

THE BIOTECHNOLOGY CENTRE



Dr. Marcia Roye, BSc., PhD., *UWI*,
Acting Head of Department

WORK OF THE CENTRE

During 2012 to 2013, the Biotechnology Centre continued its work focused on agricultural research involving medicinal plants, forestry preservation and molecular virology of begomoviruses and virus associated with citrus, potato, cucurbits and other crops. Research was also conducted investigating the glycemic indices of Jamaican foods, including studies on root and tuber crops. The Centre's academic staff members were all involved in teaching undergraduate courses within the Departments of Basic Medical Sciences and the Department of Life Sciences. They were also involved in outreach programmes, and participated in public lectures and seminars, as well as university activities such as the Annual Research Day held February 7–8, 2013. An integral part of their duties also involved the training and supervision of postgraduates conducting research at the Biotechnology Centre.

The 10th Annual workshop on “Concepts in Genetic Engineering” for Cape and A level biology high school students in Jamaica was held December 17–19, 2012. Dr. Marcia Roye, with the assistance of the Centre’s staff and postgraduates, hosted the Workshop where over seventy students from a range of high schools across the country were trained in recombinant DNA technology, biotechnology and related areas. In order to accommodate students who could not participate in the December programme, a one-day workshop on Genetic Engineering, which was developed from the Concepts in Genetic Engineering Workshop, was hosted on January 15, 2013. This particular workshop was organized for the Wolmer’s Boys 6th form class and involved 6 hours of laboratory sessions including DNA extraction, restriction analysis and agarose gel electrophoresis of digested DNA.

The second Undergraduate Symposium was hosted on January 18th, 2013, to allow undergraduates the opportunity to interact with recent graduates of the Biotechnology Centre and the Biochemistry Section of the Department of Basic Medical Sciences and to discuss local and international opportunities and challenges in the work environment, as well as difficulties encountered in pursuing graduate studies. Approximately 50 undergraduates from levels 2 and 3 attended the symposium workshop from the Biochemistry Section of the Department of Basic Medical Sciences. The Symposium was organised by Dr. Marcia Roye and Darshan Young.

A number of postgraduates, as well as the Head of Department and her research assistant attended the Northern Caribbean University Research and Technology Symposium: Vehicle to Economic Independence and Sustainability, held March 12, 2013. Dr. Roye was their keynote speaker and shared her experience of 20 years of geminivirus research and its importance to farmers in the region.

PAPERS PRESENTED

- Graham A.P., Martin D.P., Roye M.E. (2013). Genomic recombination and phylogeny of two begomoviruses infecting *Malvastrum americanum* in Jamaica” BIT’s 4th Annual World DNA and Genome Day Conference, Nanjing, China. April 25–27, p 197.
- Hamilton, C-L., Ramkissoon, A., Amarakoon I. I., Eyzaguirre, L. M., Figueroa, P., Pierre, R. B., Duncan, J, Carr, J. K, Roye, M. E. (2013). “HIV drug resistance in Jamaican adults and children”. Northern Caribbean University Research and Technology Symposium: Vehicle to Economic Independence and Sustainability. Mandeville, Manchester, March 12.
- Mitchell S.A. (2013). “Ethnomedicinal opportunities for human health from Jamaican-grown tropical herbs: Anti-cancer Guinea Hen Weed (*Petiveria alliacea*), bitter herbs, root tonics, nutraceuticals, spices, and cold bushes”. In Vitro Biology Meeting. Abstract A-15, In Vitro Cellular and Development Biology, Abstract Edition 49: S10. Providence, Rhode Island, USA, June 15–19.
- Mitchell S.A. (2013). “Phase Change: a source of recalcitrance for the initiation of Yellow Yam (*Dioscorea cayenensis*) and Yampie (*Dioscorea trifida*), two non-woody monocotyledenous tropical vines”. In Vitro Biology Meeting. Abstract P-7, In Vitro Cellular and Development Biology, Abstract Edition 49: S15. Providence, Rhode Island, USA, June 15–19.
- Mitchell S.A. (2013). “The biodiversity of the Caribbean is a rich source of health and wealth that can be sustainably developed to benefit both donor and receiver nations”. Abstract A-13, In Vitro Cellular and Development Biology, Abstract Edition 49: S9. Providence, Rhode Island, USA, June 15–19.
- Young, D.A., Amarakoon, I.I., Hernandez-Zepeda, C., Brown, J.K., Roye, M.E. (2013). “Molecular characterization of begomoviruses associated with *Rhynchosia minima* in Jamaica”. Northern Caribbean University Research and Technology Symposium: Vehicle to Economic

Independence and Sustainability. Mandeville, Manchester, March 12.

- **Asemota, H.** (2012). “Ideas for creating wealth and Economic Advancement from Local Resources”. ICAJ/JIPO Annual Conference. Jamaica Conference Centre, Kingston, November 8.
- **Delahaye C., S.A. Mitchell** (2012). “More than a herb, more like an antibiotic *callistemon viminalis*”. Scientific Research Council Third International Conference “Science & Technology Driving Development: Competitive Edge for Caribbean Entities”. Jamaica Pegasus Hotel, Kingston, November 6–8.
- **Johnson L., Tennant, P.** (2012). “Viruses infecting Sweet Potato in Jamaica”. 16th Triennial Symposium, International Society for Tropical Root Crops. Federal University of Agriculture, Abeokuta, Nigeria, September 23–28.
- **Mitchell S.A.** (2012) “Raising the standard of food safety and sustainability in Jamaica: the role of biotechnology”. 6th International Food Safety Conference, Jamaica 2012, Food Hygiene Bureau, Montego Bay, Jamaica, October 18–19.
- **Wright, R., Asemota, H. and Wheatley, A.** (2012). “Extraction of Organic Compounds from *Moringa Oleifera* Leaves & its Antioxidant Activity Using DPPH Assay” 9th International Symposium in Recent Advances in Environmental Health Research, Jackson Marriott Hotel, Jackson, Mississippi, USA, September 16–18.

PUBLICATIONS

- **Fisher L., Tennant P., Mc Laughlin W.** (2013). “Diversity of Citrus tristeza virus in Jamaica”. *Journal of Plant Pathology* 95: 201–206.
- **Picking D., Delgoda, T., Mitchell, S.A.** (2013). “*Hyptis verticillata* Jacq: A review of its traditional uses, phytochemistry, pharmacology and toxicology”. *Journal of Ethnopharmacology*. 147(1): 16–41.

- Stennett, D., Oladeinde, F., Wheatley, A., Bryant, J., Dilworth, L. and **Asemota, H.** (2013). Effects of *Dioscorea polygonoides* (Jamaican Bitter Yam) supplementation in normocholesterolemic and genetically modified hypercholesterolemic mice species. *Journal of Food Biochemistry* ISSN 1745–4514.
- **Stewart, C.**, Kon, T., Rojas, M., Graham, A., Martin, D., Gilbertson, R., and **Roye, M.** (2013). “The molecular characterisation of a Sida-infecting begomovirus from Jamaica”. *Archives of Virology*. Volume 158(8). <http://www.ncbi.nlm.nih.gov/pubmed/23933798>.
- Dilworth, L., Brown, K., **Wright, R.**, Oliver, M., Hall, S. and Asemota, H. (2012). Antioxidants, minerals and bioactive compounds in tropical staples. *African. J. Food Sci. Technol.* 2012 3(4): 90–98.
- Dilworth, L., Gardner, M., **Asemota, H.**, and Omoruyi, F. (2012). Intestinal morphology assessments of rats fed phytic acid extract from sweet potato (*Ipomea batatas*) and IP6. *Basic and Applied Pathology* 5:84–90 (doi:10.1111/baap.12000).
- Green, C.O and **Asemota, H.N.** (2012). Compositions and methods for treating hypercholesterolemia using Ortanique peel extract (USA Patent # 8,268,369 B2).
- Green, C. O., Wheatley, A.O., McGrowder, D.A., Dilworth, L.L. and **Asemota, H.N** (2012). Modulation of antioxidant enzymes activities and lipid peroxidation products in diet-induced hypercholesterolemic rats fed Ortanique peel PMFs extract. *Journal of Applied Biomedicine* 10(2): 91–102. ISSN 1214-0287.
- **Harvey, A.**, Adebayo, S., Wheatley, A., and **Asemota, H. N.** (2012). Effects of Acetylation on the Micromeritics of Yam (*Dioscorea* sp.) Starch Powder for Pharmaceutical Application. *West African Journal of Pharmacy*, 23(2):27–33.
- **Tennant, P.**, Fuchs M. (2012). “Transgenic crops resistant to fungal, bacterial and viral pathogens”. In: Meyers RA (ed). *Encyclopedia of Sustainability: Science and Technology*. Springer Science Business Media, LLC. pp 10694–10713.

- van Andel T., **Mitchell, S.A.**, Volpato, G., Vandebroek, I., Swier, J., Ruyschaert, S., Jimenez, C.A.R., Raes, N. (2012). “In search of the perfect aphrodisiac: Parallel use of bitter tonics in West Africa and the Caribbean”. *Journal of Ethnopharmacology*. Vol. 143(3): 840–850.

INCOME GENERATION

The annual workshop on “Concepts in Biotechnology and Genetic Engineering” held December 17–19, 2012 and the one day workshop on Genetic Engineering held on the 15th of January generated approximately Five Hundred Thousand Dollars (\$500,000.00).

PUBLIC SERVICE

Dr. Sylvia Mitchell

- Management Board Member, College of Agriculture and Science Education (CASE).
- Standards Council Member, Jamaica Bureau of Standards (BJS), Standards and Technical sub-committee, National Quality Awards Member and Chair of Board of Examiners.
- Member of Hope Garden’s Education and Research Sub-Committee, and Landscaping Sub-Committee NPF.
- Member of the Society of In Vitro Biology (SIVB). Co-Editor of In Vitro Reports, and Education Chair.
- Member, Jamaican Society for Agricultural Sciences (JSAS), Jamaica Society of Scientists and Technologists (JSST), and the UWI Alumni Association (UWIAA).

Professor Helen Asemota

- Reverend – Holiness Christian Church of Jamaica. Pastor at the Rose Town Kingston Branch.

- Chairman and Co-Founder, Imade Asemota Foundation for Sickle Cell Research and Patients' Welfare (IAF), North Carolina, USA.

POSTGRADUATES

Awards

Effective October 27th, 2012, **Miss Kathleen Lobban** was awarded the PhD. in Biotechnology for her thesis entitled “Biochemical and Molecular Genetic Changes Associated with in vivo and in vitro Developmental Processes in Dioscorea yam Planting Materials”. **Mr. Dennis Bailey** was also awarded the PhD. in Biotechnology effective February 21 2013, for his work on “Anthocyanins in Moonshine and Darknight yams (*Dioscorea alata*) and their Bioactivity in Cancer Cell Lines”. Both Drs. Bailey and Lobban's research was supervised by Professor Helen Asemota and Dr. Andrew Wheatley.

Seymour Webster was awarded the PhD. in Biotechnology for his project entitled “Somatic Embryogenesis of ‘Cheese’ Ackee (*Blighia sapida*) and Guinea Hen Weed (*Petiveria alliacea*): Regeneration, Molecular Analysis and Biosynthesis of Dibenzyl trisulphide. His degree was awarded effective November 1st 2012, and his research was conducted under the supervision of Dr. Sylvia Mitchell.

In March 2013, **Mr. Kimani Kitson-Walters** received the Prime Minister's Youth Award for Excellence in the category of Academics. The award is given each year to a student with unique academic performance. Mr. Kitson-Walters obtained a first class honours with a double major in Marine Biology and Biotechnology, a combination which is the first of its kind at the University of the West Indies. His current M Phil research is being supervised by Drs. Marcia Roye (Biotechnology Centre) and Mona Webber (Department of Life Sciences) and centers around identifying the genetic diversity of the Queen conch (*Strombus gigas*) in the Jamaican Fisheries.