

THE BIOTECHNOLOGY CENTRE

Professor M. Ahmad, BSc *Bhagal*, MSc, PhD LARI – *Director*

WORK OF THE CENTRE



With the cooperation and dedication of all staff members, the work of the Biotechnology Centre was advanced through education and training of postgraduate and under-graduate students. The Centre also hosted and participated in workshops and seminars throughout the year in an effort to disseminate information on Biotechnology and increase national awareness of the capabilities and advantages of this area of research.

The Biotechnology Centre carried out the pathology component of the Ministry of Agriculture's Citrus Replanting Project, which was initiated in February 2002 for four years, with research objectives to (i) survey the project area and determine the distribution and diversity of citrus viruses and viroids (ii) to test and bio-index citrus viruses and viroids; and (iii) to support the activities of the Citrus Certification Programme (CCP) with effective technologies to enable the production of certifiable planting material and to introduce more effective ways of addressing the certification process. The survey was successfully completed and pathogens initiated within the required time, however, an extension was granted for one year (February 2006 to January 2007) to complete the bio-indexing and shoot tip grafting experiments of the project. The projects principal investigators are Drs. Wayne McLaughlin and Paula Tennant.

The Generating Genius programme, sponsored by the Jamaica National Building Society and Cable and Wireless Jamaica, was hosted and coordinated by the Biotechnology Centre for High School boys with the highest GSAT scores. Dr. Sylvia Mitchell, assisted by undergraduate students from the Biochemistry Section and the Department of Mathematics and Computer Sciences provided training in Tissue Culture, Genetic Modification and how to make natural products (ex. soap, lotion candles). The students were also given introductory training in Robotics

by the Department of Physics. This year's programme, held July 9th-23rd, was the second of a five-year project to train brilliant boys.

The Environmental Foundation of Jamaica has funded the sum of JMD5,000,000.00 for a two year project from July 2006 to produce and disseminate medicinal plant monographs across the island. The initial project, whose principal investigator is Dr. Sylvia Mitchell, commenced in July 2004 for the establishment of *ex situ* and *in vitro* gene banks of Jamaican medicinal plants. The project was successfully completed in June 2006 with the establishment of Gene Banks at the Institute of Jamaica, at Hope Gardens, and at the Biotechnology Centre.

A workshop, the second in the series, on the "Concepts of Biotechnology and Genetic Engineering" was hosted by the Biotechnology Centre from December 12 - 16, 2005. The objective of the workshop was to provide a way for science teachers to increase their knowledge and obtain practical hands-on laboratory experience in Biotechnology and Genetic Engineering. The workshop was organized by Dr. Marcia Roye in collaboration with the Scientific Research Council, and lectures were delivered by members of staff of the Biotechnology Centre and the Department of Basic Medical Sciences. The objectives of the workshop were met and the programme was very successful with approximately twenty teachers from a variety of high schools in attendance. The workshop was partly sponsored by the Ministry of Education.

Dr. Marcia Roye visited the University of Georgia at Athens in Atlanta, USA for a period of six weeks from July 2006 to enhance her skills in Molecular Biology techniques, Real Time polymerase chain reaction (PCR) and multiplex Real Time PCR. She was hosted by Dr. Ron Walcott in the Department of Plant Pathology.

Vistors to the Centre

The German Ambassador Volker Schlegel visited the Centre on November 1st, 2005 to discuss some of the work of the centre and the possibility of providing funding for a short term training program for selected farmers. Ambassador Schlegel was hosted by the Director, Prof. Ahmad and the Biotechnology Academic Staff.

PAPERS PRESENTED

- Bahado-Singh, P.S., Wheatley, A.O., Osagie, A.U., Boyne, M., Morrison, E.Y.St.A, Ahmad, M.H. and Asemota, H.N. (2006) Glycemic Indices of some commonly eaten Caribbean foods and

dietary intervention using low glycemic index foods to achieve normoglycemia in type 2 Diabetics. Morgan State University 2nd International Complimentary and Alternative Medicine Conference, Baltimore, U.S.A. – May 26 - 27

- Bahado-Singh, P.S., Wheatley, A.O., Osagie, A.U., Boyne, M., Choo-Kan, E., Morrison, E.Y.St.A., Ahmad, M.H. and Asemota, H.N. (2006) Effect of low glycemic index dietary advice on glycemic control and inflammatory markers in adult type 2 diabetics in Jamaica. Northern Caribbean University 7th Science Symposium, Mandeville, Jamaica.
- Bahado-Singh, P.S., Wheatley, A.O., Osagie, A.U., Boyne, M., Choo-Kan, E., Morrison, E.Y.St.A., Ahmad, M.H. and Asemota, H.N. (2006) Effect of low glycemic index foods in the management of type 2 diabetes in the Caribbean. UWI Diabetes Outreach Project (UDOP) 12th International Conference, Ocho Rios, Jamaica – March 2-5.
- Graham, A.P., Roye, M.E., (2006). Mixed infection of a malvaceous weed in Jamaica by two new geminiviruses. 3rd Annual Graduate Students' Conference, University of the West Indies.
- Mitchell, S.A. (2005). Standardization of activities in nutraceutical and herbal products. In CD- Proceedings of Quality Assurance for the Nutraceutical Industry, November 30 – December 1st. Scientific Research Council.
- Mitchell, S.A. (2005). Jamaican herbs: A “Goldmine” of Possibilities: Alternative and Complementary Medicine Symposium, Medical Association of Jamaica, October 2.

PUBLICATIONS:

Refereed Journals

- * Bahado-Singh, P.S., Wheatley, A.O., Ahmad, M.H., Morrison, E.Y.St.A. and Asemota, H.N. (2006) Food processing methods influence the glycaemic indices of some commonly eaten West Indies carbohydrate-rich foods. *British Journal of Nutrition*. 96: 476-481.
- * Bahado-Singh, P.S., Wheatley, A.O., Osagie, A.U., Boyne, M., Choo-Kan, E., Morrison, E.Y.St.A., Ahmad, M.H. and

Asemota, H.N. (2006) Effect of low glycemic index foods in the management of type 2 diabetes in the Caribbean. *West Indian Medical Journal* 55 (Suppl): 41-42.

- * Mitchell S.A. and M. H. Ahmad (2006) Protecting our medicinal plant heritage: the making of a new national treasure. *Jamaica Journal*, Institute of Jamaica, Kingston. 29 (3): 28-33.
- * Riley, C.K., Adebayo, S.A., Wheatley, A.O., Ahmad, M.H. and Asemota, H.N. (2006) Fundamental and Derived Properties of Yam (*Dioscorea* spp.) Starch Powders and Implications in Tablet and Capsule Formulation. *Starch/Starke* 58: 418-424
- * Roye, M.E. Collins, A.M., Maxwell. D.P. (2006). The first report of a begomovirus associated with the common weed *Jatropha gossypifolia* in Jamaica. *Plant Pathology*, 55:286.

INCOME GENERATION

Grants

JM\$5M. – Environmental Foundation of Jamaica – “Production and dissemination of medicinal plant monographs” July 2006 – June 2008

J\$1,515,251 – Ministry of Agriculture – Citrus Replanting Project. February 2006 – January 2007

USD2000.00 – Campus Committee for Research and Publication and Graduate Grant Awards – “Production of Synthetic Ackee Seeds plant regeneration from somatic embryos and RAPD analysis of regenerants for genetic fidelity” for Mr. Seymour Webster, July 2006

J\$300,000 – Environmental Health Foundation – Nutritional Supplement as a tool for harm reduction in illicit drug addiction: Derivation of mechanism of action in animal model, July 2006 – June 2008

Funded Activities

J\$400,000 from the Ministry of Education for Science Teachers Workshop, December 18-22, 2005.

PUBLIC SERVICE

Prof. M. H. Ahmad

- Board Member, National Commission on Science and Technology
- Member, CARICOM Working group on genetically modified organisms (GMOs)
- Member, National Bio Safety Committee, NCST

Prof. Helen Asemota

- International Consultant, Food and Agriculture Organization, UN
- Member, Steering Committee for the Development of a Caribbean Food Composition Programme organized by the Caribbean Food & Nutrition Institute (CFNI) and PAHO

Dr. Sylvia Mitchell

- Member, Pharmaceutical Council of Jamaica
- Secretary, Caribbean Herbs Business Association of Jamaica
- Member, Deregulations Sub-Committee, National Biosafety Committee

Dr. Marcia Roye

- Member, Biodiversity Committee, NEPA

Dr. Paula Tennant

- Board Member, Papaya Growers Association
- Member of the National Biosafety Committee (NCST)

Dr. Andrew Wheatley

- Mayor, Spanish Town, St. Catherine
- Vice-Chairman, St. Catherine Parish Council
- Member, Cannabis Research Institute

CATEGORY OF STUDENTS

Postgraduates:

There are Twenty-Three postgraduates currently doing research at the Biotechnology Centre, thirteen of which are Ph D candidates and ten M Phil students. These include two new students, Miss Natwaine Gardener and Mr. Darshan Young, who registered in Biotechnology 2006. Mr. Young, supervised by Dr. Marcia Roye, will be examining the Molecular characterization of recombination between begomoviruses associated with *Rhynchosia minima* from Jamaica and Miss Gardner, supervised by Dr. Andrew Wheatley, will look at Nutritional Supplement as a tool for harm reduction in illicit drug addiction: Derivation of mechanism of action in animal model.

Mr. Cliff Riley was awarded a Ph D. degree in Biotechnology for his thesis completed in 2005. Mr. Riley received high commendation for his research on “Phyisco chemical characterization of Jamaican yam starches and their utilization as binders in paracetamol granule formulation”.