DEPARTMENT OF CHEMISTRY

Professor Paul B. Reese, BSc (Hons), UWI, DPhil, Sussex, CChem, FRSC – Head of Department

OVERVIEW

The 2009-2010 academic year was a productive one for the Department of Chemistry. Despite the budgetary constraints, the department has managed to maintain its standards of excellence in teaching and research. It continues to provide an environment which fosters and promotes the development of highly trained professionals.

Forty-seven undergraduate students, including five who gained first class honours, completed a Bachelor of Science in Chemistry and two postgraduate students completed their Doctor of Philosophy degree while another two completed their Master of Philosophy. Enrolment at the Introductory and Advanced levels continues to increase steadily.

The Peer-Led Team Learning (PLTL) initiative continues to improve the learning experience and performance of introductory level students. Other programmes such as the Occupational and Environmental, Safety and Health (OESH) programme and the CAPE workshops continue to have a positive impact on the participants.

Several of our academic staff have been featured and awarded for their excellent performance in teaching and research. The Department snatched half of the awards in the Faculty of Pure and Applied Sciences from the Principal’s Research Day Awards Ceremony. Additionally, the 21 refereed publications and 15 presentations at major conferences is an indication of the quality of research being produced by the Department.
Over J$3 Million of research grants was secured for several projects in the department, while another J$12.5 Million in income was generated.

HIGHLIGHTS OF MAJOR ACTIVITIES

The Mona Symposium

The twenty third “Mona Symposium: Natural Products and Medicinal Chemistry” was held on January 4-7, 2010. The Organizing Committee was comprised of Mr. Oscene Barrett (Student Representative), Drs. Nadale Downer-Riley, Winklet Gallimore, Julie-Ann Grant, Sandra Jarrett, Donna Minott-Kates, Roy Porter and Profs. Yvette Jackson, Helen Jacobs and Paul Reese (Organizing Secretary).

More than 60 persons, including 35 visiting participants, attended the conference. There were 28 international attendees (from Canada, Japan, Germany, the UK and the USA) and seven regional attendees (from Cave Hill and St. Augustine campuses and UTECH). The scientific programme consisted of nine plenary lectures, eleven short papers and a poster session. Tribute was paid to Professor William Reynolds who has made an enormous contribution to the discipline, spanning 50 years. Prof. Reynolds has assisted many students from the University of the West Indies (Cave Hill, Mona and St. Augustine) with their research work and has been a consistent participant in the Mona Symposium during the last 14 years.

The Occupational and Environmental, Safety and Health (OESH) Programme

For the academic year 2009-2010, a record-breaking 41 students registered for the MSc programme of which 14 were part time. Seven students registered for the BSc programme.

Peer-Led Team Learning (PLTL) Project

The Peer-Led Team Learning (PLTL) programme had been implemented by Dr. Novelette Sadler-McKnight and Mr. Imron Miller in the 2008-2009 academic year. Due to the success of the pilot project, the programme was executed on a larger scale. Approximately 20% of the introductory level
students participated and, on average, their final marks were 10% higher than those not participating.

Outreach Activities

CAPE Workshop

The annual workshop on spectroscopy and chromatography for students sitting the Caribbean Advanced Proficiency Examinations (CAPE) in Chemistry was held between January 18 and 22. There was a 56% increase in the number of participants compared to last year. A total of 762 students and 36 teachers from 35 secondary institutions across the island participated.

BEd (Distance) Project and BEd/Open Campus Programme

The Department accommodated six students from the Open Campus programmes for laboratory sessions during the summer.

The Chemical Society

The membership of The Chemical Society Mona (ChemSoc) for the academic year 2009-2010 was 36, although approximately 130 persons attended the meetings regularly. The topic “Alternative/Renewable Energy” was the focal theme of several presentations and discussions. The Society undertook a number of fun, educational and motivational activities. It offered academic advice and conducted free tutorials for the members and visitors in preparation for end of semester examinations.

Student Enrolment

The number of students enrolled for courses at the preliminary level decreased by 33% from the last academic year, while enrolment in courses at the introductory level increased by 7%. Six new graduate students joined the Department.
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<tr>
<td>Preliminary</td>
<td>203</td>
<td>189</td>
<td>193</td>
<td>129</td>
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<tr>
<td>Introductory</td>
<td>223</td>
<td>377</td>
<td>492</td>
<td>526</td>
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<td>Postgraduates</td>
<td>60 (32 F/T; 28P/T)</td>
<td>64 (32 F/T; 32 P/T)</td>
<td>59 (31 F/T; 28 P/T)</td>
<td>45 (24 F/T; 21 P/T)</td>
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**Book Loan Scheme**

Due to the significant increase in enrolment over the past two years, access to required textbooks through the library facility has become very competitive. In an effort to increase access and improve performance the Department launched a book loan scheme. Books were purchased for Chemistry students at all levels, at a total cost of J$1.5 Million, and were rented by semester. The programme was well subscribed. Demand for textbooks for the introductory courses was highest, followed by those for the preliminary courses.

**ACHIEVERS AND AWARDEES**

**Principal’s Research Day Awards**


**Silver Musgrave Medal**

**Professor Helen Jacobs** was the recipient of the Silver Musgrave Medal for Organic Chemistry (October 2009) from the Institute of Jamaica.
TWAS Fellowship

Dr. Marvadeen Singh-Wilmot was selected as one of five Young Affiliate Fellows of the Third World Academy of Sciences for 2010.

Faculty Teaching Awardees

Drs. Michael Coley, Donna Minott-Kates, Willard Pinnock and Marvadeen Singh-Wilmot were recipients of the award for Outstanding Achievement in Teaching at the Faculty Awards Ceremony. Dr. Marvadeen Singh-Wilmot also received the award for the Most Outstanding Achievement in Teaching.

Departmental Awards and Prizes

Seven undergraduate students received awards, ranging from $10,000 to $60,000, for their academic performance in Chemistry. They are Orain Brown (Cedric Hassall), Tomeika Myers (Garfield Sadler), Je-Ann Murray (Wilfred Chan), Ruel Campbell (L. J. Haynes), Isaac Morrison (Chemistry Department), Michal Camejo (Pavelich/Honkan) and Kervern James (Bert Fraser-Reid).

Promotion & Tenure

Dr. Roy Porter was promoted to the level of Senior Lecturer at the January sitting of the Campus Appointments Committee. Dr. Camille Bowen-Forbes’ contract was extended for an additional three years, while Drs. Marvadeen Singh-Wilmot and Paul Maragh were granted indefinite tenure.

Research Fellowships

Drs. Camille Bowen-Forbes and Roy Porter were recipients of UWI Research Fellowships for the period August 2009 – July 2010. The investigations were conducted by Dr. Kayanne McCook-Russell – “Study on the Phytochemical and Nutraceutical Potential of Rubus ellipticus Fruits (Cheeseberry)” (with Dr. Bowen-Forbes) and Dr. Petrea Facey – “Investigations of Endophytic Marine Fungi associated with Jamaican Mangroves for Novel and Bioactive Compounds” (with Dr. Porter).
POSTGRADUATES

Two postgraduate students successfully defended their theses and were awarded the PhD degree. They are Andrew Morris supervised by Prof. Y. Jackson and Kenesha Wilson supervised by Dr. Willard Pinnock. Another two students, Paul Clare and Tavia Riggon, (supervised by Prof. P. Reese and Dr. W. Gallimore respectively) successfully completed their MPhil degrees. Three students transferred from the MPhil to the PhD programme.

Student Exchange Programme

Two MPhil students, Rochette Sinclair and Jevon Samuels, visited the University of Gothenburg, Sweden from January 19 to June 10, 2010. While there they continued their research projects and read two graduate courses each. During that period the Department hosted four visiting undergraduate students from that University.

PAPERS PRESENTED


Alexander von Humboldt Foundation, Mexico City, Mexico (June 2010).


- **M. A. Singh-Wilmot** “Novel Materials from Lanthanide(III) Nanoclusters”. 7th Regional Conference of Young Scientist of TWAS-ROLAC, Rio de Janeiro, Brazil (May 2010).

Papers presented at 23rd Mona Symposium on Natural Products and Medicinal Chemistry, Kingston, Jamaica (January 2010).

- **C. S. Bowen-Forbes**, V. Mulabagal, Y. Liu and M. G. Nair, “Anthocyanin content and biological activity of extracts and phytochemicals from Jamaican Rubus fruits” (Poster)

- O. Barrett, **N. Downer-Riley** and **Y. Jackson**, “Approaches to the Synthesis of Benzobisthiazoles and their Derivatives”

- A. L. C. Morris and **Y. A. Jackson**, “Synthesis of a 6H-Chromeno[3,4-b]quinoline and a 6a,12a-Dehydro-7-azarotenoid”


- A. A. Johnson and **H. Jacobs**, A 2-acylcyclohexane-1,3-dione from Peperomia sp. nov. of Jamaica. (Poster).


PUBLICATIONS

Refereed Journal Articles


* C. S. Bowen-Forbes and D. A Minott, “Structural characterization of hypoglycin B, a diastereomeric dipeptide


* M. A. W. Lawrence, P. T. Maragh and T. P. Dasgupta, “Kinetics and mechanism of the aquation of a series of mixed-metal oxo-centered trinuclear cations, µ3-oxo-triaqua-hexakis(carboxylato)bis-(chromium(III)(iron(III)))³⁺,[Cr³⁺₂Fe³⁺

O(RCOO)₆(H₂O)₃]⁺, (R = H, CH₃, CH₃CH₂ and (CH₃)₂CH) in perchloric acid media,” *J. Coord. Chem.*, 2010, 63, 2517-2527.


Non-Refereed Publications


Book


**INCOME GENERATION & RESEARCH GRANTS**

Dr. H. Ellis

- **J$80,000.00** from the Ministry of Agriculture for Consultancy.

Dr. A. Greenaway

- **US$1,200.00** from the United Nations University International Network on Water, Environment and Health for collection of fish for testing for Persistent Organic Pollutants.

- **J$300,000.00** from commercial analyses.

- From the Mona Campus Committee for Research & Publications and Graduate Awards: **US$1,700.00** for standard reagents to support project;

- **US$3,200.00** for centrifuge
Prof. H. Jacobs

- **J$1,447,470.00** from the Research Fellowship Committee (Special New Initiative Grant), Mona to fund project entitled "Technology-enhanced isolation of natural products for enzyme-based and whole-organism bioactivity screening."

Dr. R. Porter

- **$191,000.00** from the Research and Publications and Graduate Awards for the project "Phytochemical Investigation of Jamaican Bursera species."
- **£6,500** from the Alexander von Humboldt Foundation.

Prof. P. Reese

- **US$2,100.00** from the Mona Campus Committee for Research & Publications and Graduate Awards (February 2010) to cover costs associated with project entitled "Biotransformation of terpenes using endophytic fungi."

Dr. N. Sadler-McKnight

- Generated a total of **J$2,484,600.00** from outreach activities.

Dr. M. Singh-Wilmot

- **US$3,000.00** from the Mona Campus Committee for Research & Publications and Graduate Awards for project entitled “Novel Framework Materials from Lanthanide(III) Nanoclusters and their Use as Gas Adsorbent and Fluorescence Sensors.”

Other Income Generated

- Summer School – **$7,677,355.50**
- Rental of Facilities – **$267,500.00**
- Consultation Fees – **$1,846,688.02**
PUBLIC SERVICE

Prof. M. Bakir
– Referee to the Journals: *Coordination Chemistry, Inorganic Chemical Communications, Talanta* and *Polyhedron*.

Prof. T. Dasgupta
– President, Caribbean Academy of Sciences
– Executive Committee Member, Regional Office of International Council of Science
– Member, Organizing Committee of UNITAR Project (Office of Prime Minister)
– Chairman, National Adhering Organization for IUPAC
– Member, POPs National Implementation Programme in Jamaica
– Member, Third World Academy of Sciences
– Editor, *Jamaica Journal of Science and Technology*

Dr. H. Ellis
– Member, Bureau of Standards Jamaica Paints and Surfaces Committee.

Dr. W. Gallimore
– Member, 23rd Mona Symposium Organising Committee
– First Year Experience (FYE) Facilitator

Dr. A. Greenaway
– Member, National Ozone Commission.
– Member, Bureau of Standards Jamaica Water System Components Technical Committee.
– Member, Jamaica National Agency for Accreditation Technical Advisory Committee.

Prof. Y. Jackson
– Scientific Consultant, Tanaud International.
– Regional Editor, MOLECULES.
– Reviewer for paper submitted to various chemistry journals.
– Member, Board of Governors, Hampton School for Girls.

Prof. H. Jacobs
– Member, Chemicals Review Committee, Ministry of Health and Environment
– UWI Representative, University Council of Jamaica’s Academic Board of Studies (for science).
– Chief Editor, Jamaica Journal of Science and Technology
– Referee for papers submitted to Natural Product Communications
– Member, Organic Chemistry Division of the International Union of Pure and Applied Chemistry (IUPAC)

Prof. R. Lancashire
– Secretary, Caribbean Academy of Sciences.
– Appointed Secretary of IUPAC Committee on Printed and Electronic Publications (CPEP).
– IUPAC representative to ICSU Committee on Data for Science and Technology (CODATA).

Dr. P. Maragh
– Assistant Chief Examiner, CXC CSEC Chemistry
– External Examiner for Chemistry, University of Technology
– External Examiner for Chemistry, Joint Board for Teacher Education
– External Examiner for Chemistry, MICO University
– External Examiner for Chemistry, College of Agriculture, Science & Education

Dr. D. Minott-Kates
– Vice Chairman, CARICOM Regional Organization for Standards and Quality (CROSS-Q)
– Member, Scientific Research Council Board Sub-Committee for Food Technology
– Member, WIGUT Management Committee
– Board Member, Grove Primary School, Gordon Town
– Executive Member, Mona Preparatory School Parents Teachers Association

**Dr. W. Pinnock**
– Faculty of Pure and Applied Sciences Rep., University Hospital of the West Indies Research Ethics Committee
– Board Member, National Water Resources Authority
– Chairman, Technical Advisory Sub-Committee, National Water Resource Authority

**Dr. R. Porter**
– Member, Technical Committee for Propane-Butane Liquefied Petroleum Gas standards, Bureau of Standards Jamaica.
– Member, Technical Committee (TC 93) for all standards relating to starch and its by-products, Bureau of Standards, Jamaica.
– First Year Experience (FYE) Facilitator

**Dr. R. Rattray**
– Secretary, Laboratories Association of Jamaica
– Director, Lions Club of Mona

**Prof. P. Reese**
– Member, Equine Drug Testing Committee, Jamaica Racing Commission.
– Member, Product Research & Development Committee, Scientific Research Council.
– Board Member, Jamaica National Agency for Accreditation, Ministry of Industry, Technology, Energy & Commerce.

Dr. N. Sadler-McKnight
– Executive Secretary, Chemistry Alumni and Friends (CHEMSAF)
– Member, Technical and Finance Committee of the Scientific Research Council (SRC)
– Faculty Advisor, UWI Circle K Club
– External Examiner, Chemistry, College of Agriculture, Science and Education (CASE)

Dr. M. Singh-Wilmot
– First Year Experience (FYE) Facilitator
– Member, Cooperative Development Committee, Jamaica
– Young Affiliate Fellow of the Third World Academy of Sciences (2010)