

**WINDWARD  
ISLANDS  
RESEARCH  
& EDUCATION  
FOUNDATION**



*2012 Annual Report*

*19<sup>th</sup> Anniversary*



Cover Photo: Grenada's Kirani James celebrates after winning the men's 400m final at the London 2012 Olympic Games. **Photograph: Dylan Martinez/Reuters**



## **Mission Statement**

Founded in 1994, WINDREF seeks to advance health and environmental development through multi-disciplinary research and education programs. WINDREF strives for program excellence by promoting collaborative relationships between internationally recognized scholars and regional scientists, and by adhering to the highest ethical and academic standards in the design and conduct of research.

## **Goals**

- To provide a scientific resource center capable of coordinating international collaborative research of the highest calibre in the areas of medical and veterinary public health, anthropology, ecology, marine and terrestrial biology, and ethics.
- To provide a first rate academic opportunity to scientists from the Caribbean and around the world offering unique research opportunities to enhance the knowledge and welfare of local and international communities.
- To conduct applied scientific research for the benefit of community and health development at the local, national and international levels.
- To share relevant scientific information with local and international communities.

## TABLE OF CONTENTS

<b>Section 1: Director’s Report on WINDREF Activities in 2012</b> (Calum N.L. Macpherson, PhD, DIC).....	1
<b>Section 2: WINDREF Organization</b>	
2.1 WINDREF Research Institute Board of Directors .....	8
2.2 WINDREF St. Vincent and the Grenadines Board of Directors .....	8
2.3 WINDREF Research Institute Scientific Advisory Board .....	8
2.4 WINDREF Research Institute Administration .....	8
2.5 WINDREF (USA).....	8
2.6 WINDREF (UK) .....	8
2.7 WINDREF (UK) Board of Trustees.....	9
2.8 WINDREF (UK) Administration.....	9
2.9 WINDREF Senior Research Fellows .....	9
2.10 WINDREF Research Fellows .....	9
2.11 WINDREF Research Scientists .....	10
<b>Section 3: Institutional Review Board (IRB)</b>	
3.1 IRB Projects Reviewed.....	12
3.2 IRB Executive Committee Members.....	12
3.3 IRB Board Members .....	12
3.4 IRB Board Members appointed in 2012.....	12
<b>Section 4: Institutional Animal Care and Use Committee (IACUC).....</b>	<b>13</b>
<b>Section 5: Current Research Projects</b>	
5.1 Implementing Renewable Energy and Preventing Land Degradation: An Intervention in the Nutmeg Industry in Grenada .....	13
5.2 Needle Stick Injury Prevention Training for Health Care Workers in the Caribbean.....	15
5.3 Summary of Simulation Center Research Activities .....	16
5.4 Caribbean EcoHealth Programme (CEHP) & Atlantis Mobile Laboratory (AML) Report on Teasdale-Corti Global Health Research Partnership Programme .....	18
5.5 Ethical Issues and Challenges in Global Population Health Research Partnerships .....	20
5.6 Investigation of disease in pre-growout fish in a commercial aquaculture operation in Ecuador, and other marine related projects .....	24
5.7 Terrestrial Protected Areas and Biodiversity .....	25
5.8 Sports for Health Program .....	27
5.9 Touch Toes Test Diabetes Awareness Campaign.....	28
5.10 South Sudan Health Assessment Project.....	30
5.11 Soil Transmitted Helminths and <i>Streptococci</i> infections among school going children between the ages of 5- 15 years old in the Parish of St. Andrew’s.....	32

5.12 Genetic Correlates of the Addictive Diseases: Cocaine, Alcohol and Marijuana Addiction - Grenada, W.I.....	36
5.13 Grenada School Nutrition Study .....	38
5.14 Exposure risks and frequencies of drug resistant bacterial indicators in oceanic tropical waters of Grenada .....	38
5.15 Using hypothesis driven research as a part of science curriculum in Genetics .....	41
5.16 Vibrio and Stenotrophomonas in the Caribbean Sea: A Potential Source of Infections in divers and snorkelers.....	44
<b>Section 6: 2012 Research Grants</b>	
6.1 Ongoing Externally funded projects.....	46
6.2 Year 2012 grant submissions .....	47
<b>Section 7: Past, Present, and Future Research Projects</b>	
7.1 Non-communicable Diseases.....	48
7.2 Infectious Diseases .....	49
7.3 Unique Projects .....	51
<b>Section 8: International Conferences Sponsored in Grenada .....</b>	<b>53</b>
<b>Section 9: Abstracts/Presentations at International Conferences/Invited Plenary/Workshops/Roundtables/Professional Meetings/CME.....</b>	<b>54</b>
<b>Section 10: Publications</b>	
10.1 Book.....	60
10.2 Book Chapters .....	60
10.3 Journal Articles.....	61
10.4 Government and NGO Policy Reports, Knowledge Translation, Other ...	67
10.5 Magazine, Newspaper, and Mass Media Reports.....	69
<b>Section 11: Reviewers for Journals and Boards .....</b>	<b>69</b>
<b>Section 12: Thesis Defenses .....</b>	<b>70</b>
<b>Section 13: Graduate Seminars.....</b>	<b>71</b>
<b>Section 14: Contact Information .....</b>	<b>73</b>

## Section 1

### Director's Report on WINDREF Activities in 2012

On behalf of the President of WINDREF, Lord Soulsby of Swaffham Prior and other members of the WINDREF (Grenada \ UK \ USA) Boards of Trustees and Directors we thank our collaborators and donors for making 2012 another highly successful year for WINDREF. The past 12 months has seen a number of events and developments which have witnessed the further expansion of the research and education activities of WINDREF.

One of the most exciting events of the year saw Kirani James win a gold medal in the Olympic Games 400 m in London. This was Grenada's first medal of any colour at an Olympic event and we extend our congratulations to him and his family. As WINDREF's Sports for Health Program Ambassador, we appreciated the value of his victory in increasing the enthusiasm for sports, especially athletics amongst the youth of Grenada.



**Dr. Randall Waechter, WINDREF's new grants coordinator, congratulates Kirani James on his gold medal win at the Olympic Games on behalf of WINDREF**

going forward and hope to cheer him on in future Olympic events!

A number of international scientists and health experts visited WINDREF over the past year. This included Drs. John Flanigan, Somdat Mahabir, and Damali Martin from the National Cancer Institute



**Launch of the Sport for Health Program at WINDREF in 2011**

We continue our work on the Sports for Health Program, and provide an update on the Program's 2012 activities in section 5.8. We wish Kirani all the best



**A number of SGU Faculty, WINDREF Research Fellows, and Grenada Ministry of Health officials meet with representatives from the US National Cancer Institute**

in the USA. A number of St. George's University (SGU) faculty, WINDREF research fellows, and Grenada Ministry of Health representatives met with Drs. Flanigan, Mahabir, and Martin at WINDREF to discuss cancer-related issues in Grenada and the Eastern Caribbean. WINDREF also hosted a number of South Korean scientists from the Korean Maritime Institute who were in Grenada to help develop a National Policy for the Integrated Management of Coastal Zones in partnership with the Government



**Participants in the USDA funded Regional Mite Identification Workshop**



**A number of SGU Faculty and WINDREF Research Fellows meet with representatives from the Korean Maritime Institute**

community outreach, WINDREF, in collaboration with faculty and students from the Department of Public Health and Preventive Medicine (DPHPM) at SGU, initiated a nation-wide "Touch Toes Test", an awareness campaign in Grenada to coincide with World Diabetes Day (November 29th). More information on this successful campaign is reported in section 5.9.

In November, thanks to a grant from Ms. Ellen Ratner, Mr. Trevor Noël and

of Grenada. The group held discussions at WINDREF with faculty from the Schools of Arts and Sciences, Medicine and Veterinary Medicine at SGU, as well as WINDREF researchers, to explore the potential of future collaborative projects.

In August, WINDREF hosted the US Department of Agriculture (USDA) funded Regional Mite Identification Workshop. The participants included trainees from throughout the region, who were presented with certificates by upon completion of the course.

In the area of public health and



**A Participant in the USDA funded Regional Mite Identification Workshop receives a certificate of completion**

myself visited the newly designated country of South Sudan to conduct a preliminary health study of peoples being repatriated back to South Sudan from Sudan. An initial cross-sectional ultrasound prevalence study of abdominal cystic hydatid disease (CHD) was conducted using a portable handheld GE Vscan ultrasound scanner.



**WINDREF Board members Dr. Calum Macpherson, Mr. Trevor Noel, and Ms. Ellen Ratner meet with Government Ministers in Wanjok, South Sudan**

No cases of CHD were seen in more than 250 patients examined. This contrasts with studies carried out in South Sudan in the early 1980's. The earlier study was conducted amongst the pastoral Toposa people whilst this study was conducted in the pastoral Dinka people.

On the granting front, a number of long-running research projects were successfully completed in 2012. This includes Dr. Martin Forde's *Caribbean Eco-Health Programme: Public and Environmental Health Interactions in Food and Water Borne Illnesses*, which



**Dr. Macpherson using the GE Vscan to examine a patient for CHD in Wanjok, South Sudan**

was a four-year \$468,500 CAD grant, as well as Dr. Forde's *Ethical Issues and Challenges in Global Population Health Research Partnerships*, which was a two-year, \$67,700 CAD grant. Finally, Dr. Muge Akpınar-Elci's grant for \$100,000 USD, titled: *Implementing Renewable Energy and Preventing Land Degradation: A Proposal for an Intervention in the Nutmeg Industry in Grenada*, was also successfully completed in 2012.

A new project, led by a recently appointed WINDREF Research Fellow, Dr. Roger Radix, was started in 2012. This research study, titled: *Grenada School Nutrition Study: Evidence to Inform Policy*, is being funded by the International Development Research Council (IDRC) in Canada, in the total amount of \$304,000 CDN over three years. In support of our ongoing



collaborative efforts, this study includes obesity experts Dr. Richard Scribner and Dr. Melinda Sothern, both from Louisiana State University. We thank the IDRC and the Global Environment Facility Small Grants Programme in Barbados and the Eastern Caribbean States for supporting these research projects and look forward to future collaboration with these agencies.

Dr. Charles Modica made a large personal donation to WINDREF at the end of 2012 which will support core activities over the coming years and help WINDREF collaborate more closely with other local and international NGO's and programs.

We also continue to apply for further research funds. In early November, WINDREF and its partners, META Group (Italy), Zernike America Latina (Panama), and Emprede (Dominican Republic) were requested to submit a final application by *infoDev*, a department of the World Bank, in response to a Letter of Intent to set up a Caribbean Climate Innovation Center (CIC) in Grenada. The initiative is designed to mitigate climate change by reducing greenhouse gas emissions through the design, implementation, and distribution of green technologies, renewable energy sources, and energy efficiency projects throughout the Caribbean Region. The proposal would involve the establishment of the Caribbean CIC Center at WINDREF.

One of the factors that attracted *infoDev* to WINDREF was its long history of solid institutional governance and



**Lord Stevens of Kirkwhelpington**

oversight, and we have continued to add strength in this area in 2012.

In 2012 Lord Stevens of Kirkwhelpington and Lord Trees of The Ross joined the WINDREF (UK) Board of Trustees. Lord Stevens, KStJ, QPM, DL, FRSA, was the Commissioner of Police of the Metropolis (head of the Metropolitan Police Service) from 2000 until 2005. He is



**Lord Trees of The Ross and Lord Soulsby of Swaffham Prior**

currently the Chancellor of Northumbria University, and holds an Honours Degree in Law, a Masters Degree in Philosophy, a Doctor of Law, Honorary Degrees of Doctor in Civil Law, Doctor of Letters and a Doctor of Philosophy. Lord Trees, DVM, PhD, was Vice-President of the European Veterinary Parasitology College from 2006 to 2009, President of the Royal College of Veterinary Surgeons from 2009 to 2010, and has been a member of the Executive Committee of the World Association for the Advancement of Veterinary Parasitology since 2011. He is only the second veterinary surgeon to become a member of the House of Lords, after Lord Soulsby. Ms. Ellen Ratner was named to the WINDREF (Grenada \ USA) Board of Directors in 2012. Ms Ratner had a distinguished career in Mental Health and founded the first Homosexual Drug Rehabilitation Unit of its kind. She has

including media coverage, international programs and fundraising.

We have also appointed five new members to the WINDREF Scientific Advisory Board: Dr. Anselm Hennis, MBBS, PhD, FRCP, FACP (University of West Indies, Cave Hill Campus, Barbados); Dr. Oscar Jordan, GCM, MB, ChB, FRCPE, DCH (Diabetician, Barbados); Dr. Neil Poulter, MD, PhD (Professor of Medicine, Imperial College, London); Dr. Melinda Sothern, PhD, CEP (Professor of Research and Director of the Behavioral Health School of Medicine, Louisiana State University); and Baron Peter Piot, CMG, MD, PhD, DIM, FRCP, FMedSci, (Director, London School of Hygiene and Tropical Medicine). These individuals enhance the diversity of scientific knowledge and expertise to our Advisory Board, which will allow us to continue to expand our research areas for the greatest impact on the region.



**Ms. Ellen Ratner**

New Research Fellows also joined WINDREF in 2012 including Dr. Roger Radix, a former Minister of Health of Grenada, who is leading one of our research projects funded by IDRC from 2012 through 2015.

I would like to extend a very warm welcome to all of our new Board Members and thank them, along with our existing Members, for giving their time and world-leading expertise to WINDREF. We wouldn't be nearly as successful without their ongoing support and encouragement.

produced numerous publications and is currently a Fox News reporter, with a special interest in the White House and United Nations. She brings to the board her invaluable experience in many areas

We congratulate WINDREF Research Fellow, Dr Muge Akpinar-Elci, MD, MPH on her 2012 appointment as Head of the DPHPM World Health Organizations collaborating center on Environmental and Occupational Health. This appointment



**Dr. Muge Akpinar-Elci, Head, WHO Collaborating Center on Environmental and Occupational Health**

greatly enhances the DPHPM ability to forge even greater collaborative links in this field and the reputation of SGU \ WINDREF.

On the research dissemination front, WINDREF hosted a number of world-leading experts this past year who gave informative lectures on health and development related topics. Among these was Baron Peter Piot, who gave the 12th annual WINDREF Research Lecture on February 15th, titled: "*Health Care in a Changing World*". Dr. Piot's lecture was well attended by a cross section of the Grenada community, faculty, and students from throughout SGU. We congratulate Dr. Piot on his latest book *No time to lose: A life in pursuit of deadly viruses*, which came out in 2012 and provides a fascinating account of his work on Ebola,



**Baron Peter Piot presenting the 4th Annual KBT Memorial and 12th Annual WINDREF Lecture, February 2012**

HIV and other viruses. It is a must read for those involved in public health.

Dr. Michael Smalley, the former Director General of the African Medical and Research Foundation (AMREF), gave a thought-provoking talk at WINDREF titled: *Development: Whose Problem Is It?*. Dr. Catherine DeAngelis, MD, MPH, (Editor in chief emerita JAMA) visited SGU



**Dr. Michael Smalley who delivered a seminar at WINDREF in 2012**



**Dr. Catherine D. DeAngelis**

in late August to deliver the White Coat Ceremony speech for the incoming School of Medicine students, and gave a talk at WINDREF titled: *“Editing JAMA: Thoughts for Researchers and Authors”*. As the first female editor of JAMA and its Editor-in-Chief for 11 years, her insights into the review process and her tireless efforts to ensure ethical practices, professionalism, integrity, and disclosure of conflicts of interest in medical research were timely and informative.

As we enter our 20th year, the future looks brighter than ever for the Institute and many new initiatives are currently being pursued both within Grenada, the wider Caribbean Region and Internationally — especially in Ecuador, Uganda, South Sudan, Kenya and Botswana. A number of climate change related research and development projects are either under way, about to begin, or have been applied for. We continue to press forward with the hoped for establishment of a World Organization for Animal Health (OIE) reference

laboratory for bee health within the School of Veterinary Medicine at SGU. This initiative will take advantage of the OIE Lab Twinning program to build capacity at SGU for expertise in bee diseases. Through REACH Grenada and its partnership to SGU, WINDREF is looking to continue supporting health and resilience among Grenada’s most vulnerable children and youth. This includes plans for an international conference, to be held in late 2013 or early 2014. A number of WINDREF research fellows are in the process of applying for external grant funding to continue their research and intervention work throughout the region.

We thank all of the donors for supporting the work of WINDREF over the past year and look forward to an even more productive 2013.

*Submitted by  
Calum N. L. Macpherson, Director*



## **Section 2**

### **WINDREF Organization**

#### **2.1 WINDREF Board of Directors**

- Lord Soulsby of Swaffham Prior, MRCVS, DVSM, MA, C.Biol., F.I.Biol., DSc (Hon), (President)
- Calum N.L. Macpherson, PhD, DIC, (Vice President)
- Margaret Lambert, MA, (Secretary/Treasurer)
- Mary Jeanne Kreek, MD, PharmD (Hon), PhD (Hon)
- Karen Lawson, PhD
- Trevor P. Noël, MPH
- Allen Pensick, PhD

#### **2.2 WINDREF St. Vincent and the Grenadines Board of Directors**

- Ed Johnson, MD, Director
- Sir Fredrick Ballantyne, MD, Deputy Director

#### **2.3 WINDREF Research Institute Scientific Advisory Board**

- Sir Frederick Ballantyne, MD
- John R. David, MD
- John J. Ferguson, MBChB, FRCGP
- Malcolm Ferguson-Smith, MBChB, FRCP, FRCPath
- Edmond Fischer, DSc
- Sir Malcolm Macnaughton, MD, LLD, FRCPG, FRAC
- Calum Macpherson, PhD, DIC
- Anselm Hennis, MBBS, PhD, FRCP, FACP

- Oscar Jordan, GCM, MB, ChB, FRCPE, DCH
- Peter Piot, MD, PhD, CMG, FRCP
- Neil Poulter, MD, PhD
- Sir Kenneth Stuart, MD, DSc (Hon)
- Melinda S. Sothern, PhD, CEP
- M.S. Swaminathan, DSc
- John B. Zabriskie, MD

#### **2.4 WINDREF Research Institute Administration**

Ms. Isha English continued as Administrative Assistant, Ms. Meg Conlon as Executive Secretary, and Ms. Naomi Alexander as Secretary. Randall Waechter, PhD, joined WINDREF as Grants Coordinator in 2012.

#### **2.5 WINDREF (USA)**

WINDREF (USA) was established as a 501 (c) 3 non-profit organization to facilitate coordination of the USA activities and to administer charitable donations from the United States. Its goal is to enhance the development of WINDREF's research and educational programs. The offices are located on Long Island in the state of New York and provide administrative and logistical support. Ms. Natasha Duggal joined the team as Administrative Assistant in New York.

#### **2.6 WINDREF (UK)**

WINDREF (UK) was set-up as a charitable trust in Winchester, England in 1999 to promote collaboration between

WINDREF scientists and academic centers of research in the United Kingdom. It is hoped that by reaching out to a larger scientific community, WINDREF will broaden its research opportunities by forming collaborations with scientists from the European community. A Board of Trustees was appointed in 1999 to oversee the activities of WINDREF (UK). A Program Coordinator was appointed to provide the administrative support and expertise that is central to WINDREF's (UK) fundraising, administrative and collaborative activities.

### **2.7 WINDREF (UK) Board of Trustees**

- Lord Soulsby of Swaffham Prior, MRCVS, DVSM, MA, C.Biol., F.I.Biol., DSc (Hon), {Chairman}
- Sir Kenneth Calman, KCB, FRCSE
- Baroness Howells of St. David, OBE
- Lord Stevens of Kirkwhelpington, KStJ, QPM, DL, FRSA,
- Lord Trees of The Ross, DVM, PhD
- Sir Kenneth Stuart, MD, DSc
- Richard Summerfield, MB, BChir
- Neil Poulter, MD
- Mr. Patrick Orr
- Margaret Lambert, MA (Ex Officio)
- Calum Macpherson, PhD, DIC (Ex Officio)

### **2.8 WINDREF (UK) Administration**

Ms. Sallyanne George continued to provide administrative support and expertise that is central to WINDREF'S (UK) fundraising, administrative and collaborative activities.

### **2.9 WINDREF Senior Research Fellows**

- Hugh W. Ferguson, BVM&S, PhD, Dipl. ACVP, MRCVS, FRCP
- Paul Fields, PhD, Brigham Young University
- Paul Garner, MBBS, PhD, Liverpool School of Tropical Medicine
- Mary Glenn, PhD, Humboldt State University
- Duane Gubler, ScD, Hawaii University
- Ruth Milner, MSc, Vancouver Hospital
- Stephen Morse, PhD, Columbia University
- Leslie Ramsammy, PhD, DSC (Hon) Minister of Health, Guyana
- Douglas Slater, MD, MPH, Minister of Health, St. Vincent and the Grenadines
- Stanley Weiss, MD, UMDMJ

### **2.10 WINDREF Research Fellows**

The following investigators have been appointed to WINDREF as Research Fellows:

- Muge Akpinar-Elci, MD, MPH
- John Adamski, MD, MSc, MPH
- Zuri Amuleru-Marshall, PhD
- Glennis Andall, PhD
- Charles Avgeris, MD, MSc
- Grant Burgess, PhD
- Dirk Burkhardt, MD, MSc, PhD
- Reccia Charles, PhD
- Sonia Chehil, MD, FRCPC
- Francis Fakoya, MBBS, PhD
- Martin Forde, DSc
- Orazio Giliberti, MD

- Richard Kabuusu, DVM, MPH
- Victoria Kimotho, MPH
- Svetlana Kotelnikova, PhD
- Matthias Lorenz, PhD
- Marios Loukas, MD, PhD
- Theresa McCann, MPH, PhD
- Barrymore McBarnette, MD
- Craig McCarty, PhD
- Clare Morrall, PhD
- Shamdeo Persaud, MD, MPH
- Roger Radix, MD, MPH, MIB, FRSPH
- Bonnie Rusk, MSc
- Samina Rutrecht, PhD
- Hugh Sealy, Ph.D., P.Eng.
- Shanti Singh, MD, MPH
- Robinson, Karin Schioler, Corey Schwartz, Sarah Scott, Christopher Skaff, David Steinberg, Derrick Tlhoiwe, Sarah Treter, Nghia Truong, James Tsai, Dan Twyan, Frank Van Natta, Ru-Amir Walker, Juliette Williams, David Winokur, Colleen Wunderlich, Elliot Yung.

## 2.11 WINDREF Research Scientists

Sadiq Al-Tamini, Jonathan Ashcroft, Sumita Asthana, Yitzhack Asulin, Bishara Baddour, Jean-Pierre Barakat, Matthew Beeson, Keith Bensen, Matthew Boles, Karen Brennan, William Brown, Matt Browne, Ella Cameron, Nicholas Caputo, Jessica Clayton, Mmakgomo Coangae, Rae Connolly, Abraham El-Sedfy, Daniel Firer, Scott Forman, Brandon Francis, Vamsi Guntur, François Hallé, Anthony Junck, Megan Kaminskyj, Sebastian Kreitzschitz, Erik Lacy, Ede Langevine, Richard Lehman, Setshidi Makwinja, Paul Mancuso, Baher Maximos, John McCormack, David Melamed, Kirk Minkus, Jerry Mitchell, Jessica Morlok, Kevin Neill, Bayela Nfila, Yolanda Ng, Michael Nillas, Steve Nimrod, Andre Panagos, Rakesh Patel, Barry Politi, Sandeep Pulim, Sean Ramsammy, Justin Rebo, Alan Rhoades, Laura

### **Section 3**

## **Institutional Review Board Report**

The St. George's University (SGU) Institutional Review Board (IRB) exists to assure that all human research proposed under the auspices of SGU or referred for review is conducted according to the highest ethical standards. SGU's IRB is registered with the Office of Human Research Protections (OHRP) in the U.S. Department of Health and Human Services. IRB review and approval is a prerequisite to obtaining academic or scientific grants from most agencies, and for publication in most journals. It is also often required for presentation of research findings at conferences.

SGU IRB members include health professionals, physicians, scientists, attorneys, clergy, and community representatives across a range of gender, ages, and cultures. At least half are Grenadian citizens and others are long time residents of Grenada. The SGU IRB has an Executive Committee comprised of its officers. The IRB meets four times a year, usually the 3rd Friday of February, April, October and November. The deadline for the receipt of proposals to be reviewed is two weeks before the meeting. Proposals that meet the criteria for Expedited Review can be submitted at any time and are reviewed within two weeks by the Executive Committee.

The IRB makes an independent determination about whether to approve or disapprove a protocol. Determinations are based upon whether or not human subjects are adequately protected from possible harms including violations of privacy and confidentiality.

Some research that involves human

subjects may be exempt from the regulations requiring IRB review. Examples include educational testing and surveys that use no identifying information to link subjects to the data, and through which disclosure of data would not reasonably place the subjects at risk of civil or criminal liability, or be otherwise damaging to the subject. Also considered for exemption is research that involves the use of existing data, documents, or specimens, where there is no identifying information about participants.

Many institutions' IRB policies stipulate that even research that may be exempt from review is to be examined by the IRB prior to classifying it as exempt. The SGU IRB has adopted this policy with the view of preventing the overload of the small pool of research participants available in Grenada, and assuring there is administrative knowledge of research taking place within SGU or Grenada before the work is conducted and findings are disseminated.

The IRB requires that a printed certificate of completion of the on-line training course "Protecting Human Research Participants" is provided to the IRB by all investigators at the time of submission of a research proposal to the IRB. The certification is valid for two years. There is no charge for the course, which is accessible at: <http://phrp.nihtraining.com/users/login.php>.

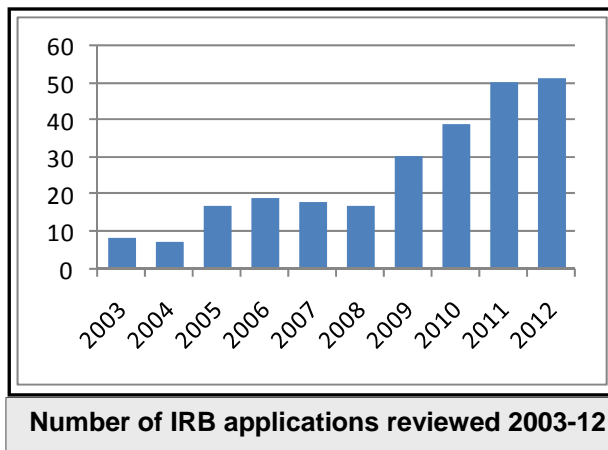
After approval by the SGU IRB, protocols that involve staff, resources or facilities at Grenada's Ministries of Health, Agriculture, Forestry and Fisheries, or Education are reviewed by the Research Oversight Committee (ROC). The ROC determines whether to allow clearance for the project to



proceed. Its members include the Chief Medical, Veterinary, and/or Education Officer, the respective Permanent Secretary, and from SGU, the University Provost, the Director of Research, and the IRB and/or IACUC Chair.

### 3.1 IRB Projects Reviewed

A total of 51 projects were submitted to the IRB in 2012, more than any other year, reflecting the continuous growth of research at SGU. Five research projects were received for review from institutions other than SGU for research projects to be conducted in Grenada. Of the projects reviewed by the IRB in 2012, 40 projects were approved by expedited review, and three formally exempted. The balance of the projects submitted were either still pending at the end of the year or incomplete submissions.



### 3.2 IRB Executive Committee Members:

- Dr. Robert Hage (Chair), Anatomical Sciences Department
- Dr. Cheryl Cox Macpherson (Vice Chair) Bioethics Department

- Dr. Jennifer Durst (Secretary), Counseling & Psychological Services
- Dr. Theresa McCann (Past Chair), Behavioural Sciences Department
- Sir Paul Scoon, Governor-General of Grenada 1978-1992
- Dr. Calum Macpherson (Ex Officio), Director of Research at SGU
- Ms. Meg Conlon, IRB Administrator, Office of Research, retiring 28 February 2013
- Mr. Kareem Coomansingh, IRB Administrator, starting 1 January 2013

### 3.3 IRB Board Members:

- Mr. Terry Charles, Director, Grenada Red Cross Society
- Mr. Winston Duncan, Director, Grenada Family Planning Association
- Mr. Basil Harford, Retired Civil Servant
- Rev. Raphael Osbert James, Presbyterian Church
- Mr. Alban John, Barrister-at-Law
- Dr. Brenda Kirkby, Behavioural Sciences Department
- Dr. Rohini Roopnarine, School of Veterinary Medicine

### 3.4 IRB Board Members Appointed in 2012:

- Dr. Muge Akpınar-Elci, Department of Public Health and Preventive Medicine
- Ms. Kathy-Ann John-Sylvester, Assistant registrar, Office of Enrolment Planning
- Mr. James Robinson, Assistant Dean of Students

*Submitted by Meg Conlon  
IRB Administrator, Office of Research*

## Section 4

### Institutional Animal Care and Use Committee (IACUC)

Federal regulations require that each institution has an Animal Care and Use Program to ensure that all animal welfare laws, regulations and policies are implemented and consistently followed at the institution. The Institutional Animal Care and Use Committee (IACUC) therefore oversees SGU's animal care and use programs, facilities and procedures and ensures the appropriate care, use, and humane treatment of animals being used for research, testing and education.

The IACUC is also responsible for establishing guidelines and procedures for animal use and reviewing all animal use protocols, ensuring compliance with federal regulations, inspecting animal facilities and laboratories and overseeing training and educational programs. During the year 2012, seventeen animal use protocols were submitted for IACUC review. Nine of the submitted applications were for research, five were for teaching, and three were for wet labs. Of the seventeen applications submitted, thirteen were approved, two were withdrawn, and two are pending revisions. The IACUC also serves as a resource to faculty, investigators, technicians, students, staff, and members of the community by providing guidance in planning and conducting all animal use procedures in accordance with the highest scientific, humane, and ethical principles.

## Section 5

### Current Research Projects

#### 5.1 Implementing Renewable Energy and Preventing Land Degradation: An Intervention in the Nutmeg Industry in Grenada

The World Health Organization (WHO) Collaborating Centre on Environmental and Occupational Health in the Department of Public Health and Preventive Medicine (DPHPM) at St. George's University (SGU) has partnered with the nutmeg industry in Grenada to evaluate the occupational health problems and help to improve health the of nutmeg production workers. The nutmeg industry is a major contributor to Grenada's economy, recently ranking as the world's second largest producer. Unfortunately in 2004, Hurricane Ivan destroyed 90% of the nutmeg trees. After Ivan, the industry suffered greatly, and has been making a slow return over the last eight years. This project focuses on activities including Occupational Health



Participating farmer with healthy nutmeg plants

and Safety (OHS) for nutmeg workers, and assessment of nutmeg replanting efforts to address land degradation. The project is funded by Global Environmental Facilities (GEF) and supported by the Centers for Diseases Control and Prevention (CDC) and the National Institutes for Occupational Safety and Health (NIOSH) in the US.



**Drs. Muge Akpinar-Elci and Satesh Bidaisee with Grenada nutmeg farmers.**

Health and exposure assessments conducted as part of the study showed that occupational health problems, especially respiratory and musculoskeletal problems, were remarkably high among nutmeg processing workers. The plant used the traditional methods for processing nutmegs, which limits the economic benefits and increases occupational risks for workers. After the assessment, we installed a solar dehydrator for the nutmeg processing plant, which served to increase the productivity and reduce occupational exposures such as mould, dust, and pesticides. The OHS train the trainer program was also tailored for the nutmeg industry. Four workers from two nutmeg processing plants and one from the Grenada Cooperative Nutmeg

Association participated the training. The training consisted of several classroom sessions and a practical session at the nutmeg plant. All five trainees successfully completed the training. Three months after the initial training, one of the trainees served as a trainer and conducted the first OHS training to nutmeg workers at one of the plants. A total of 53 workers participated in the training. At the pre-training evaluation, 43% of workers associated OHS with hazards in the environment such as dust and noise and 21% reported OHS as taking precautions. Thirty-six percent (36%) of the workers were unable to describe OHS. At the post-training evaluation, 83% of workers reported that OHS was related to protecting workers from hazards in the environment.

One of the project goals was to address land degradation that has been linked with Hurricane Ivan's destruction of the nutmeg trees and farming areas. This intervention program for the Grenada Nutmeg industry involved the planting of over 1700 nutmeg trees on around 40 acres identified as vulnerable to land degradation. Farmers benefit from assistance with land preparation provision of nutmeg trees, as well as a stipend to plant and support each tree. As such, the project has supported the rebound of the nutmeg industry in Grenada.

*Submitted by Muge Akpinar-Elci,  
MD, MPH  
WHO Collaborating Centre on  
Environmental and Occupational Health*

## 5.2 Needle Stick Injury Prevention Training for Health Care Workers in the Caribbean

In Latin America and the Caribbean, the health care labour force is comprised of approximately 22 million workers (PAHO, 2007). The repercussions of work-related injuries and diseases among health care workers have an impact on patient safety, quality of care, and communities at large. Sharps injuries are the most common cause of occupational exposure to blood and the main cause of infection by blood-borne pathogens such as hepatitis. It is estimated that about 90% of occupational exposures occur in developing countries, causing severe illness and death (PAHO, 2007). In 2011, the World Health Organization (WHO) Collaborating Centre in the Department of Public Health and Preventive Medicine (DPHPM) at St. George's University (SGU), Grenada started collaborating with Pan American Health Organization (PAHO) Caribbean Program Coordinator at Barbados, the Centers for Disease Control and Prevention (CDC), and National Institutes for Occupational Safety and Health (NIOSH) to disseminate occupational health training activities for health care workers, with a focus on prevention of exposure to blood borne pathogens. At the first regional workshop 35 participants from nine different Caribbean countries were trained as trainers. Following this workshop, a two-day workshop curriculum was developed with the aim of disseminating the training throughout the Caribbean region.



**DPHPM/SGU team of Needle stick injury prevention training programs. (Left to right) Drs. Roger Radix, Satesh Bidaisee, Muge Akpinar-Elci, Praveen Durgampudi, Omur Cinar Elci**

With the support from PAHO in 2012, the WHO Collaborating Centre in the DPHPM continued to conduct regional training programs in the four Caribbean countries of Suriname, Trinidad and Tobago, St. Lucia and Grenada. Each workshop included an understanding of hazards and risks in the healthcare environment, review of policies and safety practices, demonstration of safety devices, workplace assessments, worksite assessments, and recommendations for reducing risks and hazards. Currently, more than 150 healthcare workers have been trained, five regional healthcare centers have been evaluated and recommendations made for improving safety practices, and safety policies. Additionally, health and safety committees have been established in these healthcare institutions to support the that an average of 51 (42.1%) workers surveyed in four countries reported sustaining injuries. Data from injection safety surveys conducted by WHO and others show, on average, four Needle Stick Injuries per worker per year in the African, Eastern Mediterranean, and Asian populations (Mantel). Additionally,

there was a gap between sustaining injuries and reporting injuries as among the 51 workers who sustained injuries, only 38 (74.5%) reported them. Of those who did report the injury, 37 (97.4%) received treatment. The regional training also contributed to the establishment of a network of health and safety committees as well as an increased awareness and review of policies to meet international standards of practice.

*Submitted by Muge Akpinar-Elci,  
MD, MPH  
WHO Collaborating Centre on  
Environmental and Occupational Health*

### **5.3 Summary of Simulation Center Research Activities**

Simulation has become an essential component of medical education. Having a Simulation Center with dedicated Sim Lab in Grenada for four years has brought state-of-the-art, hands-on practice to every student in the first years of health care provider training (approximately 1,500 students per term). The Sim Lab has proven to be an outstanding venue for students to gain hands-on training that improves confidence in basic sciences academic knowledge and integration with skills in clinical practice.

Robust development of a simulation research program has paralleled integration of simulation in education. Simulation Center faculty have initiated, designed and conducted research studies. Other projects are done in collaboration with faculty from various departments to assess or evaluate teaching modalities that use simulation. Most research involves interactive simulation for pre-clinical students, but we also collaborate with clinical educators as

part of the overall University's effort to vertically integrate clinical education within basic sciences.

We are fortunate to have large groups of students in academic courses, regular cardiopulmonary resuscitation (CPR) sessions, as well as advanced elective courses that provide participants for ethical and objective educational research. Manikin response is standardized and controlled within the simulation setting which provides ideal opportunities to assess student learning and measure changes in attributes important to patient care such as provider interactions, attitudes and attention to safety.

Research is ongoing within the Simulation Center, and is woven around our mission to support educational curriculum at SGU. For example, a randomized trial is underway comparing retention of American Heart Association Basic Life Support (BLS) Cardiopulmonary Resuscitation (CPR) written knowledge and practical skill retention in pre-clinical undergraduate medical students. All simulation-based selectives use standardized protocols and



**Student group with Laerdal manikin in Sim  
Lab, T5 ICM course  
(Photo courtesy of Josh Yetman)**

assessment sheets to enhance course objectives and research.

In a recent study we worked closely with faculty from the Department of Clinical Skills to explore the use of simulation in a standard clinical setting to determine the feasibility of scheduling simulation sessions with large numbers of students; the degree of competence students achieved in clinical tasks; and comfort in a simulation learning environment. We collaboratively developed a menu of heart and lung sounds for auditory identification by students using SAM II Auscultation Manikins and modified clinical scenarios from published Laerdal simulation cases, providing a standardized opportunity for students to assess three acutely ill patients in hospital beds, simulated with full body Laerdal manikins. We also trained short-term clinical teaching fellows to facilitate each simulated bedside encounter using an appropriate simulation teaching style of case presentation and targeted feedback. All facilitators rehearsed the three different clinical scenarios to become familiar with this style of teaching that builds repetition and practice into each simulation session.



**SGU medical students in SCSK 519  
Cardiopulmonary Life Support Selective  
(Photo courtesy of Josh Yetman)**

During a single term, a total of 509 students rotated through the simulation lab in place of one of the 10 mandatory clinical visits scheduled within Introduction to Clinical Medicine. Students enthusiastically practiced patient interaction and auscultation skills as they described findings and developed differential diagnoses. Each group encounter concluded with a focused debriefing session. Students were directly involved in the simulation exercise, performing tasks independently and as part of a team. As shown in table 1, the Sim Lab sessions aided learning and met

the objectives of our study. We were able to show that a simulated clinical environment could provide a personalized and meaningful experience for large class sizes. More importantly, we demonstrated that simulation sessions were feasible within the basic sciences

**Table 1. Outcome measurements between student groups at pre- and post-testing in SGU Simulation Laboratory Dept. of Clinical Skills ICM sessions, Spring 2011.**

Characteristic	Mean (SD)	95% CI	Paired t-test p-value
Correct sounds identified, overall score out of 7 (n=496)			
Pre-test	2.6 (1.6)		
Post-test	4.9 (1.6)		
difference		2.2 to 2.5	< 0.0001
Comfort in recognizing cardiac sounds (n=424)			
Pre-test	2.0 (0.8)		
Post-test	3.2 (0.8)		
difference		1.1 to 1.2	< 0.0001
Comfort in recognizing lung sounds (n=422)			
Pre-test	2.2 (0.8)		
Post-test	3.3 (0.9)		
difference		1.1 to 1.2	< 0.0001

curriculum to enhance students' learning and practice of basic skills needed for translation to clinical rotations.

*Submitted by  
Theresa McCann, PhD, MPH*

#### **5.4 Caribbean EcoHealth Programme (CEHP) & Atlantis Mobile Laboratory (AML) Report on Teasdale-Corti Global Health Research Partnership Programme**

The CEHP and AML project came to an end in 2012. As part of the original grant agreement, an independent evaluation was conducted on the CEHP project, a summary of which is included below.

##### **CEHP External Review Introduction**

This report is a compilation of the findings of an independent evaluation carried out at the end of the project referred to as the Caribbean EcoHealth Programme: Public and Environmental Health Interactions in Food and Water-borne Illnesses. The project is part of the Teasdale-Corti Global Health Research Partnership Programme aimed at improving and strengthening health systems in Low and Middle Income Countries, such as the Caribbean Countries.

The initial proposal for the Caribbean EcoHealth Programme (CEHP) highlights the urgent need for building research capacity and capability, knowledge translation and technology transfer among public and environmental health professionals within the Caribbean

Community (CARICOM) region. The CEHP is a demand-driven research programme developed to address that need and focuses its efforts on the CARICOM region which is comprised primarily of Small Island Developing States (SIDS), some of the most vulnerable countries in the world.

The overall objective of the CEHP was to build a sustainable research environment, through a Canadian-Caribbean (North-South) partnership among key stakeholders, to improve the capacity and capability of public and environmental health professionals in the Caribbean CARICOM community, to respond in integrative and innovative ways to on-going and emerging epidemiological and environmental health challenges, by means of multi-sectoral interventions.

##### **Major Findings: Programme design**

The CEHP was designed around the EcoHealth approach which relies on the premise that human health is inextricably linked to the environment in which people live and that improvements in both can therefore be simultaneously achieved. The innovative concept seeks to:

- 1) Enhance the abilities of researchers in the South to address health development needs.
- 2) Promote and disseminate EcoHealth research methods of early and active stakeholder involvement, the use of multi and trans-disciplinary research teams, and gender awareness.
- 3) Improve human health outcomes in

developing countries.

In keeping with the EcoHealth concept, the CEHP was designed and implemented by Canadian and Caribbean researchers with the involvement of a large number of international, regional and national stakeholders. The selected activities comprising the project therefore had both national and international significance and relevance. All seven major research activities were designed around the three components of research, capacity building and knowledge translation.

The CEHP benefited from excellent planning and implementation. Project management done by a dedicated project manager working closely with assigned lead and support researchers was reasonably proactive and responsive, lending some flexibility to the implementation process. There is evidence of risk assessment and mitigation.

The activities were well designed and implemented in 12 Caribbean countries in iterative sequences rather than in parallel processes, which allowed constant improvements based on lessons learned and experience.

The project was funded by a Teasdale-Corti Grant of Can \$1.6 million, however the CEHP received several co-funding lines of support, as well as much in-kind support from all collaborating institutions. Delays in the disbursement of funds proved to be one of several challenges to the timely implementation of the programme.

Main achievements and outputs

The project outputs, both tangible and intangible were met and exceeded expectations, as set out in the initial proposal, in both scope and quantity. Hence the project ranks very highly in that regard.

- Research was to a large extent demand driven, identified and collaboratively researched by key stakeholders. Studies were therefore of particular interest to participants and in many cases of immediate use. Examples are the Rain Water Harvesting (RWH) study, the Recreational Water Quality (RWQ) study, and the Evaluation of Mercury studies.
- Results of the major thematic studies were compiled into thorough reports and presentations.
- Results were disseminated at the local, national and international levels through a variety of means including regional and international conferences, press interviews, specially planned dissemination workshops and peer review journals.
- The CEHP contributed to inform policy and local decision making through recommendations were made for policy changes at the CARICOM and national levels.
- The CEHP provided a wealth of information about EcoHealth which is verifiable by major tangible outputs which include: increased capacity of health institutions and laboratories, a pool of highly qualified personnel that can undertake EcoHealth research activities in the region.



- The programme has had notable success in linking ecology and human health issues through training workshops and courses such as the Oceans and Human Health course held in Barbados and attended by persons from the majority of the Caribbean islands, Mexico and the Virgin Islands. The exposure benefited fisheries scientists, eco-toxicologists, microbiologists, engineers, environmental scientists and public health professionals.
- The program was successful in creating multi-disciplinary teams between key Caribbean and Canadian institutions to investigate priority health problems and design effective multi-sectoral interventions. The associations are expected to outlast the programme itself. The programme has successfully met the EcoHealth criteria for North-South co-operation.
- There is much evidence that the interventions generated by the activities of the CEHP have already contributed to policy and decision making.
- The CEHP contributed to institutional strengthening through its capacity building efforts and generation of new knowledge to fill in some of the existing knowledge gaps.
- From the above the objectives of research, capacity building and knowledge translation were, to a large extent, successfully attained.

*Submitted by  
Martin St. Clair Forde, ScD, P. Eng,*

## **5.5 Ethical Issues and Challenges in Global Population Health Research Partnerships**

In 2010, Dr. Martin Forde (SGU Department of Public Health & Preventive Medicine) and his co-PIs – Dr. Sandra Tomsons (University of Winnipeg), Dr. Karen Morrison (Guelph University), and Dr. Angela Gomez (Research Consultant, Translocal.org) – were successful in obtaining a \$70,000 grant from the Canadian International Development Research Centre (IDRC) to conduct research looking at the ethical challenges facing researchers engaged in North-South research collaborations. This research was started in October 2010 with applications for ethics approval being sought and obtained from SGU's Institutional Review Board and the ethics' boards from the University of Winnipeg and the Guelph University.

Although a substantial body of literature exists that details how to address ethical issues and provide ethical oversight for classical research study designs, there currently is very little guidance available to researchers on how to deal with the unique and novel challenges that arise when conducting research that goes outside of these well-defined boundaries. Global population health research conducted by researchers from North (developed) and South (developing) countries is one such example.

North-South global population health research projects are typically characterized by North-South research teams, multi-agency involvement, and participants that are often drawn from vulnerable populations. Added to this

complexity is the possibility of different moral principles and values or possible different interpretations of the same principles and values on the part of researchers working on North-South teams. These possible different interpretations may also extend to the Southern participants or collaborators.

The fundamental goal of this research project was to determine the nature and sources of the ethical issues and challenges that arise in North-South global population health research (GPHR) initiatives. The focus has been on three key areas where ethical issues as experienced by North-South (N-S) GPHR researchers in their network of relationships have arisen: (i) GPHR researchers relationships with one another, (ii) GPHR researchers relationships with funding agencies, and (iii) GPHR researchers relationships with multiple research ethics review boards, both from the North and the South.

At the outset of this project, the initial objectives were to (1) Identify and characterize the issues and challenges faced by global population health researchers (GPHR); and (2) Generate a set of appropriate guidelines and recommendations for both GPHR researchers and members of research ethics boards (REBs) that would facilitate the prevention and resolution of these issues.

In order to better understand the causes of the ethical issues and challenges faced by North-South GPHR research teams, two reviews were initially taken: (1) Review of the set of ethics models and moral principles currently used to provide the basis for research ethics, and (2) Review of Northern and Southern understandings of moral obligations. Coming out of each of these reviews were the following two

hypotheses: **Hypothesis #1:** The standard bioethics model generating the moral principles that anchors and justifies the North's ethical guidelines is not an appropriate model for North-South population health research. Therefore, the moral principles generated by the bioethics model cannot by themselves provide an adequate set of ethics guidelines for North-South population health research. **Hypothesis #2:** The moral values of the North and South can be a source of ethical disagreement when the North's moral values are understood narrowly as the four bioethics derived moral principles which are the basis for the North's research ethics guidelines. When a richer understanding of the fundamental moral values of the North is incorporated into the discussion of the ethical issues, the moral values of the North can be reconciled and ethical issues resolved.

The following 'premises' provide the foundation upon which *Hypothesis #1* was constructed and ongoing support for it:

- The account of N-S research teams' experiences of ethical conflicts in the initial call for proposals and the corroboration of this account by the study's two global health research team members.
- The current dominant bioethics model which is used to provide guidance on the nature of ethical research and is used as the basis for most discussion of ethical research practice is firmly embedded in Western (Northern) metaphysics and axiology. Hence, N-philosophy (worldview) is by default presumed to provide the appropriate context and content for discussion of all types of research practice.
- The N-S bioethics paradigm that is embodied in N-country ethics policy statements and implemented in the

processes and procedures of Northern ethics boards does not allow or cater for notions such as social justice and community autonomy in discussions of ethical research practice since these notions are absent from and inconsistent with parts of its normative framework. Hence, it is reasonable to anticipate that the literature's discussion of ethical research generally and N-S collaborations in particular, would make invisible or marginalizes S-philosophies.

- Early in the literature review, it became obvious that S-philosophies (worldviews) were either absent from the literature (invisible) or marginalized by being mislabelled as cultural differences.
- If any significant axiological differences in N-S understanding of moral principles and values were discovered, it would be reasonable to conclude that the N-country's imposition of their dominant research ethics paradigm is an unintentional component of N's contemporary (unintended and generally unperceived by N-researchers) colonization project. In the literature, this contemporary form of the N's ongoing colonization project, which constitutes a new form of oppression, is called 'scientific colonization.'
- If the N-assumption that the N-model is '*the* model', an assumption frequently shared by S-researchers educated in the N, then the possibility for a philosophical dialogue in which S & N work out together the appropriate content for a research ethics paradigm for N-S collaboration is shut down.
- Given the extensive philosophical literature analysing competing moral theories in the Western philosophical tradition and explanations and attempts to resolve the disagreements and dilemmas generated by conflicts between their competing values, the matter of fact presentation of the fundamental moral values and principles in N-policy statements such as Canada's Tri-Council policy is as puzzling as it is misleading. However, arguably it takes a new context for reflecting upon research practice, such as N-S research collaborations, to discover the assumptions, strengths and weaknesses of the dominant paradigm.
- In the context of N-S collaborations our data showed N-S researchers were sufficiently accepting of the dominant paradigms fundamental moral values and principles to claim them as their values; nonetheless, they frequently maintained that N-guidelines that N-EBs created to implement these values were too restrictive and/or inflexible to successfully implement the fundamental values in the context of S-countries. In some S-contexts, N-practices are morally unacceptable and the dominant paradigm's fundamental values support S-consent practices.
- The theoretical and normative framework of the dominant biomedical paradigm does not contain all Western philosophy's moral theories nor utilize all aspects of Western philosophy's normative framework.

The following 'premises' explain the foundation upon which *Hypothesis #2* was constructed and ongoing support for it:

Based on the findings garnered from all of the research instruments used in this study, the following recommendations have been made.

A) Recommendations for Improving the Research Team – Ethics Board (EB) Relationship:

1. Ethics training should be given to all researchers and EB members that works to transform the all too common researchers' perception of the ethics review process as an exercise in authoritarian paternalism into one that views this necessary activity as part of an ongoing process which supports them in their efforts to engage in ethical research practice.
2. Research ethics training should support and foster a trusting mutual-respect relationship between researchers and EBs.
3. The ethics review process should be refocused and repositioned such that researchers and EBs both understand this process' mission as being geared to help train and support good researchers rather than one whose prime mission is to catch bad researchers.
4. Peer review and ethics review should be separate processes with peer review being completed prior to initiating an ethics review.
5. Research ethics training should clearly distinguish moral rules from legal rules and disentangle the blurring of this distinction in policy statements and EB requirements.
6. Research ethics training for N-S researchers, funders, and EB members assessing N-S research collaborations should be regarded as necessary tools for research practice and formalized in the manner of discipline training and the other research skills.
7. A N-S team approach to research ethics training for N-S researchers and

EB members reviewing N-S protocols is recommended.

8. Funding agencies and universities should financially support their EBs so that they have access, as necessary, to the ethical expertise they need.
9. It is recommended that N-funding agencies and N-S EBs work together with N-S researchers to build relationships of mutual respect.
10. It is recommended that N-S agencies creating ethics policy statements be active participants in the creation of the new paradigm for N-S research ethics.
11. It is recommended that the ability of N-EBs to override S-EB requirements be halted.
12. It is recommended that funders of N-S research collaborations support S-researchers in the explaining of S-moral theory(ies) and S-moral values and their application in N-S research ethics.

B) Recommendations for Improving N-S Research Team – Funder Relationship:

1. It is recommended that funders support research that will contribute to the moral foundations for N-S research collaboration being recognized as belonging to the new paradigm for N-S research. Further, funders should support research that will contribute to the development of this new paradigm.
2. Funders should be included in the N-S ethical research training that is being recommended for researchers and EB members.

C) Recommendations for Researchers:

1. Researchers should be involved in all

- aspects of revising N-S research ethics policies
2. Researchers should become engaged in, and promote, inter- and trans-disciplinary research
  3. N-S research teams should reflect on what 'team' means in the context of their global population health research partnership.
  4. N-S researchers should be more forthcoming about the benefits of this research to the N and the S.
  7. Ethics research training should be focused on the notion of moral agency rather than on following rules.
  8. N-S research ethics training should promote epistemic humility.
  9. A revised account of ethics review that is consistent with a holistic understanding of ethical research practice should be undertaken.
  10. N-S research ethics training should include N-S research teams' obligations to communities.

*Submitted by*

*Martin St. Clair Forde, ScD, P. Eng*

D) Final Recommendations:

1. N-S researchers and N-funders should work collaboratively with both N and S research ethics policy-making agencies to redesign ethics review process for N-S research collaborations.
2. N-S philosophers specializing in practical ethics and politics should be invited to be part of research ethics research and training.
3. N-governments, N-research policy makers, N-funders and N-universities should assume the collective responsibility for hosting and conducting International Research Ethics Workshops.
4. N-S EBs should revise their aims and review processes for N-S protocol review.
5. There should be on-going relationship-building meetings and dialogue between N-S research teams the N-S EBs.
6. Discussions of research ethics should acknowledge that most Universities concern about research ethics is an anomaly and thus recommend that they engage in the philosophical discussion with researchers and EBs that is required in order to morally rectify this anomaly.

### **5.6 Investigation of disease in pre-growout fish in a commercial aquaculture operation in Ecuador, and other marine related projects**

We are continuing to work on a disease of the liver and gastro-intestinal tract of farmed tilapia in Ecuador that leads to massive mortality. Dr Richard Kabuusu and I are coming to the conclusion that this is most probably an infectious disease, likely viral, based largely on the histopathological and ultrastructural changes to the liver, where



**Produmar, S.A. Fish Farm, Ecuador**

we see syncytial giant cells. Dr Jorge del Pozo of the Royal (Dick) Veterinary School, Edinburgh University has been examining some of the material collected for transmission electron microscopy and has noted moderate numbers of virus-like particles within the cytoplasm of affected cells. To help move us forward, we have recently signed a collaboration agreement with Dr Ian Lipkin, Columbia University. Dr Lipkin's group is widely regarded as the foremost viral discovery team worldwide, and his input into the project is considered a valuable and significant move.

*Submitted by  
Hugh W. Ferguson, BVM&S, PhD,  
DipACVP, MRCVS, FRCPath*

### **5.7 Terrestrial Protected Areas and Biodiversity**

Dr. Bonnie Rusk, Founding Director of the Grenada Dove Conservation Programme and a Research Fellow with WINDREF, has been involved in numerous projects related to biodiversity and terrestrial protected areas during 2012. Since 1991, Dr. Rusk and the Grenada Dove Conservation Programme continue to collaborate closely with the Forestry and National Parks Department, (Ministry of Agriculture, Forestry and Fisheries Grenada). The organization supports the Forestry and National Parks Department in meeting its commitments under the UN Convention of Biological Diversity, Multilateral Environmental Agreements, and supports and assists with the implementation of its policies and programmes related to protected areas,

biodiversity and endangered species.

In August 2011, the Government of Grenada's Cabinet approved the protection of the last parcel of Crown land identified as habitat of the Grenada Dove, and added it to the Perseverance Protected Area. Its legal designation is awaiting Parliamentary approval.

In December 2012 the Grenada Dove Conservation Programme received a grant from the Critical Ecosystem Partnership Fund (CEPF) to work with the Forestry and National Parks Department to further strengthen the protection of two of its internationally listed Key Biodiversity Areas (KBAs). These KBAs, also BirdLife international's Important Bird Areas, have been identified from Dr. Rusk's extensive work identifying key habitat of the Critically Endangered Grenada Dove (*Leptotila wellsi*). The 1.5 year project is entitled "*Strengthening the Legal Protection of the Mt Hartman National Park KBA and the Beausejour/Grenville Vale KBA in Grenada*". For this project, The Grenada Dove Conservation Programme will be collaborating with the Caribbean Birding Trail, Society for the Study and Conservation of Caribbean Birds, Dr. Easter-Pilcher (SGU School of Arts and Sciences), BirdLife International and other local and international organizations.

CEPF is a joint program of Conservation International, the European Union, the Global Environment Facility, l'Agence Française de Développement, the Government of Japan, the MacArthur Foundation and the World Bank, that provides grants for

private sector organizations to help protect biodiversity hotspots—Earth’s most biologically rich yet threatened areas. The Project will extend through April 2014.

Also in 2012, Dr. Rusk is continued data collection for the research study titled “*Breeding study of the endangered endemic Grenada Dove: Data to inform species management decisions*”. This project is funded by the Mohammed Bin Zayed Species Conservation Fund. Data collection began in 2010 and, with assistance from the Forestry and National Parks Department staff, is continuing through the 2013 breeding season.



**Dr. Rusk and Mr. Plenty baiting traps in the Mt. Hartman Grenada Dove Protected Area**

The Grenada Dove Conservation Programme, in collaboration with the Forestry and National Parks Department, received a grant from BirdLife International and the “Save our Species” Programme to carry out a legislative review of Grenada’s laws pertaining to private lands identified for formal protection in Grenada’s 2010 System

Plan for Parks and Protected Areas. A significant portion of lands identified for formal protection in the 2010 System Plan is privately owned, as is most of the remaining critical habitat of the Grenada Dove. “Save our Species” is a global coalition funded by IUCN, Global Environment Facility (GEF) and the World Bank.

A number of collaborative efforts continued in 2012. This included the supervision of an M.Sc. Applied Ecology and Conservation candidate, Nicholas Bolton, came from the University of East Anglia, Norwich, United Kingdom, to Grenada to carry out a study titled: “Predator Monitoring at Mt. Hartman National Park – Baseline data to support predator control and other limiting factors for the Grenada Dove”. Working with Dr. Rusk and the Forestry and National Parks Department, this study will help support the development of a mongoose control programme at and surrounding Grenada Dove habitat. Along with habitat loss, predation by mongoose is a primary factor affecting the Grenada Dove population. Furthermore, the Grenada Dove Conservation Programme is collaborating with Craig Berg from the Milwaukee County Zoological Gardens and Ms. Billie Harrison from the Racine Zoological Gardens in the development of outreach materials on Grenada’s endangered species. Finally, the Grenada Dove Conservation Programme continues collaboration with the Scout Association of Grenada to carry out outreach and education activities related to

conservation for Grenada's school children.

In the area of public service, Dr. Rusk served as a member of the committee with the Ministry of Finance, Ministry of the Environment and other government and non-governmental stakeholders to develop the Project Information Form (PIF) for the Government's GEF-5 National funding allocation related to biodiversity. Further, at the request of the Fisheries Department Marine Protected Area Coordinator, Rusk wrote and obtained a grant from the National Fish and Wildlife Federation for the project "*Strengthening Grenada's Marine Protected Area Enforcement Capacity*". The grant was written for and will be implemented by the Fisheries Division and Grenada Fund for Conservation. Lastly, Dr. Rusk continues to participate as a member of the National Implementation Support Partnership (NISP) Committee, established to support implementation of the Programme of Works for Protected Areas under the Convention on Biological Diversity.

*Submitted by  
Bonnie L. Rusk, PhD*

## 5.8 Sports for Health Program

In the wake of Kirani James' Olympic gold medal win in the 400 m in London in 2012, this past year was a significant one for the Sports for Health program in Grenada. As the Sports for Health Program Ambassador, Kirani's win—which marked the first Olympic medal for Grenada—was very exciting for

the entire country. In the wake of this achievement, WINDREF continued to develop the Sports for Health program in partnership with the Royal Grenada Police Force (RGPH) and the Department of Public Health and Preventive Medicine at St. George's University.



**Dr. Satesh Bidaisee observes participants in the Sports for Health Program**

A longitudinal study of 350 participants in the community fitness clubs located in Point Saline, La Sagesse, Gouyave and Grenville, as well as 245 students in all 22 high schools in Grenada continued with two follow-up health assessments. When compared with baseline measurements taken in 2011, all community participants and students demonstrated an improvement in their health status with reductions in Body Mass Index (BMI) as well as Waist to Hip Circumference. Participants also reported a 100% satisfaction with their participation in the Sports for Health program. The physical activities of stretching, jogging, and aerobics displayed in various sporting pursuits and latin dancing were also evaluated by measuring the effort of participants in units of Metabolic



Equivalent (METs) via accelerometer devices in collaboration with Louisiana State University. The physical activities of the Sports for Health program were also found to be effective at producing participant intensity at levels equal to or greater than similar exercise programs in comparable sporting disciplines. In addition to health assessments, community participants and students also benefitted from dietary recommendations and health education sessions on diabetes and hypertension prevention and control.

In 2012, the Sports for Health program saw an increase in the number of participants by 150 persons as well as the addition of three sites for fitness clubs to increase the accessibility and availability of the program to communities in Grenada. The Sports for Health program therefore remains on course towards its primary goal of addressing the burden of chronic non communicable disease in Grenada. We look forward to increasing the number of persons and communities that will benefit from the program in 2013.

*Submitted by Satish Bidaisee, PhD*

### **5.9 Touch Toes Test Diabetes Awareness Campaign**

In February 2012, WINDREF, as part of the Sports for Health program piloted the Touch Toe Test (TTT) as a practice towards identifying peripheral neuropathy among persons with complications of diabetes who are at risk for receiving amputations in Grenada.

The TTT was administered to all participants in the Sports for Health program and was well received by participants as a simple test that can be applied by persons in the communities themselves.

In observance of World Diabetes Day 2012, WINDREF partnered with several stakeholders, including the Ministry of Health and the Grenada Diabetes Association, to develop a national TTT education campaign. A video clip demonstrating the TTT was developed and distributed using television, radio, facebook, and YouTube (<http://www.youtube.com/watch?v=iO4UHLGQdVk>). Furthermore, a flyer was developed and distributed through national newspapers, clinics, and community centers, and community based activities.

For the period November 14th to November 28th, 2012, the TTT was conducted on more than 1200 persons. Fifty seven persons were identified as having a loss of sensitization in at least one toe and referred to health centers for follow up testing and care. The national TTT campaign in observance of World Diabetes Day in Grenada was noted to raise the national level of awareness as individuals continuously report to health centres after having conducted the TTT. In addition, the TTT campaign proved to be a viable screening tool to identify early signs of peripheral neuropathy, reduce adverse health consequences, and promoting quality of life.

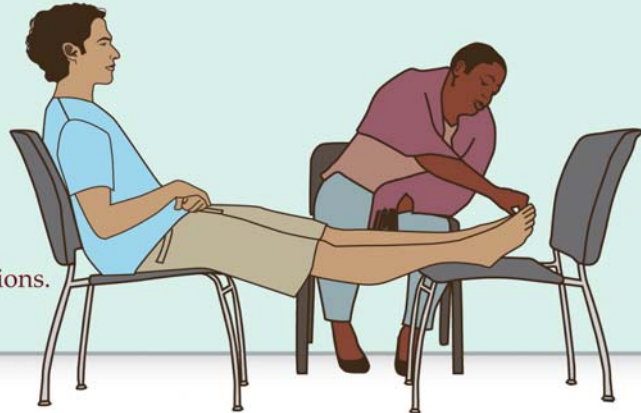
The TTT test was pioneered by Dr. Jerry Raymann, an SGU Clinical Faculty member based in Ipswich, UK. Dr.

The Public Health Student Association, in collaboration with WINDREF and the Ministry of Health, presents:

# Touch Toe Test

## Love the feet you walk on

Diabetes and its complications are increasing health concerns in Grenada that cause loss of sensation in the feet. Affected persons are vulnerable to injuries and cuts that could lead to infections, and, eventually, amputation. Conducting this simple touch test on toes and caring for one's feet can prevent such complications.



①

INSPECT



Person is placed in a comfortable position with feet elevated and feet checked for cuts or bruises..

②

CLOSE EYES



Ask your subject to keep their eyes closed while you touch their toes. Inform them to respond with a "yes" if they feel your touch.

③

LIGHT TOUCH



Start the test, touching the big (first) toe using your finger or a light object. The touch must be light (**do not press or poke** the toe). If your subject does not respond, this should be noted as a "no."

④

TOES 1,3,5



Continue to touch the rest of the toes: The big (first) toe of the other foot, and the middle (third) and small (fifth) toes of both feet, at random. Do not tell your subject which toe you are touching and continue until all six toes have been touched.

If your subject does not feel the touch in one or more toes, they are very likely to have reduced sensation and may be at risk for injury. Advise them to see their doctor at a health care center or hospital immediately.

Remember to check your feet regularly and keep any injuries clean.



St. George's University

Flyer for the Touch Toe Test, which was developed by [redacted]. The flyer was inserted into all the local Grenada newspapers and explains how to perform this important test. This flyer was developed through a partnership between the Grenada Ministry of Health, the Diabetes Association, Public Health Students Association, led by President Jenna T. Nakagawa, Public Health Faculty, and WINDREF.

Raymann's studies in the UK demonstrated that raising awareness of periphery sensitivity in the toes could ultimately result in a 70% reduction in amputation due to secondary infections as a result of this condition. The Ministry of Health in Grenada reported that more than 45 diabetes-related amputations were performed in 2011. By November 2012, an additional 27 cases had been recorded. In a population of 100,000 people, this one of the world's highest amputation rates for Diabetes-related infections or conditions and it is hoped that the TTT will reduce this unacceptably high level of surgical intervention. This will be beneficial to the individuals concerned and to the health sector of Grenada in general. The diabetes test kits were generously donated by Mr. Bruce Ratner through Ms. Ellen Ratner. These test kits will be continuously used in the study population and will also be used to encourage continued participation in the boot camps run by the GSU of the Grenada Police Force.

*Submitted by Satesh Bidaisee and Calum Macpherson*

### 5.10 South Sudan Health Assessment Project

With funding from Ms. Ellen Ratner, Mr. Trevor Noel and Dr. Calum Macpherson visited South Sudan in November 2012 to assess the feasibility of longer term longitudinal health studies amongst the Dinka People of the Wanjok Region. Ms. Ratner visits this region as part of her humanitarian team every three months and has implemented a number of successful health initiatives for peoples who have been recently liberated back to



**Dr. Luka examines an infant in his clinic in Wanjok, South Sudan**

South Sudan from Sudan. She works closely in collaboration with a resident physician, Dr. Luka, MD, who has worked in the region supported by Christian Services International, for many years.

Dr. Luka's clinic provides an essential service of basic diagnosis and treatment for patients living in Wanjok, a town of 30,000 people.



**Pharmacist at Dr. Luka's clinic issuing medicines that have been prescribed by Dr. Luka. A number of essential drugs such as antimalarials were often missing for months in this region**

The preliminary health study looked at the facilities and the potential development of the clinic and how best to collect data in the future to provide evidence-based outcomes to improve the clinic's services to the local population.

The people who are liberated from their time in Sudan receive a "sack of hope" and a goat to help re-establish themselves back in the communities from which they were removed. The sack of hope contains an impregnated bed net and essential food supplies. The initial survey identified additional items, which could be added to the sack of hope. These include albendazol, antimalarials, and micronutrient supplements. Future health studies to be conducted by



**Each repatriated person received a goat from the "old goat" (Ms. Ellen Ratner), who has established an innovative funding mechanism by identifying each goat with a donor**



**Recently repatriated Dinka People receive their "sack of hope" and goats**

physicians from collaborating medical schools and students from St. George's University will look at health indicators in the repatriated population and compare them with the resident population.

One of the constraints to good health in this region is the lack of safe drinking water and sanitation. In the future, students will examine the effects of these constraints on the local people.

Basketball is a popular sport in this region of South Sudan. The Chicago



**Delivery of water by donkey-drawn cart in Wanjok, South Sudan**

Bulls' Mr. Luol Deng comes from this region of South Sudan. Sports are popular and play an important role in healthy lifestyles for the youth of this region. Ms. Ratner maintains a very cordial relationship with the local Minister of Sport and the WINDREF Sports for Health Program could be implemented in this region in the future.

South Sudan is a land-locked country in east-central Africa with a population of just over 8 million. Following the second Sudanese civil war and Comprehensive Peace Agreement of 2005, South Sudan became an independent state on 9 July 2011. It is



**Playing basketball in Wanjok on a court sponsored through Ellen Ratner's partnership links**

one of the poorest countries on earth, with over 90% of the population living on less than \$1 per day. The country is also acknowledged to have some of the worst health indicators in the world. WINDREF looks forward to working with Ms. Ratner

and her sponsors to help the people of this region in the future.

*Submitted by Calum Macpherson,  
Director*

### **5.11 Soil Transmitted Helminths and *Streptococci* infections among school going children between the ages of 5- 15 years old in the Parish of St. Andrew's**

This research project is a two part study. The first component is the streptococcal portion being conducted in St. Andrew's parish, Grenada. This component is investigating the incidence of *Streptococci* infections among school going children between the ages of 5-15 years old in the Parish of St. Andrew's. The second component focuses on the Incidence of Neglected Tropical Diseases (NTDs) with a specific emphasis on the "Soil Transmitted Helminths" with the aim to eliminate the three main helminths, hookworms (*Ancylostoma duodenale*, *Necator americanus*), Roundworms (*Ascaris lumbricoides*) and Whipworms (*Trichuris trichiura*). The second component of this study has evolved into an larger elimination program for all of Grenada, Carriacou and Petite Martinique.

The streptococcal portion has all fourteen (14) Primary schools in the parish of St. Andrew's included in the study: Belair Government, St. Matthew's Roman Catholic (R.C.), St. Michael's R.C., Holy Cross R.C., Holy Innocent Anglican, St. Giles Anglican, St. Mary's R.C., Telescope Government, Paraclete Government, St. Andrew's R.C., St. Andrew's Methodist, Tivoli R.C. St. Andrew's Anglican and Crochu R.C. Rheumatic Fever is as a result of

exposure to *Streptococcus pyogenes*. The sequelae of this can lead to Rheumatic heart disease. Rheumatic heart disease is a debilitating condition that is usually brought on by stenosis of the mitral or aortic valves.

In Grenada, four of the fourteen schools that were selected for the streptococcal study had been included in an initial Streptococcal surveillance that was carried out in Grenada, Carriacou and Petite Martinique in 200/2002. The initial study also included diagnostic work and an educational component and was carried out with the assistance of the Ministry of Health and Education (Grenada), Rockefeller University (New York) and the Centre for Disease Control and Prevention (Atlanta). That study was funded by the Richard Lounsbery Foundation.

The anticipated sample size for this study was 750 children. Throat and blood



**Trevor Noël, Emediong Udo and Idis Mark George with the Holy Innocents Anglican students wearing their sensitization “sore throat can cause heart disease” stickers after their screening and sensitization day**

samples were observed in the laboratory for Streptococci. A total of 590 blood samples and 360 throat samples were

collected by the community nurse and physician. The school children were randomly selected and were between the ages of 5 – 15 years old.

The blood samples were subjected



**Trevor Noël viewing a positive throat culture and carrying out ASO Titres in the WINDREF laboratory**

to Anti streptolysin O titres tests and the throat swabs to cultural isolation for *beta hemolytic streptococci*. Positive *beta hemolytic streptococci* samples are currently stored in the WINDREF Institute in Grenada and will be sent to Rockefeller University and the University of Minnesota for further subtyping. The Streptococcal sample collection component of the study began in May 2010 and was completed in January 2012. In addition to this testing, there was an educational component that provided and continues to provide primary prevention via multimedia campaign. The educational component of the study was begun with the initial sensitization of the community nurse and educational workers.

The protocol for this study was passed and approved through St. George’s University IRB and subsequently passed and approved by the Research Oversight Committee at both the Ministry of Education and the Ministry of Health. Eleven hundred informed consent forms

were distributed to the schools mentioned above. In each school, the distribution was random with the classes being selected using a random number generator. We received 729 signed informed consent forms, and 698 completed knowledge, attitudes, behavior, and practices (KABP) questionnaires. In total, 590 blood samples and 590 throat samples were collected and analyzed.



**Sister Idis Mark George administering a throat swab at Holy Innocents Anglican School**

SCHOOL	Positive ASO Titre %	Positive Combined βHS %	Total Students
Belair Government	9.8	6.6	61
St. Matthew's R.C.	4	10	50
Telescope Government	13	6	54
Paraclete Government	11.1	7.4	27
St. Andrew's Anglican	0	6.9	29
St. Michael's R.C.	4.3	19.6	46
Holy Cross R.C.	6.1	12.2	49
Holy Innocent Anglican	4.8	11.3	62
St. Giles Anglican	0	17.1	35
St. Mary's R.C	6	39	33
Crochu R.C.	2.6	12.8	39
St. Andrew's R.C.	0	4	25
St. Andrew's Methodist	23.7	15.8	38
Tivoli R.C.	2.4	0	42
Total	6.3	12.05	590

**Display of streptococcal survey for St. Andrew's schoolchildren 5 – 15 years in 2010 - 2012**

The positive sera samples for anti – bodies to streptococcal infection (% ASOT +) and throat swab cultures positive for beta hemolytic *streptococci* infection can be seen in Table 1. The prevalence results of this sample averaged 6.3% positive ASO Titre and 12.1% positive combined *beta Hemolytic Streptococci*. Preliminarily, these rates appear to be lower than those that were done nationally in the 2000 – 2002 study. However, these rates will be carefully compared with the previous study and discussed in the PhD thesis.

The 729 KABP questionnaires have been analyzed using Microsoft Excel. The results of the 590 blood and 590 throat samples will be correlated with the 590 KABP questionnaires as part of the PhD

The educational posters were designed and produced as part of a mass media sensitization approach. These posters were distributed in the 14 primary schools as part of the educational component.

All positive cases were seen by the physician and treatment was given by the community nurse and physicians (both from the St. Andrew's area) at the schools or at decentralized clinics in the community. The medication (penicillin/ erythromycin) was purchased by WINDREF through Parris Pharmacy in Grenville. We chose this pharmacy because it is owned by Mr. Reginald Buckmire, PhD (a St. Andrew's Parish based businessman). This meant that all



**MD student Emediong Udo, a primary prevention sensitization program volunteer, with one of the St. Andrew's Primary School children**

the persons that took responsibility for the persons in this area were from St. Andrew's lending to a strong sense of ownership and empowerment within the community.

The second portion of this study focuses on the Incidence of Neglected Tropical Diseases with a specific emphasis on the "Soil Transmitted Helminths" with the aim to tackle the three main helminths. The second component of this study has been increased from only the St. Andrew's area to a larger elimination program for Grenada, Carriacou and Petite Martinique. This section of the study focuses on the Incidence of Neglected Tropical Diseases with a specific emphasis on the "Soil Transmitted Helminths" with the aim to tackle the three main helminths, hookworms (*Ancylostoma duodenale*, *Necator americanus*), Roundworms (*Ascaris lumbricoides*) and Whipworms (*Trichuris trichiura*). From an ethical perspective, the elimination program was approved by the St. George's University IRB and the Research Oversight Committees of both the Ministry of Education and Ministry of Health

(Grenada) for the St. Andrew's area. At the national level (Grenada, Carriacou and Petite Martinique) it has been approved by the St. George's University IRB and we await final approval from the Research Oversight Committees of both the Ministry of Education and Ministry of Health (Grenada).

The evolution of this project from solely the St. Andrew's area, to be a Grenadian National elimination program has resulted in a revision of the sample size and an increase from 14 to 58 schools involved. On the advice of our statistician forty one of the fifty eight primary schools have been selected for inclusion in this study and if a grade/standard is selected all members of that grade/standard will be given the opportunity to participate regardless of class size to adhere to ethical soundness.

The 1,700 informed consent forms and knowledge, attitudes, behavior, and practices (KABP) questionnaires have been distributed to the 41 schools for dissemination by the school Principals to the parents/guardians. These informed consent forms KABP questionnaires have already been pilot tested in the fourteen St. Andrew's schools. The prevalence of Soil transmitted helminthes will be ascertained and we will investigate the possible correlation of these results with the KABP questionnaire. The pharmaceutical company, Glaxo Smith Kline has promised the drug, albendazole free of cost for three years for this elimination program.

The educational component continues in that we continue to place and use the printed posters for sensitization purposes in all the primary and secondary schools in Grenada, Carriacou and Petite Martinique.





Poster on “Practices to Prevent Soil Transmitted Worm Infections” in Crochu R.C. School

The initial funding for this two-part study was provided by the Bartholomew J



400 meter Olympic champion Kirani James (middle left) with his coach, Harvey Glance (left), his agent, Ronaldo Nehemiah (right), and WINDREF Sports for Health Board Member, Trevor Noël (middle right)

Lawson Foundation through REACH (GRENADA). This NTD project is incorporated as part of the wider WINDREF vision of the Sports for Health Program.

*Submitted by Trevor P. Noël, MPH  
Assistant Director*

### 5.12 Genetic Correlates of the Addictive Diseases: Cocaine, Alcohol and Marijuana Addiction - Grenada, W.I.

In Grenada, blood samples are taken from normal volunteers, drug-free former cocaine users, drug-free former marijuana users, drug-free former alcohol users, or current drug and alcohol users. To assess their levels and types of addiction, a standard scale – developed by the Kreek Lab – is used for each patient, called the KMSK scale.

The KMSK scale is a brief survey that is 90-100% effective in screening for alcohol, marijuana, cocaine and heroin



Dave Alexander (Drug Avoidance Office), Trevor Noël (WINDREF), Mary Jeanne Kreek (Rockefeller University), Elizabeth Japal, Assistant Drug Control Officer

addiction. This scale is used for all patients studied in the Kreek Lab. The patients are also asked about their family origin, as this information may play a role in further genetic studies done by the



**Nurse Idis Mark – George speaks with a control subject**

Kreek Lab.

To date 53 case participants have completed the full KMSK questionnaires and blood draws in Grenada. Our control participant's selection is ongoing and we have completed 90 control samples. The samples and KMSK and family origin questionnaires that are administered are



**Dr. Mary Jeanne Kreek, Head of Kreek Laboratory, Rockefeller University, New York**

sent to Rockefeller University (New York) where they are analyzed.

In the past, our research nurses, have included Nestar Edwards (Chief Nursing Officer for Grenada), Beverly Mends and Kathleen Collier. Most recently the nurse assisting with this project has

been Idis Mark-George. Recent talks have been held to include nurses from the St. George's University School of Nursing. These nurses have been entrusted with the process of receiving a signed informed consent form and drawing the blood and administering the Family Origin Questionnaire and the KMSK scale to the participants.

The Kreek Lab collaborates with WINDREF in Grenada in an effort to gain a better understanding of the biology of addictive diseases, particularly the genetic basis of addiction. Grenada provides a unique study sample as heroin and other such opiates have yet to enter the country. In most countries, opiate and cocaine addiction is rampant and sometimes may go hand in hand. Thus, the Grenada study acts as a control for any heroin-cocaine addiction comorbidity observed in previous genetic studies of addicts.

Whole blood samples taken from subjects in Grenada are shipped to the Kreek Lab at Rockefeller University for



**Dave Alexander, Drug Avoidance Officer, presents at the 10-year anniversary of the creation of GRENDIN**

DNA isolation. The DNA is further analyzed by lab members who look for any polymorphisms – variations in DNA – that may occur in specific regions of the DNA: mu and kappa opioid receptor genes being two of the many.

Projects of a similar nature are being run in several other areas of the world, including Stockholm, Lund, and Uppsala in Sweden, Oslo in Norway, Tel Aviv in Israel, and Las Vegas in Nevada, Oakland in California, New York City in New York, USA.

Trevor Noel is the WINDREF representative on the Grenada Drug Intervention Network (GRENDIN). which celebrated its tenth anniversary in December and we continue to work closely with Drug Avoidance Officers from the Ministry of Education. Both WINDREF and Rockefeller University have been collaborating with the Drug Avoidance office on this project for ten years.

*Submitted by Trevor P. Noël, MPH  
Assistant Director*

### 5.13 Grenada School Nutrition Study

Work began on the Grenada School Nutrition Study in the last few months of 2012. Led by Dr. Roger Radix, the overall objective of the project is to decrease the probability of the adoption of an obesogenic lifestyle among adolescents in Grenada. The specific objectives of the project are to:

- Identify habits and environmental factors perceived by the population to be associated with obesogenic lifestyles;
- Identify dietary and physical activity-related policies that are relevant for addressing the obesity challenge in Grenada and to investigate the barriers

- to their adoption and implementation;
- Directly assess physical activity as well as to obtain self-reported measures of dietary and physical activity;
- Characterize the modifiable factors in



**Research Investigators and research staff meet to discuss data collection for the Grenada School Nutrition Study**

the food and physical activity environment to which students are exposed;

- Measure student activity level within their school and neighbourhood contexts and identify the associated individual and school-level factors that explain overweight and obese outcomes and the modifiable factors in the school and neighbourhood environments.

The lead investigators for the project have started collaborative research meetings, the necessary equipment for carrying out the study has been acquired, and the research staff have been identified. We look forward to carrying out this study in the coming years.

*Submitted by  
Roger Radix, M.D.*

### 5.14 Exposure risks and frequencies of drug resistant bacterial indicators

**in oceanic tropical waters of Grenada**

**Background:**

The origin of antibiotic resistance in the tropical marine environment is relevant to traveler's health because of the potential recreational exposure of visitors to the drug-resistant pathogens as well as the need for predicting emerging resistant pathogens. Phenotypic identification of drug resistance in *Escherichia coli* (*E. coli*) and *Enterococcus faecalis* (*E. faecalis*) reproducibly isolated from the sea water as indicators of fecal pollution is relevant for the health of the half-million visitors to the island of Grenada in 2011. It has been estimated that about 3-13% of DNA in bacteria is subjected to horizontal gene transfer using the conjugative R-plasmids, phages, and integrons of class 1 as gene cassettes. Resistance genes are transferred in the sea by phages such as Colomer (Lluch et al., 2011). In addition, about 1% of microbial population accept a new gene via recombination in the oceanic water (McDaniel, 2012) and even higher in the human gut where the drug resistance genes are replicated being a part of a conjugative plasmid and a resistant host.

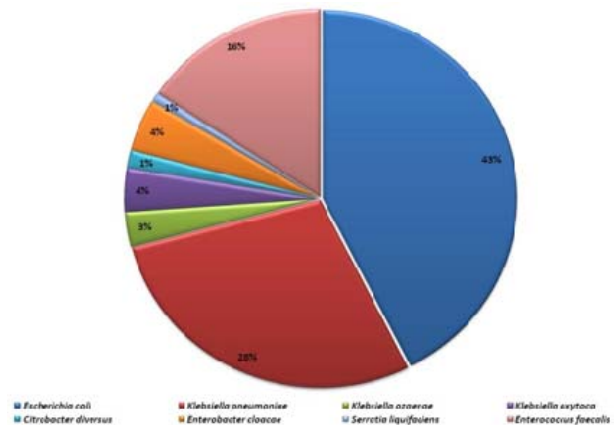
**Objective:**

We investigated the potential of human exposure to drug resistant marine bacteria in tropical seawaters of Grenada.

**Method:**

The Environmental Testing Unit of St. George's University (SGU) analyzed 225 samples using the most probable number (MPN) method between

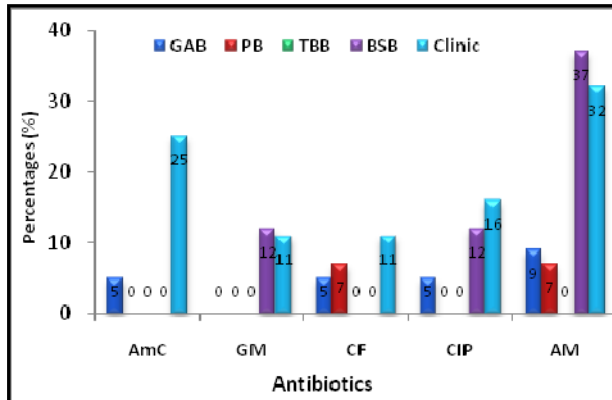
November 2008 and November 2010. The water was collected on a weekly basis from Grand Anse Beach (GAB), Prickly Bay (PB), Black Sand Beach (BSB), and True Blue Bay (TBB). The effect of rainfall on indicator variation was tested using Correlation Coefficient Analysis. The percentage compliance was estimated using the United States Environmental Protection Agency (EPA) and World Health Organization (WHO) guidelines. *E. coli* and *Klebsiella pneumoniae* (*K. pneumoniae*) strains were tested against 12 antibiotics while *E. faecalis* was tested against six antibiotics. Probability of exposure was modeled.



**Figure 1. Percentage of samples positive for bacterial indicators from the 4 coastal waters of Southern Grenada between November 2008 and November 2010**

**Results:**

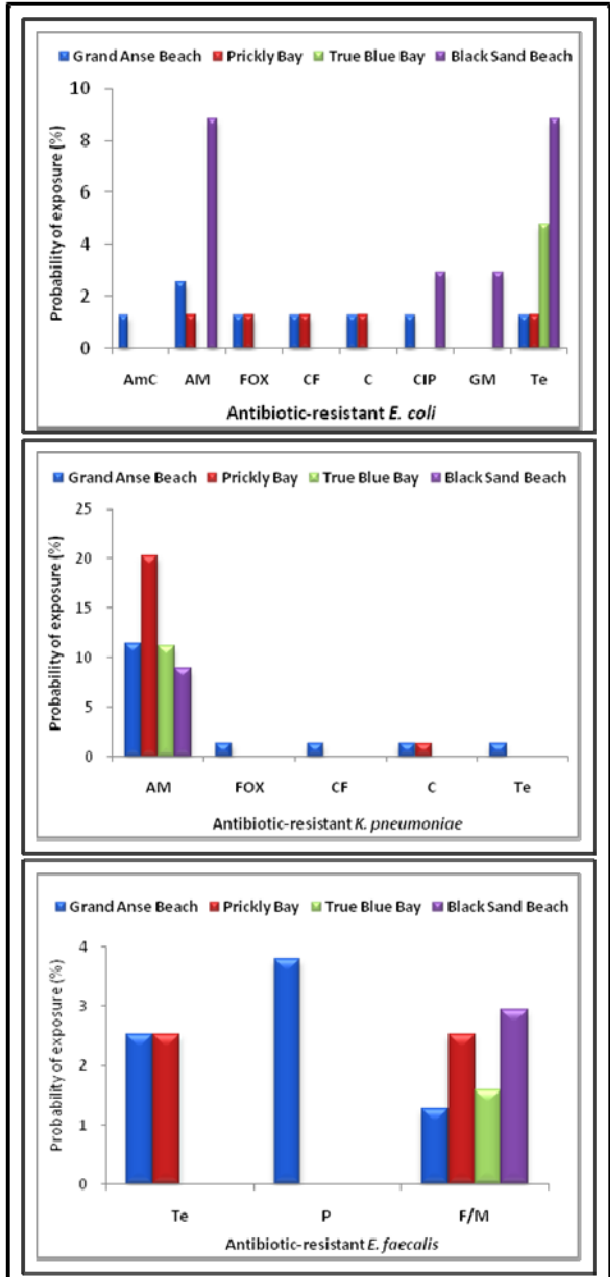
Of the 116 bacterial species isolated from the tested sites, *E. coli* dominated and comprised 43% of the sample, *K. pneumoniae*, 28% of the sample, and *E. faecalis*, 16% of the sample (Figure 1).



**Figure 2. Percentage of resistant strains of *E. coli* isolated from urine compared to those isolated from the 4 coastal sites of Southern Grenada between November 2008 and November 2010**

*E. coli* strains were resistant to ampicillin, amoxicillin/clavulanate, chloramphenicol, cephalothin, cefoxitin, gentamicin, ciprofloxacin, and tetracycline. Twelve percent of *E. coli* isolated during this period from the four marine sites presented resistance to gentamicin and ciprofloxacin which was comparable to the percentage of urinary tract infection (UTI) originated *E. coli* (Figure 2).

Five percent of marine *E. coli* presented resistance to amoxicillin and cephalothin. Ampicillin resistance was typical for 37% of marine isolates of *E. coli*. Only seven percent of the marine *E. coli* were multiresistant, and 14% to a single antibiotic. Our model predicted 10% likelihood of exposure for ampicillin and tetracycline-resistant *E. coli* (or every tenth exposure to the seawater) in BSB. The likelihoods of human exposure in seawater were 10% for tetracycline resistant *E. coli*, 20% for ampicillin-resistant *K. pneumoniae*, and 4% for penicillin-resistant *E. faecalis* (Figure 3).



**Figure 3. Probability of exposure to antibiotic-resistant bacterial indicators in the coastal waters to southern Grenada during a period of two years**

Marine *E. coli* presented similar susceptibility patterns to UTEC against gentamicin, cephalothin, and ciprofloxacin in all tested sites. Resistance to ampicillin

was similar to clinical strains only in long before the extreme selection pressure isolates from BSB and GAB. Marine *E. coli* that was imposed in the antibiotic era. We presented different resistance patterns hypothesize that some organisms and against amoxicillin/clavulonic acid when some environments harbor antibiotic compared to the clinical strains except in resistance genes irrespective of the BSB. human use of antibiotics. For example, RND efflux systems sorts out the bacterial communication in biofilms and antibiotic

### Discussion:

We showed that tropical seawater resistance (Minagawa et al., 2012) while may be a source of antibiotic resistant ampicillin promotes the SOS response and bacteria. Highest level of compliance was MMR, survival and stress response in host observed for coastal water of Grand Anse and nutrient poor environments. Exposure (GAB), bacteria isolated from this beach to beta-lactams, rifampicin and presented resistances to 10 different ciprofloxacin induces formation of single antibiotics. Indicators detected in TBB, PB stranded DNA, proteolysis of LexA and and GAB were not a result of rainwater induces the SOS response which activates caused sewage or rhizosphere runoff. the error-prone DNA polymerases II, IV and V, which leads to increased rates of (Amadi et al., 2011). We also showed the mutation (Ochman et al., 2000; Cirz et al., presence of marine *E. coli* presenting the 2005, Jolivet-Gourgeon et al., 2011). UTI resistance patterns in BSB (Amadi et al., 2012), which is highly relevant for Interestingly, low nutrients and the UVB understanding the epidemiology of exposure induce similar responses in resistance while identifying a new microbial cells (Blount et al., 2012). reservoir and potential of transmission of Therefore, the prevalence and diversity of resistance genes horizontally. Along with resistance genes in the marine environment may indicate their native resistance genes the integron gene roles in environmental stress response cassettes include multiple virulence factors and communication in natural microbial such as ability to invade the host cell, adhere to the host cell, produce capsule, communities. evade the immune response, longevity as well as ability for horizontal gene transfer

*Submitted by Svetlana Kotelnikova & Victor Amadi*

## **5.15 Using hypothesis driven research as a part of science curriculum in Genetics**

The determinants of antibiotic resistance existed naturally and were probably subjected to horizontal transfer

### Introduction

Bringing the study of genomics into

undergraduate life sciences courses is a way to provide large numbers of students the opportunity to learn to use state-of-the-art bioinformatics tools to explore real data while answering research questions. Genomics not only offers a new way to teach foundational concepts, but it also can be used to show how bioinformatic algorithms are mathematical articulations of biological principles. Given that the DNA sequence is the international language of biology, genomics and bioinformatics also provide a unifying thread across the undergraduate life sciences curriculum. They can be used anywhere from introductory through graduate courses, providing the intellectual framework for hypothesis-driven research projects.

The practicum in bioinformatics has been offered at St. Georges University (SGU) for students taking Genetics SASBIOL 320 starting from August 2010. The Practicum in Bioinformatics is linked to the Joint Genome Institute (JGI) project funded by the USA Department of Energy and National Science Foundation in

The project at SGU has been introduced as a pilot project, replacing the group-based assignment in BIOL 320 for 26 candidates during Spring 2012 and for 27 during Fall 2012. For this project, students worked in groups to annotate the genome of a target organism. We selected the genome of acidophilic iron-oxidising *Archaeum Ferroplasma acidarmanus fer1* for the annotation. The genome is comprised of 980 genes. The students annotate individual genes over the course of six weeks however they work closely with other members of the group (up to a maximum of four) and their teaching assistants while being supervised by Dr. Kotelnikova and Mr. R. Naraine. In particular, the students were supervised by Christian Paulsingh, Alvin Chitterman, Sarah Marie Graff, and Bevon Reyaz Babwah during Spring term 2012 and by Karla Farmer, Tatyana Joab, Christian Paulsingh, Jennifer Makgopa and Amanda Edgar during Fall term 2012. They were



**IMG-ACT Fall 2012 Biol320 students & facilitators**



**IMG-ACT Teaching Assistant supervisors. Top left to right: Alvin Chitterman, Christian Paulsingh, Tatyana Joab. Bottom left to right: Bevon Babwah, Sarah Graff**

Undergraduate Research in Microbial Genome Annotation and supported by the Department of Microbiology and Immunology, School of Medicine, SGU.

also offered weekly 30 minute sessions with the instructor and demonstrator. The scientific goal of the annotation of the

*Ferroplasma acidarmanus* gene was to determine its correct start codon, provide evidence for possible co-regulation with other genes, and if the gene was subjected to duplications and/or lateral gene transfer events; to find cellular localization for the protein and identify possible enzymatic or non-enzymatic function.

Methods:

The JGI Integrated Microbial Genomes Annotation Collaboration Toolkit (IGM-ACT) and IGM EDU websites are currently linked to SAKAI course site for Genetics SASBIOL 320. Educational and training manuals are available for the students online in My Courses. The IGM ACT link facilitates students' access to more than 20 bioinformatic applications (including Kyoto Encyclopedia of Genes and Genomes (KEGG) orthology, BLASTn and BLASTp) that have been developed by the most advanced institutes involved with the sequencing and annotating of genomes. In addition to aiding understanding of the structural basis of cellular localization, this set of modules enables exploration of the evolutionary relationship between archaeal and bacterial genes. These applications facilitate both single gene and metagenomic annotations.

Results:

The direction of the research is driven by the hypothesis which is based on the results BLASTp and cellular localization of the protein. In total, SGU undergraduate and graduate students contributed to the annotations of 120 genes and discovered new functions for 45 genes since January 2011. The following goals were achieved:

1. To practice interpersonal skills
2. To strengthen library and web literature search skills
3. To learn how to use various sequence analysis computer programs and how to work within a Web-based community-accessible databases.
4. To learn how to analyze DNA and protein sequences for similarity, for molecular chimerism, align sequences using BLASTn and BLASTp and produce phylogenetic trees.
5. To understand genomic terminology and concepts and to comprehend the gene-protein-pathway relationship, operon structure, conserved DNA sequences involved in gene regulation and synteny, gene duplication and lateral gene transfer.

As part of the project, the students were asked to report their findings in the form of individual lab notebooks and lab reports, documenting their experience with empirically based knowledge allocation. The group-based results were presented as webpage reports at PBWORKs SGU GENETICS. In addition to the research, the students are asked to fill out the evaluations offered by the Department of JGI's Genomics and Bioinformatic Education twice, before and after the exercise.

Discussion:

Normally, the opportunity to annotate is offered only to students after their first examination in Genetics. Students performing at 80% and above are given the option of selecting the annotation for their group-based course assignment. Groups of students which performed at the examination below 80%



were offered the opportunity to perform the annotation research during Fall term of 2011. Following the exercise none of the students dropped the course, however the data on academic performance and progress of the students following the exercise need to be evaluated. However, very positive feedback has been obtained from the students who participated in the exercise. One participant cited the experience during her Graduation speech in May 2012. Students have indicated that annotation helped them to understand a number of basic concepts, including the difference between enzymatic and non-enzymatic proteins, the processes of transcription and translation, cellular localization of proteins, horizontal gene transfer, gene evolution, and gene and genome structure and organization. Finally they experienced the weaknesses and strengths of bioinformatics while dealing with the biases of comparative genomics in an attempt to identify their gene function.

*With support from NSF, MCB0851094 and NSF, EF1105897*

Acknowledgements: Mr. Edwin Sperr

Submitted by S. Kotelnikova,  
S. Giesler, & R. Naraine

### **5.16 *Vibrio* and *Stenotrophomonas* in the Caribbean Sea: A Potential Source of Infections in divers and snorkelers**

#### Background:

Almost half a million visitors, many of whom or over 55 years old, had access to the marine environment in Grenada in 2011. The beaches of the island are a

popular tropical tourist destination for swimming, snorkelling and diving. Due to the risks of skin, enteric or respiratory infections in stressed and immune-compromised travellers caused by *V.cholera*, *V.mimicus*, *V. parahaemolyticus*, *V. harveyii*, *V. alginolyticus* or *Stenotrophomonas sp.*, there is considerable interest in tracking tropical marine bacteria. Reliable and safe identification of marine *Vibrio* is challenging because they are pathogenic and carry multiple gene copies of heterogeneous 16S rDNA. The differentiating power of sequencing the 16S rDNA and Fatty Acid Methyl Esterase Analysis is low for this group of organisms. The reproducibility of phenotypic identification can be limited by differential gene expression.

#### Objectives:

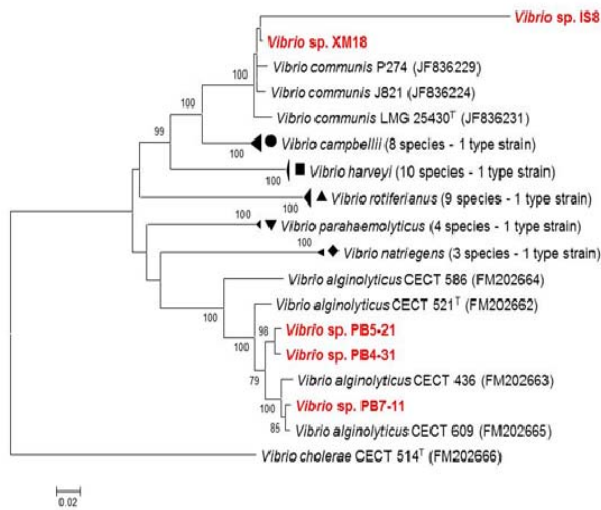
To identify strains PB 7-11, PB 5-21, PB 4-31, DB 6-33 isolated from the sea bottom biofilms (Caputo et al. 2005; Kotelnikova et al. 2008) and XM-18, IS-8 isolated from tropical marine sponges (Craine et al., 2007; Jamiesson, 2008) using the multi-loci sequence analysis (MLSA).

#### Method:

Identification and phylogenetic analysis of seven genes including *recA*, *pyrH*, *rpoD*, *gyrB*, *rctB*, *toxR*, and 16S rDNA utilizing the MLSA (Pasqual et al. 2009) and Maximum Likelihood, Maximum Parsimony, and Neighbour-Joining methods were performed on six unknown and three reference type strains of *Vibrio*.

**Results:**

The resolving power of each gene varied based on the number of maximum parsimony sites. Evolutionary divergence within a particular clad agreed between different construction algorithms. All isolates from the bottom biofilms in Prickly Bay belong to *V. alginolyticus* and *V. campbellii* while DB 6-33 isolated from Dragon bay is *Stenotrophomonas maltophilia*. The sponge isolates were more closely related to *V. communis*. Phenotypical identification alone was



**Concatenated Neighbour-Joining (Kimura 2-parameter model) phylogenetic tree constructed using genes *rctB*, *rpoD* & *toxR*, showing the evolutionary lineage of *Vibrio* isolates. Confidence in tree topology is based on bootstrap of 1000**

ineffective to delineate between the *Vibrio* species.

**Conclusion:**

The approach used in our research enabled the efficient molecular identification of *Vibrio* and *Stenotrophomonas* species in marine

bottom biofilms and sea sponges in popular recreational destinations in Grenada. This method may be utilized in identification of genes of pathogens representing a considerable public health concern based on DNA extracted from the environment which will not require the culturing of the virulent organism.

Submitted by: Ravindra Naraine, Karla Famer, & Svetlana Kotelnikova

**Section 6.0****2012 Research Grants**

We would like to thank all of the donors who have made WINDREF's work possible in 2012:

- The Bartholomew J. Lawson Foundation for Children, in partnership with Reach Grenada, for the Helminths and Rheumatic Fever Project
- Dr. Mary-Jeanne Kreek, Kreek Laboratory, Rockefeller University, NY, for the support of the "Genetic Correlation of Addictive Diseases" project
- St. George's University, for ongoing support, including the Small Research Grant Initiative which has helped some WINDREF scientists
- The Teasdale-Corti Foundation for the grant supporting the Caribbean Eco-Health Programme (CEHP)
- The World Bank (for the Canadian Persistent Organic Pollutants (POPs) Trust Fund) for the Caribbean POPs

Study

- Global Environment Facility Small Grants Program (GEF SGP) for support of the Nutmeg factory project
- International Development Research Centre (IDRC) for support of the “Ethical Issues and Challenges in Global Population Health Research Partnerships” project
- International Development Research Centre (IDRC) for support of the “Grenada School Nutrition Study: Evidence to Inform Policy” project
- Produmar, S.A. for support of the “Investigation of disease in pre-growout fish in a commercial aquaculture operation in Ecuador” project.
- Critical Ecosystem Partnership Fund (CEPF)
- Mohammed Bin Zayed Species

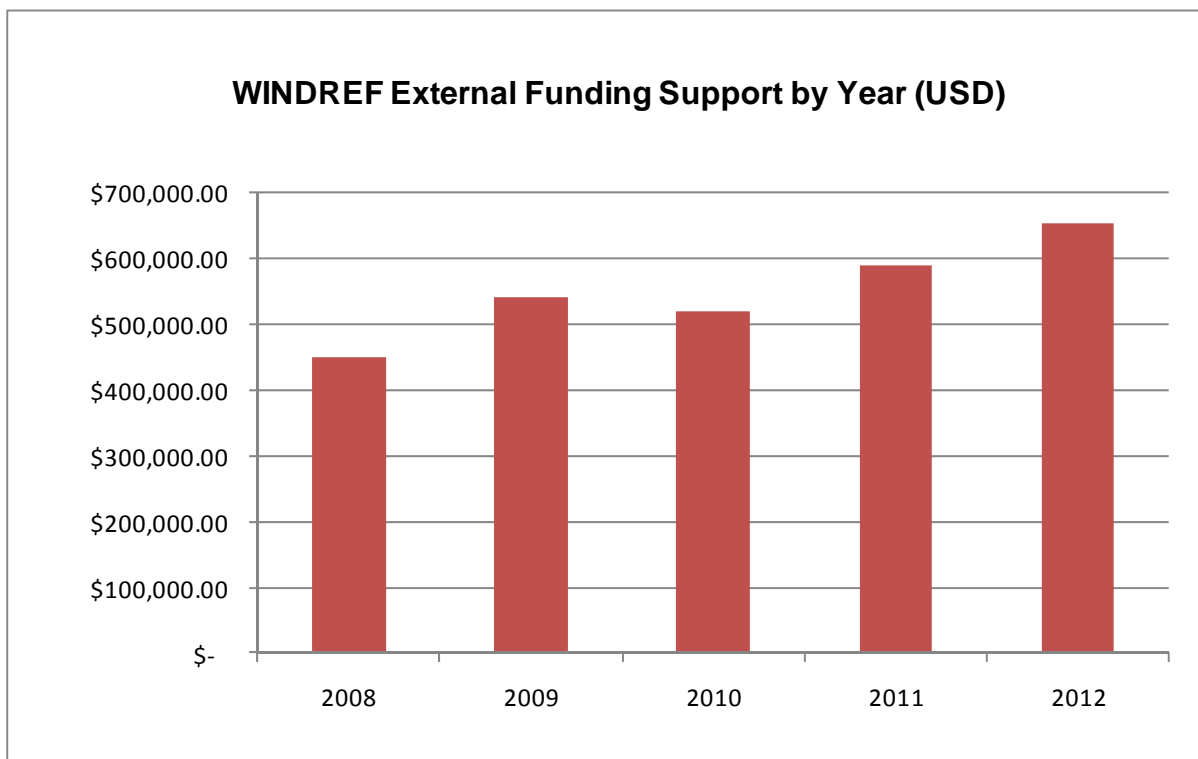
Conservation Fund

- BirdLife International and the “Save our Species” Programme

**6.1 Ongoing externally funded projects**

There were eight ongoing funded projects in 2012 with a total multi-year value of approximately \$1,062,150 USD:

- Noël, T.P. Neglected Tropical Diseases (NTDs) and Rheumatic Fever in Grenada: a project to prevent/eliminate helminthic and rheumatic fever infections among children (5-15 years of age). Bartholomew J. Lawson Foundation for Children. \$41,903. 2009 - 2014.
- Noël, T.P. Genetic Correlates of the Addictive Diseases: Cocaine, Alcohol and Marijuana Addiction - Grenada, W.I., Dr. Mary-Jeanne Kreek, Kreek Laboratory, Rockefeller University,



NY. \$30,000. 2005-2011

- Akpinar-Elci, M. Implementing Renewable Energy and Preventing Land Degradation: An Intervention in the Nutmeg Industry in Grenada. Global Environment Facility Small Grants Program (GEF SGP) on behalf of the three GEF Implementing Agencies –United Nations Development Program (UNDP), United Nations Environment Program (UNEP) and the World Bank. \$50,000. National Institute for Occupational Safety and Health (NIOSH) \$64,313. 2010 - 2012.
- Forde, M. Caribbean EcoHealth Programme (CEHP): public and environmental health interactions in food and water-borne illnesses. Teasdale-Corti Foundation. \$442,268. 2008 - 2012.
- Forde, Martin. Ethical Issues and Challenges in Global Population Health Research Partnerships. IDRC 103460-093. \$67,671 CAD 2010 - 2012
- Macpherson, Calum. Sport for Health. House of Lords Fundraiser. \$50,000. 2011 - 2012
- Ferguson, Hugh: Investigation of disease in pre-growout fish in a commercial aquaculture operation in Ecuador. Produmar, S.A. \$61,995. 2011-2013
- Radix, Roger: Grenada School Nutrition Study: Evidence to Inform Policy. IDRC 106884. \$304,000 CAD, 2012-2015.

## 6.2 Year 2012 Grant submissions

In 2012 four grant applications were submitted to external funding agencies for a total value of \$3,560,070 USD:

- Akpinar-Elci, Muge: Revitalizing Nutmeg Industry in Grenada. *Department of Foreign Affairs and International Trade (DFAIT) via the High Commission of Canada (Barbados) - Canada Fund for Local Initiatives (CFLI)*. \$20,070 CDN. 2013.
- Bonaparte, Beverly: A Caribbean University Interdisciplinary and Integrated Drug Demand Reduction Proposal. *General Secretariat of the Organization of American States, Executive Secretariat of the Inter-American Drug Abuse Control Commission (ES/CICAD)*. \$40,000 USD. 2013-2014.
- Sealy, Hugh & Waechter, Randall: Caribbean Climate Innovation Center. *infoDev (Department of the World Bank)*. \$3,500,000 USD. 2013-2018.

## Section 7

### Past, Present, and Future Research Projects

#### 7.1 Non-communicable Diseases

- Angiotensin converting enzyme and angiotensinogen gene polymorphisms in the Grenadian population: relation to hypertension
- Development of a decision rule for screening Obstructive Sleep Apnea and its epidemiologic relevance to the people of Grenada
- Prevalence and associated risk factors of hypertension in a sample population of native Caribbean's in Grenada, West Indies
- Assessing the prevalence of diabetic complications by examining type I and type II adult diabetics for signs of retinopathy, neuropathy, nephropathy and dermatological changes associated with poor glucose control within the native Caribbean population of Grenada
- Hypertension management and control in two Caribbean countries
- Assessment of the effectiveness of broad-spectrum treatment to children with protozoan and nemathelminthic parasitic infections on diarrhea and school attendance
- The effects of iron-deficiency anemia on cognition and behavior in infants
- Diurnal variation of urinary endothelin-I and blood pressure: related hypertension
- Alcohol consumption in Grenada
- The incidence and mortality of cancer in Grenada over the ten year period: 1990-1999
- The prevalence of abnormal haemoglobin traits in Grenadian secondary school adolescents
- Knowledge, attitudes, beliefs and practices of sickle cell anemia in Grenadian primary and secondary school children
- Decompression sickness among the indigenous fishing population in Grenada: Assessing the burden of disease
- WINDREF / SGU Hurricane Relief
- Spice Research Program
- Sulfate-reducing bacteria in oxidized freshwater of tropical mangroves
- Novel antibiotics from tropical marine environments: drug development in Grenada
- Study of the mutacin C-7A
- Gram-negative bacteria isolated from aquatic environments of Grenada (61.4°W, 12.0°N), West Indies
- Identification of bacteria producing antibiotics isolated from deep marine biofilms of Grenada
- SGU Environmental Testing Unit (ETU)
- Post-hurricane water surveillance in problematic areas of Grenada
- Evaluation of the relocation potential for villagers residing in Queen

Elizabeth National Park, Uganda

- Study of the calls of the spotted hyena at feeding
- Survey on the attitude of villagers in Queen Elizabeth National Park, Uganda towards the threat of lions, leopards and hyenas
- Epidemiology of human injuries resulting from wildlife in ten villages within Queen Elizabeth National Park, Uganda
- Rural Ugandan village perspective on lion, leopard and hyena conservation
- Epidemiology of human injuries by wildlife in six villages within Queen Elizabeth National Park, Uganda
- Prevalence of *Campylobacter fetus* subspecies *venerealis* and other microorganisms in the reproductive tracts of cattle from the southern region of Santo Domingo, Dominican Republic
- Antimicrobial properties of skin secretions from *Eleutherodactylus johnstonei* on bacteriological isolates
- Examination and analysis of prostate cancer in Grenada
- A Church-based intervention to improve hypertension prevention and control among women in Grenada
- Occupational Health Problems among Nutmeg Factories Workers, SGU Small Research Grant Initiative
- Sport for Health Programme
- Grenada School Nutrition Study: Evidence to Inform Policy

7.2 Infectious Diseases

- Investigation of the prevalence of SIV in the mona monkey (*Cercopithecus mona*) in Grenada
- Seroprevalence of HIV-I and HIV-II in pregnant women in Grenada, W.I. – their knowledge of AIDS and their exposure hazards to the virus
- A cross sectional study of the current status of *Schistosoma mansoni* in St. Lucia by field surveys and supplementary data collection
- Identification and characterization of hantaviruses among the mammal population of Grenada
- HIV/AIDS health education and evaluation program in Grenada
- The seroprevalence of *Toxoplasma gondii* in a population of pregnant women and cats in Grenada, West Indies
- The efficiency of diagnosing women of *Toxoplasma gondii* using PCR techniques in comparison with ELISA
- Dengue virus in Grenada: seroprevalence and associated risk factors
- A current appraisal of dengue virus in Grenada – serotype analysis and vector assessment
- A site receptivity study determining the threat of reintroduction of malaria into Grenada through the study of Anopheline spp. mosquito vectors
- Chlamydial infection among STD clinic attenders in Grenada

- Fever in Grenada
- Mosquitoes and tourism in Grenada
- Effectiveness of a formula feeding/weaning intervention program in preventing transmission of HTLV-1 from seropositive mothers to newborns in Grenada
- A multi-center longitudinal research study of the behavioral significance of the prevalence of HIV-1 infection in pregnant women and their babies on the islands of Grenada and St. Vincent
- A multi-center longitudinal research study of the ethical analysis of informed consent of the prevalence of HIV-1 infection in pregnant women and their babies on the islands of Grenada and St. Vincent
- Determining the role of IL-15 in mediating function of viral-specific CD8+ T cells in the myelopathogenesis of HTLV-1: symptomatic versus asymptomatic patients
- Intestinal protozoan infections in 6-12 year old children in Grenada
- Intestinal helminth infections in 6-12 year old children in Grenada
- The prevalence of intestinal parasites in school children in rural Guyana
- The prevalence of filariasis and its effects on children aged 8-14 in the central corentyne region of rural Guyana
- The prevalence of streptococcal infection in school children aged 5 – 15 years in Grenada, Carriacou and Petit Martinique
- Studies examining the elimination of lymphatic filariasis as a public health problem in Guyana
- Seroprevalence of heartworm infection in dogs in Grenada
- Dengue in Grenada
- Assessing the potential risk factors of dengue and dengue hemorrhagic fever in the tri-island state of Grenada, Carriacou and Petit Martinique
- A comparative study to find out if there is an association between sexual practices and knowledge in adult populations of Botswana and Grenada with the prevalence of HIV/AIDS
- HIV/AIDS in rural Botswana differentiating between informing and educating
- Evaluating the level of perceived fear and desensitization towards HIV/AIDS in Botswana
- Rheumatic Fever in Grenada
- Streptococcal program in St. Vincent
- Isolating T cells from Rheumatic Fever positive blood: immunofluorescent assay of T lymphocytes via fluorescently labeled monoclonal antibodies
- Possible genetic predisposition to Rheumatic Fever: demonstrating the inheritance fashion of non-HLA B lymphocyte alloantigen D8/17, a marker for Rheumatic Fever
- ELISA antibody titres against group A

- streptococcal M protein moiety and cell wall N-Acetyl-D-Glucosamine in Grenadian Rheumatic Fever patients
- Evaluating the effectiveness of educational methods in the prevention of Rheumatic Fever and knowledge, awareness and practices
- Prevalence of intestinal helminth infections in rural Grenadian school children
- Cystic echinococcosis in Morocco and Uganda
- Elimination of Lymphatic Filariasis in Guyana Program
- **Neglected Tropical Diseases and Rheumatic Fever in Grenada: A project to prevent/eliminate helminthic and rheumatic fever infections among children (5-15 years of age)**
- Effects of Grenadian medicinal plants on endemic microbial causes of diarrhoeal diseases
- The neurobiological basis of hypoglycemia-associated autonomic failure
- Stimulation of angiotensin 4 in cardiac fibroblasts activates matrix metalloproteinases through MAP kinases pathways: A model for astrocytes
- REM sleep and memory
- End of life care in Grenada
- Novel antibiotics from tropical marine environments
- Genetic correlates of the addictive diseases: cocaine, alcohol, and marijuana addiction– Grenada
- An investigation of pediatric botanical medicine for acute respiratory infections

### 7.3 Unique Projects

- Characterization of five amphibians inhabiting Grenada and subsequent isolation and antimicrobial assay of potential antibiotics derived from their skin
- Mona monkey studies in West Africa
- Investigation of medicinal plants in Grenada
- Use of medicinal plants in Grenada
- Medicinal drugs from the sea: what do Grenada's waters have to offer?
- Beekeeping in Grenada: effects of the mite *Varroa jacobsoni* and its control
- Efficacy of phage therapy using an in vitro biofilm wound model system
- Degradation of 7 keto cholesterol by Xenohydrolases
- Ecological survival properties of pelagic and benthic indicator microorganisms from the St. John's river outflow in Grenada
- The public health importance of dogs, Grand Anse, Grenada
- Greater occipital nerve zones for treatment of occipital neuralgia
- Photovoltaic power generation program



- Review of current biomedical waste management practices in the Organization of Eastern Caribbean States (OECS) Countries
- Microbial diversity in the iron-oxidizing biofilms of soda springs in Grenada
- Circadian cycle of iron-oxidation in warm soda springs in St. Andrew's, Grenada, West Indies
- Do the microorganisms in the soda spring water derive energy from the oxidation of manganese?
- Novel marine bacteria and their antagonistic properties against medically relevant biofilms
- Physiological characterization of novel marine bacterial species isolated off Grenada
- Characterization of marine sponge-associated bacteria and cytotoxic activity of sponge extracts towards human cancer cells
- Examining HIV/AIDS provider stigma: assessing regional concerns in the islands of the Eastern Caribbean
- Knowledge, attitudes and practice survey for women (baseline survey)
- Caribbean EcoHealth Programme: public and environmental health interactions in food and water-borne illnesses (CEHP)
- Persistent Organic Pollutants
- Implementing Renewable Energy and Preventing Land Degradation: An Intervention in the Nutmeg Industry in Grenada
- Effects of prenatal ethanol exposure on the role of matrix-metalloproteinase mediated neural crest cells in an avian model
- Assessing Medical Students' Behavior, Perception, and Knowledge of UV Exposure and Sunscreen Application in the Caribbean (Grenada)
- Basic Life Support Knowledge and Skill Retention in Pre-Clinical Undergraduate Medical Students
- Student Satisfaction, Comfort and Self-confidence in a Simulation Lab Practice Session
- Reducing marine Litter in the Wider Caribbean: Developing and Implementing Best Waste Management Practices
- Ethical Issues and Challenges in Global Population Health Research Partnerships
- Disaster Management in Grenada: Northumbria University Student Research
- Baseline Coral Reef Monitoring Program for Sandy Island Oyster Bed Marine Protected Area Mooring Buoy Installation Project
- Genome annotation in microorganisms and metagenomic libraries as a part of an undergraduate curriculum
- Molecular identification of marine *Vibrio* isolated in Grenada
- Occurrence of Antibiotic-resistant Fecal Indicators in Coastal waters of

Southern Grenada

- Investigation of disease in pre-growout fish in a commercial aquaculture operation in Ecuador

**Section 8.0**

**International Conferences  
Sponsored in Grenada (1)**

- USDA Regional Mite Identification workshop, executed by the USDA-APHIS, Inter-American Institute for Cooperation on Agriculture (IICA) CARICOM Secretariat with technical expertise provided by the Florida Association for Volunteer Action in the Caribbean and the Americas (FAVACA), August 2012.

## Section 9.0

### Abstracts/Presentations at International Conferences Invited Plenary/Workshops/Roundtables/ Professional Meetings/CME (65)

- Akpinar-Elci, G., M., Radix, R., Elci, O.C. (2012). Prevalence of Chronic Respiratory Disease Over Time In Grenada, The Caribbean. Paper presented at the ATS, San Francisco, CA.
- Akpinar-Elci, M. (2012). Prevention of Needle Stick Injuries and Blood Borne Pathogen Exposure among Healthcare Workers. Paper presented at the Occupational Health for Health Care Workers Conference, Dubai, United Arab Emirates.
- Akpinar-Elci, M., Bidaisee, S., Thomas-Purcell, K.B., Elci, O.C. (2012). Occupational Health and Safety Train the Trainer Program in a Nutmeg Production Plant in Grenada, The Caribbean. Paper presented at the 140th Annual Meeting of the American Public Health Association (APHA), San Francisco, CA.
- Ali, M., Chaudhury, I., Marshall, E. Turner, B., Snosek, M., Tubbs, S.R., Anderson, R.H., Loukas, M. (2012). The anatomy of the aortic root. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Amadi, V. A., Dolphin, G., Gue, R., Graff, S., Kotelnikova, S. V. (2012). Tropical Beach waters harbor resistant bacterial indicators: *Escherichia coli* presented similar antibiotic resistance patterns to uropathogenic isolates. Paper presented at the 3rd ASM Conference on Antimicrobial Resistance in Zoonotic Bacteria and Foodborne Pathogens in Animals, Humans and the Environment, Aix-en-Provence, France.
- Amadi, V. A., & Kotelnikova, S. V. (2012). Temporal Variation of Indicators in Coastal Waters of Southern Grenada. Paper presented at the Conference of Society for Applied Microbiology (SfAM), Edinburgh, Scotland.
- Bidaisee, S., Macpherson, C. C., Macpherson, C. N. L. (2012). Human behavior, climate change, and viral zoonoses. Paper presented at the One Health One Medicine Conference, St. George's University, Grenada.
- Bidaisee, S. (2012). Sexual and Reproductive Health Education: A case for inclusion in the curriculum of primary schools in the Caribbean. Paper presented at the 140th Annual Meeting of the American Public Health Association (APHA), San Francisco, USA.
- Bidaisee, S. (2012). An Exploration of Zoonotic Disease Knowledge in Grenada. Paper presented at the XXIII International Conference on Rabies in the Americas (RITA) meeting, Sao Paulo, Brazil.
- Bidaisee, S. (2012). Sexual and Reproductive Health Education: A case for inclusion in the curriculum of primary schools in the Caribbean. Paper presented at the World Federation of Public Health Associations, 13th World Congress on Public Health, Addis Ababa.
- Boadu, A., Sawyer, J., Benhusen, S., Bahadoor-Yetman, A., Messam, L.,

- McIntosh, C., Baldwin, A. (2012). Cervical Lesion Prevalence in Carriacou: An Analysis of Cervical Specimens (2007-2009). Paper presented at the 28th International Papillomavirus Conference & Clinical and Public Health Workshops, San Juan, Puerto Rico.
- Bubb, K., Cassidy, L., Walters, A., Shoja, M.M., Tubbs, R.S., Loukas, M. (2012). Piriformis syndrome: Implications of anatomical variations, diagnostic techniques, and treatment options. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Carmichael, S. W., Tubbs, R.S., Loukas, M. (2012). How to conduct a scientific study that could be published in Clinical Anatomy. Paper presented at the 2nd International Anatomical Sciences and Cell Biology Conference.
- Carmichael, S. W., Tubbs, R.S., and Loukas, M. (2012). Clinical anatomy and reverse translational research. Paper presented at the XXII International Symposium on Anatomical Sciences, San Paolo, Brazil.
- Chappell, T. M., Panchani, P., Moore, G.D., Tubbs, R.S., Shoja, M.M., Loukas, M., Kozlowski, P.B., Khan, K.H., Dilandro, A., D'Antoni, A.V. (2012). Anatomic, histologic, and radiographic study of the fibular collateral ligament. Paper presented at the Clinical Anatomy.
- Chikweto, A., Hariharan, H., Bhaiyat, M.I., Tiwari, K.P., Kumthekar, S., Dragon, L., Sharma, R.N. (2012). Klebsiella Pneumoniae Infection in a squirrel monkey. On Focused Scientific Group: Diagnostic Pathology.
- Chiochinkatmun, N., Elci, M.A., Macpherson, C.C. (2012). Palliative and Hospice Care in the Caribbean Region. Paper presented at the The 72nd Annual UWI-BAMP Independence Conference, in association with NACCPM and BSEC. Pain Management: Clinical, Legal and Ethical Implications, Barbados.
- Delcastillo, E., Prior, A., Roach, T., Snosek, M., George, R., Tubbs, R.S., Loukas, M. (2012). An endoscopic and ultrasound approach to the valves of the femoral veins. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Dewailly, E., Forde, M., Morrison, K.E., Badrie, N. (2012). Collaboration in environmental health in the Caribbean region: Can we do better? Paper presented at the 57th Annual Caribbean Health Research Council Conference, Cayman Islands.
- Dewailly, E., Rouja, P., Peek-Ball, C., Côté S, Forde, M. (2012). Evaluation of a public health intervention to lower mercury exposure in Bermuda. Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social justice and the Social Determinants of health, Ottawa, Ontario, Canada.
- Dewailly, E., Rouja, P., Forde, M., Peek-Ball, C., Côté S, Sandy, L., Robertson, L. (2012). Mercury lowering: Evaluation of a public health intervention on mercury exposure from fish consumption in

- Bermuda. Paper presented at the 57th Annual Caribbean Health Research Council Conference, Cayman Islands.
- Drebot, M. A., Krecek, R.C., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Malowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonotic agent seroprevalence among islands in the Caribbean: Preliminary results from a Caribbean EcoHealth Programme initiative. Paper presented at the 57th Annual Caribbean Health Research Council Conference, Cayman Islands.
- Folterman, C., Zurada, A., Ettienne, D., Gielecki, J., Michalak, M., Kucharczyk, E., Tubbs, R.S., Loukas, M. (2012). Transverse pericardial sinus: Normal or pathologic? An anatomical CT approach. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Forde, M. (2012). Developing and enhancing research capacity in the Caribbean. Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social justice and the Social Determinants of health, Ottawa, Ontario, Canada.
- Forde, M., Cox, C., Boodram, N. (2012). Determining the safety of rainwater harvesting systems in the Caribbean. Paper presented at the Caribbean Academy of Sciences' 18th General Meeting and Conference "Hazard Mitigation: Protecting Caribbean Infrastructure-Securing Caribbean Communities", Bridgetown, Barbados.
- Forde, M., Dewailly, E. (2012). Assessing prenatal exposure to persistent organic pollutants (POPs) and other toxicants in the Caribbean. Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social justice and the Social Determinants of Health, Ottawa, Ontario, Canada.
- Forde, M., Dewailly, E., Morrison, K.E., Badrie, N. (2012). The Caribbean EcoHealth Programme (CEHP): building collaborative research capacity and capabilities to address environmental and public health issues in the Caribbean. Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social justice and the Social Determinants of Health, Ottawa, Ontario, Canada.
- Forde, M., Dewailly, E., Côté, S., Kaddar, N., Robertson, L. (2012). Assessing the prevalence of persistent organic pollutants (POPs) in humans in the Caribbean: Preliminary findings of the Caribbean EcoHealth (CEHP) POPs study. Paper presented at the 57th Annual Caribbean Health Research Council Conference, Cayman Islands.
- Forde, M., Robertson, L., Sandy, L. (2012). Community Based Environmental Monitoring in The Commonwealth of Dominica (CoD). Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social justice and the Social Determinants of Health, Ottawa, Ontario, Canada.
- Forde, M., Dewailly, E., Morrison, K.E., Badrie, N. (2012). The Caribbean EcoHealth Programme (CEHP) a collaborative research and capacity development methodology for addressing environmental health issues in the Caribbean. Paper

- presented at the 6th Biennial Caribbean Environmental Forum and Exhibition, St. Kitts & Nevis.
- Forde, M., Dewailly, E., Côté, S., Robertson, L. (2012). Prevalence of persistent organic pollutants (POPs), pesticides, lead, and mercury in pregnant women in the Caribbean. Paper presented at the 6th Biennial Caribbean Environmental Forum and Exhibition, St. Kitts & Nevis.
- Garon, J., & McCann, T. J. (2012). Teaching theatrical techniques to enhance realism in simulation. Paper presented at the Society for Simulation in Healthcare 12th Annual International Meeting on Simulation in Healthcare, San Diego, CA.
- Georgiana, M., Hillman, D., Burns, D., Hage, R., Tubbs, R.S., Loukas, M. (2012). A new ultrasonographic identification of the recurrent laryngeal nerve: A feasibility study. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Havens, K., Bidaisee, S., Macpherson, C. N. L. (2012). An Assessment of Stray Dog Control Practices in Grenada. Paper presented at the 27th Caribbean Veterinary Medical Association Meeting, Port of Spain, Trinidad.
- Hillman, D., Kollias, T., Louis, R.G. Jr., D'Antoni, A., Tubbs, R.S., Loukas, M. (2012). Mapping the contributions of the furcal nerve. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Kalchofner Guerrero, K. S., Wuhrmann, R., Schwarz, A. M. M., Feldmann, S., Hartnack, S., & Bettschart-Wolfensberger, R. (2012). Comparative study of a new metamizole (dipyrone) formulation and carprofen on postoperative pain in dogs undergoing ovariohysterectomy. Paper presented at the Association of Veterinary Anaesthetists Spring Meeting, Davos, Switzerland.
- Kollias, T., Louis, R.G. Jr., Tubbs, S.R., Ellias, J., Loukas, M. (2012). Intercostal to long thoracic nerve transfer for the treatment of winged scapula: Cadaveric feasibility study. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Kotelnikova, S. (2012). Is meat a biological weapon? Oral presentation. Paper presented at the One Health One Medicine Conference, St. Georges University, Grenada.
- Krecek, R. C., Wood, H., Drebot, M., Loftis, A., Lee, E., Robertson, L., Dimotrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K. E., Forde, M. (2012). Prevalence of zoonotic infections in the Caribbean: Can you catch diseases from animals? Paper presented at the 6th Biennial Caribbean Environmental Forum and Exhibition, St. Kitts & Nevis.
- Krecek, R. C., Wood, H., Drebot, M., Loftis, A., Lee, E., Robertson, L., Dimotrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K.E., Forde, M. (2012). A community level study of zoonotic infections in the Caribbean: A global health research opportunity. Paper presented at the Teasdale-Corti Symposium: Innovations in Global Health Research-Global social

- justice and the Social Determinants of Health, Ottawa, Ontario, Canada.
- Loukas, M., Hage R., Burns, D., Jordan, R., Curry, B., Brahim F., Marshall, E., Bubb, K., Wade, A. (2012). An innovative approach teaching 650 medical students in the anatomy at St. George's University in Grenada. Paper presented at the Experimental Biology FASEB, San Diego, CA.
- Loukas, M., Hage R., Burns, D., Jordan, R., Brahim F., Marshall, E. (2012). How do you teach 650 medical students anatomy and clinical implications in 16 weeks? It is done at St. George's University, Grenada twice a year! Paper presented at the Association of Medical Education in Europe, Lyon, France.
- Loukas, M., Hage, R., Burns, D., Jordan, R., Rao, V., Curry, B., Brahim, F., Marshall, E., Bubb, K., Wade, A., George, R., Barhuah, S. (2012). Quo Vadis. Teaching anatomy to 1,300 medical students per year at St. George's University, Grenada. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Macpherson, C. C. (2012). Autonomy, bioethics, and climate change. Paper presented at the 11th World Congress of Bioethics, International Association of Bioethics (IAB), Rotterdam.
- Maetani, T., Macarthur, D.H., Adams D.M., Loukas, M., Huang T.L., Ward., R.J. (2012). When life is flipped: Getting a handle on Notch-displaced longitudinal vertical meniscal tears and associated mimics and pitfalls. Paper presented at the Radiological Society of North America 98th Annual meeting, Chicago.
- Marshall, E., Spentzouris, G., Muhleman, M., Shaffer, K., Tubbs, R.S., Gielecki, J., Loukas, M. (2012). The clinical anatomy of the inferior vena cava. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- McCann, T. J., Brady, G. M., & Scott, A. K. M. (2012). Interactive simulation for pre-clinical medical students. Paper presented at the Society for Simulation in Healthcare 12th Annual International Meeting on Simulation in Healthcare, San Diego, CA.
- McCann, T. J., & Speake, J. (2012). A new mixed model simulation lab experience for large numbers of preclinical medical students. Paper presented at the Society for Simulation in Healthcare 12th Annual International Meeting on Simulation in Healthcare, San Diego, CA.
- Morrison, K., Watson-Burgess, H., Forde, M., Gomez, A. (2012). Understanding obstacles to ethical global health research. Paper presented at the 57th Annual Caribbean Health Research Council Conference, Cayman Islands.
- Morrison, K. E., Forde, M., Dewailly, E., Robertson, L., Indar, L., Krecek, R.C., Drebot, M., Wood, H., Cox, C., Badrie, N. (2012). Instituting Ecohealth at the Regional Level: Structure, Findings and Recommendations of the Caribbean Ecohealth Programme (2007-2012). Paper presented at the Ecohealth 2012 Conference, Kunming, China.
- Morrison, K. E., Tomsons, S., Gomez, A., Forde, M. (2012). Ethical issues and experiences in global North-

- South population health research: implications for Ecohealth. Paper presented at the Ecohealth 2012 Conference, Kunming, China.
- Morrison, K. E., Forde, M., Robertson, L., Dewailly, E., Indar, L., Krecek, R.C., Drebot, M., Wood, H., Cox, C. Badrie, N. (2012). Critical links between animal and human health: Caribbean Ecohealth Programme Research Results 2007-2012. Paper presented at the Global Development Symposium, University of Guelph, Canada.
- Morrison, K. E., Tomsons, S., Forde, M., Gomez, A. (2012). Ethical Issues and Challenges in Global North-South Population Health Research. Paper presented at the Global Development Symposium, University of Guelph, Canada.
- Neff, B., Rodrigo, S., Akpinar-Elci, M., (2012). Resident perspective on rainwater harvesting in Grenada. Paper presented at the International Conference on Governance for Sustainable Development of Caribbean SIDS, Curacao.
- Panchani, P., Chappell, T., Moore, G.D., Tubbs, R.S., Shoja, M.M., Loukas, M., Kozlowski, P.B., Khan, K.H., Dilandro, A.C., D'Antoni, A.V. (2012). Anatomic and histologic study of variations in the deltoid ligament of the ankle. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Pinckney, R. D., Paterson, T.E. (2012). Aberrant migration of *Dirofilaria immitis* in dogs. Paper presented at the NAVC Clin Brief (Make Your Diagnosis 9).
- Prior, A., Roach, T., Turner, B., Bubb, K., Tubbs, S.R., Loukas, M. (2012). An endoscopic and ultrasound approach to the valves of the small saphenous veins. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Riccardi, R., Mahalean, S., Kollias, T., Bubb, K., Turner, B., Snosek, M., Tubbs, R.S. Loukas, M. (2012). High take off coronary arteries and its potential association with sudden cardiac death. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Roach, T., Prior, A., Marshall, E., Wade, A., Tubbs, S.R., Loukas, M. (2012). An endoscopic approach to the valve of the inferior vena cava. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Roberts, W., Burns, D., Gilkes, M., Yadav, A., Koppelman, E., Tubbs, R.S. Loukas, M. (2012). An ultrasonographic identification of the variations of the internal jugular vein. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.
- Rooney, J., Bourne-Yearwood, K., McGill, F., & McCann, T. J. (2012). The introduction of a simulation laboratory to preclinical students at St. George's University in Grenada. Paper presented at the Trinidad and Tobago Medical Association 17th Medical Update and Research Conference, Port of Spain, Trinidad.
- Sealy, H. J. (2012). The Relevance of the Carbon Market to the Water and Waste Sectors in the Caribbean.



Paper presented at the Proceedings of the 21st Annual Conference and Exhibition of the Caribbean Water and Wastewater Association, Nassau, Bahamas.

Snosek, M., Bellary, S., Cankara, N., Shoja, M.M., Tubbs, S.R., Spinner, R.J., Loukas, M. (2012). Ulnar nerve innervation of the medial head of the triceps brachii muscle: A cadaveric study. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.

Turner, B., Prior, A., Roach, T., Forrester, D. Tubbs, R.S., Loukas, M. (2012). Endocardiac endoscopic lead extraction: A cadaver feasibility study. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.

Wear, C., Burns, D., Forrester, D., Marshall, E., D'Antoni, A.V., Tubbs, R.S., Loukas, M. (2012). An ultrasono-graphic identification of the posterior interosseous nerve for identification of posterior interosseous neuropathy. Paper presented at the 29<sup>th</sup> Annual American Association of Clinical Anatomists Conference, St. George's University, Grenada.

## Section 10.0 Publications

### 10.1 Books (3)

Bidaisee, S. (2012). Paradigm shift in educational research and contemporary debates: Lambert Academic Publishing.

Loukas, M., Benninger, B., Tubbs, R.S. (2012). Tubbs Gray's Clinical Photographic Dissector of the Human Body: with STUDENT CONSULT Online Access: Elsevier Saunders, Philadelphia.

Macpherson, C., Meslin, F., Wandeler, A. (2012). Dogs, Zoonoses and Public Health 2nd edition (2nd ed.): CABI.

### 10.2 Book Chapters (4)

Kooby, D. A., Loukas, M., Skandalakis, J.E., McClusky, A.D. III, Mirilas, P. (2012). Chapter 126: Surgical Anatomy of the Pancreas. In Fischer's Mastery of Surgery 6th edition (pp. 1375-1392). Philadelphia: Walters Kluwer Lippincott Williams and Wilkins Philadelphia.

Ricketts, R. R., Loukas, M., Skandalakis, L.J., & McClusky, D. A., Mirilas, P. (2012). Chapter 58: Surgical Anatomy of the Diaphragm. In Fischer's Mastery of Surgery 6th edition (pp. 718-736). Philadelphia: Walters Kluwer Lippincott Williams and Wilkins Philadelphia.

Skandalakis, L. J., McClusky, A.D. III, Loukas, M., Mirilas, P. (2012).

Chapter 80: Anatomic Considerations in Gastroduodenal Surgery. In Fischer's Mastery of Surgery 6th edition (pp. 957-979). Philadelphia: Walters Kluwer Lippincott Williams and Wilkins Philadelphia.

Wekerle, C., Waechter, R., & Chung, R. (2012). Contexts of vulnerability and resilience: Child maltreatment, cognitive functioning, and close relationships. In M. Ungar (Ed.), *The Social Ecology of Resilience* (pp. 187-198). Springer.

### 10.3 Journal Articles (85)

- Abbasnejad, F., Shoja, M. M., Agutter, P. S., Alakbarli, F., Loukas, M., Shokouhi, G., Khalili, M., Tubbs, R.S. (2012). Rabi Rashidi (Rashidi Quarters): a late thirteen to early fourteenth century Middle Eastern Medical School. *Childs Nervous System*, 28(11), 1823-1830.
- Aire, T. A., Ozegbe, P.C. (2012). Components and developments of the centriolar complex during and beyond spermiogenesis in a passerine bird, the masked weaver (*Ploceus velatus*). *Tissue and Cell*, 44, 63-67.
- Bellary, S. S., Waleters, A., Gielecki, J., Shoja, M.M., Tubbs, R.S, Loukas, M. (2012). Jacob B. Winslow (1669-1760). *Clinical Anatomy*, 25(5), 545-547.
- Bellary, S. S., Lynch, G., Housman, B., Esmaili, E., Gielecki, J., Tubbs, R.S., Loukas, M. (2012). Medial plica syndrome: a review of the literature. *Clinical Anatomy*, 25(4), 423-428.
- Brick, T. A., Schuenemann, G.M., Bas, S., Daniels, J.B., Pinto, C.R., Rings, D.M., Rajala-Schultz, P.J. (2012). Effect of intrauterine dextrose or antibiotic therapy on reproductive performance of lactating dairy cows diagnosed with clinical endometritis. *Journal of Dairy Science* (Online).
- Butler, C. M., Sloet van Oldruitenborgh-Oosterbaan, M.M., Stout, T.A., van der Kolk, J.H., Wollenberg, Lv., Nielen, M., Jongejan, F., Werners, A.H., Houwers, D.J. (2012). Prevalence of the causative agents of equine piroplasmiasis in the southwest of The Netherlands and the identification of two autochthonous clinical *Theileria equi* infections. *Veterinary Journal*, 193(2), 381-385.
- Cassidy, L., Walters, A., Bubb, K., Shoja, M.M., Tubbs, R.S., Loukas, M. (2012). Piriformis syndrome: implications of anatomical variations, diagnostic techniques, and treatment options. *Surgical Radiological Anatomy*, 34(6), 479-486.
- Chikweto, A., Bhaiyat, M. I., Tiwari, K. P., de Allie, C., Sharma, R. N. (2012). Spirocercosis in owned and stray dogs in Grenada. *Veterinary Parasitology*, 190(3-4), 613-616.
- Chikweto, A., McNeil, P., Bhaiyat, M.I., Stone, D., Sharma, R.N. (2012). Neoplastic and non-neoplastic cutaneous tumors of dogs in Grenada. *ISRN Veterinary Science* (Online).
- Dean, C., Etienne, D., Hindson, D., Matusz, P., Tubbs, R.S., Loukas, M. (2012). Pectus excavatum (funnel chest): a historical and current prospective. *Surgical Radiological Anatomy*, 34(7), 573-579.
- Dean, C., Etienne, D., Carpentier, B.,

- Gielecki, J., Tubbs, R.S., Loukas, M. (2012). Hiatal hernias. *Surgical Radiological Anatomy*, 34(4), 291-299.
- Delannoy, C. M. J., Zadoks, R. N., Lainson, F. A., Ferguson, H. W., Crumlish, M., Turnbull, J. R., Fontaine, M.C. (2012). Genome Announcement: Draft genome sequence of a nonhaemolytic fish-pathogenic *Streptococcus agalactiae* strain. *Journal of Bacteriology*, 194(22), 6341-6342.
- Dewailly, E., Rouja, P., Forde, M., Peek-Ball, C., Côté, S., Smith, E., Drescher, O., Robertson, L. (2012). Evaluation of a Public Health Intervention to Lower Mercury Exposure from Fish Consumption in Bermuda. *PLOS ONE*, 7(10).
- Ditty, B., Shoja, M. M., Tubbs, R. S., Loukas, M. (2012). The mendosal suture. *Clinical Anatomy*, 25(4), 521-523.
- Etienne, D., John, A., Menias, C. O., Ward, R., Tubbs, R. S., Loukas, M. (2012). Annular pancreas: a review of its molecular embryology, genetic basis and clinical considerations. *Annals of Anatomy*, 194(5), 422-428.
- Etienne, D., Zurada, A., Matusz, P., Shoja, M.M., Tubbs, R.S., Loukas, M. (2012). James Watson Kernohan (1896-1981): Frontiers in neuropathology. *Clinical Anatomy*, 25(4), 527-529.
- Gibson-Kueh, S., Chee, D., Chen, J., Wang, Y. H., Tay, S., Leong, L. N., Ng, M. L., Jones, J. B., Nicholls, P. K., Ferguson, H. W. (2012). The pathology of 'scale drop syndrome' in Asian seabass. *Lates calcarifer Bolch*, a first description. *Journal of Fish Diseases*, 35:(1), 19-27.
- Griessenauer, C. J., Shoja, M. M., Loukas, M., Tubbs, R. S. (2012). The value of hyperbaric oxygen therapy in postoperative care of subarachnoid hemorrhage. *Medical Gas Research*, 2(1), 29.
- Herath, T. K., Ferguson, H.W., Thompson, K., Adams, A., Richards, R. H. (2012). Ultrastructural morphogenesis of salmonid alphavirus. *Journal of Fish Diseases*, 35(11), 799-808.
- Iregui, C. A., Guarín, M., Tibatá, V. M. & Ferguson, H. W. (2012). Novel brain lesions caused by *Edwardsiella tarda* in a red tilapia: case report. *Journal of Veterinary Diagnostic Investigation*, 24(2), 446-449.
- John, A., Etienne, D., Klaassen, Z., Shoja, M. M., Tubbs, R. S., Loukas, M. (2012). Variations in the locations of the recurrent laryngeal nerve in relation to the ligament of Berry. *The American Journal of Surgery*, 78(9), 947-951.
- Klaassen, Z., Choi, M., Musselman, R., Eapen, D., Tubbs, R. S., Loukas, M. (2012). A review of supernumerary and absent limbs and digits of the upper limb. *Surgical Radiological Anatomy*, 34(2), 101-106.
- Kuipers von Lande, R. G., Worth, A. J., Guerrero, T. G., Owen, M. C., Hartman, A. (2012). Comparison between a novel bovine xenograft and an autogenesis cancellous bone graft in the tibial tuberosity advancement procedure. *Veterinary Surgery*, 41(5), 559-567.
- Lenz, R., Moore, G. D., Panchani, P. N., Dilandro, A. C., Battaglia, F., Tubbs, R. S., Shoja, M. M., Loukas, M., Kozłowski, P. B., D'Antoni, A. V.,. (2012). The transverse occipital ligament: an anatomic, histologic,

- and radiographic study. *The Spine Journal*, 12(7), 596-602.
- Loukas, M., Walters, A., Boon, J. M., Welch, T. P., Meiring, J. H., Abrahams, P. H. (2012). Pericardiocentesis: A Clinical Anatomy Review. *Clinical Anatomy*, 25(7), 872-881.
- Loukas, M., Tubbs, S. (2012). Gene L. Colborn (1935-2011). *Clinical Anatomy*, 25(6), 793-794.
- Loukas, M., El-Zammar, D., Tubbs, R. S., Birungi, J., Jacob, J., Shoja, M. M., Anderson, R. H. (2012). Intervenous tubercle of lower: true tubercle or normal interatrial fold? *Clinical Anatomy*, 25(6), 729-736.
- Macpherson, C., Akpınar-Elci, M. (2012). Impact of Climate change on Caribbean life. *American Journal of Public Health*, 103(1).
- Macpherson, C. C. (2012). Teaching professionalism in science courses: Anatomy to zoology. *Kaohsiung Journal of Medical Sciences*, 28(2), 8-12.
- Matusz, P., Miclaus, G. D., Ples, H., Tubbs, R. S., Loukas, M. (2012). Absence of the celiac trunk: case report using MDCT angiography. *Surgical Radiological Anatomy*, 34(10), 959-963.
- McClugage, S. G., Watanabe, K., Shoja, M. M., Loukas, M., Tubbs, R. S., Oakes, W. J. (2012). The history of the surgical repair of spina bifida. *Childs Nervous System*, 28(10), 1693-1700.
- Medl, N., Guerrero, T. G., Holzle, L., Haessig, M., Montavon, P. M. (2012). Intraoperative contamination of the suction tip in clean orthopedic surgeries in dogs and cats. *Veterinary Surgery*, 41(2), 254-260.
- Miclaus, G. D., Matusz, P., Loukas, M., Ples, H. (2012). Rare case of the trunk of the inferior phrenic arteries originating from a common stem with a superior additional left renal artery from the abdominal aorta. *Clinical Anatomy*, 25(8), 979-982.
- Mortazavi, M. M., Tubbs, R. S., Riech, S., Verma, K., Shoja, M. M., Zurada, A., Benninger, B., Loukas, M., Cohen-Gadol, A. A. (2012). Anatomy and pathology of the cranial emissary veins: a review with surgical implications. *Neurosurgery*, 70(5), 1312-1318; discussion 1318-1319.
- Muhleman, M., Charran, O., Matusz, P., Shoja, M. M., Tubbs, R. S., Loukas, M. (2012). The proatlas: a comprehensive review with clinical implications. *Childs Nervous System*, 28(3), 349-356.
- Muhleman, M. A., Wartmann, C. T., Hage, R., Matusz, P., Shoja, M. M., Tubbs, R. S., Loukas, M. (2012). A review of the tragal pointer: anatomy and its importance as a landmark in surgical procedures. *Folia Morphologica*, 71(2), 59-64.
- Murthy, V., Chamberlain, R.S. (2012). Defining a Place for Nipple Sparing Mastectomy in Modern Breast Care: An Evidence-based Review. *Breast Journal (Online)*.
- Oelhafen, K., Shayota, B.J., Muhleman, M., Klaassen, Z., Shoja, M.M., Tubbs, R.S., Loukas, M. (2012). Peritoneal bands: a review of anatomical distribution and clinical implications. *The American Journal of Surgery*, 78(4), 377-384.
- Osiro, S., Tiwari, K. J., Matusz, P., Gielecki, J., Tubbs, R. S., Loukas, M. (2012). August Forel (1848-1931): A Look at his Life and Work. *Childs Nervous System*, 28(1), 1-5.
- Osiro, S., Wear, C., Hudson, R., Ma, X. X.,

- Zurada, A., Michalak, M., Loukas, M. (2012). A friend to the airways: a review of the emerging clinical importance of the bronchial arterial circulation. *Surgical Radiological Anatomy*, 34(9), 791-798.
- Osiro, S., Downs, E., Grater, J., Loukas, M. (2012). Francis Sibson (1814-1876): the unsung hero of modern surgery and anesthesia. *World Journal of Surgery*, 36(8), 1993-1997.
- Osiro, S., Tiwari, K.J., Matusz, P., Gielecki, J., Tubbs, R. S., Loukas, M. (2012). Grisel's syndrome: a comprehensive review with focus on pathogenesis, natural history, and current treatment options. *Childs Nervous System*, 28(6), 821-825.
- Osiro, S., Zurada, A., Gielecki, J., Shoja, M. M., Tubbs, R. S., Loukas, M. (2012). A review of subclavian steal syndrome with clinical correlation. *Medical Science Monitor*, 18(5), RA57-63.
- Osiro, S. B., Cunningham, D., Shoja, M. M., Tubbs, R. S., Gielecki, J., Loukas, M. (2012). The twisted colon: a review of sigmoid volvulus. *American Journal of Surgery*, 78(3), 271-279.
- Ozegbe, P. C., Aire, T. A., Deokar, M. S. (2012). The cytoskeleton proteins in the contractile tissues of the testis and its excurrent ducts of the passerine bird, Masked Weaver (*Ploceus velatus*). *Tissue and Cell*, 44(1), 22-31.
- Pinkerton, K., Rom, W., Akpınar-Elci, M., Bayram, H., Brandli, O., Hollingsworth, J., Kinney, P., Margolis, H., Martin, W., Smith, K., Takaro, T., Upahyay, D., Wegman, L. (2012). An Official American Thoracic Society Workshop Report: Climate Change and Human Health. *Proceedings of the American Thoracic Society*, 9(1), 3-8.
- Piras, A., Guerrero, T. G. (2012). Minimally invasive repair of metatarsals. *Veterinary Clinics of North America: Small Animal Practice*, 42(5), 1045-1050.
- Porzionato, A., Macchi, V., Stecco, C., Loukas, M., Tubbs, R. S., De Caro, R. (2012). Surgical Anatomy of the pectoral nerves and the pectoral musculature. *Clinical Anatomy*, 25(5), 559-575.
- Rooney, J., Bourne-Yearwood, K., McGill, F., & McCann, T. J. (2012). The introduction of a simulation laboratory to preclinical students at St. George's University in Grenada. *Caribbean Medical Journal*, 74, 11-15.
- Shoja, M. M., Agutter, P. S., Loukas, M., Shokouhi, G., Khalili, M., Farhoudi, M., Tubbs, R. S. (2012). Cranioplasty in medieval Persia and the potential spread of this knowledge to Europe. *Childs Nervous System*, 28, 1993-1996.
- Shoja, M. M., Loukas, M., Tubbs, R. S., D'Antoni, A., DiLandro, A., Curé, J.K. (2012). An aberrant cerebellar artery originating from the internal carotid artery. *Surgical Radiological Anatomy*, 34(3), 285-288.
- Shoja, M. M., Harris, A., Shoshani, Y., Siesky, B., Primus, S., Loukas, M., Tubbs, R. S. (2012). Central retinal artery originating from the temporal short posterior ciliary artery associated with intraorbital external-to-internal carotid arterial anastomoses. *Surgical Radiological Anatomy*, 34(2), 187-189.
- Singh, N., Bixby, C., Etienne, D., Tubbs, R. S., Loukas, M. (2012).

- Alexander's disease: reassessment of a neonatal form. *Childs Nervous System*, 28(12), 2029-2031.
- Solomon, R., Giganti, M., Weiner, A., Akpinar-Elci, M. (2012). Water safety education among primary school children in Grenada. *International Journal of Injury Control and Safety Promotion* (Online).
- Stone, D. M., Kumthekar, S.M., Chikweto, A., Thomas, D., Tiwari, K., Sharma, R.N. (2012). Exposure to zoonotic abortifacients among sheep and goats in Grenada. *International Journal of Animal and Veterinary Advances*, 4(2), 113-118.
- Stuart, K., & Soulsby, E. J. L. (2012). Reducing global health inequities, part 1. *Journal of the Royal Society of Medicine*, 104, 321-326.
- Stuart, K., & Soulsby, E. J. L. (2012). Reducing global health inequities, part 2: Myriad challenges. *Journal of the Royal Society of Medicine*, 104, 401-404.
- Stuart, K., & Soulsby, E. J. L. (2012). Reducing global health inequities, part 3: Collaboration and funding. *Journal of the Royal Society of Medicine*(104), 442-448.
- Tubbs, R. S., Shoja, M.M., Loukas, M., Carmichael, S.W. (2012). Oliver Wendell Holmes, Sr. (1809-1894): Physician, jurist, poet, inventor, pioneer, and anatomist. *Clinical Anatomy*, 25(8), 992-997.
- Tubbs, R. S., Mortazavi, M. M., Shoja, M. M., Loukas, M., Cohen-Gadol, A. A. (2012). The zygomaticotemporal nerve and its relevance to neurosurgery. *World Neurosurgery*, 78(5), 515-518.
- Tubbs, R. S., Muhleman, M., McClugage, S. G., Loukas, M., Miller, J. H., Chern, J. J., Rozzelle, C.J., Oakes, W.J., Cohen-Gadol, A.A. (2012). Progressive symptomatic increase in the size of choroidal fissure cysts. *Journal of Neurosurgery: Pediatrics*, 10(4), 306-309.
- Tubbs, R. S., Nguyen, H. S., Loukas, M., Cohen-Gadol, A. A. (2012). Anatomic study of the lamina terminalis: neurosurgical relevance in approaching lesions within and around the third ventricle. *Childs Nervous System*, 28(8), 1149-1156.
- Tubbs, R. S., Steck, D. T., Mortazavi, M. M., Shoja, M. M., Loukas, M., Cohen-Gadol, A. A. (2012). Giovanni Battista Morgagni (1682-1771): his anatomic majesty's contributions to the neurosciences. *Childs Nervous System*, 28(7), 1099-1102.
- Tubbs, R. S., Louis, R. G. Jr., Song, Y. B., Mortazavi, M., Loukas, M., Shoja, M. M., Cohen-Gadol, A. A. (2012). External landmarks for identifying the drainage site of the vein of Labbé: application to neurosurgical procedures. *British Journal of Neurosurgery*, 26(3), 383-385.
- Tubbs, R. S., Song, Y. B., Loukas, M., Shoja, M. M., Gadol, A. A. (2012). Wilhelm Fabricius von Hilden (Guilhelmus Fabricius Hildanus) 1560-1634: Pioneer of early neurosurgery. *Childs Nervous System*, 28(5), 657-659.
- Tubbs, R. S., Muhleman, M., Loukas, M., Oakes, W. J. (2012). Chiari I malformation and syringomyelia in a child following a lightning strike. *Childs Nervous System*, 28(5), 751-753.
- Tubbs, R. S., Muhleman, M., Miller, J., Shoja, M.M., Loukas, M., Wellons, J. C., Oakes, W. J. (2012). Cervical ribs with neurological sequelae in children: a case series. *Childs*

- Nervous System, 28(4), 605-608.
- Tubbs, R. S., Bosmia, A. N., Mortazavi, M. M., Loukas, M., Shoja, M., Cohen-Gadol, A. A. (2012). Hieronymus Brunschwig (c. 1450-1513): his life and contributions to surgery. *Childs Nervous System*, 28(4), 629-632.
- Tubbs, R. S., Rompala, O., Verma, K., Malakpour, M., Shoja, M. M., Mortazavi, M. M., Loukas, M. (2012). James Drake (1667-1707): Anatomist and political activist. *Clinical Anatomy*, 25(3), 295-298.
- Tubbs, R. S., Shoja, M. M., Loukas, M. (2012). William Henry Battle (1855-1936). *Journal of Neurology*, 259(4), 790-791.
- Tubbs, R. S., Rompala, O. J., Verma, K., Mortazavi, M. M., Benninger, B., Loukas, M., Chambers, M. R. (2012). Analysis of the uncinatate processes of the cervical spine: an anatomical study. *Journal of Neurosurgery: Spine*, 16(4), 402-407.
- Tubbs, R. S., Riech, S., Verma, K., Mortazavi, M. M., Loukas, M., Benninger, B., Cohen-Gadol, A. A. (2012). Sir Charles Bell (1774-1842) and his contributions to early neurosurgery. *Childs Nervous System*, 28(3), 331-335.
- Tubbs, R. S., Muhleman, M., Loukas, M., Cohen-Gadol, A. A. (2012). Ventriculoperitoneal shunt malfunction from cerebrospinal fluid eosinophilia in children: case-based update. *Childs Nervous System*, 28(3), 345-348.
- Tubbs, R. S., Gianaris, N., Shoja, M. M., Loukas, M., Cohen-Gadol, A. A. (2012). "The heart is simply a muscle" and first description of the tetralogy of "Fallot". Early contributions to cardiac anatomy and pathology by bishop and anatomist Niels Stensen (1638-1686). *International Journal of Cardiology*, 154(3), 312-315.
- Tubbs, R. S., Muhleman, M., Loukas, M., Oakes, W.J. (2012). A new form of herniation: the Chiari V malformation. *Childs Nervous System*, 28(2), 305-307.
- Tubbs, R. S., Hattab, E. M., Loukas, M., Chern, J. J., Wellons, M., Wellons, J.C. 3rd, Iskandar, B. J., Cohen-Gadol, A. A. (2012). Histological analysis of the third ventricle floor in hydrocephalic and nonhydrocephalic brains: application to neuroendocrine complications following third ventriculostomy procedures. *Journal of Neurosurgery: Pediatrics*, 9(2), 178-181.
- Tubbs, R. S., Mortazavi, M., Shoja, M. M., Loukas, M., Cohen-Gadol, A. A. (2012). Maister Peter Lowe and his 16th century contributions to cranial surgery. *Neurosurgery*, 70(2), 259-263.
- Tubbs, R. S., Lancaster, J. R., Mortazavi, M. M., Loukas, M., Shoja, M. M., Hattab, E. M., Cohen-Gadol, A. A. (2012). Do grossly identifiable ganglia lie along the spinal accessory nerve? A gross and histologic study with potential neurosurgical significance. *World Neurosurgery*, 77(2), 349-351.
- Tubbs, R. S., Kakati, D., Chern, J. J., Loukas, M., Shoja, M., Mortazavi, M. M., Cohen-Gadol, A. A. (2012). Tatsuji Inouye: the mind's eye. *Childs Nervous System*, 28(1), 147-150.
- Tubbs, R. S., Radcliff, V., Shoja, M. M., Naftel, R. P., Mortazavi, M. M., Zurada, A., Loukas, M., Cohen-Gadol, A. A. (2012). Dorello canal revisited: an observation that

- potentially explains the frequency of abducens nerve injury after head injury. *World Neurosurgery*, 77(1), 119-121.
- Tubbs, R. S., Mortazavi, M. M., Louis, R. G., Loukas, M., Shoja, M. M., Chern, J. J., Benninger, B., & Cohen-Gadol, A. A. (2012). The anterior atlantodental ligament: its anatomy and potential functional significance. *World Neurosurgery*, 77(5-6), 775-777.
- van der Kolk, J. H., van Putten, L. A., Mulder, C. J., Grinwis, G. C., Reijm, M., Butler, C. M., von Blomberg, B. M. (2012). Gluten-dependent antibodies in horses with inflammatory small bowel disease (ISBD). *Veterinary Quarterly*, 32(1), 3-11.
- Watanabe, K., Shoja, M. M., Loukas, M., Tubbs, R. S. (2012). Buntaro adachi (1865-1945): Japanese master of human anatomic variation. *Clinical Anatomy*, 25(8), 957-960.
- Williams, C. F., Moravec, F., Turnbull, J. F., Ferguson, H. W. (2012). Seasonal development and pathological changes associated with the parasitic nematode *Philometroides sanguineus* in wild crucian carp *Carassius carassius* (L.) in England. *Journal of Helminthology*, 86(3), 328-338.
- Yalcin, B., Tubbs, R. S., Durmaz, A., Comert, A., Toygar, M., Loukas, M., Develi, S. (2012). Branching pattern of the external branch of the superior laryngeal nerve and its clinical importance. *Clinical Anatomy*, 25(1), 32-39.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Jamaica. Jamaica.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Bermuda. Bermuda.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for St. Vincent. St. Vincent.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for St. Lucia. St. Lucia.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for St. Kitts & Nevis. St. Kitts & Nevis.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Montserrat. Montserrat.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Grenada. Grenada.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM

**10.4 Government, NGO Policy Reports, Knowledge Translation, Other (21)**



- Region: National Report for Dominica. Dominica.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Antigua & Barbuda. Antigua & Barbuda.
- Forde, M., Dewailly, E. (2012). Prenatal exposure to Persistent Organic Pollutants (POPs), pesticides, and heavy metals in the CARICOM Region: National Report for Belize. Belize.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Antigua. Antigua.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Belize. Belize.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Grenada. Grenada.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for St. Vincent. St. Vincent.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for St. Lucia. St. Lucia.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for St. Kitts & Nevis. St. Kitts & Nevis.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Montserrat. Montserrat.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Jamaica. Jamaica.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Dominica. Dominica.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for Bermuda. Bermuda.
- Krecek, R. C., Drebot, M. A., Wood, H., Loftis, A., Lee, E., Robertson, L., Dimitrova, K., Makowski, K., Dillon, L., Dewailly, E., Morrison, K., Forde, M. (2012). Zoonoses Study in the CARICOM Region: National Report for CARICOM.

#### 10.4 Magazine, Newspaper, and Mass Media Reports (5)

- Amadi, V. A., Kotelnikova, S. V. (2012). Occurrence of antibiotic-resistant fecal indicators in coastal waters of southern Grenada, West Indies. *Microbiologist (Magazine of The Society for Applied Microbiology)*.
- Forde, M., Morrison, K.E., Badrie, N., Dewailly, E. (2012). Policy Implications of the Caribbean EcoHealth Programme. Caribbean Health Research Council (CHRC) News, pp. 2,4.
- Forde, M. (2012). Results and policy implications of Persistent Organic Pollutants Study conducted in Montserrat [Radio]. Montserrat: ZJB Radio Montserrat FM.
- Forde, M. (2012). Results and policy implications of Persistent Organic Pollutants Study conducted in Montserrat [Radio]. Grenada: Spice Capital Radio.
- Kotelnikova, S. (2012). Is meat a biological weapon? *Gorodskije Novosti*.

#### Section 11.0

##### Journals and Board Review Activity

**Dr. Muge Akpinar-Elci:** American Journal of Respiratory and Critical Medicine, The Archives of Environmental and Occupational Health, Chest.

**Dr. Francis Fakoya:** Journal of Anatomical Sciences

**Dr. Martin Forde:** Environmental Monitoring and Assessment.

**Dr. Svetlana Kotelnikova:** Earth Science Reviews, Elsevier, International Journal of Systematic and Evolutionary Microbiology

**Dr. Marios Loukas:** Surgical and Radiologic Anatomy, Clinical Anatomy, Neuroanatomy, European Journal of Surgical Research, Journal of Brachial Plexus and Peripheral Nerve Injury, Journal of Anatomy, Pain Practice, Medical Science Monitor, Indian Journal of Plastic surgery, American Journal of the Medical Sciences, Clinical Rehabilitative Tissue Engineering Research, Life Sciences, Anatomy, International Journal of Experimental and Clinical Anatomy, Current Urology, World Journal of Surgery, Clinical Medicine Case Reports, World Journal of Emergency Medicine, Acta Neurochirurgica, Turkiye Klinikleri Journal of Medical Sciences, Turkiye Klinikleri Journal of Ophthalmology, Journal Biomedicine International, Journal of Clinical Medicine and Reseach, Anatomical Record, International Journal of Cardiology, Journal of Neurosciences in Rural Practice, Case reports in

Medicine, Malaysian Journal of Medical Sciences, Journal of Clinical Anesthesia, European Journal of Radiography, Pace, Anatolian Journal of Cardiology, Polish Annals of Medicine, Journal of Hand and Microsurgery, Medical Science Educator, Anatomical Science International, Medical Hypotheses, Archives of Medical Science, European Journal of Anatomy, Case Reports in Radiology, Anatomy Research International, International Journal of Medicine and Medical Sciences, Advances in Physiology Education, Intercontinental Journal of Medicine and Medical Sciences, Croatian Medical Journal, Osteoarthritis and Cartilage, Clinical Oral Implants Research, BMC Medical Education.

**Dr. Calum Macpherson:** Acta Tropica, Annals of Tropical Medicine and Parasitology, BMC Infectious Diseases, Emerging Infectious Diseases, Epidemiology and Infection, Gastroenterology, International Journal for Parasitology, Journal of the Caribbean Veterinary Medical Association, Lancet, Parasitology International, Small Animal Practice, Transactions of the Royal Society of Tropical Medicine and Hygiene, Trends in Parasitology, Veterinary Record.

**Dr. Theresa McCann:** Injury Prevention

**Dr. Clare Morrall:** Revisita de Biologia Tropical (the International Journal of Tropical Biology and Conservation).

**Dr. Randall Waechter:** First Nations Child and Family Review, Youth and Society.

## **Section 12.0**

### **Thesis Defenses (1)**

Megan Herbers, BSc. "Preliminary Pathological and Bacteriological Studies in Grenada of Selar Crumenophthalmus: Caged vs. Non-caged Populations". 30 April, 2012.

**Section 13.0**  
**Graduate Seminars (33)**

Cindy Parker, MD, PhD. "Climate Change and Health: What is the Role of the Provider, Researcher, and Scientist?". 18 January, 2012

Linda Stone, PhD. "Human Rights and Needless Deaths: Ethical Implications of Inequalities in Health Care Systems". 25 January, 2012.

Brandon Francis, MD, MPH/ "From University Teaching Hospital to the United States Army: The Boundaries of Bioethics". 1 February, 2012.

Darshan Hemendra Mehta, MD, MPH. "Is it All in Your Head? The History and Role of Mind Body Medicine in Conventional Healthcare". 8 February, 2012

Robert M. Veatch, MD. "Oaths in Medical School: Empty Ritual or Something Else?". 15 February, 2012.

Heidi Larson, PhD. "Addressing the Vaccine Confidence Gap". 17 February, 2012.

Kenneth B. Storey, PhD, FRSC. "Mammals on Ice: Biochemical Regulation of Winter Hibernation". 22 February, 2012.

Gerry Rayman, MD. "Reducing the Burden of Diabetic Foot Disease—Audit., Research, and Clinical Practice. 29 February, 2012

Amy Baldwin, PhD. "Human Papilloma Virus (HPV). 7 March, 2012.

Martin Forde, ScD, PEng. "Caribbean Eco-Health Program Results". 21 March, 2012.

Nicole Bilbro, MPH, Julianna Maccarone, MPH, Avinash Sharma, MPH. "Practicum Experiences Around the Globe". 28 March, 2012.

David E. Levin, PhD. "Regulation of Stress-induced Gene Expression by Control of Transcriptional Attenuation". 4 April 2012.

John Penn, MD. "Ocular Angiogenesis Research in the Ranibizumab Era". 11 April, 2012.

Lynette A. Hart, PhD. "Enhancing Animal Care: Why it Matters". 18 April, 2012.

Avi Bahadoor, BSc. "The Immunological Response of HPV". 25 April, 2012.

Gerard Corcoran, MS, FRCS. "Ethics in Cancer and Palliative Care". 2 May, 2012.

Joy Rachel C. Ganchingco, BSc. "Antimicrobial Resistance Profiles of Zoonotic *Campylobacter* Species Isolated from Pigs in Grenada". 2 May, 2012.

Ian Hosein, MD & Dorothy Hosein, MD. "Innovative Ways of Dealing with Healthcare Challenges". 4 May, 2012.

Donna Futterman, PhD. "Scaling up HIV Testing: Lessons Learned from the Bronx and South Africa". 6 June, 2012.

- Catherine D. DeAngelis, MD, MPH. "Editing JAMA: Thoughts for Researchers and Authors. 22 August, 2012.
- Dr. Connolly, Dr. Louie, Dr. S. Longworth, & Dr. J. Longworth. "Clinical Ethics Cases". 29 August, 2012.
- Sean Philpott, PhD. "Ethics Consultation for Translational Research". 5 September, 2012.
- Joseph Merlino, MD. "Ethical Reflections on the 9/11 Response 11 Years Later". 12 September, 2012.
- Ella Derbyshire, MD. "Healthcare in Arctic Alaska". 14 September, 2012.
- Tar-Ching Aw, MBBS, PhD, FRCP, FRCPC, FFOM, FFPHM. "The Diagnosis of Occupational Disease". 19 September, 2012.
- Amit Chhabra, PhD. "Constitutional Law and Decision-making at the End of Life". 26 September, 2012.
- Michael Smalley, PhD. "Development: Whose Problem Is It?". 10 October, 2012.
- Randall Waechter, PhD. "The Ethics of Child Maltreatment Research". 24 October, 2012.
- Cheryl Cox-Macpherson, PhD & Joanna Rayner, PhD. "SGU's Energy, Waste, and Bioethics Initiatives: Shall We Switch Off?". 31 October, 2012.
- Avi Bahadoor-Yetman, BSc. "Cervical Cancer: Our Problem! Our Solution!". 7 November, 2012.
- Ray M. Kaplan, DVM, PhD, DACVM, DEVPC. "FAMACHA©: Tool for Applying an Evidence-Based Approach to Small Ruminant Parasite Control". 14 November, 2012.
- Paul Garner, PhD. "Deworming for Development: Fact or Fiction?". 28 November, 2012.
- Karla Farmer, BSc. "RNA gene Silencing: Comparison of eukaryotic and prokaryotic mechanisms". 5 December, 2012.

## **Section 14.0**

### **Contact Information**

#### **Director, WINDREF (Grenada)**

Dr. Calum N.L. Macpherson  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-3068  
Fax: 1 (473) 444-3041  
E-mail: [cmacpherson@squ.edu](mailto:cmacpherson@squ.edu)

#### **Assistant Director, WINDREF (Grenada)**

Mr. Trevor Noël  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-3997  
Fax: 1 (473) 444-3041  
E-mail: [trevornoel@squ.edu](mailto:trevornoel@squ.edu)

#### **Grants Coordinator (Grenada)**

Dr. Randall Waechter  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-3997  
Fax: 1 (473) 444-3041  
E-mail: [rwaechte@squ.edu](mailto:rwaechte@squ.edu)

#### **Admin. Assistant, WINDREF (Grenada)**

Mrs. Isha English  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-3997  
Fax: 1 (473) 444-3041  
E-mail: [ienglish@squ.edu](mailto:ienglish@squ.edu)

#### **Secretary, WINDREF (Grenada)**

Ms. Naomi Alexander  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-4175 x 2555  
Fax: 1 (473) 444-3041  
E-mail: [nalexander@squ.edu](mailto:nalexander@squ.edu)

#### **SGU IRB & WINDREF (Grenada)**

Mr. Kareem Coomansingh  
P.O. Box 7, St. George's  
Grenada, West Indies

Tel: 1 (473) 444-4175 x 2221  
Fax: 1 (473) 439-4388  
E-mail: [kcoomans@squ.edu](mailto:kcoomans@squ.edu)

#### **Administrative Assistant, WINDREF (USA)**

Ms. Valerie Smith  
3500 Sunrise Highway, Building 300  
Great River, NY 11739  
Tel: 1 (800) 899-6337  
Fax: 1 (631) 665-2796  
E-mail: [vismith@squ.edu](mailto:vismith@squ.edu)

#### **Exec. Secretary, WINDREF (UK)**

Ms. Sallyanne George  
Kingdon's Yard, Parchment Street  
Winchester, Hampshire, SO 23 8AT  
United Kingdom  
Tel: 01962 850650  
Fax: 01962 850567  
E-mail: [sgeorge1@squ.edu](mailto:sgeorge1@squ.edu)

#### **Caribbean EcoHealth Programme (CEHP)**

Dr. Martin Forde  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 439-2000 x.2349  
Email: [mforde@squ.edu](mailto:mforde@squ.edu), [martin-forde@mac.com](mailto:martin-forde@mac.com)

#### **Caribbean Environmental Research Initiative (CERI)**

Dr. Svetlana Kotelnikova  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-4175 ext. 2465  
Fax: 1 (473) 439-1845  
E-mail: [skotelnikova@squ.edu](mailto:skotelnikova@squ.edu)

#### **Renewable Energy and Energy Efficiency Initiative (REEF)**

Dr. Hugh Sealy  
P.O. Box 7, St. George's  
Grenada, West Indies  
Tel: 1 (473) 444-4175 ext.  
Fax: 1 (473)  
E-mail: [hsealy@squ.edu](mailto:hsealy@squ.edu)





*WINDWARD  
ISLANDS  
RESEARCH  
& EDUCATION  
FOUNDATION*

