THE UNIVERSITY OF THE WEST INDIES

SCIENCE BRANCH LIBRARY

EXHIBITION

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“THE FACULTY OF SCIENCE & TECHNOLOGY IN THE NEWS”

- Teaching in the Faculty of Science and Technology then Faculty of Natural Sciences commenced at Mona in 1949 with students in the Departments of Botany, Chemistry, Mathematics, Physics, and Zoology

- In 952 the faculty saw 11 students graduating; by 2000 over 9,000 graduates have been produced. Today, the Faculty is among the largest in the University providing teaching in Agriculture, Biochemistry, Biology, Botany, Biotechnology, Chemistry, Computer Science, Geography, Geology, Mathematics, Meteorology, Physics, Engineering and Zoology

- Most undergraduate students in the Faculty are full-time students and there are currently over 2,437[1]

- In addition to undergraduate and postgraduate teaching, research forms an important aspect of the work of the Faculty. The Faculty has over 120 members in its academic staff and offers Diploma, MSc, MPhil and PhD programmes in almost all of its 7 departments

- This exhibition showcases members of our faculty who have been in the local or international news since 2011 to the present. Highlighting our faculty members in this way will be an ongoing feature of the Science Branch Library

Professor Paul Reese[2]

ACTING DEAN
FACULTY OF SCIENCE & TECHNOLOGY
MONA CAMPUS

- Professor Paul Reece succeeded Professor Kahwa as Dean of the Faculty of Science and Technology, **October 1st 2013**

- Professor Reese is a past student of Kingston College and in 1979 he graduated from the University of the West Indies with the Bachelor of Science Honours degree in Chemistry and Biochemistry

- In 1984 he received his Doctor of Philosophy in Organic Chemistry (Steroid Reaction Mechanisms) from the University of Sussex, UK. He later pursued postdoctoral research on the "**Biosynthesis of Fungal Antibiotics**" and "**Development of new 2D NMR Techniques**" at the University of Alberta, Canada.

- He joined the Department of Chemistry in 1986 as a Lecturer and was promoted to Senior Lecturer in 1996 while he was a Natural Sciences and Engineering Research Council of Canada/Canadian International Development Agency Research Fellow at the Chemistry Department, University of Alberta

- He has numerous publications in highly rated international journals and is also one of the inventors on a patent entitled "**Medicaments for the treatment of Strongyloides stercoralis infections**"

- A Chartered Chemist and a Fellow of the Royal Society of Chemistry (London), Professor Reese is also a reviewer for papers submitted to journals such as Phytochemistry, Organic Letters, Bioorganic & Medicinal Chemistry, and Biotechnology Progress

- He is renowned in the field of Bio-organic Chemistry, a new interdisciplinary research area for the UWI. His work involves the isolation of natural products from local plants as well as the chemical and microbial transformation of those compounds which possess important biological activity

- Professor Reese is also an expert in structure determination, mechanistic chemistry, and synthesis, and has attracted several grants worth over US$300,000 for research and study to the university

- His investigations have led to findings that are important to the Caribbean and academia.
  - ✓ These include the isolation of agents active against the cattle tick
  - ✓ He has discovered a new family of natural products (sesquiterpenoid) that are toxic to the adult sweet potato weevil
  - ✓ Studies on the preparation of relatives of some antiviral and anticancer compounds have also been carried out

- He is the recipient of several awards for scholarship, his most recent being UWI Best Research Publication in 2013, *An Efficient Method for Producing Novel Pharmaceuticals and Agrochemicals Using Fragments of Fungal Material* and he also shared with Dr. Trevor Yee, the UWI Research Project with the Greatest Business, Economic Development in 2013 for their work on *Novel treatment of Hyperglycaemia and Hypertension, High Blood Sugar Levels and High Blood Pressure in the Rat Models*

- Professor Reese has served the UWI and his department in various capacities. He is the Organising Secretary for the biennial "Mona Symposium on Natural Products and Medicinal Chemistry," the longest running conference of its kind in the Caribbean

RESEARCH INTERESTS

- Bio-Organic Chemistry with the main interests being:
  - Chemical and microbial transformation of terpenes and steroids of biological interest
  - Isolation and characterisation of natural products from Scrophulariaceae, Labiatae and Capparaceae plant families
  - Purification and identification of secondary metabolites from marine and terrestrial fungi
  - Steroid partial synthesis and reaction mechanisms.

SCHOLARLY PUBLICATIONS

REFEREED PUBLICATIONS IN INTERNATIONAL JOURNALS

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10. Steroid hydroxylation by *Whetzelinia sclerotiorum*, *Phanerochaete chrysosporium* and *Mucor plumbeus*. A.S. Lamm, A.R.M. Chen, W.F. Reynolds and **P.B. Reese**, *Steroids*, **2007**, 72, 713-722.

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12. Stemodane and stemarane diterpenoid hydroxylation by *Mucor plumbeus* and *Whetzelinia sclerotiorum*. A.R.M. Chen, P.L.D. Ruddock, A.S. Lamm, W.F. Reynolds and **P.B. Reese**, *Phytochemistry*, **2005**, 66, 1898-1902.

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BOOK CHAPTERS

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2. Microwave Oven Reaction Enhanced (MORE) Preparation of Substituted Stilbenediamines. R.J. Lancashire and **P.B. Reese**, in *Electronic Conference on Trends in Organic Chemistry*, ed. H.S. Rzepa, J.M. Goodman and C. Leach, Royal Society of Chemistry Publications, London, **1995**.

3. Intact incorporation of partially assembled intermediates into acetate-derived polyketide antibiotics. Z. Li, F.M. Martin, **P.B. Reese**, Y. Yoshizawa and J.C. Vederas. in *Secondary-Metabolite Biosynthesis and Metabolism*, ed. R.J. Petroski and S.P. McCormick, Plenum Press, New York, **1992**, pp 27-39.

Dr. Marcia Roye[3]

SENIOR LECTURER and ASSOCIATE DEAN
FACULTY OF SCIENCE & TECHNOLOGY
MONA CAMPUS

- Dr. Marcia Roye, Lecturer in Biotechnology is the recipient of the L'Oreal-UNESCO Special Fellowship Grant **2011**, to mark the centennial of Marie Curie's Nobel Prize in Chemistry. Marie Curie is the first woman to have won a Nobel Prize and the only woman to have won in two different sciences, Chemistry and Physics

- Dr. Roye was selected from among a group of 20 women who received the L'Oreal-UNESCO International Fellowship.

- She is also the first Jamaican to have received the L'Oreal-UNESCO International Fellowship in 2000

- Dr. Roye is among over 1100 women scientists from 103 countries worldwide to have been distinguished by Awards or supported in the pursuit of their career through the L'OREAL-UNESCO Women in Science partnership

- For the past 15 years Dr. Roye has been engaged primarily with molecular virology of gemiviruses with special emphasis on identification, distribution, molecular characterization and control of diseases associated with crops and weeds from the Caribbean

- Her research has identified numerous plant viruses in Jamaica, Belize, Barbados, Antigua and St. Kitts and Nevis and has played an integral role in the development of control strategies of these plant viruses

- In Jamaica in particular, Dr. Roye's research has resulted in the identification of more than 24 plant viruses associated with red pea, broad bean, tomato, scotch bonnet pepper, cabbage and common weeds. Her research has been instrumental in facilitating the control of viruses in two crops by cultivation of resistant varieties of tomato and cabbage. This has enabled the local agriculture market to flourish as these plant viruses can cause significant yield loss

- Since 2008 her research in viruses has expanded to include humans. Along with the Institute of Human Virology of the University of Maryland School of Medicine she has embarked on research in the detection of antiretroviral (ARV) drug resistance to HIV in Jamaican patients. The research serves to improve ARV treatment and outcome for HIV- affected individuals as well as the quality of life of the HIV patients

- Dr. Roye and her team are able to assist the medical profession by performing viral sequencing of HIV and can provide this vital information to physicians and patients. From the blood samples of individual patients, they are able to sequence the virus and provide very specific information that helps the doctor determine which drug combinations that individual is likely to respond to, so the patient can receive the most effective therapy. This is very vital in Jamaica where resources to conduct sophisticated laboratory analyses are deficient

- Marcia Roye has also extended her reach and expertise to CAPE Biology students and teachers by developing and hosting annual workshops on "**Concepts in Genetic Engineering**" where participants are given training in recombinant DNA technology

SCHOLARLY PUBLICATIONS

REFEREED PUBLICATIONS IN INTERNATIONAL JOURNALS

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Professor Michael Taylor[4]

HEAD
DEPARTMENT OF PHYSICS
FACULTY OF SCIENCE & TECHNOLOGY
MONA CAMPUS, JAMAICA

SILVER MUSGRAVE MEDALLIST

- Professor Michael Taylor was awarded the **Silver Musgrave Medal** by the Institute of Jamaica for his work in climate change, October 16, 2013. The Musgrave Medals, named after former Governor of Jamaica Sir Anthony Musgrave, are awarded each year in gold, silver and bronze to persons who have made significant contributions to the development of literature, science and the arts in Jamaica and the West Indies.

- He was one of the few students to win a Jamaica Government Exhibition Scholarship to attend The University of the West Indies, Mona Campus

- In 1992 he earned a BSc with First-Class Honours from UWI, and later received a UWI Postgraduate Scholarship to embark on an MPhil programme. The final year of his MPhil studies was funded by an Organisation of American States (OAS) Fellowship

- He also completed a PhD in 1999 at the University of Maryland, College Park, USA, funded by a University of Maryland Postgraduate Fellowship

and later by a National Aeronautical and Space Administration (NASA) Fellowship

- He returned in that year to teach in the Department of Physics at and in 2004 he received an International Young Scientist Award, a Young Scientist/Technologist Award from the Scientific Research Council of Jamaica (2005), and no less than three UWI Mona Research Awards (2003, 2007 and 2008)

- He is the recipient of the UWI award for the Most Outstanding Research Activity in 2013 for his work on *Studies in Climate Change*

RESEARCH INTERESTS

- Understanding the dynamical mechanisms that drive climate variability within the Caribbean
- Deducing climate change and long term climate variability within the Caribbean, through the use of climate models
- Understanding/Quantifying the Caribbean region's vulnerability to climate change
- Building a Caribbean Climate Database
- Enabling seasonal prediction of Caribbean climate

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Dr. Trevor Yee[5]

EXECUTIVE DIRECTOR
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BRONZE MUSGRAVE MEDALLIST

- Dr. Trevor Yee was awarded the **Bronze Musgrave Medal** by the Council of the Institute of Jamaica on October 16, 2013, for his contribution to Natural Products research.
- The son of a Chinese grocer and traditional Chinese herbal medicine practitioner and a school teacher, he has dedicated his academic life to natural products research6
- He excelled in Chemistry at St. George's College, and moved on to obtain a Bachelor of Science Degree in Chemistry and Botany and a PhD in Organic Chemistry from the University of the West Indies
- He then completed a post doctoral fellowship at University of British Colombia in Canada in Organic Chemistry
- Dr. Yee's research focuses on the physical and chemical properties of chemicals extracted from natural compounds derived from living organisms such as fungi, bacteria and plants

- In 2003 he became the Executive Director of the Natural Products Institute (NPI)

- Dr. Yee has overseen a number of funded research projects including Propagation Research for the sustainable management of Bitterwood, a medicinal plant native to Jamaican forests, the bark and the wood of which is used in herbal medicines, tonics and the food and beverage industry.

- Dr. Yee has moved to ensure local economic benefits from this potentially lucrative market by developing and seeking a patent for a commercial process that converts raw Bitterwood into a finished product of a quality which satisfies the demands of the overseas processor

- In 2008-2009 the Extraction Process invented by Dr. Trevor Yee of the Institute and Prof. Helen Jacobs of the Dept. of Chemistry for the extraction of the active ingredients of Bitterwood, has now been awarded a United States as well as a Jamaican Patent. This was the first US Patent, granted to the UWI, Mona Campus.

- They were granted another US Patent for their extraction processes of Bitterwood, Picrasma excelsa (Simaroubaceae), "Process to Extract Quassinoids". This latest US Patent No. 8,217,187 B2 was issued July 10th, 2012. Another US Patent application with several improvements to the original processes, was submitted on 1st Feb. 2012, and is pending

- Dr. Yee and collaborators have also researched methods of controlling both the Lime Swallowtail, Papilio demoleus and the Citrus Swallowtail, Heraclides andraemon, both invasive alien butterflies that currently threaten our Citrus industry. The resulting methods of control have been submitted for two US Patents.
- He has also collaborated with Drs. Lisa Alexander-Lindo and Denise Daley-Beckford of the Department of Basic Medical Sciences and Prof. Paul Reese of the Dept. of Chemistry in the search for new potential oral hypoglycaemic and hypotensive agents from the leaves and stems of local Eucalyptus plants that would compare with the known diabetic and high blood pressure medicines Metformin and Captopril. This research investigation has also been submitted for a US Patent

- Along with Professor Paul Reese he is the recipient of the UWI Research Project with the Greatest Business, Economic Development in 2013 for their work on *Novel treatment of Hyperglycaemia and Hypertension, High Blood Sugar Levels and High Blood Pressure in the Rat Models*

- Dr. Yee's has also done work with the Bureau of Standards to ensure public safety by determining products standards for Cosmetics and Household Chemicals as well as the Code of Practice for Hairdressing Salons and Barber Shops

- The recent work of the NPI has included:
    - The development of a commercial extraction process for Jamaican Bitterwood - the active ingredients of which have a global usage but the extraction of which has been done overseas, historically.
    - The development of control measures against several agricultural pests, inclusive of novel control measures against two introduced citrus pests.
    - A collaborative investigation, with the Department of Basic Medical Sciences, and the Dept. of Chemistry into an ethno-medical plant extract for use against high blood pressure and high blood sugar levels.
    - Research into the development of a treatment against the virulent Citrus Greening Disease.
    - The development of agricultural wastes into the production of organic fertilizers and as a renewable energy source.
    - The investigation of various plant, marine and fungal extracts for anticancer and cancer preventing properties; and the development of several cancer screens. The investigation of potential drug-herb interactions
    - The Work of the NPI has also included the development of botanical pesticide formulations for the management of cruciferous vegetables, coffee, and other economic plants, as well as the control of ticks of cattle, and the development of nutraceuticals.

Much of the Institute's research is both novel and with commercial potential, with the result that it has been granted several international patents for its research

SCHOLARLY PUBLICATIONS

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