hub of the World”, in collaboration with the Chairman of the Jamaican National Commission on UNESCO, Joy Douglass, RADA, South Trelawny Council and local farmers. The Yam Research Group of the Centre and graduate students working with Prof. Asemota spearheaded arrangements for the presentations they wanted to give and the Parish RADA officials partook in the scientific presentations and activities. The students were overjoyed as they explained their science to the farmers, High School Students in the Parish, etc. Over 200 people came to the event. The Parish Councillor and officials took time out to specially acknowledge the UWI students with gifts for their role in helping to stimulate the Youth and farmers that attended the event. Professor Asemota, Dr. Racheal Irving, and the following UWI PG students gave presentations at this event– Racquel Wright; Sasha-Gay Williams, Melisa Williams, Bamidele Bamikole, Keaton Logan, Lowen Williams, Orville Byfield, and Eon Campbell also attended.

- Shivanjali Dondapathi, Tamara Grant, and Mr. Orville Byfield (working on Yams Research) attended the Yam Stakeholders' Meeting held on October 17, 2017 at the Ministry of Agriculture & Fisheries. Mrs. Dondapati made an oral presentation on the NSF-Yam BREAD PHENO project along with Professor P. Alonge, one of the project's collaborators from NCU.

- Prof. Helen Asemota attended the 2017 Grant Challenges Meeting in Washington D.C. in September/October 2017 in order to fulfil the invitation to the meeting received from USAID and funded by Bill & Melinda Gates Foundation.
- Prof. Helen Asemota attended NSF Principal Investigators' meeting held in Washington DC. USA in October 2017.
- Prof. Helen Asemota attended the 2017 STEM Women of Color Concave in DC Metropolis, Washington, USA, in October 2017, sponsored annually USA through NSF.
- Prof. Helen Asemota, Prof. Marcia Roye and Dr. Sylvia Mitchell attended and lectured in the 2017 UNUBIOLAC Training Workshop at the UWI, Saint Augustine Campus in Trinidad & Tobago from December 4–9, 2017.
- Prof. Helen Asemota was specially invited by the Regional Representative of the Food and Agriculture Organization of the United Nations, ADG Julio Berdegué, to attend the 35th Session of the FAO Regional Conference for Latin America and the Caribbean, that took place in Montego Bay from March 5 to 8, 2018. The Regional Conference discussed how to strengthen the Food and Nutrition Security of the Community of Latin American and Caribbean States (FSN-CELAC) and to discuss other strategies that can help countries of the Region to achieve Zero Hunger, while also promoting food systems that favour healthy diets.
- Prof. Helen Asemota along with her post graduate students, Ryan Francis, Sasha-Gay Wright and Melisa Williams attended the 24th University Diabetes Outreach Programme (UDOP) Annual International Diabetes Conference that took place on April 26–28, 2018 at the Jewel Runaway Bay Beach & Golf Resort, and presented 3 Posters. Mr. Keaton Logan, Associate Post Graduate Student of the Biotechnology Centre, working with Prof. Helen Asemota received the Best Poster Award for his poster presented at the UDOP Conference.
- The Biotechnology Centre actively participated, and ten students

The Biotechnology Centre

presented their research findings (2 Orals and 8 Posters =10) at the 11th FST Conference 2018, which was held April 25 to 27, 2018 at the Science Lecture Theatre – (SLT3), Mona Campus.

- Mr. Lowen Williams, post graduate student of the Biotechnology Centre presented a seminar on “The Characterization of Chromium Complex of Di-2-Pyridylketone Semicarbazone and the Induction of Type 2 Diabetes.” Lowen is supervised by Prof. Asemota/Dr. McGrowder and co-supervised by Prof. Bakir of Chemistry and Dr. Nwokocha of BMS.
- Dr Sylvia Mitchell represented the Biotechnology Centre as a Judge at the INVOCAP Science Education Symposium organised by Scientific Research Council, held at Mico University, October 17th, 2017.
- Dr Sylvia Mitchell attended CAS forum, Protection of Jamaica’s Plant Genetic Resources, October 26th, 2017.
- Dr Sylvia Mitchell attended CASE Founders Day, CASE, Portland, January 26th, 2018.
- Dr Sylvia Mitchell attended CASE Alumni Panel Discussion on the State of Jamaica’s National Food Security, Pegasus, May 17th, 2018.
- Prof. Asemota was Keynote Speaker at the Opening Ceremony of the Northern Caribbean University’s ‘Research Day’ for the 2017-2018 academic year.

FOREIGN VISITS BY BIOTECHNOLOGY STAFF – EXCHANGE VISIT TO THE STATE UNIVERSITY OF NEW YORK (SUNY-BINGHAMTON)

A team of researchers from Jamaica went on a collaborative exchange visit to the State University of New York through provisions of the NSF Bread PHENO Project entitled “Development and Field Testing of Paper-based Biosensors to Increase Productivity of Smallholder Agriculture in Developing Countries” from July 12–25, 2018. The team was led by Professor Helen Asemota, Project co-PI. The other exchange Scientists were Professor Vincent Wright and Professor Patience Alonge (both of Northern Caribbean University), and UWI PG students, Mr. Keaton

Logan and Ms. Tamara Grant of the Basic Medical Sciences Dept. and Biotechnology Centre, respectfully. The overall objective of the project is to apply advanced technologies in addressing the yam anthracnose disease that is devastating the production of sweet yam in Jamaica. The purpose of the visit is to conduct research for which facilities are limiting and to facilitate the exchange of ideas and knowledge between collaborators. During the visit, the team was engaged in the sub-culture and microscopic analyses of fungi infecting yams, as well as the synthesis of compounds with potential for treatments of anthracnose disease. In addition, members of the team were showed how to separate compounds in yam using FLASH CHROMATOGRAPHY. The technology regarding formation and characterization of nanoparticles, which was deposited with at the Biotechnology Centre in 2017 when the SUNY visited UWI, was further re-enforced in this visit of UWI Group and the local Jamaican participants. The itinerary of the visit included Seminar presentations by Visitors as well as the Hosts, various research meetings, various lab experimentations and historical site visits.

VISITORS TO THE BIOTECHNOLOGY CENTRE

Students from the Campion College visited the Biotechnology Centre on April 4, 2018 and various research groups demonstrated various lab activities.

- Dr Ayala Zavala Jesus Fernando of CIAD Mexico visited the Biotechnology Centre in April 2018. He submitted an MOU draft from CIAD to the UWI Mona through Professor Asemota and the Dean of FST. The MOU was subsequently signed.
- Students from the Montego Bay Community College and the Knox College visited the Biotechnology Centre on April 25, 2018. Students were exposed to the various equipment in different labs.
- Professor Valarie Adema from the United States International University in Kenya, Africa, visited the Biotechnology Centre in April 2018, courtesy of the UWI Global Affairs Office, and expressed interest in collaborating with the Biotechnology Centre.

COLLABORATION AND MOUS

The Centre continues to collaborate with various departments within the university such as the FST and FMS for research and teaching as well as neighbouring universities/research institutions and foreign institutions who support group and co-supervising for our postgraduate students.

Our current list of international and local collaborators include: Morehouse School of Medicine, USA; School of Pharmacy, Roosevelt University, USA; SUNY Binghamton, USA; University of Toronto, Mississauga, Canada; Albany State University, USA; University of Salento, Italy; Cordoba University, Colombia; Redeemers University, Nigeria; Trees that Feed Foundation, Illinois, USA; University of California, Davis (US-Davis); The Bamboo Project, Government of Jamaica; Bureau of Standards, Jamaica; JAMPRO; The National Environment and Planning Agency (NEPA); OAS; The 4H Club, Jamaica; Agro Systems Consultants, Jamaica; Grace Kennedy Limited; National Committee on Science and Technology; Northern Caribbean University; STEA; Scientific Research Council (SRC); MSET; Peckham Development Council, Pan-American University, Aguascalientes, Mexico, CICY and CIAD, Mexico, IICA, CARDI, CMI, UTECH, Southern University of Baton Rouge(SUBR).

Dr. Mitchell has an MOU with King Mongkut's University of Technology North Bangkok (Thailand), Chinese Academy of Science (China), Wallenford Company (Jamaica)

There is also an MOU with CIAD, Mexico, from Research collaboration.

SPECIAL PROJECTS – GRANTS

There are currently two grant research projects and one income generating – bio-skills training & bio-services outreach project, under Special Projects -

- Development and Field Testing Of Paper-Based Biosensors to Increase Productivity of Small Holder Agricultural Projects in Developing Countries

- A National Science Foundation (NSF) sponsored project, under the BREAD PHENO Program in collaboration with the State University of New York (SUNY – Binghamton). Professor O. Sadik of SUNY is the PI and Professor H. Asemota of UWI is co-PI. This project seeks to revolutionize yam production through the development and field testing of low cost genotyping and phenotyping biosensors and molecular genetic tools. The Centre collaborates with RADA officials and small holder yam farmers in Manchester and Trelawny, through the help of NCU in Manchester and STEA in Trelawny. The project operates under a Sub Award agreement between SUNY and UWI.

Researchers from the Biotechnology Centre and NCU regularly visit Yam Farms in Bilby and Grove place, Manchester for RADA and farmers facilitated research on yam and anthracnose finding ways for possible suppression or eradication of the disease that has nearly wiped out Sweet Yam production and to observe experimental farms for possible suppression of the Anthracnose disease agents using selected and orchestrated green technologies.

Bioengineering of Yams & Other Selected Caribbean Roots and Tuber Crops Biomaterials for Value-Chain Expansion & Pre-Commercialization Analyses – This is a Jamaica–Mexico Bilateral Commission Project which involves collaboration with Mexican Scientists. The project focuses on bioengineering biomaterials for value-chain expansion & pre-commercialization analyses. This year was the second year of the Project. This project is to boost agro industry via expansion of value chain of selected Caribbean crops, especially Yams, as well as plants such as Moringa, Sugarcane, and some herbs. So far in this project, Professor Helen Asemota (Project PI) is in collaboration with CIAD Mexico through Dr. Jesus Fernando Ayala Zavala of CIAD, as well as Dr. Carlos Borroto of CICY Mexico.

Bamboo Project

Bamboo Research Project Management Committee (BRPMC): The BRPMC operates under the MOU between UWI and the Bureau of Standards. The activities below represent the work of the Biotechnology Centre and the Bureau of Standards as part of the ‘Peckham Bamboo

The Biotechnology Centre

Pre-Processing Project' being funded by OAS. Dr. Sylvia Mitchell is the UWI Project PI.

Data taken on bamboo propagation experiments from August to October 2017 at UWI, Clapham and Peckham.

OAS and PIOJ representatives visited the Biotechnology Centre on August 1, 2018. They were happy with the work of the Biotechnology Centre in the bamboo project.

Farmers visited the Centre on September 25th 2017 and viewed the bamboo field collection. Farmers were trained on the GPS, in order to obtain field data for the generation of maps of the bamboo farmers of Peckham with the assistance of Mona Informatics. Farmers received further training at Mona Informatics on January 25th, and March 16th 2018. Data collected was used to generate maps at Mona Informatics on March 24th. Data analysis was completed by July 2018.

Dr. Mitchell assisted with the building of a bamboo greenhouse at Peckham.

Bamboo collected from sites around Jamaica were initiated into tissue culture, these experiments are ongoing. Several students have helped with these studies including those paid under the project, volunteers and undergraduate research project students.

Dr. Mitchell mounted a display on the findings of the bamboo project in Clarendon on October 27th, 2017.

Cannabis

The Biotechnology Centre through Dr Sylvia Mitchell, Research Group Leader completed the 'Draft Protocol Manual for Jamaican Cannabis cultivators' for the Cannabis Licensing Authority (CLA).

ABS

Dr Sylvia Mitchell during the period under review assisted with IUCN ABS project along with other Caribbean colleagues entitled "Advancing the Nagoya Protocol in Countries of the Caribbean Region: ABS – Bio-

prospecting in the Caribbean Region.” In addition, Dr Mitchell assisted Jamaica ABS group with preparations to Jamaica signing of the Nagoya Protocol for monitoring Access and Benefit sharing of Jamaica’s Biodiversity and Traditional Knowledge.

THE BIOTECHNOLOGY CENTRE NEWSLETTER SERIES:

The Centre produces a Newsletter Series as a means of disseminating information about its activities, through Mona Messaging Services. Newsletter Series #1 was started in 2014 and the Centre is currently preparing Series #10, to showcase our most recent and ongoing activities.

STAFF TRAINING:

November 2nd, Seminar on Predatory Publishing, FST

- Dr Sylvia Mitchell was trained in the 2018 Certificate Course, Crop Simulation Modelling – Regional Capacity Building. Climate Change and Livestock Impact Assessment Training Application, DSSAT Summer Module 1 & 2, Physics Department, UWI; July 16-27, 2018.
- Dr Sylvia Mitchell attended online ISO TC296 Working Group 1 on Bamboo Terminology, January 23rd, 2018.

STAFF/STUDENTS ACHIEVEMENTS/AWARDS:

- Ms. Deiondra Robinson received the Outstanding Student Scientist Award at the Faculty of Science and Sport (FOSS) 5th International Scientific Conference held at the University of Technology Jamaica (UTECH).
- Dr. Mitchell was given an award for being the IAPB (International Association for Plant Biotechnology) Country Representative for Jamaica, Awarded at IAPB meeting in 2018, and IAPB PIC 7.
- Dr Mitchell was nominated in June, 2018 to be one of 70 women who are graduates of UWI as part of the ‘UWI 70 Women Project’

of the Institute for Gender & Development Studies, Regional Coordinating Office, Regional Headquarters, UWI.

INCOME GENERATION

In addition to income from Research Grants, the Centre also harnessed income from provision of some bio-services: The two conducted in the year under review were to Jamrow Trading Limited and Grace Kennedy Limited which generated an overall amount of JMD249,000 for - the product analysis of Bitter Wood and analysis of Browning reactions in Yellow Yam By-products respectively. The Services were coordinated by Mrs. Shivanjali Dondapati, Research Assistant to Prof. Asemota, with experimental help from Lasherae Turner (Undergraduate student of Biochemistry), Tamara Grant (PG student of Biotechnology) and Elizabeth Mills (Yam Project Field Assistant).

Professor Marcia Roye and her Team also staged the High School 'Genetic Engineering Workshop' this year which also generated some income.

PUBLICATIONS

Referred Journal Publications

- Benkeblia, N. and Beaudry, R.M. (2018). Effects of temperature regimes on postharvest respiratory parameters of ackee fruit arils (*Blighia sapida* Koenig). *International Food Research Journal* 25: 119–126.
- Williams, R.S. and Benkeblia, N. (2018). Biochemical and physiological analyses of star apple (*Chrysophyllum cainito*) during different “On Plant” maturation and ripening stages. *Scientia Horticulturae* 236: 36–2.
- Williams, M., Asemota, H.N., Williams, E., McGrowder, D., Nwokocha, C., Voutchkov, M. & Francis, R. (2018). The effect of a combination treatment of biomagnetic therapy and a low glyceimic

influenced diet on non-fasting blood glucose levels in type 2 diabetic rats. *Diabetes Management*, 8(3).

- Williams, M., Asemota, H.N., Williams, E., McGrowder, D., Nwokocha, C. & Voutchkov, M. (2018). The Effects of Biomagnetic Therapy in Type II Diabetic Rats and the potential uses in Nano-Technology. Proceedings of the 7th IMEKO TC19 Symposium on Environmental Instrumentation and Measurements, Aguascalientes, Mexico: Published by Elsevier.
- Racquel J. Wright, Ken S. Lee, Hyacinth I. Hyacinth, Jacqueline M. Hibbert, Marvin E. Reid, Andrew O. Wheatley, Helen N. Asemota. (2017). An Investigation of the Antioxidant Capacity in Extracts from *Moringa oleifera* Plants Grown in Jamaica. *Plants* 6(4):48–55. DOI 10.3390/plants6040048.
- Webber-Waugh, Annice, Thaxter Nesbeth, Karen, Anderson-Johnson, Pauline, Salako-Akande, Ajibike, Asemota, Helen, Young, Lauriann (2017). Drug Seeking Behavior of Amphetamine Addicted Sprague-Dawley Rats Is Eliminated after Nutritional Supplementation. *Journal of Behavioral and Brain Science*, 2017, 7, 585-597. <https://www.researchgate.net/deref/https%3A%2F%2Fdoi.org%2F10.4236%2Fjbs.2017.712041>
- Williams, M., Asemota, H.N., Williams, E., McGrowder, D., Nwokocha, C. & Voutchkov, M. (2017). The Biochemical Effects of Biomagnetic Therapy in Type II Diabetic Rats. Proceeding from the 26th Annual Research Conference and Workshop - Cannabis and Cannabinoids: Research, Opportunities and Challenges, University of the West Indies, Jamaica. *West Indian Medical Journal*, 66 (Suppl. 4).
- Kitson-Walters, K. A., Candy, A. S., Truelove, N. K., Roye, M. E., Webber, M. K., Aiken, K. A., & Box, S. J. (2018). Fine-scale population structure of *Lobatus gigas* in Jamaica's exclusive economic zone considering hydrodynamic influences. *Fisheries Research*, 199, 53-62.
- Truelove, N., Box, S., Aiken, K., Blythe-Mallett, A., Boman, E.,

- Booker, C., Davis, M., Delgado, G., Glazer, R., Kitson-Walters, K., Kough, A., Perez-Enriquez, R., Roye, M., Segura-Garcia, I., Webber, M., Stoner, A. (2017). Isolation by distance and spatial genetic structure in an overharvested international fishery. *Diversity and Distributions* 23(11), 1292-1300.
- Mitchell S.A. (2017) Developing a vibrant and sustainable Jamaican industry with *Bambusa vulgaris*: establishing standard macro and micropropagation protocols as a key part of the process. June 10–13, 2017 in Vitro Biology Meeting. P-3051. Pg26.
 - Mitchell, S. (2017) Encouraging scientific study on medicinal plants in the Caribbean so as to safely integrate folk medicine into conventional medicine healthcare. In: Des îles en clair-obscur. La recherche scientifique en milieu insulaire tropical (Ed JP Claude and N Chonville), Connaissances et Savoirs, Anatole, France. pg 41–71.
 - Amarakoon I.I., C-L. Hamilton, S.A. Mitchell, P.F. Tennant and M.E. Roye. (2017). Chapter 28: Biotechnology; Part VII Technology Applications using biological systems. In: S. Badal and R. Delgoda (Eds) Pharmacognosy: Fundamentals, Applications and Strategy. Elsevier Academic Press, USA. 416 pgs.
 - Delahaye CM, S Mitchell and D Robinson (2017) Potential of two Jamaican essential oils against mosquitoes and bacteria. *Jamaica Journal of Science and Technology* 26: 26–33.
 - Morgan, K. and Benkeblia, N. (2017). Effects of modified atmosphere packaging (MAP) on microbiological and sensory quality of ackee fruit arils (*Blighia sapida* Koenig) stored under refrigerated regimes. *Packaging Research* 2: 12–21.
 - Racquel J. Wright, Ken S. Lee, Hyacinth I. Hyacinth, Jacqueline M. Hibbert, Marvin E. Reid, Andrew O. Wheatley, Helen N. Asemota. (2017). An Investigation of the Antioxidant Capacity in Extracts from *Moringa oleifera* Plants Grown in Jamaica. *Plants* 6(4):48-55. DOI 10.3390/plants6040048.

- Webber-Waugh, Annice, Thaxter Nesbeth, Karen, Anderson-Johnson, Pauline, Salako-Akande, Ajibike, Asemota, Helen, Young, Lauriann (2017). Drug Seeking Behavior of Amphetamine Addicted Sprague-Dawley Rats Is Eliminated after Nutritional Supplementation. *Journal of Behavioral and Brain Science*, 2017, 7, 585-597. <https://www.researchgate.net/deref/https%3A%2F%2Fdoi.org%2F10.4236%2Fjbs.2017.712041>.
- Stewart J, Ross-Davis A, Gra a R, Alfnas A, Peever T, Hanna J, Uchida J, Hauff R, Kadooka C, Kim M-S, Cannon P, Namba S, Simeto S, Pérez C, Rayamajhi M, Lodge D, Arguedas M, Medel-Ortiz R, López-Ramirez A, Tennant P, Glen M, Machado P, McTaggart A, Carnegie A, Klopfenstein N. (2018) Genetic diversity of the myrtle rust pathogen (*Austropuccinia psidii*) in the Americas and Hawaii: Global implications for invasive threat assessments. *Forest Pathology* e12378. 13 p. <https://doi.org/10.1111/efp.12378>.

Books:

- Benkeblia, N. (2017). *Phytonutrients and Crops Improvement*. Wiley & Sons Publisher, Chichester, UK, 544 p.
- Tennant P, Fermin G, Foster J (2018) *Viruses: Molecular Biology, Host Interactions and Applications to Biotechnology*. Academic Press. 392 pp

Book Chapters:

- Santos, C., Benkeblia, N. and Vasconcelos, M. (2017). High-throughput phenotyping: a modern tool for enhanced phytonutrient content. In: *Phytonutritional Improvement of Crops*. N. Benkeblia (Ed.). Wiley & Sons, Chichester, UK, pp. 203–232.
- Benkeblia, N. (2017). Phytonutrients Improvement of Sweetpotato. In: *Phytonutritional Improvement of Crops*. N. Benkeblia (Ed.). Wiley & Sons, Chichester, UK, pp. 391–406.
- Benkeblia, N. (2017). Chromatographic techniques of mono- and di- saccharides analysis. In: *Carbohydrates in food*. A-C. Eliasson (Ed.). CRC Press, Boca Raton (FL), pp. 1–36.

- Benkeblia, N. (2018). Harnessing the nutritional and commercial benefits of jackfruit (*Artocarpus heterophyllus*) in the tropics and subtropics. In: Agriculture, Food, and Food Security: Some Contemporary Global Issues. C. L. Beckford (Ed.). Nova Science Publisher, Hauppauge (NY), pp. 1–28.
- Benkeblia, N. (2018). Unlocking the full potential of carambola (*Averrhoa carambola*) as a food source: botany, growing, physiology and postharvest technology. In: Agriculture, Food, and Food Security: Some Contemporary Global Issues. C. L. Beckford (Ed.). Nova Science Publisher, Hauppauge (NY), pp. 131–158.
- Tennant, P., Gubba, A., Roye, M. Gustavo, F. Viruses as Pathogens: Plant Viruses. In: Tennant, P., Gustavo, F, Foster, J.E. (Eds) Viruses Molecular Biology, Host Interactions, and Applications to Biotechnology. Elsevier Academic Press, USA. 2018. pp. 137–156.

Conference Presentations & Abstracts:

- Mitchell, SA (2018) Traditional Jamaican dietary culture with health benefits – foods herbs and various dishes. Jamaica Island Nutrition Network (JINN) Symposium: Nutrition in Gastronomy and Tourism, Mico College, May 10th, 2018.
- Mitchell, SA (2018) On-farm research linked to Agricultural and Biotechnology-related academic institutions is to be encouraged in Jamaica: the case of pineapple (*Annanas cosmosus*), ginger (*Zingiber officinalis*) and bamboo (*Bambusa vulgaris*). CASE Founders Weekend Symposium, CASE, Portland, Jamaica, January 26th, 2018.
- Mitchell, SA (2017) Talked on Love 101 FM, on October 17th 2017, World Food Day, Change the future of migration, invest in food security and rural development.
- Mitchell, SA (2017) Ethnobotanical research conducted by the Medicinal Plant Research Group, BTC, UWI & Proposed Jamaica/South Africa Project. Science symposia on water and indigenous knowledge system research collaborations between Jamaica and South Africa & schools' Science Regional Oratorical, Eastern Symposium, International Seabed Authority Conference Centre, November 30th, 2017.

- Robinson, D., Holness, S., Tennant, P., Roye, M. (2018). Identification and Molecular Characterization of Viruses infecting Tomato, Scotch Bonnet Pepper and Sweet Pepper Using small-RNA Next Generation Sequencing. 11th FST Conference, UWI, Mona. April 25–27, 2018. (Poster Presentation)
- Deiondra Robinson: The use of small RNA next generation sequencing to uncover viruses infecting tomato, sweet pepper and scotch bonnet pepper Faculty of Science and Sport (FOSS) 5th International Scientific Conference UTECH, Jamaica. (Oral Presentations).
- Dondapati, S., Asemota, H., Alonge, P., Sadik, O. (2017). National Science Foundation Project- BREAD: Development and Field Testing of Paper-based Biosensors to Increase Productivity of Smallholder Agriculture in Developing Countries. Yam Stakeholders meeting, Jamaica. Oral presentation.
- Ryan D. Francis, Michael T. Gardner, Perceval S. Bahado-Singh, Andrew O. Wheatley and Helen N. Asemota. (2017). Glycemic Index: Nano-Considerations and Impact in Rat Model of Type 2 Diabetes. 2017 EnvIMEKO 17 – 7th IMEKO. TC19. Symposium on Environmental Instrumentation and Measurements Aguascalientes, Mexico, August 3–7 2017.
- Lutas Nikolai., Riley Cliff., Asemota Helen. (2017). Challenges Associated With The Control of Coffee Leaf Rust In Farms Located in The Blue Mountains. Annual CARISCIENCE Regional Conference. Oral Presentation.
- M. Williams, H. Asemota, C. Nwokocha, M. Voutchkov and D. McGrowder. (2017) The Biochemical Effects of Biomagnetic Therapy on Type II Diabetic Rats and potential use in Nanotechnology. EnvIMEKO 17 – 7th IMEKO TC19 Symposium on Environmental Instrumentation and Measurements Aguascalientes, Mexico, August 3–7, 2017.
- Robinson, D., Holness, S., Tennant, P., Roye, M. (2017). The use of small RNA next generation sequencing to uncover viruses infecting tomato, sweet pepper and scotch bonnet pepper. CARISCIENCE

- Regional Conference & Exposition, Knutsford Court Hotel, Kingston. November 9–10.
- Marriott, C., Amarakoon, I, Brown J., Roye, M. (2017). The characterization of geminiviruses infecting crops, weeds and ornamental plants in Jamaica using next generation sequencing. CARISCIENCE Regional Conference & Exposition, Knutsford Court Hotel, Kingston. November 9–10.
 - S. Wright, W Aiken, H Asemota (2018). Biomedical Engineering of Jamaican Yam tuber for Drug Targeted Therapy in Prostate Cancer and its Potential Use in Green Nanotechnology Formulation The 40th The Jamaica Institute of Engineers & The Canadian Society of Civil Engineers, “Engineering Week”; Theme” Engineering Our Future Through Celebrating Our Heritage.”September 2018, University of the West Indies, Mona Campus, St. Andrew, Jamaica.
 - S Wright, W Aiken, H Asemota (2018). Comparison of cytotoxicity of the RLY2 Extract in Androgen Sensitive and Insensitive Prostate Cancer cell lines. The 11th Faculty of Science and Technology Conference; Theme” Science for Society: F.I.T. for Purpose (Foundational, Innovative, Transformational) April 2018, University of the West Indies, Mona Campus, St. Andrew, Jamaica.
 - S Wright, R Wright, K Logan, W Aiken, A Wheatley, H Asemota (2018). The Versatility of Jamaican Medicinal Plants for the Management of Type 2 Diabetes and other NonCommunicable Diseases University Diabetes Outreach Programme (UDOP) Conference The 24th Annual International Conference, “Diabetes Complications: How are we managing?”April 2018, Jewel Runaway Bay Beach and Golf Resort, St. Ann, Jamaica.
 - K Logan, S Wright, R Wright, M Lawrence, M Bakir, C Nwokocha and H Asemota (2018). Potential action of semicarbazones in the management of diabetes and its complications University Diabetes Outreach Programme (UDOP), the 24th Annual International Conference, “Diabetes Complications: How are we managing?” April 2018, Jewel Runaway Bay Beach and Golf Resort, St. Ann, Jamaica.

POSTERS:

- Adwalia Fevrier-Paul, Adedamola Soyibo, Nimal DeSilva, Sylvia Mitchell, Mitko Voutchkov Evaluation of Whole Blood Elemental Trends in End Stage Renal Disease Patients in Jamaica. 11th FST Conference 2018. Poster.
- Sasha-Gay Wright, William Aiken, Helen Asemota. Comparison of cytotoxicity of the RLY2 Extract in Androgen Sensitive and Insensitive Prostate Cancer cell lines. 11th FST Conference 2018. Poster.
- Kenroy Wallace, Wesley Gray, Helen Asemota. The Effect of Extracted bioactive material from *Dioscorea alata cv. White Yam* tuber on Prostate and Breast Cancer cells. 11th FST Conference 2018. Poster.
- Racquel Wright, Lee Ken, Hyacinth Hyacinth, Jacqueline Hibberts, Marvin Reid, Andrew Wheatley, Helen Asemota. Phytochemical analysis of Jamaican *Moringa oleifera* leaf extracts and possible implications for treatment of oxidative stress conditions. 11th FST Conference 2018. Poster.
- Lowen Williams, Mohammed Bakir, Donovan McGrowder, and Helen Asemota. The use of metallic semicarbazone complexes in the management of type 2 diabetes. 11th FST Conference 2018. Poster.
- Melisa Williams, Chukwuemeka Nwokocho, Mitko Voutchkov, Donovan McGrowder, Elvira Williams, Helen Asemota. The biochemical effects of biomagnetic therapy on type II diabetic rats. 11th FST Conference 2018. Poster.
- Robinson, D., Holness, S., Roye M. The use of small RNA next generation sequencing to identify viruses affecting tomato, sweet pepper and scotch bonnet pepper in Jamaica. 11th FST Conference 2018. Poster.
- Robinson, D., Holness, S., Tennant, P., Roye, M. (2018). Identification and Molecular Characterization of Viruses infecting Tomato, Scotch Bonnet Pepper and Sweet Pepper Using small-RNA Next Generation Sequencing. 11th FST Conference, UWI, Mona. April 25–27, 2018. (Poster Presentation)

The Biotechnology Centre

- Logan K.A. Wright S.A., Wright R.J., Lawrence M.A., Bakir M., Nwokocha C.R., and Asemota H.N. Potential action of semicarbazones in the management of diabetes and its complications. UDOP Conference 2018. Poster.
- S. Wright, R., K. Logan, W. Aiken, H. Asemota. The Versatility of Jamaican Medicinal Plants for the Management of Type 2 Diabetes and other Non-Communicable Diseases. UDOP Conference 2018. Poster.
- M. Williams, C. Nwokocha, M. Voutchkov, D. McGrowder, E. Williams, H. Asemota. Biomagnetic Therapy and Type II Diabetes. UDOP Conference 2018. Poster.
- Sadik.O., Dondapati, S., Asemota. H. Development and Field Testing of Paper-based biosensors to increase productivity of small holder agriculture in developing countries. The UWI, Mona Research Days 2018. Poster.

PUBLIC SERVICE:

Professor Helen Asemota

- Ordained Minister of the Gospel (Reverend) – Pastor with the Holiness Christian Church of Jamaica.
- Chairman, Board of the International Centre for Environmental and Nuclear Sciences (ICENS).
- Member, PSOJ Innovative Committee
- Member, NHMIJ Board, JIS. Also Member of the Sub-Committee for Education.
- Chairman and Co-Founder, Imade Asemota Foundation for Sickle Cell Research and Patients' Welfare (IAF), North Carolina, USA.
- Interviewee and Conveyor, CXC Biotechnology Syllabus Panel Meetings.
- Director, Biotechnology Centre (FST, Mona).
- International Measurement Convention (IMEKO) Rep. in Jamaica.

- STEM Women of Science Concave (SWOC), USA. Founding Member.
- Conveyor/Project PI/Lead Trainer, the 2016 United Nations University Biotechnology Programme for Caribbean and Latin American countries (UNUBIOLAC) International Biotechnology Training Workshop/Symposium
- General Co-chair, the 2017 IMEKO TC19 International Symposium in Aguascalientes, Mexico.

Dr. Sylvia Mitchell

- Member, Technical Working Group, Cannabis Licensing Authority, 2016 to Present
- Member, Health and Wellness Network Committee, Linkages Council, Ministry of Tourism, 2016 to Present
- Member, Ginger working group, Ministry of Industry, Commerce, Agriculture and Fisheries, 2017
- Member, ABS working group meeting, MEGJC
- Technical Secretary, Bamboo and Indigenous Material Products Standards Technical
- Committee (BIMPSTC), Bureau of Standards Jamaica, 2016–2018
- Founding Member, Bamboo Industry Association of Jamaica, 2016 to Present
- Bureau of Standards Jamaica, Pension Trustee, 2013 to Present.
- Biology (SIVB), 2009 to Present
- Member, Organization for Women in Science for the Developing World (OSWD).
- Convenor, Working Group, Bamboo Charcoal, TC296, ISO, 2017–2018
- Member, Working Group, Bamboo Terminology, TC296, ISO, 2017 to Present
- Member of Organising Committee, Caribbean Bamboo Conference

in November 2018. Will be presenting a paper on the work done under this project.

- Convenor of ISO Bamboo standard working group on bamboo charcoal for 2017. Sent document for ISO meeting in Indonesia in 2–24th August, 2017.
- Co-editor of In Vitro Reports (posted on their website every three months), Society of In Vitro Biology (SIVB), 2009 to Present
- Member, Society of In Vitro Biology (SIVB), 2003 to Present.
- Member, Organization for Women in Science for the Developing World (OSWD).
- Convenor, Working Group, Bamboo Charcoal, TC296, ISO. Organizer first meeting of the WG1, Indonesia, held August 23, 2017

Professor Marcia Roye

- Assistant Dean for Graduate Studies & Research, Faculty of Science & Technology, Mona
- Member of the Advisory Board of the National Compliance Regulatory Authority of the Bureau of Standards, Jamaica.
- Volunteer Cape Biology Teacher at Wolmer’s Boys’ School and St Andrew High School for Girls. Topic: Genetic engineering.

Professor Nouredine Benkeblia

- Scientific Activities Appointed “Associate Editor”, Canadian Journal of Plant Science

Member of the Canadian Society of Plant Science International Symposia

- Member of the Organizing Committee of the 2nd Asian Horticultural Congress, 26–28 September, 2017, Chengdu, China.
- Member of the Organizing Committee of the International Conference on Food Technology and Nutritional Science, 26–27 June, 2017, Baltimore, MD, USA.

Professor Paula Tennant

- Professor of Virology in the Department of Life Sciences, Mona
- Member, American Phytopathological Society
- Member, Caribbean Academy of Sciences, Jamaica Chapter
- Member, Jamaica Society of Scientists and Technologists