

## THE BIOTECHNOLOGY CENTRE



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

### WORK OF THE CENTRE

In the period, August 1st 2014–July 31st, 2015, the activities of the Centre focused on research training, and teaching, and were augmented with rendering of bioservices to the wider community, greater pre-commercialization activities for research products, and improved publicity through orchestrated participatory outreach/collaboration.

### RESEARCH

The main areas of research in the year involved:

- Agro-based studies including medicinal plants, yams, moringa, forestry preservation, molecular virology, as well as study of begomoviruses and other viruses associated with citrus, potato, cucurbits and other crops.

- Biomedical research focused on investigations of the glycemic indices of Jamaican foods including root and tuber crops and analyses of mechanism of action of supplements or secondary metabolites in animal model of diseases such as diabetes, hypercholesterolemia in collaboration with the Basic Medical Sciences Department and the Scientific Research Council (SRC).
- Drug Abuse research was also pursued in collaboration with experts from the Psychiatry and Community Health Department, and Maryland, USA.
- Biomagnetic Therapy and associated metabolic effects in disease states in collaboration with the Department of Basic Medical Sciences and Physics and a physicist in North Carolina

## TEACHING

The academic members of the Centre (Professor Asemota, Dr. Roye, Professor Tennant, and Dr. Mitchell) were involved in teaching at both undergraduate and postgraduate levels either within the Department of Basic Medical Sciences, FMS, or the Department of Life Sciences, FST, or FST main courses. The courses taught in the Department of Basic Medical Sciences by staff included: Biotechnology I, Biotechnology II, Molecular Biology I, Molecular Biology II, Introduction to Microbiology and Molecular Biology, Food Microbiology and Biotechnology, Plant Biotechnology, Biochemistry for Physical Therapy Students, Biochemistry Laboratory Research Project, and Plant Biochemistry & Physiology, along with their associated lab classes. In the Department of Life Sciences, staff taught in Molecular Biology & Genetics, Principles of Plant Biotechnology, Virology, and Plant Biotechnology, and in “Standards and Risk Management in Agricultural Production Systems”, one of the courses in the MSc in Agricultural Entrepreneurship Programme in the Faculty of Science and Technology. The main FST courses taught are Science Medicine and Technology, Principles of Plant Biotechnology and Research Skills and Practices in Biology. This was done in addition to the training and supervision of postgraduate students of the Centre.

### **New Graduate Programme:**

Approval was received for the M Sc in Biotechnology programme in July 2015, for starting at Mona Campus in September 2015. The Biotechnology Centre collaborated with St. Augustine in developing this new programme.

### **BIOSERVICES**

The Centre renders bioservices to the National Environment and Planning Agency (NEPA), under an MOU agreement. During the period under review, this earned the Centre the sum of one hundred and sixty nine thousand dollars (J\$169,000.00).

### **FOREIGN VISITS**

Dr. Marcia Roye visited the University of Toronto, Mississauga to work with Dr. David McMillen, Department of Chemical and Physical Sciences, using yeasts to develop cheaper blood tests. Typically blood tests for the detection of different diseases are very expensive. The technology development on which both are collaborating would reduce the associated costs of blood tests significantly. Dr. Roye also made a seminar presentation entitled “Virus Evolution: HIV Drug Resistance and Geminivirus Research in Jamaica” to an audience of about fifty academic staff and postgraduates.

The Director of the Centre, Professor Asemota, participated as one of the University of the West Indies’ Representatives to Cartagena, Colombia, for the period September 1–5, 2014 under the second phase of the SUE-CARIBE Joint Research Project Programme. The areas of research for which she was responsible, along with her Colombian counterpart, the Director of the Biotechnology Centre of the University of Cordoba, Prof. Isidro Suarez, included: Genetic characterization of yam germplasm in Colombia and the Caribbean (Jamaica and Trinidad); Characterization of yam cultivars for phytoesterol content; Yam Gene Bank for food security; Value-added yam products development. Professors Asemota and Suarez made a joint presentation on the Application of Biotechnology

for Tuber crops improvement and byproducts development. Before the Conference ended, Professor Asemota was asked to give a talk on ways of maintaining high publication rate in academia. This was well received and appreciated by the audience.

## **COLLABORATION**

The Centre collaborates internally with various Departments in the FMS and FST for Research and Teaching, especially the Departments of Basic Medical Sciences, Psychiatry and Community Health, Chemistry, Life Sciences, and Physics. The Centre remains grateful to the host of Experts/Professors/Lecturers in the FMS and FST, neighboring universities/research institutions and foreign institutions who render help as supervisors/co-supervisors/advisors for our postgraduate students.

Through collaboration with the Yucatan Center for Scientific Research (CICY), Mexico, the Centre hosted the Visit of Dr. Carlos Borroto in collaboration with the IICA, Jamaica. The follow up is that 2 UWI staff members were invited to participate in the In Vitro Clonal Propagation of Tropical Plants Training Programme offered by the CICY in collaboration with Faculty of Food and Agriculture, UWI St Augustine, Trinidad and Tobago, where the training programme was hosted from June 15–26, 2015. Dr. Sylvia Mitchell received further training in in vitro technologies with a certificate of achievement at the end of the programme.

Our current list of international and local collaborators include: Morehouse School of Medicine, USA; School of Pharmacy, Roosevelt University, USA; SUNY Binghamton, USA; Timeless Herbal, Canada; 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 (UC-Davis); 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); Peckham Development Council

## **SPECIAL PROJECTS**

### **Yam Starch & Products' Precommercialization Project**

Approval was received through the Office of the Principal for the commencement of the Yam Products Precommercialization (Pilot) Project which commenced August 1, 2014, at the Biotechnology Centre. The objectives are to determine operational costs, and effect scale up of production of the developed Biotech Yam Value-added Products as well as modified yam starch for use in pharmaceutical formulations. The project's PI is Professor Helen Asemota while Dr. Alexia Harvey, was employed as the Research Fellow, effective August 1, 2014. On Monday December 1, 2014, Mr. Jordan Freeman joined the staff of the Biotechnology Centre in the capacity of Research Assistant on the Pre-commercialization project. The Centre collaborated with the UWI-Hosang Group and the Mona School of Business and Management (MSBM) to prepare interested students of the Yam Biotechnology Research Group for the prestigious Victor Hosang Venture Competition, using their Yam and Moringa value-added research products. The two groups that entered the competition and the student members are:

1. 'Yamaica': Kenroy Wallace, Keaton Logan, Channalee Wilson and Melissa Williams
2. 'NutraFarms Ja': Racquel Wright, Nikashae Scott, Danielle Stephenson, Carlton Barrows and Lowen Williams

The finals were held on Friday, the 22nd of November 2014 where Group 'Yamaica' won two hundred and fifty thousand dollars (\$250,000) and was placed third in the competition with yam spread products. The participation of the students was coordinated through the Centre's Yam Products Pre-commercialization Project's Research Fellow, Dr. Alexia Harvey with the support of the Principal Investigator, Professor Helen Asemota. Dr. Chadwick Anderson of the FST Dean's Office and MORI

also assisted the groups to prepare for the competition.

### **Breadfruit Project**

Trees that Feed Foundation, USA, continued to support research into tissue culture propagation of breadfruit trees at the Biotechnology Centre. The second sum of USD3,000.00 (Three thousand US dollars) was made available to the Biotechnology Centre for the period September 1, 2014 to August 31st, 2015. The PI of the Breadfruit project is Dr. Sylvia Mitchell.

### **BIOTECHNOLOGY CENTRE NEWSLETTERS**

The *Biotechnology Centre Newsletters* was started and two series were released during the period under review. The first, Series #01, was released in December 2014, while Series #02, in March 2015. The Newsletter features, the research and outreach activities of staff and students, and interns at the Centre.

### **OUTREACH**

The Centre was involved in a number of outreach programmes and events throughout the year.

### **UWI Research Day 2015**

During Research Day 2015 (February 9–11, 2015), the Biotechnology Centre displayed various finished products at the Centre's booth. Dr. Sylvia Mitchell demonstrated Plant Tissue Culture techniques to visitors and also gave a demonstration entitled "A piece of plant to feed the nation." Dr. Melaine Randle gave a tour of the Centre to a number of students from different High Schools, including the Annotto Bay High School, and coordinated a demonstration entitled "DNA isolation made simple". Ms. Lamar Thomas demonstrated fungi isolation from various types of foods to the visitors. Some of the Centre's Yam nutraceutical products and byproducts were also displayed, and attracted many visitors

and samplers. Among the displayed nutraceutical products popularly sampled were the Moringa bars/balls and three different yam spreads. The Yam Research Group students of Professor Asemota prepared the samples for the display, which was coordinated by Dr. Alexia Harvey, Research Fellow in the Group.

### **National Nutraceutical Industry Launch by the Prime Minister of Jamaica**

The Centre, on invitation by the National Commission on Science and Technology (NCST) participated in the launching of the National Nutraceutical Industry by the Prime Minister on March 5, 2015. Dr. Sylvia Mitchell prepared a basket containing plantlets of herbal plants which was presented to the Prime Minister. The Prime Minister acknowledged among others, Professor Helen Asemota for her research work over the years and the entire University of the West Indies, Mona campus. Some of the Biotechnology Centre's nutraceutical products, moringa bites and three different varieties of yam spreads were displayed for sampling and were acknowledged by the News Media that was present.

### **World Teachers' Day**

The Jamaica Teaching Council hosted the 'Forum for Innovations in Teaching' to commemorate the 'World Teachers' Day, Invest in the Future, Invest in Teachers' theme, on October 10–11, 2014, at the National Arena. For the event, the Biotechnology Centre was invited to participate in the Ministry of Education's STEM Academic display. Our presentation highlighted Tissue Culture and associated biotechnologies. Other UWI technologies like robotics and a mobile science lab were also highlighted in the booth.

### **World Standards Day**

Dr. Sylvia Mitchell partook in various activities held to celebrate World Standards Day hosted by the Jamaica Bureau of Standards on October 14th, 2014. The year's theme was 'Standards level the playing field'. Dr.

Mitchell presented the Chairman's report of the Examiners Board at the National Quality Awards (NQA) banquet. The NQA Programme is Jamaica's first quality systems based awards programme which seeks to recognize and reward local companies that demonstrate the application of standards and quality systems in both the production of goods and delivery of services.

#### **Western Outreach Programme, FST**

Dr. Alexia Harvey and Mr. Jordan Freeman represented the Biotechnology Centre at the Faculty's Annual Undergraduate Western Outreach Programme held on January 11 and 12, 2015. Mr. Freeman interviewed with Newstalk 93FM and highlighted the Centre's work, as well as its upcoming Biotechnology Agro Conference. The team was successful in encouraging students to consider the field of biotechnology for undergraduate studies and postgraduate research.

#### **Mandeville Hospital Book Launch**

On March 4, 2015, Professor Helen Asemota gave a speech at a book launch by Mandeville Hospital in Manchester which was staged by the Ministry of Health, Southern Regional Health Authority in collaboration with Integrated Medical Services. The title of the book is *Clinical Dialogues in Hospital Medicine* by Gabriel Ukala, FRCP, Edin.

#### **4H Club Exposition**

The Biotechnology Centre participated in the 4H Club Exposition on Friday 24th of April held on the Denbigh Agricultural grounds. The Centre displayed plants, products and posters. The Centre handed over a number of tissue culture plants (including turmeric, yams, and pineapple) to the 4H club for planting and replication at Salsbury. The Centre, through Professor Asemota and Dr. Mitchell together with the National Council on Science and Technology (NCST), Agri-Systems Consultants, and the 4H Club developed a Youth Training Programme in support of the advancement of the Nutraceutical Industry at grassroots



levels – focusing on provision of raw materials, sustainability and preservation. A funding proposal was developed spearheaded by the Centre.

## **NON-DEGREE SHORT TRAINING PROGRAMMES**

### **Genetic Engineering for Science Teachers and Students Workshop**

The 12th Annual workshop on “Laboratory Concepts in Genetic Engineering” for Cape and A Level Biology High School students, as well as Science Teachers from Tertiary Level Institutions in Jamaica, was held December 18–19, 2014. Dr. Marcia Roye and her Research Assistant, Ms. Cindy-Leigh Hamilton organized and coordinated the workshop. With the assistance of Laboratory Technicians from the Basic Medical Sciences Department and the Centre’s postgraduates, participants were trained to extract plasmid DNA, digest the plasmid DNA with restriction enzyme, and run gel electrophoresis. Two workshops were convened at the Faculty of Medical Sciences Complex for Research and Teaching. On the first day, Thursday the 18th of December, the Centre had eighty participants from Knox Community College, Shortwood Teachers’ College and St. Andrew High School, while on the 19th students came from Mannings High School, St. George’s College and St. Jago High School. Overall there were more than one hundred and sixty (160) participants for both days.

### **Bio-Skills Training Workshop for Teachers:**

In March 2015, a training workshop in Plant Tissue Culture & Wine making was organized and hosted for eight (8) Teachers from the Shortwood Teachers College. The trainers were Dr. Mitchell and Prof. Asemota.

### **Half-Way-Tree Primary School Internship**

On March 24, 2015, 10 students from the Half Way Tree Primary

School and two of their teachers visited the Centre for laboratory demonstrations and discussion in preparation for the National Young Innovators Competition. Dr. Sylvia Mitchell demonstrated tissue culture techniques and Dr. Melaine Randle gave them an overview of basic molecular biology techniques such as DNA isolation and gel electrophoresis. The School was second in the competition.

## **CONFERENCES AND WORKSHOPS ATTENDED**

### **The 2015 Katalyxt Conference – “Creating wealth through Agriculture, Technology and Culture”**

Professor Asemota was invited as one of the guest speakers in the Katalyxt Conference held at the Knutsford Court Hotel on May 21, 2015. Her presentation was entitled “Development of the Agricultural Sector through Innovative Research”. The conference with the theme “Creating wealth through Agriculture, Technology and Culture” brought a number of sectors together including representatives from the banking industry, entertainment, academic institutions, and small businesses where ideas for business growth through innovation and efficiency were presented, represented and discussed.

### **The Society for In vitro Biology Meeting**

Dr. Sylvia Mitchell attended the Society for In vitro Biology (SIVB) Meeting held in Tuscon, Arizona, May 30th to June 3rd 2015, where she received the 2015 Distinguished Service Award for Outstanding Service to the SIVB. She also co-convened a session entitled: “Medicinal Plants, Propagation and Nutraceuticals” where she invited Dr. Ina Vandebroek, from the New York Botanical Gardens, to present two papers at the session, one of which was coauthored by Dr. Mitchell entitled “The Ethnobiology of Jamaica, the Dominican Republic and New York City: Similarities and Differences”. Dr. Vanderbroek also presented a second paper entitled “Reconciling different worldviews: Biomedicine vs traditional medicine”. Dr. Mitchell authored and presented

two papers in the session entitled “Application of In Vitro Techniques for the Conservation & Sustainable Use of Endemic, Indigenous, & Native Ethnomedical Plants of the Caribbean” and “An Update on Cannabis Legislation, Research, and Development in Jamaica and Its Relevance to the Region”.

#### **NCU 2015 Science Symposium**

The Director of the Centre, Professor Helen Asemota, gave the key note address at the Northern Caribbean University 2015 Science Symposium in Mandeville, Manchester on March 10, 2015. She spoke on “Wholistic Synergy and Transformational Solutions through Research.”

#### **10th Biennial Conference of the Faculty of Science and Technology**

The Biotechnology Centre participated in the FST 10th Conference held June 9–11, 2015. Under the theme “STEM: The Engine of Growth” four papers were presented by Biotechnology faculty at the conference. The conference offers an opportunity for researchers from a broad range of disciplines across Science, Technology, Engineering and Mathematics to showcase their work and the associated relevance to development.

#### **JAMPRO Training Workshop**

On April 8th and 9th members of staff (Professor Helen Asemota, Dr. Sylvia Mitchell, Ms. Lamar Thomas, Mr. Jordan Freeman, and Mrs. Shivanjali Dondapatti) of the Biotechnology Centre attended the UNESCO National Science, Technology and Innovation (STI) Policy Indicator Workshop held at the Scientific Research Council, Kingston 7. It involved a wide cross section of representatives from the private sector, the Planning Institute of Jamaica, Ministry of Agriculture, Ministry of Science, Technology, Energy and Mining, the Northern Caribbean University, the University of Technology, and the University of the West Indies. The main aim of the workshop was to define key terms such as Research and Development, Education, Training, Science and Technology. The clarity of terminology would be necessary for UNESCO’s

future collection of science indicators from relevant institutions for the development of technology policies.

### **National Nutraceutical Industry Stakeholder Consultation Workshop**

The Centre was invited to participate in the National Commission on Science and Technology (NCST) and the National Nutraceutical Industry's National Nutraceutical Industry Stakeholder Consultation Workshop on Wednesday April 29th, 2015, at the Planning Institute of Jamaica (PIOJ). The aim of the workshop was to discuss the way forward for Jamaica in the Nutraceutical Industry. The workshop looked at coordinating an approach to manage industry activities and bring practitioners, support agencies and other critical stakeholders under one umbrella.

### **SUMMER INTERNSHIP AT THE CENTRE**

#### **The TEF Programme**

In June 2015, Miss Karen Levy coordinated the Tourism Enhancement Fund Programme at the Centre where eight (8) students participated in the training programme organized at the Biotechnology Centre. Based on the suggestion of the Director, Professor Asemota, Mr. Jordan Freeman, the first Biotechnology Business Incubatee, trained at the Centre, with the help of the MSBM and Ms. Campbell of the Mona Business Initiative, trained and supervised the work of six participants while Miss Levy offered oversight to these students and also trained two others in office administration and front desk management. The students who worked with Mr. Freeman were taught to conceptualize biotechnology business ideas and then write proposals about the business idea. The culminating activity for the TEF students involved making presentations on their proposals to a panel of 4 judges drawn from the Biotechnology Centre and the Mona School of Business. The presentations were done in pairs at the Mona School of Business and a certificate was awarded to the winning team. All students were awarded Certificates of Summer

Internship Completion for the period June 8th to July 17th, 2015. Miss Levy also assisted in the recruitment of other TEF students for training in the Departments of Chemistry and Basic Medical Sciences where they were supervised by Mrs. Grace Hosang and Mrs. Yvonne Bailey respectively.

### **Internship for Foreign Scientists/Visitors at the Centre**

On the invitation of the Director, Miss Suvi Rantamo from the Department of BioSciences, University of Helsinki, Finland, interned at the Biotechnology Centre during the period June 22 to August 21, 2015. She was supervised by Dr. Melaine Randle and Dr. Sylvia Mitchell under the project “RAPD Analysis of *Theobroma cacao* from two Agricultural Research Stations in Jamaica”. Miss Rantamo was taught a number of techniques, including DNA isolation, agarose gel electrophoresis, polymerase chain reaction (PCR), and random amplified polymorphic DNA (RAPD). This internship earned the Centre one thousand US Dollars (USD1,000.00).

### **VISITORS TO THE CENTRE**

During the period under review, the Centre received numerous international and local visitors.

#### **UNU BIOLAC Representatives:**

On Monday 29th of September 2014, the Centre welcomed two representatives of the United Nations University Biotechnology Programme for Latin America and the Caribbean (UNU BIOLAC), Professor Jose Ramirez and Dr. Ivan Galindo-Castro. The guests were introduced to staff and students and to the various research work being conducted at the Centre, and a tour the facilities. The guests also met with the Acting Dean of the Faculty, Professor Michael Taylor, along with the Head of Department of Life Sciences and Head of the Natural Products Unit.

According to the visitors, the UNU-BIOLAC Program offers opportunities for networking and collaboration within Caribbean and Latin America in Biotechnology programs and research opportunity to bring trainers from other parts of the world under the UNU-BIOLAC program as well as funding opportunities for short-term research training in other regional laboratories.

**Dr. Carlos Borroto, CICY**

Dr. Carlos Borroto, Advisor to the General Director of the Yucatan Research Center for Scientific Research (CICY), Mexico, visited the Centre at the request of the Director in collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA), April 24–25, 2015. The Centre invited Dr. Borroto to explore collaboration between the UWI Biotechnology Center and the CICY as well as to present a public seminar on Agricultural Biotechnology and Entrepreneurship in Cuba and Mexico.

On 24th April 2015 Dr. Borroto was introduced to the staff and students at the Biotechnology Centre where he briefly discussed the works of the CICY including its current activities and achievements. The Biotechnology Centre team was able to discuss possible growth ventures and areas in which the Biotechnology Centre and the CICY could collaborate. Afterwards, Dr. Borroto and the Director, met with Dean Paul Reese along with the Representative of IICA in Jamaica, Dr. Elizabeth Johnson. The group discussed ways in which the Biotechnology Centre, UWI and Jamaica could benefit from the commercialization of research products.

On Saturday, 25th September 2015, Professor Helen Asemota, Dr. Sylvia Mitchell, Dr. Elizabeth Johnson of IICA, as well as Dr. Sharon Smith of the Mona School of Business Services, held a meeting with Dr. Borroto. Dr. Borroto was taken to visit the virus-tested tissue culture plantlets at the Centre's experimental farm, the germplasm Garden and the Mona Micro-plant Facility managed by Dr. Mitchell. The team discussed ways in which the two institutions could share techniques and knowledge, as well as how the CICY could provide training for staff and

students and seek grant funding for the development of some agricultural research areas and the successful commercialization of biotechnology products.

**Mr. Tim Cranston, University of Halifax**

Mr. Tim Cranston of the St. Mary University in Halifax, Canada, visited the Centre on May 13, 2015 to hold discussions towards possible collaboration with the Biotechnology Centre and the Mona School of Business Management (MSBM). The parties discussed work on product development, analyses and commercialization with seaweed biomaterial produced by a particle reduction method and other biomaterials to be produced from local plant sources, e.g. citrus. Mr. Cranston was met by Prof. Helen Asemota, Drs. Sylvia Mitchell and Alexia Harvey, of the Biotechnology Centre and Professor Douglas Lindo of the MSBM.

Other notable visitors included Dr. Ina Vandebrook from the New York Botanical Gardens, USA, Dr. Tenniel Ramikie who conducted research on Cannabinoids at the Vanderbilt University, and appointed as Research Fellow at Harvard University, as well as our very own Prof. Harvey Reid (UWI retired) of Country House Products, Mandeville, Jamaica.

**BIOTECHNOLOGY CENTRE SEMINARS**

In the academic year in question, the following public seminars were organised by the Centre and presented by the indicated invitees:

- “Medical Ethnobotany in the Americas and the Caribbean” presented by Dr. Ina Vandebrook on August 13, 2014.
- “Crop Systems Biology: Identification of candidate genes in the post-genomics era, presented by Iván Galindo-Castro, September 29th, 2015.
- Trends in Medical Biotechnology presented by Professor José Ramirez Ochoa, of the United Nations’ University Biotechnology Programme, September 29th, 2015

- “The Transformation: from an idea to the shelf” presented by Prof. Harvey Reid on November 20th, 2014.
- “The Endogenous Cannabinoid Systems and Stress” presented by Dr. Tenniel Ramikie on March 4th, 2015.
- “Agricultural Biotechnology: Realities and Perspectives. Case studies Cuba and Mexico” by: Prof. Carlos G. Borroto on April 24th, 2015.

## PUBLICATIONS

In the period under review, the Centre achieved 25 publications consisting of eleven (11) International Refereed Journal Publications, one (1) book chapter, and 12 Conference Abstracts/Presentations, as listed below:

### Refereed Journals:

- Lowell L. Dilworth, Felix O. Omoruyi, **Helen N. Asemota**. (2015). Effects of IP6 and Sweet Potato (*Ipomoea batatas*) Phytate on Serum, Liver and Faecal Lipids in Rats. *International Journal of Food Science and Nutrition Engineering* 5(1): 53–58.
- Perceval S. Bahado-Singh, Cliff K. Riley, Andrew O. Wheatley, Michael S. Boyne, Errol Y. Morrison and **Helen N. Asemota**. (2015). High fiber Caribbean diets with low-intermediate GI improve glycemic control cardiovascular and inflammatory indicators in overweight persons with type 2 diabetes: a randomized control study. *Current Research in Nutrition and Food Science*. ISSN: 2347-467X, Online ISSN: 2322-0007. <http://www.foodandnutritionjournal.org/volume3number1/>. Available online at <http://www.foodandnutritionjournal.org/coming-issue/>
- Marsha-Lyn McKoy, Kevin Grant, **Helen Asemota**, Oswald Simon & Felix Omoruyi. (2015). Renal and Hepatic Function in Hypercholesterolemic Rats Fed Jamaican Bitter Yam (*Dioscorea polygonoides*). *Journal of Dietary Supplements* 12 (2): 173–183
- Picking D., R. Delgoda, N. Younger, L. Germosén-Robineau, I.



Boulogne. **S.A. Mitchell** (2015) *TRAMIL ethnomedicinal Survey of Jamaica. Journal of Ethnopharmacology*. 169: 314-327.

- Ramkissoon, A.P., Amarakoon, I.I., Hamilton, C., Pierre,R.B., Eyzaguirre, L.M., Carr, J.K., Blattner, W.A., and **Roye, M.E.** (2015). Analysis of Reverse Transcriptase and Protease Genes of HIV for Antiretroviral Drug Resistance in Treatment-Exposed Jamaican Pediatrics. *Aids Research and Human Retroviruses* Volume 31, Number 00, 2015 .
- Riley, Cliff Kelvin, Bahado-Singh, Perceval Stephen, Wheatley, Andrew O'Brien and **Asemota, Helen Nosakhare.** (2014). Physicochemical properties of low-amylose yam (*Dioscorea* spp.) starches and its impact on amylase degradation in vitro. *International Journal of Nutrition and Food Sciences*, 3(5): 458–464.
- Dilworth LL, Brown KJ, Wright RJ, Oliver MS and **Asemota HN.** (2014). An assessment of bioactive compounds and antioxidants in some tropical legumes, seeds, fruits and spices. *Journal of Research in Biology* 3(7): 1182-1194.
- Dewayne E. Stennett, Frederick Oladeinde, Andrew O. Wheatley, Lowell L. Dilworth, Christine Hohmann, Joseph Bryant and **Helen N. Asemota.** (2014). Evaluation of the effects of bitter yam tuber supplementation on serum parameters used to assess hepatotoxicity and nephrotoxicity in transgenic mice. *Journal of Bioscience and Biotechnology*, 3(2): 133–139.
- McKoy, M.L.; Thomas, P.G.; **Asemota, H.N.**; Omoruyi, F.; Simon, O. (2014). Effects of Jamaican bitter yam (*Dioscorea polygonoides*) and diosgenin on blood and fecal cholesterol in rats. *J. Med. Food* 17(11): 1183-8. doi: 10.1089/jmf.2013.0140. Epub 2014 Jul 24.
- **Green C.E.** and **S.A. Mitchell** (2014). The Effects of Blanching, Harvest Time and Location (with a Minor Look at Postharvest Blighting) on Oleoresin Yields, Percent Curcuminoids and Levels of Antioxidant Activity of Turmeric (*Curcuma longa*) Rhizomes Grown in Jamaica. *Modern Chemistry Applications* 2 (4)140–148.

- Riley, C.K., Bahado-Singh, P.S, Wheatley, A.O and **Asemota, H.N.** (2014) Physicochemical properties of low-amylose yam (*Dioscorea* spp.) starches and its impact on amylase degradation in vitro. *International Journal of Nutrition and Food Science* 3(5): 458-464.

## Books

Tripathi, S., Castro, L., Fermin, G., **Tennant, P.** (2014) “Advances in Papaya Genomics”. In: N Benkeblia (ed) *Omics Technologies and Crops Improvement*. CRC Press Taylor and Francis Group, Boca Raton, FL. pp 219–252.

## PAPERS PRESENTED

- **Asemota, H.** (2015). “Wholistic Synergy and transformational solutions through Research.” Keynote Address. Northern Caribbean University 2015 Science Symposium, Mandeville, March 10, 2015.
- **Asemota, H.A.** (2015) “Development of the Agricultural Sector through Innovative Research”. Katalyxt Conference: “Creating wealth through Agriculture, Technology and Culture”, May 21, 2015.
- Bakir, M. Nelson, P., Lawrence, M., Johnson, T., Wallace, K. and **Asemota, H.** “Physico-chemical and biological properties of polypyridyl hydrazonic ligands” STEM Science and Technology Annual Conference, June 9, 2015.
- Lindo A, Robinson D, **Tennant P.** (2015). Characterization of genetically unique cocoa (*Theobroma cacao*) genotypes located at Orange River germplasm collection, St. Mary using quantitative pod traits. 10th Conference of the Faculty of Science and Technology. Mona, Kingston, June 9–11, 2015.
- **Mitchell S.A.** (2015) Application of In Vitro Techniques for the Conservation & Sustainable Use of Endemic, Indigenous, & Native Ethnomedical Plants of the Caribbean. Medicinal Plants, Propagation and Nutraceuticals (S-15), In Vitro Biology Meeting, Tucson,

Arizona, USA, May 30 –June 3, 2015. Abstract J-2, In Vitro Cellular and Development Biology, Abstract Edition 51, pg S10-11.

- **Mitchell S.A.** (2015) An Update on Cannabis Legislation, Research, and Development in Jamaica and Its Relevance to the Region. Medicinal Plants, Propagation and Nutraceuticals (S-15), In Vitro Biology Meeting, Tucson, Arizona, USA, May 30–June 3, 2015. Abstract J-4, In Vitro Cellular and Development Biology, Abstract Edition 51, pg S11.
- **Mitchell S.A.** (2014) Medical Cannabis in the Caribbean: a discussion of the issues from the viewpoint of the Nagoya Protocol. 3Rd Caribbean ABS Workshop, hosted by the Ministry of Sustainable Development, Energy, Science and Technology, Saint Lucia in cooperation with the ABS Capacity Development Initiative, Caribbean Community Secretariat & Secretariat of the CBD, November 24–27th 2014, Bay Gardens Hotel, Saint Lucia.
- **Mitchell, S.A.** (2014) Ethnobiotechnology possibilities and challenges in Jamaica. Society for Scientific Advancement (SOSA) 3rd Annual Conference 'Catalyzing Therapeutic Innovation'. November 21, University of the West Indies, Kingston, Jamaica.
- **Mitchell S.A.** (2015) Harnessing the potential of the Medicinal Cannabis Industry to help fuel Jamaica's development for all. In: IP & Innovation: Research as an Ingredient for Development with Focus on Ganja. Intellectual Property Week Seminar, Think Tank Programme, JIPO. April 23, 2015.
- Thomas L, **Tennant P.** (2015). Diversity of pathogens associated with pumpkin (*Cucurbita pepo*) during commercial production. 10th Conference of the Faculty of Science and Technology. Mona, Kingston, June 9–11. Poster.
- Vandebroek I and **S.A. Mitchell** (2015) The Ethnobiology of Jamaica, the Dominican Republic and New York City: Similarities and Differences. Medicinal Plants, Propagation and Nutraceuticals (S-15), In Vitro Biology Meeting, Tucson, Arizona, USA, May 30–June

3, 2015. Abstract J-1, In Vitro Cellular and Development Biology, Abstract Edition 51, pg S10.

- William, M.S., Voutchkov, M., Nwokocha, C.R., and Asemota, H.N. (2015). The Biochemical Effects of Biomagnetic Therapy on Type II Diabetic Rats. STEM Science and Technology Annual Conference, June 9, 2015.

## **INCOME GENERATION**

During the period August 1, 2014 to July 31st, 2015, income generated from Bioservices, Internships and Workshops organized by the Centre amounted to approximately One Million Jamaican Dollars (J\$1,000,000.00) and one thousand USA Dollars (US\$1,000).

## **PUBLIC SERVICE:**

### **Professor Helen Asemota:**

- Ordained Reverend – serving Holiness Christian Church of Jamaica Denomination as a Pastor.
- Chairman and Co-Founder, Imade Asemota Foundation for Sickle Cell Research and Patients' Welfare (IAF), North Carolina, USA.
- Curriculum Review, Ministry of Education, Jamaica.
- University Accreditation Assessor, University Commission of Jamaica (UCJ)
- Education Committee Chair, International Proxy Parents (IPP)
- IEEE Member of TC 19 Group
- International Measurement Convention (IMEKO) Rep. in Jamaica.
- STEM Women of Science Concave (SWOC), USA. Founding Member.

### **Dr. Sylvia Mitchell:**

- Member of Caribbean Access and Benefit Sharing (ABS) Development Initiative Steering Committee

- Member of the Society for In vitro Biology – Education Chair, and Co-Editor of In vitro Report
- Member, Management Board, College of Agriculture and Science Education (CASE)
- Member, Standards Council, Standards and Technical Sub-Committee, National Quality Awards, and Chair of the Board of Examiners, Bureau of Standards of Jamaica (BJS)
- Member, Hope Garden's Education and Research Sub-Committee, NPF

**Dr. Marcia Roye:**

- Assistant Dean for Graduate Studies & Research, Faculty of Science & Technology, Mona

**Professor Paula Tennant**

- Head of Department of Life Sciences, Mona

**POSTGRADUATE STUDENTS**

A total of 14 postgraduate students are registered for the PhD or MPhil in Biotechnology at the Centre, out of which 6, listed below, entered the programme at the beginning of the academic year under review. The 6 new students are, Foster, Kimberly; Marriott, Chantal; Mayne, Nicaine; Bell, Princess; Scott, Nikashae; and Williams, Lowen. The other students previously registered and working at the Centre are Chenielle Delahaye, Cheryl Green, Raxon Gordon-Simmonds, Soyanni Holness, Kimani Kitson-Watson, Adriel Ramkissoon, Deiondra Robinson, and Racquel Wright. Some students, registered in other departments also conduct research at the Centre, such as Alisa Lindo of the Department of Life Sciences, Keaton Logan, Melissa Williams and Kenroy Wallace of the Department of Basic Medical Sciences.

In November 2014, Miss Natwaine Gardner was awarded the PhD degree in Biotechnology with high commendation for her work on the “Analysis of drug addiction treatment or secondary prevention using

nutritional supplements: Mechanisms of action in an animal model of cocaine dependence”. This research entailed a multi-disciplinary approach and encompassed a wide range of persons that so willingly lent their expertise. This very diverse supervisory team was led by Professor Helen Asemota (Biochemistry, Molecular Biology and Biotechnology) and included Dr. Andrew Wheatley (Biochemistry and Biotechnology), Dr. Winston De la Haye (Substance Abuse and Psychiatry), Dr. Donovan McGrowder (Chemical Pathology), Dr. Lowell Dilworth (Chemical Pathology and Biochemistry), Dr. Perceval Bahado-Singh (Clinical Biotechnology) Dr. Henry Lowe (Ethno Chemistry) and Dr. Ajibike Salako-Akande (Inventor of Nutritional Supplement formulation). Every member of this multidisciplinary team, along with Dr. Lorraine Young (Neurology, Physiology) and Professor Denise Eldemire-Shearer (Community Health and Psychiatry) graciously gave their invaluable contribution which facilitated this pioneering research to its completion.

Mr. Kimani Kitson-Watson received a Smithsonian Graduate Fellowship to pursue research for 12 weeks at the Smithsonian Marine Station in Fort Pierce, Florida. The award was granted by the Link Foundation and the Smithsonian Institution of the USA. Mr. Kitson-Watson, who is being supervised by Dr. Marcia Roye (and Dr. Webber, Life Sciences Department) will study the restriction site associated DNA technique at the Institution in Florida. His MPhil work involves examining the fine-scale population structure of the Queen Conch (*Strombus gigas*) in the Jamaican Fishery.

Miss Racquel Wright, PhD candidate in Professor Asemota’s Research Team, visited the Morehouse School of Medicine in Atlanta, Georgia during November 2014 and again for a second period starting June 2015, as a part of an ongoing collaboration with Dr Jacqueline Hibbert of the Department of Microbiology, Biochemistry and Immunology and Professor Marvin Reid of UWI. Miss Wright is completing work on the project “Antioxidant and anti-inflammatory properties of *Moringa oleifera* towards use in the treatment of sickle cell anemia”. The Morehouse visits are targeted at analyzing the anti-inflammatory properties of *Moringa* extract in endothelial cells. The visits were made possible by the National

Institute of Health (NIH) Fogarty Global Health Fellowship Grant #5R25TW009340, under a broad network of collaboration involving Duke University and the University of North Carolina, Chapel Hill, where the grant is located.