

DEPARTMENT OF MICROBIOLOGY



Professor John F. Lindo, BSc, PhD *UWI*
Head of Department

WORK OF THE DEPARTMENT

Service

The Department of Microbiology provide laboratory diagnostic services to the University Hospital of the West Indies as its main client and as part of undergraduate and postgraduate teaching in the Faculty of Medical Sciences. Further, it serves a number of private hospitals, laboratories and medical centres. The total number of clinical specimens processed increased by 8.9% over the year from 56,393 to 61,398 when compared to 2011/2012. However, the total number of units decreased by 6.27%.

BIOSAFETY LEVEL III LABORATORY

The department received funding from the National Health Fund to complete the furnishing and equipping of the Biosafety Level III (BSL3)

laboratory. Work will be completed in academic year 2013–2014 and Jamaica will have its first BSL3 laboratory as recommended by the World Health Organisation several years ago. This will allow the department to handle highly infectious material in a safe manner.

CARIBBEAN MEDICAL MYCOLOGY REFERENCE LABORATORY

The upgrade of the Mycology Services towards the establishment of the Caribbean Medical Mycology Reference Laboratory has continued with work being focussed on drafting of Standard Operating Procedures for fungal diagnosis and antifungal susceptibility testing. The laboratory will offer testing for antifungal resistance in clinical samples, identify new and emerging fungal infections and test new drugs in those in development.

NATIONAL INFLUENZA CENTRE

The National Influenza Centre (NIC) working with the Pan American Health Organization and the Ministry of Health contributed to the following national and regional publications as part of its mandate on influenza surveillance:

- Weekly PAHO Influenza Regional Reports (EW 1–52, 2012): www.paho.org/reportesinfluenza
- Weekly CARPHA reports – (EW 1 to 52, 2012)
- Weekly Surveillance Bulletin – Jamaica, Surveillance Unit, Ministry of Health (EW 1 to 52, 2012)

The NIC Jamaica successfully participated along with a total of 181 laboratories from 141 countries in six WHO regions in the World Health Organization (WHO) External Quality Assessment Programme (EQAP) for the Detection of Influenza Viruses with a turnaround time of 24 hours.

LABORATORY INFORMATION SYSTEM

The department continued the roll out of the Laboratory Information System although the project faced major challenges with the location of a central accessing area. The area has been identified and work will be undertaken to facilitate a 2014 Go-live date.

Research

During the period under review the department spent considerable effort in developing the research capacity of its graduate students. The aim was to have all research projects conducted in the department be of a high enough standard for publication in a peer reviewed journal. Students were encouraged to present an abstract to at least one conference and then to convert this into a full paper for publication. This has borne fruit and 16 of the 29 papers presented this year were led by graduate students. The students have now embarked on the second phase of publishing by writing manuscripts for peer-reviewed journals.

The department places great value on its international collaborations and Ms Nicole Christian continued to conduct research on molecular and genetic basis of antibiotic resistance with Professor Tim McHugh at University College, London. Further, Ms Cheridah Todd is conducting collaborative research on free living amoebae with Dr Jacob Lorenzo Morales at the Universidad de La Laguna, Spain. During the year under review Dr Alison Nicholson established collaborative research with Case Western Research University, Ohio, USA (Professor Michael Jacobs and Dr Altreisha Foster) to study pneumococcal disease. In addition, Dr Joshua Anzinger established collaborations with Rush University (Professor Greg Spear) and the University of Nevada, Reno (Professor Buxton) to study bacterial vaginosis in HIV-infected patients and premature labour, respectively.

The National Influenza Centre (NIC) continued its collaboration with the Pan American Health Organization, the Centers for Disease Control and Prevention (CDC), Atlanta and the Caribbean Public Health Agency.

Dr. Sandra Jackson who is Director of the NIC established collaborative studies on influenza with Dr. Jonathan Gubbay of the Public Health Ontario Laboratory of Canada. The Departments of Medicine, Child Health and Microbiology participated in the establishment of the first Caribbean Infectious Disease Fellowship training programme in collaboration with the University of South Carolina's School of Medicine, USA.

Dr. Orville Heslop established collaborative research on molecular typing of *Clostridium difficile* in hospital acquired infections with Dr. Michael Mulvey at the National Microbiology Laboratory, in Manitoba, Canada. Further he is working with Dr. Mary Brandt of the Mycology Branch, CDC, on the molecular epidemiology of new and emerging fungal infections.

The department welcomed several distinguished visitors who are part of our collaborative studies. These included Ms Chika Ozongwu (UCL), Professor Michael Jacobs and Dr Altreisha Foster (Case Western), Professor Gregory Spear (Rush, Chicago).

NEW ACADEMIC STAFF MEMBERS

The capacity of the department to carry out its tasks was advanced significantly in the year under review by the recruitment of new academic staff members including, Dr Joshua Anzinger who was recruited as a Lecturer. Dr Anzinger holds the PhD in Microbiology and Immunology from Rush University and joined the staff after postdoctoral work at the National Institutes of Health. His area of interest is in the immunology and pathophysiology of HIV infections and its relationship with chronic diseases. Dr Yohann White who holds the MBBS from the UWI, PhD in Immunology from Kagoshima University and the DTM&H from the London School of Hygiene and Tropical Medicine was appointed jointly between the Departments of Medicine and Microbiology. He will focus on research in human retrovirology and cellular immunology. In addition Dr Kristian Angeby who holds MD and PhD degrees from the Karolinska Institute in Stockholm, Sweden was appointed Honorary Research Fellow. Dr Angeby who was manager of the Tuberculosis laboratory at

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the Karolinska Institute has an interest in mycobacterial infections of importance to human health. Ms Cheridah Todd was appointed Research Assistant and will focus of developing the area of molecular parasitology. The main thrust of her research is on the distribution and characteristic free-living amoebae in the Jamaican environment and in clinical samples.

NON ACADEMIC APPOINTMENTS

- Ms Alcía Jones Chief Medical Technologist – January 1, 2013
- Mr Evan Edwards Chief Medical Technologist – June 1, 2013
- Ms Monique Miller Senior Medical Technologist – June 1, 2013
- Ms Rochelle Meyler Senior Medical Technologist – June 1, 2013
- Mrs Sandra Jackson Records Management Assistant I – June 1, 2013

POSTGRADUATE TRAINING

The following candidates successfully completed the DM (Medical Microbiology) programme:

1. Dr Camille-Ann Thoms-Rodriguez
2. Dr Glendee Reynolds-Campbell
3. Dr Rohan Willis

The department currently has seven DM, one PhD, four MPhil and 14 MSc candidates.

PAPERS PRESENTED

- **Anzinger JJ**, Zhou J, Lam L, Gouillou M, Jaworowski A, McCune JM, Landay AL, Crowe SM, Palmer CS. “Glut1 expression on intermediate monocytes is a potential marker of inflammation in HIV-positive subjects”. International AIDS Society, July 2013, Kuala Lumpur, Malaysia.

- **Anzinger JJ.** “How macrophages get fat: Elucidation of a novel mechanism for cholesterol accumulation in atherosclerosis”. UWI FMS Conference Workshop, November 2012, Kingston, Jamaica.
- **Anzinger JJ, Buono C, Barthwal MK, Chang J, Xu Q, Kruth HS.** “Macrophage Foam Cell Formation Occurs by Fluid-Phase Pinocytosis of LDL”. UWI FMS Conference, November 2012, Kingston, Jamaica. (Poster Presentation).
- **Anzinger JJ.** “Appetite for Destruction: Macrophage Pinocytosis of LDL Promotes Atherosclerosis”. University of Nevada, Seminar, January 2013, Reno, Nevada, USA. (Invited *Oral Presentation*).
- **Brown MG, Lindo JF, Brown PD, Vickers IE, Jackson ST.** Co-infections of leptospirosis, and dengue in Jamaica 2007–2008. *West Indian Medical Journal* 61 (Suppl. 6), 38. Faculty of Medical Sciences 21st Annual Research Conference, University of the West Indies, Mona, Kingston 7, Jamaica in November 2012.
- **Jones A, Christian N, Anscombe C, Fletcher HM, McHugh TD, Lindo JF** Molecular detection of *Trichomonas vaginalis* infection in women at the University Hospital of the West Indies. *West Indian Medical Journal* 2012; 61 (Suppl): 54. Faculty of Medical Sciences 21st Annual Research Conference, University of the West Indies, Mona, Kingston 7, Jamaica in November 2012.
- **Heslop OD, Mulvey MR, Smikle MF, Levett PN.** “Unique *Clostridium difficile* pulse field gel electrophoresis types at two Jamaican Hospitals”. American Society of Microbiologists, May 2013, Denver Colorado, USA. (Poster presentation).
- **Jackson S, Nagassar R, James K, Gibson R, Rhoden T.** The diagnosis of neurological HIV through antibody detection in the CSF. 21st Annual Research Conference on the Non-Communicable Diseases – A Threat to Life and the Economy: *West Indian Medical Journal*. Vol. 61 (Suppl 6), 2012, Jamaica (Abstract and Poster presentation).
- **Jackson S, Nagassar R, James K, Gibson R and Rhoden T.** Evaluation

of rapid HIV antibody assays in the diagnosis of neurological HIV. *J Neurol Neurophysiol* S1: 2155-9562-S1.003-17/Special Issue – Central Nervous System – Drug Effects & Novel Drug Development- September, 2012. Philadelphia, USA (Poster presentation)

- **Jackson S**, James K, McMorris M, Steer K, Nagassar R and Eldemire-Shearer D. Poor Vaccine Uptake as a potential barrier to Influenza Pandemic Preparedness. 29th Clinical Virology Symposium. April, 2013, Florida, USA. (Poster presentation).
- **Jackson S**. Melbourne-Chambers R. Childhood chorea-encephalopathy. City-Wide ID Case Conference, University of South Carolina's School of Medicine. SC, USA. February 2012.
- **Jackson ST**, James K, Mowatt L, Roye-Green K, Shaw K, Nevins D, Beecher C, Richards, Mcintosh M, Harvey K, L, Blake C, Williams J. Chlamydia as a cause of blindness. Review of ocular Chlamydia trachomatis frequency in Jamaica. Regional V2020 Meeting, Georgetown, Guyana. December 2012 (Abstract and *Oral Presentation*)
- Cook, JM., Hardie, R., Bailey, K., Tapper, M., Anderson, J., Vickers, I., **Lindo, JF**. (2013). Seroepidemiology of human toxocariasis in Jamaica. *West Indian Medical Journal* 62(Suppl. 5), 24. Ophthalmological Society of the West Indies 24th Annual Research Conference, Paramaribo, Suriname in July, 2013.
- Cook, JM., Hardie, R., Bailey, K., Tapper, M., Anderson, J., **Vickers, I., Lindo, JF**. (2012). Seroprevalence of human toxocariasis in Jamaica. *West Indian Medical Journal* 61 (Suppl. 6), 38. Faculty of Medical Sciences 21st Annual Research Conference, University of the West Indies, Mona, Kingston 7, Jamaica in November 2012.
- Cook, JM., Hardie, R., Anderson, J., Tapper, M., Choy, L., Bailey, K., Vickers, I., **Lindo, JF**. (2012). Insights into the Seroepidemiology of Toxocariasis in Jamaica. *The American Journal of Tropical Medicine and Hygiene* 87 (Suppl.5), 344.
- Lawrence DA, Stott BR, Herbein JF, **Lindo JF**. Diagnosis of intestinal protozoan infections using antigen detection at the University

Hospital of the West Indies. *West Indian Medical Journal* 2012; 61 (Suppl): 54. Faculty of Medical Sciences 21st Annual Research Conference, University of the West Indies, Mona, Kingston 7, Jamaica in November 2012.

- Thoms-Rodriguez CA, **Nicholson AM**, Christian N, Willey B, Mazzulli T. Antibiotic resistance profile and the investigation of meropenem (MEM) efflux in multidrug-resistant (MDR) *Acinetobacter* spp. at the University Hospital of the West Indies. *West Indian Medical Journal* 2012; 61; Suppl. 6: 57–58. (Poster Presentation at the 21st Annual Faculty of Medical Sciences (FMS) Research Conference, Kingston, Jamaica, November 2012.)
- Thoms-Rodriguez CA, **Nicholson AM**, Christian N, Willey B, Didier H, Mulvey MR Mataseje L McCracken M Boyd D Christie C, Mazzulli T. Outbreak/endemic OXA carbapenemase positive *Acinetobacter* spp in a tertiary care hospital in the Caribbean. *West Indian Medical Journal* 2012; 61 (Suppl. 6) 38. (Oral Presentation at the 21st Annual Faculty of Medical Sciences (FMS) Research Conference, Kingston, Jamaica, November 2012)
- Reynolds G, **Nicholson AM**, Bodonaik N: Gentamicin and amikacin resistance in Gram negative bacilli over 30 years at a tertiary level teaching hospital, November 2012.
- Thoms-Rodriguez C, **Nicholson AM**, Christian N, Willey BM, Mazzulli T. Efflux detection in meropenem (MEM) resistant *Pseudomonas* (P.) *aeruginosa* isolates. (Poster Presentation at the 52nd Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), San Francisco, September 9–12, 2012.
- Garita M, **Nicholson AM**, Cuesta G, Mould J. Cost-effectiveness of Linezolid versus Vancomycin in the Treatment of Ventilator-Associated Pneumonia in Jamaica Poster Presentation at International Society for Pharmacoeconomics and Outcomes Research (ISPOR), Dublin, Ireland 2013.
- Cheung D, **Nicholson AM**, DaCosta M. Epidemiology, Antimicrobial Susceptibility and Co-infection of *Escherichia coli* in Blood and

Urine Poster Presentation American Society for Microbiology (ASM)
2013 Boston, USA.

- G Reynolds, **Nicholson AM**, Christian N, Willey B, Mazzulli T. 16S rRNA methyltransferases in Gram negative bacilli from the Caribbean (Poster ICAAC Conference 2013)
- **Smikle MF, Christian NA, Brown MG, Heslop OD, Vickers IE.** HLA association in HIV exposed children in Jamaica. American Society of Microbiologists, May 2013, Denver Colorado, USA. (Poster presentation)
- Willis R, **Smikle M, Heslop O**, Bodonaik N, Thame M, Kumar U, Aung M, Kellier A, Drysdale S, Leon V. Epidemiology and Antimicrobial Sensitivity Pattern of Streptococcus pneumoniae Infection in the Jamaican Population. *West Indian Medical Journal* 2012; 61 (Suppl. 6): 56.
- **Willis R***, Jajoria P, Harper B, Gonzalez EB, Petri M, Akhter E, Fang H, Pierangeli SS. Effect of Hydroxychloroquine and Statin Therapy on Pro-inflammatory Cytokines and Disease Activity in a Lupus Cohort. *West Indian Medical Journal* 2012; 61 (Suppl. 6) 39. *Oral Presentation* at the 21st Annual Faculty of Medical Sciences (FMS) Research Conference, Kingston, Jamaica, November 2012)
- Willis R, **Smikle M, Heslop O**, Bodonaik N, Thame M, Kumar U, Aung M, Kellier A, Drysdale S, Leon V. Morbidity and Mortality of Streptococcus pneumoniae Infections at the University Hospital of the West Indies *West Indian Medical Journal* 2012; 61 (Suppl. 6):55.
- Willis R, **Smikle M, Heslop O**, Bodonaik N, Thame M, Kumar U, Aung M, Kellier A, Drysdale S, Leon V Pneumococcal Vaccine Coverage and Clinical Associations of Streptococcus pneumoniae Serogroups in the Jamaican Population *West Indian Medical Journal* 2012; 61 (Suppl. 6): 56.
- **Willis R***, Bodonaik N, McMorris N. Epidemiology and Microbial Aetiology of Culture-Proven Meningitis Cases at the University Hospital of the West Indies. *West Indian Medical Journal* 2012; 61

(Suppl. 6):58. (Poster Presentation at the 21st Annual Faculty of Medical Sciences (FMS) Research Conference, Kingston, Jamaica, November 2012.)

PUBLICATIONS

Books and book chapters

- Arima N, Makoto Y, **White YRG**. 'Prevention of human T-cell lymphotropic virus infection and adult T-cell leukemia' In Chang Mei-Hwei and Jeang Kuan-Teh (Eds.). *Viruses and Human Cancer – From Basic Science to Clinical Prevention*. Springer, 2013.

Refereed Journal Articles

- Hoefsloot W, van Ingen J, Andrejak C, **Angeby K**, et al. The geographic diversity of nontuberculous mycobacteria isolated from pulmonary samples: A NTM-NET collaborative study. *European Respiratory Journal*. 2013 April 18.
- **Ängeby K**, Juréen P, Kahlmeter G, Hoffner SE, Schön T. Challenging a dogma: antimicrobial susceptibility testing breakpoints for *Mycobacterium tuberculosis*. *Bull World Health Organ*. 2012 September 1;90(9):693-8. doi: 10.2471/BLT.11.096644.
- **Ängeby K**, Juréen P, Chryssanthou E, Schön T. Tentative susceptibility testing breakpoint for the neuroleptic drug thioridazine, a treatment option for multi- and extensively drug resistant tuberculosis. *International Journal of Mycobacteriol*. Volume 1, Issue 4, December 2012.
- Barthwal MK, **Anzinger JJ**, Xu Q, Bohnacker T, Wymann MP, Kruth HS. "Fluid-phase pinocytosis of native low density lipoprotein promotes murine M-CSF differentiated macrophage foam cell formation". *PLoS One*. 2013;8(3):e58054.

- **Heslop OD, Roye-Green K**, Coard K, Mulvey MR. A unique strain of community-acquired *Clostridium difficile* in severe complicated infection and death of a young adult. *BMC Infect Dis*. 2013 July 1;13(1):299.
- Fanfair RN, **Heslop O**, Etienne K, Rainford L, Roy M, Gade L, Peterson J, O'Connell H, Noble-Wang J, Balajee SA, Brandt ME, **Lindo JF**, Park BJ. *Trichosporon asahii* among intensive care unit patients at a medical center in Jamaica. *Infect Control Hosp Epidemiol*. 2013; 34(6):638–41. doi: 10.1086/670633.
- **Lindo JF**. Chagas: a neglected tropical disease. *West Indian Medical Journal*. 2012 September;61(6):557–8.
- Carrington S, Cohall DH, Gossell-Williams M, **Lindo JF**. The antimicrobial screening of a Barbadian medicinal plant with indications for use in the treatment of diabetic wound infections. *West Indian Medical Journal* 2012 December;61(9):861–4.
- Robinson RD, Waugh CA, **Todd CD**, Lorenzo-Morales J, **Lindo JF**. Rat lungworm: an emerging zoonosis in Jamaica. *Hawaii Journal of Medicine & Public Health*. 2013 June;72(6 Supl2):33.
- Chroboczek T, Boisset S, Rabigade JP, Meugnier H, Akpaka PE, **Nicholson AM** et al Major West Indies MRSA clones in human beings. Do they travel with their hosts? *Journal of Travel Medicine* 2013, 20: (5): 283–8.
- Nagassar RP, Bridgelal-Nagassar RJ, McMorris M, Roye-Green KJ. *Staphylococcus aureus* pneumonia and dengue virus co-infection and review of implications of coinfection. *BMJ Case Reports* 2012 (2012)
- Justiz-Vaillant AA, Akpaka PE, McFarlane-Anderson N, **Smikle MF**. Comparison of Techniques of Detecting Immunoglobulin-binding Protein Reactivity to Immunoglobulin Produced by Different Avian and Mammalian Species *West Indian Medical Journal* 2013; 62: 12–20.

- **White Y**, Yoshimitsu M, Kozako T, Matsushita K, Koriyama C, Uozumi K, Suzuki S, Kofune H, Arima N. Effects of exogenous interleukin-7 on CD8(+) T-cell survival and function in human T-cell lymphotropic virus type 1 (HTLV-1) infection. *Leuk Lymphoma*. 2013 [Mar 8; epub ahead of print; doi: 10.3109/10428194.2013.772174].
- Hamada T, **White Y**, Nakashima M, Oiso Y, Fujita M, Okamura H, Iwagawa T, Arima N. The bioassay guided isolation of growth inhibitors of adult T-cell leukaemia (ATL), from the Jamaican *Hyptis verticillata*, and NMR characterization of hyptoside. *Molecules*. 2012;17:9931-9938

INCOME GENERATION/GRANTS

Grants Obtained

Anzinger JJ.

Vaginal Lactobacilli capture of HIV

- US\$10,000.00, Caribbean Health Research Council, 2013–2015
- US\$15,000.00, UWI New Initiative, 2013–2015

Christian NC.

Molecular epidemiology of quinolone resistance among clonal types of *Escherichia coli*, *Klebsiella pneumoniae* and *Acinetobacter* spp

- US\$10,000 Caribbean Health Research Council, 2013–2015

Lindo JF, Copeland S and Jackson ST

Establishing a Biosafety Level III laboratory and strengthening viral diagnosis for Jamaica

- US\$263,193.79, National Health Fund

Jackson ST

Influenza surveillance

- US \$13,696.00 – Pan American Health Organisation

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Vickers IE, Brown MG, Ducasse M, Harvey K, Lindo JF

Laboratory Evaluation of a Commercial Rapid Dengue Diagnostic Test Kit for the Detection of NS1 Antigen, IgM and IgG Antibodies in Jamaica.

- \$1,398,500.00 (Ministry of Health)

White YH.

Effects of exogenous interleukin-7 on CD8(+) cytotoxic T-lymphocyte survival and function in Jamaican patients with human T-cell lymphotropic virus type 1 infection.

- \$ 957,255.00 UWI New Initiative, 2013–2015

Opportunities for advancing policy in the scale up of a robust multisectoral response to HIV and sex work in Jamaica – UNFPA (to The Grata Foundation on research project)

- US\$22,000; April 2013, role: co-investigator; Principal investigator – **Professor Russell Pierre.**

Positive MSM intervention – UNFPA to The Grata Foundation on project

- US\$12,750; December 2012; role: co-investigator; Principal investigator – **Professor Russell Pierre.**

PUBLIC SERVICE

Dr. Kristian Angeby

- Member, International Union Against Tuberculosis and Lung Disease
- Member, European Society of Mycobacteriology
- WHO TBTEAM expert in the field of laboratory strengthening.

Professor John Lindo

- Membership Chair, Rotary Club of New Kingston
- Member, American Society of Tropical Medicine and Hygiene

- Member, Inter-American Development Bank Civil Society Consulting Group (ConSOC)

Dr. Sandra Jackson

- Member, Ministry of Health's IHR Technical Advisory Group of Experts
- Member, Pandemic Preparedness Committee

Professor Monica Smikle

- Member, Lions Club of Mona