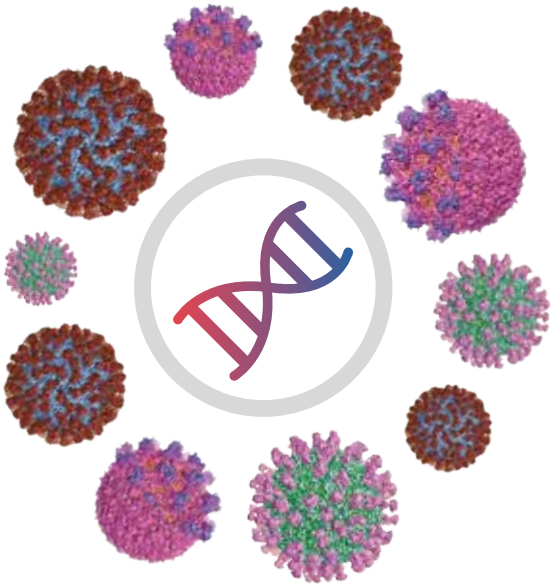

IDRI ANNUAL SCIENTIFIC RETREAT 2019

16 March 2019
08:30AM to 02:00PM
CARLTON Hotel, Singapore

SingHealth DukeNUS
ACADEMIC MEDICAL CENTRE

Infectious Diseases
Research Institute

Message from IDRI Co-Directors

The Infectious Diseases Research Institute (IDRI) is a joint institute between SingHealth and Duke-NUS Medical School under the SingHealth Duke-NUS Academic Medical Centre (AMC) matrix. It serves as a bridge between SingHealth Infectious Diseases Centre (SIDC) and the Duke-NUS Emerging Infectious Diseases (EID) Programme. Our goal is to be each other's committed partners for Infectious Diseases (ID) research within the AMC with the current areas of focus being emerging infections as well as the prevention and treatment of infections by multi-drug resistant organisms (MDRO).

The annual retreat provides the opportunity for us to keep up with the latest research activities in IDRI as well as meeting existing and future collaborators in person. This will also be the forum to discuss potentially new approaches and mechanisms for improving collaboration and scientific delivery. Starting this year on we look forward to the launch of our very 1st "Strategic Collaboration Fund" specifically aiming to encourage and facilitate inter-institutional collaborative research between principal investigators of Duke-NUS (EID) and SingHealth Institutions in Infectious Diseases.

Thanks for coming and hope you will all enjoy the retreat.

IDRI Co-Directors

SingHealth DukeNUS
ACADEMIC MEDICAL CENTRE
Infectious Diseases
Research Institute

Professor Gavin Smith

Principal Investigator, Programme in Emerging Infectious Diseases, Duke-NUS Medical School

Title: Introduction: "SingHealth Duke-NUS Global Health Research Institute"

Abstract: The SingHealth Duke-NUS Global Health Institute (SDGHI) is a joint institute of SingHealth and Duke-NUS, which aims to address current and emerging health challenges across ASEAN member states and in other Asian countries. The Institute seeks to tackle prevalent health challenges, strengthen health systems and better insulate countries from pandemics and disease threats. The Institute builds on the collective strengths and expertise of SingHealth and Duke-NUS Medical School faculty and leverages Duke University's long history in global health.

Biography: Dr. Gavin Smith is a Professor of Emerging Infectious Diseases and Global Health with appointments at Duke-NUS Medical School in Singapore and the Duke Global Health Institute at Duke University. His primary training was in ecology and evolution at The University of Melbourne. He obtained his PhD from The University of Hong Kong, where he also undertook his post-doctoral training in the Department of Microbiology. Dr. Smith's research program primarily investigates the ecology and evolution of zoonotic viruses and the molecular epidemiology of human respiratory pathogens. His contributions are internationally recognized, having received numerous research awards including a 7-year career development award from the USA National Institutes of Health; and being appointed as Beijerinck Guest Chair Professor by the Royal Netherlands Academy of Arts and Sciences. His studies have played a key role in global efforts to control influenza outbreaks by providing genetic analysis to expert committees formulating policy in this area, including pre-pandemic vaccine strain selection. Another key part of his work has been in engaging scientists in Asia to assist in developing local research and technical capacity for disease detection, prevention and control.

Research Interests: Influenza, Respiratory viruses, Emerging infectious diseases, Evolution and Molecular epidemiology.

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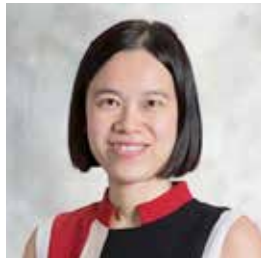
Dr Jenny Low

Senior Consultant, Infectious Diseases, SGH
Associate Professor, Programme in Emerging Infectious Diseases, Duke-NUS Medical School
Co-Director, ViREMiCS

Title: "Updates on ViREMiCS"



Abstract: Since its inception in 2017, ViREMiCS has achieved several milestones and made significant progress and scientific contributions. In this talk, we will briefly outline and highlight some of these achievements.

Biography: Associate Professor Jenny Low received her medical degree from the National University of Singapore in 1998. She went on to obtain her specialty accreditation in Infectious Diseases in 2004 and subsequently pursued her interest in epidemiology and public health at the Bloomberg School of Public Health, Johns Hopkins University where she obtained her MPH in 2009. Associate Professor Jenny Low is a senior consultant with the Department of Infectious Diseases, Singapore General Hospital where she is also a clinician scientist. Besides clinical work, she spends most of her time doing translational clinical research and conducting proof of concept clinical trials with a focus on accelerating translation of biologic therapeutics from bench to bedside.

Research Interests: Epidemiology of Infectious Diseases in particular dengue and viruses, Viral therapeutics and vaccine discovery particularly host immune responses to viruses and vaccines and role of innate immune response in modulating the outcome of infections or vaccination.

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Dr Kristen Coleman

Research Fellow, Programme in Emerging Infectious Diseases, Duke-NUS Medical School

Title: "Bioaerosol Sampling for Respiratory Viruses in Singapore's Mass Rapid Transit Network"

Abstract: As a leading global city with a high population density, Singapore is at risk for the introduction of novel biological threats. This risk has been recently reinforced by human epidemics in Singapore of SARS coronavirus, 2009 pandemic H1N1 influenza A virus, and enterovirus 71. The ability to quickly identify and robustly track such threats to initiate an early emergency response remains a significant challenge. In an effort to enhance respiratory virus surveillance in Singapore, our Duke-NUS team conducted a pilot study employing a noninvasive bioaerosol sampling method to detect respiratory viruses in Singapore's Mass Rapid Transit (MRT) network.

Biography: Dr. Kristen Coleman currently serves as a Postdoctoral Research Fellow in the Emerging Infectious Diseases Programme at Duke-NUS Medical School where she manages Professor Gregory Gray's Laboratory of One Health Research and provides expertise in conducting bioaerosol research throughout Southeast Asia. Kristen earned her PhD in Biology in May 2017. Her doctoral research focused on measuring airborne influenza virus in the school environment, where she volunteered a significant amount of her time educating schoolchildren on the importance of personal hygiene in relation to the spread of respiratory pathogens.

Research Interests: Bioaerosol science, Respiratory viruses, Pediatric illness, Environmental microbiology and Science outreach and policy.

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Professor Gregory Gray

Division of Infectious Diseases, Duke University's School of Medicine; Duke Global Health Institute; Duke Nicholas School of the Environment
Principal Investigator, Programme in Emerging Infectious Diseases, Duke-NUS Medical School

Title: "Bioaerosol Sampling for Respiratory Viruses in Singapore's Mass Rapid Transit Network"

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Biography: Gregory C. Gray MD, MPH, FIDSA is a Professor at Duke University with three affiliations: The Division of Infectious Diseases in Duke University's School of Medicine, Duke Global Health Institute, and Duke Nicholas School of the Environment. He also serves part-time as a Professor in the Program in Emerging Infectious Diseases at Duke-NUS Medical School, Singapore and as a Professor of Global Health at Duke Kunshan University in China. He manages research teams in each of these institutions. His medical boards are in Preventive Medicine and Public Health. Dr. Gray has conducted diverse epidemiological studies of infectious diseases for 25 years in 5 continents. He has authored more than 300 peer-reviewed manuscripts and book chapters. Much of his work has involved identifying risk factors for occupational diseases, particularly for respiratory virus infections. A strong supporter for the One Health approach, he has won multiple One Health research and training grants, helped to establish centers of One Health (USA, Romania, China) and developed four graduate programs in One Health (PhD, MHS, and certificate).

Research Interests: Emerging infectious diseases, Zoonotic respiratory viruses, Adenoviruses, Influenza viruses, Enteroviruses and Coronaviruses.

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Associate Professor Matthias Maiwald

Senior Consultant and Head of Microbiology, Pathology and Laboratory Medicine, KKH

Title: "Molecular diagnostic and genomic assessment of Bordetella species and strain variants causing pertussis and pertussis-like disease in Singapore"

Abstract: Bordetella pertussis is the agent of pertussis (whooping cough), a major childhood disease. The introduction of pertussis whole cell vaccines (WCVs) historically caused a drop in pertussis morbidity and mortality, but some countries, including Singapore, are seeing a rise in the numbers of pertussis cases since the 1990s, during which WCVs were replaced with acellular vaccines (ACVs). Several ACV-utilising countries have observed a surge of B. pertussis strains with genomic alterations that constitute escape mechanisms ("vaccine escape strains"). In Singapore and its surrounding countries, there are two major gaps in knowledge: (a) the proportion of species other than B. pertussis among paediatric respiratory tract infections, and (b) whether vaccine escape strains occur and contribute to the recent surge in cases. Our project has several arms, (a) to perform a comprehensive molecular diagnostic assessment of the various Bordetella species in paediatric respiratory tract samples, (b) to isolate as local Bordetella strains in culture, and (c) to subject these strains to full genome sequencing and bioinformatic analyses. While this project is still in progress, we have tested several hundreds of paediatric respiratory specimens. The outcome of this research is expected to provide crucial information for (a) diagnostic and therapeutic strategies for paediatric respiratory tract infections, and (b) Singaporean national vaccination policies.

Biography: Matthias Maiwald is a Senior Consultant in Microbiology at KK Women's and Children's Hospital in Singapore and an Adjunct Associate Professor at the Department of Microbiology, National University of Singapore, and at Duke-NUS Graduate Medical School. He previously worked at the University of Heidelberg, Germany, subsequently at Stanford University, USA, and then at Flinders University in Adelaide, Australia. He holds a German board certification in medical microbiology, a Fellowship of the Royal College of Pathologists of Australasia, and is a Diplomate of the American Board of Medical Microbiology. He has a publication record of about 120 articles, including journal articles and medical textbooks chapters.

Research Interests: Molecular biology of fastidious emerging pathogens, including the causative agent of whooping cough (Bordetella pertussis) and the Whipple's bacterium (Tropheryma whipplei), Infection control and hospital epidemiology with an emphasis on hand hygiene, skin antisepsis, and prevention of infections in surgery, and Clinical microbiology relevant to women's and children's health.

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Dr Yung Chee Fu

Consultant, Infectious Diseases Service, KKH

Title: "Elizabethkingia Anophelis - An 'emerging' pathogen"

Abstract: The talk will describe the detection and control of Elizabethkingia Anophelis nosocomial cluster and discuss the 'emerging' epidemiology of Elizabethkingia Anophelis in hospitals and communities.

Biography: Dr Yung Chee Fu graduated from University of Bristol Medical School and completed post-graduate training in Cambridge and London.

Research Interests: Infectious diseases, Vaccines, Epidemiology and Public Health.

Email: yung.chee.fu@singhealth.com.sg

Associate Professor Andrea Kwa Lay Hoon

Assistant Director (Research), SGH
Associate Professor, Programme in Emerging Infectious Diseases, Duke-NUS Medical School and SingHealth-Duke-NUS Medicine ACP

Title: "Integrating Novel Strategies into the treatment algorithm for antimicrobial resistance"

Abstract: The unabated rise in antimicrobial resistance, emergence of extensively drug-resistant pathogens and the dearth of new antibiotic development have become a global health threat. A comprehensive strategy is required to tackle antimicrobial resistance. The threat of antimicrobial resistance in general and Carbapenem-Resistant Enterobacteriaceae (CRE) specifically is one faced by all hospitals in Singapore and globally. A research and operational strategy to tackle antimicrobial resistance will require a model that encompasses bench, bedside and health system.

Biography: Dr Andrea Kwa received her Doctor of Pharmacy Degree in 2006, from New York's Albany College of Pharmacy and Health Sciences. She completed her undergraduate studies at the National University of Singapore in 1996, thereafter her two-year postdoctoral research fellowship at the University of Pittsburgh's Division of Infectious Diseases, where she researched anti-fungal resistance and molecular diagnostics. Dr Andrea Kwa is currently a Pharmacy Clinician Scientist and Assistant Director of Health Services Related Research Unit at Singapore General Hospital. She is also a faculty member of Duke-NUS Medical School's Emerging Infectious Diseases program. Dr Kwa also heads a laboratory that looks at antimicrobial pharmacodynamics/pharmacokinetics and resistance at Academia. She also performs health services research involving antimicrobial stewardships, risk factors and outcomes of resistant infections. Dr Kwa has authored about 60 publications and is an avid reviewer for many scientific journals.

Research Interests: Elucidation of multiple antibiotics in combination against extreme drug resistant bacteria in an one compartment static in-vitro model or a dyamic in-vitro pharmacokinetic/pharmacodynamic two-compartmental model simulating fluctuating clinically achievable antibiotic concentrations, Population pharmacokinetics/ pharmacodynamics of antimicrobials, Molecular diagnostics in fungal diseases and anti-fungal resistance, Risk factors and outcomes via statistical modelling, and Health services research involving antimicrobial stewardships.

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Dr Lim Tze Peng

Senior Principal Pharmacist Researcher, SGH
Assistant Professor, SingHealth-Duke-NUS Medicine ACP and Pathology ACP

Title: "Integrating Novel Strategies into the treatment algorithm for antimicrobial resistance"

Abstract: The unabated rise in antimicrobial resistance, emergence of extensively drug-resistant pathogens and the dearth of new antibiotic development have become a global health threat. A comprehensive strategy is required to tackle antimicrobial resistance. The threat of antimicrobial resistance in general and Carbapenem-Resistant Enterobacteriaceae (CRE) specifically is one faced by all hospitals in Singapore and globally. A research and operational strategy to tackle antimicrobial resistance will require a model that encompasses bench, bedside and health system.

Biography: Dr. Lim Tze Peng graduated in Pharmacy from the National University of Singapore (NUS) in Singapore in 2004. He embarked on a year-long research fellowship split over 2007 and 2009 at the University of Houston School of Pharmay. He then obtained his Ph.D. in Microbiology from NUS YLLSOM in 2014. He is currently a Senior Principal Pharmacist Researcher at Singapore General Hospital and Assistant Professor at SingHealth Duke-NUS Medicine Academic Clinical Programme and Pathology Academic Clinical Programme. His work is aimed at identifying the optimal treatment algorithm in the treatment of extensively drug resistant bacteria that causes hospital acquired infections worldwide. He had authored over 30 publications on antimicrobial pharmacokinetics and pharmacodynamics and infectious disease therapeutics.

Research interests: Pharmacokinetic and Pharmacodynamic Modelling of Antimicrobials for prediction of drug disposition and exposure effect size, Antimicrobial Combination Testing to predict and translate in vitro / vivo results to antimicrobial combination therapy in patients, Therapeutic Drug Monitoring in Infectious Diseases to optimise antimicrobial therapy at infection sites, Development of diagnostic approaches / tools to optimise antimicrobial therapy and molecular mechanisms of antimicrobial resistance.

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Dr Jean Sim Xiang Ying

Associate Consultant, Department of Infectious Diseases, SGH

Title: "Tweaking everyday objects to prevent the spread of AMR"

Abstract: Hand hygiene and good infection control practices are key in our fight against antimicrobial resistance. Together with our SUTD collaborators we have created innovations for the privacy curtains in our wards to help improve hand hygiene compliance. We will present the results of our feasibility studies for our light-emitting curtains (LEC) and the handrub interacting curtains (HIC).

Biography: Dr Jean Sim graduated in 2009 from the Yong Loo Lin School of Medicine. She has completed her MRCP (UK), Mmed (Singapore) and in 2017 her specialist examinations in Infectious Diseases. She is currently an Associate Consultant with the Department of Infectious Diseases at the Singapore General Hospital.

Research interests: Antimicrobial resistance, Infection prevention and control, Hospital epidemiology, Healthcare innovations and Medical Technology.

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Dr Dorothy Ng Hui Lin

Senior Resident, Infectious Diseases, SingHealth

Title: "Determinants of an attenuated dengue vaccine strain"

Abstract: Vaccines are the most economical public health tool for preventing or slowing the spread of infections and alleviating human suffering; yet, the molecular basis of live vaccine attenuation remains poorly understood. Here, we construct and use infectious clones of PDK-53, an attenuated dengue virus serotype 2 vaccine strain, in combination with site-directed mutagenesis, to tease out the key mutations that confer viral attenuation and elucidate a genetic basis for its attenuation. If the basic genetic and molecular mechanisms of vaccine attenuation are better understood, then this can potentially be developed into an evidence-based approach to live-attenuated vaccine design and safety monitoring.

Biography: Dr Dorothy Ng is an A*STAR scholar and graduated with a MBBS-PhD degree from University College London in 2014. She became an AMRI Khoo Scholar between Oct 2016 – Jan 2018, during which she started post-doctoral research under the mentorship of Professor Ooi Eng Eong in the Duke-NUS Emerging Infectious Diseases Programme. Since Jan 2019, she now continues this research as an Infectious Diseases Clinician Scientist Senior Resident in SingHealth.

Research interests: Dengue, Vaccinology and Immunology.

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Dr Erin Zhang

Product Manager, MGI Tech, Biomed Global

Title: Research and Clinical Applications (NGS Pathogenic and TB solution) based on DNBSeq Technology.

Abstract: The talk will introduce DNBSeq technology and touch upon its various applications within research and clinical studies.

Biography: Dr. Erin Zhang is the Product Manager for sequencing platforms at MGI Tech, a subsidiary of BGI Group. At MGI Tech, she is responsible for product lifecycle planning and execution. She manages marketing and communication efforts to increase brand awareness and achieve business goals. Before joining MGI Tech, Erin worked as a product manager for digital PCR and has extensive hands-on experience in molecular and cellular biology field throughout her career. She completed her Ph.D. in pharmaceutical biology at National University of Singapore.

Research Interest: Developing the Next Generation Sequencing technology in all applications, utilizing for both research and clinical industries.

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Infectious Diseases Research Institute Annual Scientific Retreat - 2019

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