COLLEGE OF HEALTH SCIENCES

The Principal College of Health Sciences to present the following for the conferment of the

Degree of Doctor of Philosophy



BBOSA Nicholas

A molecular phylogenetic and modelling approach towards understanding the transmission dynamics and genetic diversity of HIV-1 in the fishing communities of Lake Victoria, Uganda

Dr. BBOSA Nicholas used molecular phylogenetic and modelling approaches to dissect the transmission dynamics of HIV in the fishing communities of Lake Victoria. The fishing communities are disproportionately affected by HIV relative to the general population and for a long time, the dynamics of HIV transmission were not well understood. His research revealed for the first time in Uganda that the fishing communities were a sink for HIV transmission from the general population and negated the generally held assumption of the fishing communities being viral reservoirs. The findings have contributed towards informing public health policies on the implementation of targeted interventions for effective HIV epidemic control in most at-risk populations. This study was funded by the UK Medical research council, and was supervised by Prof. Pontiano Kaleebu, Prof. Andrew Leigh-Brown, Dr. Bernard S. Bagaya, Assoc. Prof Noah Kiwanuka and Dr. Rebecca N. Nsubuga.

Conferment of the Degree of Doctor of Philosophy



BWIRE Godfrey

Molecular characterization and rapid detection of *Vibrio cholerae* in Uganda: the relationship between human pathogens and aquatic environment.

Dr. BWIRE Godfrey studied *Vibrio cholerae*, the bacteria responsible for repeated cholera outbreaks in Uganda to determine their genetic profile, spread, transmission, virulence, aquatic environmental reservoirs and a field cholera rapid diagnostic test (RDT). The study found that cholera outbreaks in Uganda were due to three genetically related *V. cholerae* clones. The clones showed transmission within Uganda, East and Central African regions. The surface water sources in Uganda were possibly not reservoirs for the epidemic *V. cholerae*. The accuracy of the cholera RDT, a modified *Crystal VC*[®] dipsticks was high. This study enhances our understanding of cholera outbreaks and may help in prevention, control and elimination of cholera in Uganda. The study was jointly funded by the Uganda Ministry of Health and Bill and Melinda Gates Foundation (USA) and supervised by Prof. Christopher Garimoi Orach (MakSPH) and Prof. David Allen Sack (John Hopkins University, USA).

Conferment of the Degree of Doctor of Philosophy



EGESA Moses

Human B and T cell responses to novel *Schistosoma mansoni* skin-stage antigens

Mr. EGESA Moses studied human immune responses to parasite components expressed at the vulnerable skin larva stage of the human blood fluke, *Schistosoma*. It was not known how endemic populations respond to recombinant components of the larvae and how these immune responses relate with intensity of infection when people get re-infected. The recombinant antigens induced inflammatory cytokine responses. Additionally, antibodies to these antigens were detectable and were affected by treatment. Although not associated with reinfection intensity, the information generated informs the selection and prioritization of vaccine targets. This study was funded by a Wellcome Trust Strategic Award and the DELTAS Africa Initiative and supported by European Commission's Seventh Framework Programme, and was supervised by Dr. Bernard Bagaya, Prof. Maria Yazdanbakhsh and Dr. Stephen Cose.

Conferment of the Degree of Doctorate of Philosophy



KADDUMUKASA. Martin

Sodium intake in post-stroke patients – its influence on blood pressure, knowledge and perceptions and stroke outcomes in Uganda

Dr. KADDUMUKASA Martin's thesis focuses on salt intake and cardiovascular stroke. He estimates the daily intake and its association with blood pressure and stroke. He further investigates knowledge, perceptions, and consumption decisions after stroke. He uses 24-hour urine to determine the salt intake in stroke patients. He notes that stroke survivors with high blood pressure have twice the levels of salt compared to stroke survivors without blood pressure. Poor knowledge, perceptions, and salt use beliefs. Finally a high frequency of stroke recurrence and death was observed in this group. This study recommends primary stroke prevention through salt intake reduction and population salt awareness through education. This study was supported by NIH MEPI-linked Neurology Award (No. 5R24TW008886), Fogarty International Centre and was supervised by Prof. E. Katabira, Prof. Martha Sajatovic, Prof. Larry Goldstein and Dr.Pundik.

Conferment of the Degree of Doctor of Philosophy



KAYIMA James

Hypertension in Uganda: epidemiology and association with HIV infection and genetics

Dr. KAYIMA James investigated the association of HIV infection and selected genes with blood pressure traits among Ugandans. He observed that, unlike the western populations, the frequency of hypertension was lower among HIV-infected compared to uninfected subjects in Uganda. Further, he uncovered the profound negative effect of SUB/NPR3 gene on systolic blood pressure. These finding suggest a protective effect of HIV on hypertension; and a potential modifying effect of SUB/NPR3 gene on hypertension in African populations. This work elucidates the role of HIV and population-specific genetic factors in the control of hypertension risk. It builds a foundation for formulation of prevention efforts for cardiovascular disease among high-risk groups; and for pharmacogenetic studies to identify appropriate medication for

hypertensive black populations. This study was funded by Medical Education Partnership Initiative on Cardiovascular Disease (MEPI-CVD), and was supervised by Dr. Achilles Katamba, Prof. Harriet Mayanja Kizza, Prof. Xiaofeng Zhu and Prof. Mahboob Rahman.

Conferment of the Degree of Doctor of Philosophy



MBOOWA Gerald

Functional host-genetic loci associated with pediatric HIV-disease progression in Uganda and Botswana

Dr. MBOOWA Gerald used genomics and bioinformatics approaches to identify a set of genes that informs us which person if HIV-infected will take many years to develop AIDS (symptoms) without HIV-treatment. His research revealed that following HIV infection, there are two groups of people; Rapid-AIDS progressors (develop symptoms in 3-years or less after infection) and Long-term non-progressors (>10-years to develop symptoms) without HIV-treatment. These findings have implications for the current "Test-and-Treat and Treat-for-Life" HIV-treatment policy; when one tests HIV-positive and started on treatment-for-life exposing them to drugs' dangerous side-effects yet some HIV-infected people have nature ability to stay for many years without developing symptoms in absence of HIV-treatment. This study was funded by the Collaborative African Genomics Network-(CAfGEN) and Training Health Researchers into Vocational Excellence in East Africa-(THRiVE-2), and supervised by Prof Moses Joloba and Dr. David Kateete.

Conferment of the Degree of Doctor of Philosophy



MPIMBAZA Arthur Mwambari

Determinants of severe malaria among children hospitalised at Jinja Regional Referral Hospital, Uganda

Dr. MPIMBAZA Arthur Mwambari studied determinants of severe malaria among children in the Busoga sub-region. Risk factors for severe malaria included delayed care seeking by more than 24 hours after fever onset and seeking care at a drug shop as the initial response. For convenience, drug shops were the most common provider sought by caregivers of children with severe malaria. However, drug shops offered sub-optimal healthcare services compared to public health facilities. Hemoglobin S heterozygotes, alpha thalassemia heterozygosity and homozygosity were associated with protection against severe malaria. Drug shops were a problem, contributing to delay and severe malaria. The role of drug shops in caring for children with malaria needs to be re-evaluated and services at public health facilities strengthened. This study was funded by NIH Fogarty International Center (TW009343 and TW007375) and was supervised by Assoc. Prof. Charles Karamagi, Prof. Anne Katahoire, Grace Ndeezi and Philip J Rosenthal.

Conferment of the Degree of Doctor of Philosophy



NABATANZI Rose (Ms)

Innate immune system recovery after long-term antiretroviral therapy in an African cohort

Dr. NABATANZI Rose studied whether key blood cell populations of HIV infected adults recover completely after at least seven years of treatment with antiretroviral therapy (ART). This research found that despite at least seven years of effective ART, key first line defence cells among HIV-infected individuals were still fewer and produced low chemical mediators of first line defence against invading germs; compared with age-matched healthy HIV uninfected individuals. More emphasis should be put on ways of improving the body's defence system for individuals on long-term ART to levels comparable to HIV-uninfected individuals, to prevent or delay HIV-associated complications among adults aging with the disease. This study was funded by DELTAS Africa Initiative, the Wellcome Trust and UK government and Alliance for Global Health and Science at University of California, Berkeley, USA; and was supervised by Prof. Damalie Nakanjako, Prof. Moses Joloba, Prof. Stephen Cose and Prof. Sarah Rowland Jones.

Conferment of the Degree of Doctor of Philosophy



NAJJUKA Christine Florence (Ms)

Characterisation of extended spectrum Beta lactamases elaborated in Enterobactereaceae in Uganda

Dr. NAJJUKA Christine Florence investigated the prevalence of Extended Spectrum beta-Lactamases (ESBLs), the factors associated with gastrointestinal carriage, genotypes, transmission dynamics and co-resistance among clients attending outpatient clinics in Kampala, Kayunga and Mpigi Districts. She found predominance of cefotaximase in Kampala and presence of plasmid-mediated AmpC beta-lactamase genes, especially in ceftriaxone-susceptible *Escherichia coli*. Use of ciprofloxacin, inoculation and routine health follow up were risk factors, while rural residency and visiting lower health centres were protective of carriage of resistant bacteria. Transmission was predominantly by horizontal gene transfer of cefotaximase with at least two non-beta-lactam resistance genes. The findings inform widespread gut colonisation by bacteria resistant to 3rd generation cephalosporins and commonly used non beta-lactam agents, a source for transmission and infection with unpredictable and limited treatment options. This study was funded by Sida-Makerere Bilateral Research Programme and the Carnegie Cooperation of New York, and was supervised by Prof. Moses L. Joloba and Prof. Sabiha Y. Essack.

Conferment of the Degree of Doctor of Philosophy



ZIDA Andre

Creating and institutionalizing supports for evidence-informed decision making, including a rapid response service, in the Burkina Faso health system

Dr. ZIDA Andre's research focused on decision making in the Burkina Faso health system. His investigation focused on the institutionalization of a policy support unit called rapid response to provide evidence for urgent decision-making. The study showed that the institutionalization of decision support units demands a robust framework and political will. It can be non-linear, and it depends on the leadership of unit managers to implement relevant activities, mobilize funding, and recruit and maintain sufficient human resources. This study developed a clear roadmap for evidence-informed decision-making and policy unit institutionalization. This study was funded by International Development Research Centre (IDRC) and the European Union, and was supervised by Prof. Nelson K. Sewankambo, John N. Lavis and Dr. Bocar Kouyate.