TRANSMISSION OF RESPIRATORY VIRUSES:

from basic science to evidence based options for control

19-21 June 2017, Hong Kong

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International Society for Influenza and other Respiratory Virus Diseases

Theme-Based Research Scheme on
Viral, Host and Environmental Determinants of
Influenza Virus Transmission and Pathogenesis

Funded by Research Grants Council

Programme & Abstract Book

TRANSMISSION OF RESPIRATORY VIRUSES:
from basic science to evidence based options for control

Programme at a glance

Day 1 - Monday, 19 June 2017 (1/F, Grand Ballroom)

08:00 – 09:00	Registration
09:00 – 09:10	Opening remarks
09:10 – 10:40	Oral presentations
10:40 – 11:00	*Refreshment break*
11:00 – 13:00	Oral presentations
13:00 – 14:00	*Lunch*
14:00 – 15:15	Oral presentations
15:15 – 15:35	*Refreshment break*
15:35 – 16:50	Oral presentations

Day 2 - Tuesday, 20 June 2017 (1/F, Grand Ballroom)

09:00 – 10:30	Oral presentations
10:30 – 10:50	*Refreshment break*
10:50 – 12:50	Oral presentations
12:50 – 14:00	*Lunch*
14:00 – 15:15	Oral presentations
15:15 – 15:40	*Refreshment break*
15:40 – 16:55	Oral presentations
18:00 – 21:00	*Poster session & cocktail reception (5/F, Salon Room)*

Day 3 - Wednesday, 21 June 2017 (1/F, Grand Ballroom)

09:00 – 10:45	Oral presentations
10:45 – 11:05	*Refreshment break*
11:05 – 12:50	Oral presentations
12:50 – 14:00	*Lunch*
14:00 – 15:15	Oral presentations
15:15 – 15:30	Discussion and Closing Remarks
15:30 – 16:00	Refreshments available

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On behalf of the Scientific Committee, I would like to welcome you to Hong Kong for this international conference on **Transmission of respiratory viruses: from basic science to evidence based options for control**.

This 3-day meeting aims to bring researchers working on different respiratory viruses and those from diverse disciplines together, to discuss respiratory virus transmission among humans and at the animal-human interface, experimental models for virus transmission, determinants of transmission, and effective measures to control respiratory virus transmission. We hope that this conference will provide a forum for the presentation and discussion of the latest research on this topic, and to define future research priorities. We hope these interactions will deepen understanding and foster cross-disciplinary collaborations.

We are delighted to have an exciting line-up of eminent researchers who will give invited presentations. Many high-quality abstracts have been submitted which will be presented as oral or poster presentations. We hope that we will have active discussion on the papers presented and that you will have the opportunity to interact with researchers from diverse disciplines.

We would like to acknowledge key Conference support from the Li Ka Shing Faculty of Medicine, The University of Hong Kong on the occasion of its 130th Anniversary, from The Croucher Foundation, logistical support from the International Society for Influenza and Other Respiratory Virus Diseases (ISIRV) and the Research Grants Council of Hong Kong.

On behalf of the Scientific Committee, I wish you all a stimulating and productive meeting and an enjoyable stay in this vibrant city of Hong Kong.

Yours sincerely,

Malik Peiris
Conference Chair
School of Public Health
The University of Hong Kong

Overview

Given the speed with which viruses transmitted by the respiratory route spread globally (e.g. SARS, the 2009 influenza pandemic, MERS), epidemics caused by these viruses pose the greatest threats to global public health. Surprisingly, little is known about the mechanisms by which these viruses are transmitted; much of what is believed to be known being based on dogma than "fact". Such knowledge gaps include the relative importance of contact, fomites, and air-borne (large droplet vs. small droplet) spread; the aero-biology of virus transmission; what interventions prevent such transmission; the role of viral "quasi-species" in transmission; and viral / host determinants of adaptation of animal viruses for transmission in humans. In turn, these knowledge-gaps compromise the impact and rational use of non-pharmaceutical interventions for infection prevention and control.

Ongoing work addressing some of these gaps in knowledge tends to occur within individual silos, by pathogen (e.g. influenza, RSV, rhinovirus, measles, MERS) or by experimental approach (e.g. those working with experimental animal models; basic virology; epidemiology; aero-biology; infection control). This conference aims to cut across these divisions to bring together researchers working with different viruses and using different experimental approaches. We expect these interactions to deepen understanding and to foster collaborations internationally.

There are still many uncertainties about the determinants and dynamics of respiratory virus transmission from human to human. Major questions that will be discussed at the conference include: What proportion of respiratory virus transmission occurs through the aerosol (fine particle) route? How many virions are involved in transmission from person to person, for different viruses? How do host, viral and environmental factors influence the routes of transmission? How much viral evolution occurs at the transmission event, versus during the course of infection within a host? Which locations or environments are more supportive to viral transmission? How do all of these issues vary between viruses?

Transmission is the consequence of complex virus-host interactions. Experimental animal models provide data on viral and host factors associated with enhanced transmission potential and on mechanisms (e.g. aerobiology; modes of transmission) of transmission. Animal models provide the benefit of being able to control for variations often observed in human transmission studies due to differences in prior immunity,

genetic factors, age etc, and when combined with serial sampling with pathology, immuno-histochemistry, or labelled viruses, permit insights not achievable solely with epidemiological or human volunteer challenge studies.

Zoonotic transmission can lead to emergence of explosive epidemics or pandemics, SARS, the 2009 pandemic, MERS being recent examples. However, the viral and host determinants of the emergence of viruses efficiently transmissible in humans remains poorly understood. Such understanding is important for surveillance at the animal-human interface and to risk-assess the many zoonotic transmission events that regularly occur and identify those for which medical countermeasure development needs to be prioritized.

A wide variety of non-pharmaceutical measures are used to control respiratory virus transmission. Major questions that will be discussed at the conference include: Which measures are more effective in reducing the transmission of respiratory viruses, such as source control measures, environmental controls, etc? What is the risk of transmission in different settings and the impact of control measures on risk? What are the best approaches to control nosocomial transmission of respiratory viruses? What novel strategies may be deployed to control respiratory virus transmission? How do all of these issues vary between viruses? What are the options for prevention of zoonotic emergence?

Scientific Committee

Conference Chair
Professor Malik Peiris
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Scientific Committee Members
Professor Larry Anderson
Department of Pediatrics
Emory University School of Medicine, USA

Professor Benjamin Cowling
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Professor John Edmunds
Faculty of Epidemiology & Population Health
London School of Hygiene and Tropical Medicine, UK

Professor Ron Fouchier
Department of Viroscience
Erasmus MC Rotterdam, The Netherlands

Professor Yi Guan
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Professor David Hui
Department of Medicine & Therapeutics
The Chinese University of Hong Kong, Hong Kong SAR, China

Professor Yoshihiro Kawaoka
School of Veterinary Medicine
University of Wisconsin-Madison, USA

Dr Tommy Lam
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Professor Yuguo Li
Department of Mechanical Engineering
The University of Hong Kong, Hong Kong SAR, China

Professor Donald Milton
School of Public Health
University of Maryland, USA

Professor Colin Parrish
College of Veterinary Medicine
Cornell University, USA

Professor Leo Poon
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Dr Richard Webby
Infectious Diseases Department
St. Jude Children's Research Hospital, USA

Dr Hui-Ling Yen
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Local Organizing Committee

Professor Benjamin Cowling (Chair)

Professor Malik Peiris

Dr Tommy Lam

Professor Leo Poon

Dr Hui-Ling Yen

School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Invited Speakers

Professor Larry Anderson

Department of Pediatrics
Emory University School of Medicine, USA

Larry J. Anderson, MD, is Professor and Marcus Chair of Infectious Diseases, Division of infectious Diseases, Department of Pediatrics, Emory University School of Medicine. Dr. Anderson joined Emory University School of Medicine, Atlanta, GA, USA in 2010 after over 30 years at the United States Centers for Disease Control and Prevention (CDC). He has worked on epidemiology, disease burden and pathogenesis of non-influenza respiratory viruses, especially respiratory syncytial virus.

Professor Raul Andino

Department of Microbiology and Immunology
University of California, San Francisco, USA

Dr. Andino is Professor of Microbiology and Immunology at the University of California, San Francisco, where he specializes in RNA viruses, with focus on molecular biology, immunology and evolutionary biology. His research includes mechanisms of replication, antiviral RNAi and adaptation. He is interested in the evolution of the immune system and in the role of virus population diversity in pathogenesis. Understanding the rules that control host and virus evolution has important implications for vaccine development and antivirals.

Dr Jessica Belser

Influenza Division
Centers for Disease Control and Prevention, USA

Jessica Belser is a microbiologist in the Influenza Division at the US Centers for Disease Control and Prevention. She received her BA from Rutgers University and her PhD from Emory University. As a member of the Immunology and Pathogenesis Branch, her research has focused on the molecular determinants that confer virulence and transmission of seasonal and emerging influenza viruses with pandemic potential, with an emphasis on those within the H7 subtype. In recent years she has developed several in vitro, ex vivo, and in vivo models to study the apparent ocular tropism of H7 subtype viruses. She has published over 80 peer-reviewed papers on influenza and has been recognized with the CDC's Charles C Shepard Laboratory and Methods Award. She is a recipient of the 2012 Presidential Early Career Award for Scientists and Engineers (PECASE) and was named a Kavli Frontiers of Science fellow in 2014.

Professor John Edmunds

Faculty of Epidemiology & Population Health
London School of Hygiene and Tropical Medicine, UK

John Edmunds is Professor of Infectious Disease Modelling at the London School of Hygiene & Tropical Medicine and Dean of the Faculty of Epidemiology and Population Health. John's research focuses on modelling the spread of infectious diseases and the design of efficient control programmes. He has published over 230 scientific articles in this field. He has been involved in helping the UK Government to plan and prepare for pandemic flu and similar emergencies over a number of years. He works closely with colleagues at Public Health England on vaccine and influenza-related issues, and advises policy-makers on these topics. He has been a member of a number of national and international advisory committees, including WHO's Ebola Science Committee, the UK's New and Emerging Respiratory Virus Technical Advisory Group (NERVTAG) and various subcommittees of the Joint Committee on Vaccines and Immunisation (JCVI).

Professor Ron Fouchier

Department of Viroscience
Erasmus MC Rotterdam, The Netherlands

Ron Fouchier (1966) received a PhD in Medicine from the University of Amsterdam in 1995 for studies on HIV and he continued to study HIV as a post-doctoral fellow at the Howard Hughes Medical Institute, University of Pennsylvania School of Medicine in Philadelphia, from 1995-1998 with Prof. M. Malim. He subsequently started a new group to study the molecular biology of respiratory viruses, in particular influenza A virus, at the Viroscience Department of Erasmus MC Rotterdam, headed by Prof. A. Osterhaus. As a fellow of the Royal Dutch Academy of Sciences (KNAW), he studied influenza virus zoonoses and pathogenicity. Achievements of his team include the identification and characterization of several "new" viruses; the human metapneumovirus (HMPV), human coronavirus NL63, the SARS coronavirus (SARS-CoV), the MERS coronavirus (MERS-CoV), and a new influenza A virus subtype (H16). Currently, his research is focused on the evolution and molecular biology of respiratory viruses in humans and animals, with special emphasis on influenza virus antigenic drift, zoonoses, transmission, and pandemics and on HMPV. Fouchier is alumni member of the "Young Academy" of the KNAW, elected member of the KNAW and chair of the KNAW domain Medical, Biomedical and Health Sciences. He is also a member of the Royal Holland Society of Sciences and Humanities, recipient of the 2006 Heine-Medin award of the European Society for Clinical Virology and the 2013 Huibregtsen prize for top innovative science with societal impact. He co-authored more than 350 publications that have been cited >30,000 times (H-index 79). Fouchier is an editor for several infectious disease journals, and member of advisory committees for Dutch government

and (international) scientific organisations and conferences. He is Scientific Director of the postgraduate school Molecular Medicine (~500 PhD students) and the MSc program Infection and Immunity of Erasmus MC. His group is part of an NIH/NIAID Center of Excellence for Influenza Research, and participates in several WHO working groups. His research is further funded by several EU programs and Dutch and US government.

Professor David Hui

Department of Medicine & Therapeutics
The Chinese University of Hong Kong, Hong Kong SAR, China

Prof Hui is the Chairman of Dept of Medicine & Therapeutics, Stanley Ho Professor of Respiratory Medicine, and the Director of the Stanley Ho Centre for Emerging Infectious Diseases at the Chinese University of Hong Kong (CUHK).

He has been working as an academic clinician since 1998 at the Prince of Wales Hospital, HK where a major outbreak of SARS occurred in 2003. Since 2004, he has frequently served as an advisor to the WHO and joined several urgent WHO missions related to the clinical management of emerging severe acute respiratory infections (SARI) including avian influenza, pandemic influenza and MERS. His research interests include the clinical management of SARI, safety of respiratory therapy in the post SARS era, and prevention of nosocomial transmission of SARI. Prof Hui has published well over 270 peer-reviewed journal articles and 24 book chapters.

Professor Yoshihiro Kawaoka

School of Veterinary Medicine
University of Wisconsin-Madison, USA

Dr. Yoshihiro Kawaoka was educated in Japan, receiving his DVM in 1978 and his PhD in 1983 from Hokkaido University. Dr. Kawaoka established the technique of reverse genetics, which allows the generation of 'designer' influenza viruses. This technology – coupled with his findings regarding the attenuation of deadly influenza viruses – has been used to develop candidate H5N1 influenza virus vaccines. Reverse genetics is also utilized to generate live attenuated influenza vaccines that are used worldwide. Dr. Kawaoka has also studied the 1918 Spanish influenza virus, which killed over 40 million people. He discovered that infection with this virus caused an abnormal immune response.

In addition to his work with influenza virus, Dr. Kawaoka also studies Ebola virus. Dr. Kawaoka was the first to establish a pseudotype virus system that allows the analysis of Ebola virus glycoprotein under BSL2 conditions. Dr. Kawaoka has also developed another system that allows the study of the entire Ebola virus replication cycle under non-BSL4 conditions.

In recognition of his achievements, Dr. Kawaoka was awarded the prestigious Robert Koch Award in 2006, and the Medal of Honor (Purple Ribbon) in 2011 and the Japan Academy Award in 2016 from the Emperor of Japan for his innovative research in the field of influenza virology. In 2013, he was elected as a Foreign Associate of the United States National Academy of Sciences. In 2015, he received UNESCO Carlos J. Finlay Prize for Microbiology.

Professor Yuguo Li
Department of Mechanical Engineering
The University of Hong Kong, Hong Kong SAR, China

Yuguo Li is Professor and Head of Department of Mechanical Engineering, The University of Hong Kong. He studied at Shanghai Jiaotong University (B.Eng. in refrigeration engineering), Tsinghua (MSc in thermal engineering) and Royal Institute of Technology (PhD in fluid mechanics) in Stockholm, and was a Principal Research Scientist at CSIRO prior to 2000 when he joined the University. His research interests are in built environment engineering. His current research topics include city climate/environment, environment studies of respiratory infection and indoor air quality. He carried out research on hospital ventilation for Hospital Authority and WHO. His work led to the findings of the roles played by airflow in the 2003 Amoy Gardens SARS outbreak. He led the development of 2009 WHO guidelines on natural ventilation. He is currently President of International Society of Indoor Air Quality and Climate (ISIAQ) Academy of Fellows, and has served as an Associate Editor of Indoor Air since 2007. He received John Rydberg Gold Medal from SCANVAC (Association of HVAC societies in the Nordic Countries) in 2014, an Honorary Doctor Degree from Aalborg University, Denmark in 2015, and the Inoue Memorial Award of SHASE (The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan) in 2016.

Professor Veronika von Messling

Veterinary Medicine
Paul Ehrlich Institut, Germany

Dr. Veronika A. von Messling is Director of the Veterinary Medicine Division at Paul-Ehrlich-Institut, the German regulatory authority for vaccines and biomedicines, in Langen, Germany. She obtained her veterinary degree, Tierarzt (D.V.M. equivalent) in 1996, and her doctorate degree in veterinary virology (Dr. med. vet.) in 1998 from the Veterinary School Hannover, Germany. After completing her postdoctoral training in virology and molecular biology at the Institute of Virology in the laboratory of Prof. Georg Herrler at the Veterinary School Hannover, and in molecular virology and gene therapy in the laboratory of Prof. Roberto Cattaneo at Mayo Clinic and Foundation in Rochester, Minnesota, she joined INRS-Institut Armand-Frappier in 2004 as Assistant Professor. In 2010, she took up an Associate Professor position in the Emerging Infectious Diseases Department at Duke-NUS Graduate Medical School in Singapore, before moving to Paul-Ehrlich-Institute in 2012.

Her research program aims at characterizing the pathogenesis of respiratory viruses, especially morbilliviruses and influenza to develop novel prophylactic and therapeutic strategies. Projects involve the study of recombinant genetically modified virus in vitro and in different animal models including ferrets, which are naturally susceptible both viruses.

Professor Donald Milton

School of Public Health
University of Maryland, USA

Dr. Milton earned a BS in Chemistry from the University of Maryland Baltimore County (Cum Laude), an MD from Johns Hopkins University and a DrPH (Environmental Health) from Harvard University. He is currently Professor, Maryland Institute for Applied Environmental Health, University of Maryland School of Public Health, College Park, MD, and Department of Medicine, School of Medicine, University of Maryland. He is board certified in Internal and Occupational and Environmental Medicine and has 20 years of experience in occupational medicine referral practice. He has served on the editorial boards of Applied Environmental Microbiology, Indoor Air, and BMC Public Health. He is a recipient of the Lloyd Hyde Research Award from Emory University, the Harriet Hardy Award from the New England College of Occupational and Environmental Medicine, and was elected a Fellow of the International Society for Indoor Air Quality and Climate in 2008. He received “Best Paper” awards for papers on indoor environment and infection risk published in the journal Indoor Air. He holds two

patents with one more pending for exhaled breath and bioaerosol samplers and related methods. He is current PI of "Contagious Phenotypes of Acute Respiratory Infection: Identification, Characterization, and Biomarkers" funded by the US Defense Advanced Research Projects Agency.

Professor Arnold Monto
School of Public Health
University of Michigan, USA

Arnold S. Monto, MD is the Thomas Francis Jr. Collegiate Professor at the University of Michigan School of Public Health's Department of Epidemiology. The focus of his work has been the epidemiology, prevention and treatment of acute infections in the individual and the community. Respiratory infections, in particular influenza, have been a major interest. He has worked on these issues in tropical as well as temperate regions. He led the studies of respiratory infection in Tecumseh, MI, a landmark study of infection in the community, and is now updating these observations in Michigan households with children.

Dr. Monto has been involved in assessing the efficacy of various types of influenza vaccines in prophylaxis and antivirals in prophylaxis and therapy of influenza. He now heads observational studies of effectiveness of influenza vaccines in various settings. These investigations have raised questions about the role of repeat vaccination on influenza prevention. His recent activities have also included evaluation of face masks and hand hygiene in the control of influenza transmission and determination of efficacy of the traditional inactivated and live attenuated influenza vaccines.

He has been a member of the National Allergy and Infectious Disease Advisory Council of the US National Institutes of Health. He is a past president of the American Epidemiological Society, the 2009 recipient of the Alexander Fleming Award of the Infectious Diseases Society of America for lifetime achievement and the 2012 recipient of the Charles Merieux award of the National Foundation for Infectious Diseases. He was a member of the Emergency Committee making recommendations to the World Health Organization during the last influenza pandemic and is now a member of the Vaccine and Related Biological Products Advisory Committee of the FDA.

Professor James Nokes
KEMRI-Wellcome Trust Research Programme, Kenya and
School of Life Sciences, University of Warwick, UK

James Nokes is Professor of Infectious Disease Epidemiology at the School of Life Sciences, University of Warwick, UK. Since 2001, he has been based full time at the Wellcome Trust Major Overseas Programme, Kilifi, coastal Kenya. James trained in Zoology (BSc) followed by a PhD in virus epidemiology. His principle interests are the transmission dynamics and control of human viral pathogens, including respiratory syncytial virus and rotavirus. The focus of his WT Senior Investigator Award is the integration of epidemiological and genomic data to infer transmission pathways at different scales of interest from the household to countrywide. His research group is inter-disciplinary using molecular, phylogenetic, immunological, mathematical, statistical and field approaches to address key questions relating to respiratory and enteric virus persistence, transmission, and intervention.

Dr Edward Nardell
Department of Global Health & Social Medicine
Harvard Medical School, USA

Most of my academic career has focused on TB transmission control, with a particular emphasis on environmental and engineering controls. In the US, I was co-PI of a nationwide study of the safety and efficacy of upper room UV in homeless shelters (TB UV Shelter Study, TUSS, 1992-2000). Globally, much of my basic research has been done in the Airborne Infections Research (AIR) facility near Pretoria, South Africa, where human subjects infect sentinel guinea pigs through the ventilation system. Studies at the AIR facility have demonstrated that upper room UV can be 80% effective in preventing MDR-TB transmission, masks on patients only 56% effective, and room air filtration much less so under the same rigorous conditions. In addition to these older interventions, I have been committed to more innovative research. As part of a large effort to test newer air disinfection strategies, funded by various sources, I established an environmental aerobiology chamber at Harvard School of Public Health. Work at this facility, in conjunction with the AIR Facility has led to several innovations in air disinfection, such as "eggcrate and LED UV" as well as to a new computer- assisted UV design system (Visual-UV). Drawing upon these experiences, I lead an annual 2-week course on Building Design and Engineering Approaches to Airborne Infection Control in Boston, attracting an international student body of architects, engineers, and health care workers. More recently, I have been testing CO2 monitoring as a novel way to measure the impact of these environmental and engineering controls - in particular building design – on risk for

airborne infection, using the proportion of "shared air" as a proxy for risk. A pilot study in Cape Town provided important preliminary data on this approach and an upcoming study at Stellenbosch University/Tygerberg Hospital in South Africa will further that research.

Professor Christopher O'Callaghan
Institute of Child Health
University College London, UK

Chris is Professor of Respiratory & Paediatric Medicine at the University College London (UCL) Great Ormond Street Institute of Child Health where he heads Respiratory, Critical Care and Anaesthesia. His research interests include aerosol medicine, the ciliated respiratory epithelium in rare and common respiratory disease and the effects of viral and bacterial infection. He established and runs the UK national diagnostic service for primary ciliary dyskinesia. He has a major interest in multimedia education recently establishing a not for profit social enterprise to take this forward (www.worldmedicaleducation.com).

Professor Colin Parrish
College of Veterinary Medicine
Cornell University, USA

Colin Parrish is the John M. Olin Professor of Virology in the Baker Institute for Animal Health, at the College of Veterinary Medicine at Cornell University. He grew up in New Zealand, and has a BSc (Hons.) from Massey University in Palmerston North, New Zealand, and a Ph.D. in Virology from Cornell University. He completed postdoctoral studies of flaviviruses at Monash University. He has been on the faculty at Cornell University since 1988. The research in his laboratory focuses on the study of viruses, of virus structures, and the evolution of new viral host ranges. The model systems include the canine parvovirus, a cat virus that transferred into dogs in the 1970s to cause a global pandemic of disease, and the H3N8 and H3N2 canine influenza viruses, which transferred from horses or birds to dogs to cause two epidemics of canine disease. His studies are also examining the basis of viral emergence, in particular the risk factors associated with origins of viruses in new animal hosts and in humans, and on the viral, host and population attributes that allow those pathogens to emerge and spread.

Professor Leo Poon
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Prof Leo Poon received his doctoral training in Sir William Dunn School of Pathology in University of Oxford (1996-1999). After his graduation, he returned to Hong Kong and worked as a postdoctoral fellow in the Chinese University of Hong Kong (1999-2001). He joined The University of Hong Kong in 2001. Prof Poon has strong interests that are related to emerging viruses, ranging from studying basic biology of RNA viruses to developing molecular diagnostic tools for infectious diseases. His work primarily focuses on influenza virus and coronavirus. He published over 170 peer-reviewed articles, and he is an ISI top 1 % most cited scientist (Total number of citations: 14945; H-index: 59). He was named as one of the "Highly Cited Researchers" in 2015 and 2016 by Thomson Reuters. He was awarded the prestigious Senior Research Fellowship by the Croucher Foundation in 2017.

In 2003, Prof Poon involved in the discovery of a novel coronavirus as the aetiological cause of SARS. He is one of the firsts who decoded the first SARS coronavirus sequence. These findings allowed him to develop several useful molecular tests for the diagnosis of SARS. The identification of SARS coronavirus in humans and animals also prompted him to hunt for novel viruses in wildlife and this leaded to the discovery of the first and many others coronaviruses in bats.

Prof Poon involves in influenza research for over 20 years. He studied the replication and pathogenesis of this virus. He developed several molecular tests for emerging avian influenza viruses (e.g. H5N1, pandemic H1N1/2009 and H7N9). In 2009, he played an active role in the H1N1 pandemic and identified the first reassortant of pandemic H1N1/2009 virus in pigs. Currently, he focuses on researching the viral replication and vaccinology of influenza virus.

Prof Poon serves as a virology expert in several international organizations. He is a committee member in the Coronavirus Study Group under the International Committee on Taxonomy of Viruses (2006-now) and he is also an expert in the Influenza Molecular Diagnosis Working Group, World Health Organization (2009-now). He previously served as an ad hoc consultant in the Food and Agriculture Organization of the United Nations (2013-2014) and in the World Organization for Animal Health (2014) for MERS. He is an editor Virus Evolution (2014-now).

Dr Charles Russell
Department of Infectious Diseases
St. Jude Children's Research Hospital, USA

Charles Russell completed his Ph.D. in 1998 at the University of California at Berkeley. His doctoral research focused on membrane protein structure and the energetics of protein binding to membranes. From 1998-2004, he was a postdoctoral fellow in the laboratory of Dr. Robert Lamb of the Howard Hughes Medical Institute at Northwestern University. There, he dissected mechanisms by which paramyxoviruses and influenza viruses cause membrane fusion. His most notable postdoctoral achievement was the discovery that the energy released upon paramyxovirus fusion (F) protein refolding is coupled to the work performed during membrane fusion. Since 2004, he has been a PI at St. Jude Children's Research Hospital in Memphis, TN. His lab studies respiratory infectious diseases caused by influenza and paramyxoviruses in both normal and immunocompromised hosts. Basic research ranges from high-resolution structure to virus pathogenesis and transmission with the ultimate goal of connecting molecular mechanisms with biological phenotypes. A primary focus is the surface entry proteins, which the laboratory is also targeting with vaccines and therapeutics. The Russell lab developed the first negative-strand RNA reporter virus for non-invasive imaging of in vivo infection. They have used this system to dissect upper- versus lower-respiratory tract infection and detail for the first time infection anisotropy by paramyxoviruses after airborne transmission. The Russell lab has also played a central role in the discovery of a novel determinant of influenza virus transmission and interspecies adaptation: HA acid stability.

Dr Kanta Subbarao
WHO Collaborating Centre for Research and Reference on Influenza
The Peter Doherty Institute for Infection and Immunity, Australia

Dr. Kanta Subbarao was appointed in 2016 as Director of the WHO Collaborating Centre for Reference and Research on Influenza at VIDRL and the Peter Doherty Institute for Infection and Immunity in Melbourne. Dr. Subbarao is a virologist and a physician with specialty training in pediatrics and pediatric infectious diseases. She received her M.B.B.S. from Christian Medical College, Vellore in India, completed training in pediatrics and pediatric infectious diseases in the US and earned an M.P.H. in epidemiology from the University of Oklahoma Health Sciences Center. She received postdoctoral training in the Laboratory of Infectious Diseases (LID), National Institute for Allergy and Infectious Diseases, National Institutes of Health (NIH).

Prior to her arrival in Melbourne, she was Chief of the Emerging Respiratory Viruses Section of LID, NIAID, NIH in Bethesda from 2002-2016 and chief of the Molecular Genetics Section of the Influenza Branch at the CDC in Atlanta from 1997-2002.

Dr. Subbarao' s research is focused on newly emerging viral diseases of global importance including pandemic influenza, severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS) and includes study of virus biology and pathogenesis, immune responses to infection and vaccination, development and preclinical and clinical evaluation of vaccines. Dr. Subbarao has authored more than 175 peer-reviewed publications in leading journals including Science, Nature, PNAS and the Journal of Virology, and 50 reviews or chapters, a majority on influenza and SARS. She is a Fellow of the American Academy of Microbiology and the Infectious Diseases Society of America and is a member of the American Society of Microbiology, Pediatric Infectious Diseases Society and American Society for Virology. She serves on the Editorial Board of PLoS Pathogens and mBio.

Dr Robert Webster

Department of Infectious Diseases
St. Jude Children's Research Hospital, USA

Robert G. Webster is an Emeritus Member of the Division of Virology; Department of Infectious Diseases at St. Jude Children's Research Hospital. His interests include the emergence and control of influenza viruses, viral immunology, the structure and function of influenza virus proteins and the development of new vaccines and antivirals. Together with Graeme Laver he developed one of the first subunit vaccines for influenza that is still being produced in Australia. The major focus of his research is the importance of influenza viruses in wild aquatic birds as a major reservoir of influenza viruses and their role in the evolution of new pandemic strains for humans and lower animals. He contributed to the establishment of the Center of Excellence for Influenza Research at the University of Hong Kong and to the Center of Excellent for Influenza Research and Surveillance at St Jude Children's Research Hospital and to our understanding of the continuing evolution and control of novel influenza viruses. His curriculum vita contains over 700 original articles and reviews on influenza viruses with pandemic potential. He has trained many scientists who now contribute to our understanding of the evolution and pathogenesis of influenza and to vaccine and antiviral developments.

Honors:
Fellow of the Royal Society, London, 1989
National Academy of Sciences of the United States of America, 1998
Fellow of the Royal Society of New Zealand (Honorary)

Dr Hui-Ling Yen

School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Dr. Hui-Ling Yen received her Ph.D. in Epidemiological Science in 2005 from The University of Michigan, Ann Arbor followed by her postdoctoral training at St. Jude Children's Research Hospital, Memphis, TN. Her research interests focus on understanding the mechanism facilitating the transmission of influenza virus among and between different hosts, studying the potential virus-host interactions that affect viral pathogenicity and clinical outcome, and examining the molecular determinants that confer antiviral resistance.

Dr Huachen Zhu
School of Public Health
The University of Hong Kong, Hong Kong SAR, China

Dr Zhu received her BS degree in Biochemistry and PhD in Genetics from Sun Yat-sen University. She joined the University of Hong Kong in 2007 and is now Assistant Professor of the School of Public Health and Adjunct Professor of Shantou University (STU). She is Co-director of the Joint Laboratory for International Cooperation in Virology and Emerging Infectious Diseases, Ministry of Education, China, and also Associate Director of the Joint Institute of Virology (STU/HKU) and the State Key Laboratory of Emerging Infectious Diseases (HKU-Shenzhen Branch).

The central theme of Dr Zhu's research is influenza and other emerging infectious diseases (EIDs). Over the past five years, she has been at the forefront of assessing risks of emerging viruses and identifying threats to human health through viral EIDs, bringing about fundamental understanding of how viruses develop at the human and animal interface. Her team has identified the zoonotic sources, transmission routes, evolutionary pathways and precursors leading to the genesis of multiple severe viral threats to human health. Repeatedly, this work has been published in Nature and Science, the top two journals in the category of Multidisciplinary Sciences, and has made significant contributions to the control of EIDs in China and the world.

Dr Zhu believes that interest is the best teacher and discovery is the best reward for a researcher. She enjoys working in a field that helps to promote global health and also provides insight into the mystery of life. Her research has attracted funding from the NIH of the USA, the Wellcome Trust, the National Natural Science Foundation of China, the Shenzhen high-end talents program, The Top-tier University Scheme of Guangdong, and the Hong Kong government sources. She was awarded Promising Investigator Prize by the International Society for Influenza and other Respiratory Virus Diseases (ISIRV, 2013), and received HKU Research Output Prize or Faculty Outstanding Research Output Award every year since 2011, and Outstanding Young Researcher Award of HKU in 2016. She is also one of the First Prize winners of the National Medical Science and Technology Award (CMA 2015) and the National Preventive Medicine Award (CPMA 2015).

General Information

Language
English is the official language of the conference. All presentations and discussions will be conducted in English.

Registration Times
08:00 - 16:50 on 19 June 2017

General location
The 3-day conference is held at Harbour Grand Hong Kong. It is situated at 23 Oil Street, North Point, Hong Kong.

Conference and Cocktail Reception
Conference
The conference includes 2 refreshment breaks and 1 lunch each day, and it is served at 1/F Grand Ballroom, Harbour Grand Hong Kong.

Cocktail Reception
The cocktail reception is scheduled on 22 June 2017 from 18:00 to 21:00 and it is served at 5/F, Salon Room, Harbour Grand Hong Kong.

Oral presentation
Before the start of your session, please provide your slides in PPT or PDF format to our IT staff located at the front of the 1/F Grand Ballroom, Harbour Grand Hong Kong.

Poster presentation
Poster Display
1/F Grand Ballroom, Harbour Grand Hong Kong (19-21 June 2017)
5/F Salon Room, Harbour Grand Hong Kong (20 June 2017 Cocktail reception)

Poster set-up time
08:00 - 11:00a.m. on 19 June 2017

Poster removal time
16:30 - 17:00 on 21 June 2017

Programme

Day 1 - Monday, 19 June 2017
1/F, Grand Ballroom

08:00 – 09:00 Registration

Moderators: Prof Benjamin Cowling & Prof James Nokes

09:00 – 09:10 Opening remarks – *Prof Gabriel Leung & Prof Malik Peiris*

09:10 – 09:40 I16 – A historical perspective of influenza transmissibility – *Dr Robert Webster*

09:40 – 10:10 I2 – Transmission of influenza and rhinovirus infections: How traditional concepts developed and changed - *Prof Arnold Monto*

10:10 – 10:40 I3 – Quantifying human and animal interactions in South East Asia – *Prof John Edmunds*

10:40 – 11:00 Refreshment break

Moderators: Dr Robert Webster & Prof John Edmunds

11:00 – 11:30 I4 – Aerosol spread of RSV & models to investigate the earliest time points of infection – *Prof Christopher O'Callaghan*

11:30 – 12:00 I5 – RSV transmission in the community: uncovering the pathway to infant infection – *Prof James Nokes*

12:00 – 12:15 O1 – Identifying household transmission of RSV through subtyping and sequencing – *Dr Emily Martin*

12:15 – 12:30 O2 – The genomic and epidemiological dynamics of respiratory syncytial virus in New South Wales, Australia between 2010-2016 – *Dr John-Sebastian Eden*

12:30 – 12:45 O3 – Household transmission of seasonal influenza from HIV-infected and -uninfected individuals in South Africa, 2013-2014 – *Prof Cheryl Cohen*

12:45 – 13:00 O4 – Community burden of acute respiratory viruses: Results from the Flu Watch study – *Dr Nancy Leung*

13:00 – 14:00 Lunch

Moderators: Prof Christopher O'Callaghan & Dr Kanta Subbarao

14:00 – 14:15 O5 – Uncovering the epidemiological dynamics of influenza from serological data – *Dr Adam Kucharski*

14:15 – 14:30 O6 – Construction of the influenza A virus transmission tree in a college-based population: co-transmission and interactions between influenza A viruses – *Dr Xu-Sheng Zhang*

14:30 – 14:45 O7 – Influenza virus transmission modulated by ambient humidity along with other seasonal forces in Hong Kong – *Dr Sheikh Taslim Ali*

14:45 – 15:15 I6 – Towards improved animal models for transmission of human and zoonotic respiratory viruses – *Prof Ron Fouchier*

15:15 – 15:35 Refreshment break

Moderators: Prof Arnold Monto & Prof Ron Fouchier

15:35 – 16:05 I7 – Applying aerobiological techniques to improve models of influenza virus infection – *Dr Jessica Belser*

16:05 – 16:20 O8 – Detection of infectious influenza virus in airborne droplets – *Dr Wendy Barclay*

16:20 – 16:35 O9 – Seasonal, pandemic, and emerging influenza viruses transmit with similar efficiency over sequential rounds of airborne contact in ferrets – *Dr Kanta Subbarao*

16:35 – 16:50 O10 – Airborne-transmissible influenza A viruses are expelled from the upper respiratory tract of ferrets – *Dr Sander Herfst*

Day 2 - Tuesday, 20 June 2017
1/F, Grand Ballroom (Meeting) & 5/F, Salon Room (Cocktail reception)

Moderators: Prof Malik Peiris & Prof Yoshihiro Kawaoka

09:00 – 09:30 I8 – Morbillivirus transmission determinants: learning from the best – *Prof Veronika von Messling*

09:30 – 10:00 I9 – Defining particle sizes that mediate airborne transmission of influenza A virus in ferrets – *Dr Hui-Ling Yen*

10:00 – 10:30 I10 – Insights into influenza virus biology, host-pathogen interactions and interventions from airborne transmission studies in ferrets – *Dr Kanta Subbarao*

10:30 – 10:50 Refreshment break

Moderators: Prof Raul Andino & Prof Veronika von Messling

10:50 – 11:05 O11 – Impact of Highly Pathogenic Avian Influenza Virus Strain on Generation and Transmission of Bioaerosols during Slaughter Processing of Infected Chickens and Ducks – *Dr David Swayne*

11:05 – 11:20 O12 – Restricted MERS-CoV replication in the upper respiratory tract is associated with limited receptor expression – *Dr W. Widagdo*

11:20 – 11:35 O13 – Evaluation of bioaerosol samplers in a ferret model of influenza virus infection – *Dr Christian Bekking*

11:35 – 11:50 O14 – Transmission of Human Respiratory Syncytial Virus in Ferrets – *Dr Koert Stittelaar*

11:50 – 12:20 I11 – Flu-vision: total imaging systems for analyzing influenza virus infection – *Prof Yoshihiro Kawaoka*

12:20 – 12:50 I12 – The emergence, evolution and spread of the H3N8 and H3N2 canine influenza viruses as models for host range variant respiratory pathogens – *Prof Colin Parrish*

12:50 – 14:00 Lunch

Moderators: Prof Colin Parrish & Dr Charles Russell

14:00 – 14:30 I13 – Mechanisms of RNA virus evolution affecting epidemics and virulence – *Prof Raul Andino*

14:30 – 15:00 I14 – Quantifying influenza virus transmission bottlenecks in humans – *Prof Leo Poon*

15:00 – 15:15 O15 – Next generation sequencing of influenza viruses in a household cohort reveals an effective transmission bottleneck of close to one – *Dr Adam Lauring*

15:15 – 15:40 Refreshment break

Moderators: Prof Leo Poon & Dr Jessica Belser

15:40 – 16:10 I15 – Ortho- and para-myxovirus transmission: from bioluminescence imaging to pandemic potential – *Dr Charles Russell*

16:10 – 16:25 O16 – The molecular basis of mammalian transmissibility of avian H1N1 influenza viruses and their pandemic potential – *Dr Robert Webster*

16:25 – 16:40 O17 – Genomic variations and underrepresented mutations in seasonal influenza A viruses obtained from infected individuals – *Dr Rafael Medina*

16:40 – 16:55 O18 – Mammalian pathogenesis and transmission of novel H1 swine-origin influenza viruses recently isolated from humans – *Dr Joanna A. Pulit-Penaloza*

18:00 – 21:00 Poster session & cocktail reception

Day 3 - Wednesday, 21 June 2017
1/F, Grand Ballroom

Moderators: Prof Yi Guan & Prof Larry Anderson

09:00 – 09:30 I1 – Disease and Temporal and Geographic Patterns of Respiratory Virus Transmission – *Prof Larry Anderson*

09:30 – 10:00 I17 – Transmission and evolution of the A(H7N9) influenza viruses in China – *Dr Huachen Zhu*

10:00 – 10:15 O19 – Risk assessing influenza A virus for tropism to the human respiratory tract using ex vivo explant cultures – *Dr Michael Chan*

10:15 – 10:30 O20 – Environmental Sampling for the Surveillance of Influenza A Virus Infection in Swine – *Dr Karren Prost*

10:30 – 10:45 O21 – Differences in genetic and phenotypic characteristics of MERS coronaviruses may explain the lack of zoonotic MERS in West Africa – *Prof Malik Peiris*

10:45 – 11:05 Refreshment break

Moderators: Dr Edward Nardell & Dr Hui-Ling Yen

11:05 – 11:35 I18 – Environment modeling studies of respiratory infection – *Prof Yuguo Li*

11:35 – 12:05 I19 – Lessons for virus transmission from the human-to-guinea pig TB transmission model – *Dr Edward Nardell*

12:05 – 12:35 I20 – Can we define a contagious phenotype? – *Prof Donald Milton*

12:35 – 12:50 O22 – Optimization and comparison of different air-samplers to collect infectious aerosolized respiratory viruses from the air – *Dr Jasmin Kutter*

12:50 – 14:00 Lunch

Moderators: Prof Donald Milton & Prof Yuguo Li

14:00 – 14:15 O23 – Exhaled air leakage during application of a jet nebulizer in an isolation room with floor versus ceiling level exhaust – *Prof David Hui*

14:15 – 14:30 O24 – Broadly reactive T cell activating vaccine does not provide sterilizing immunity enabling secondary transmission of influenza in ferrets – *Dr Sophie Valkenburg*

14:30 – 15:00 I21 – Prevention of exhaled air leakage during aerosol-generating procedures – *Prof David Hui*

15:00 – 15:15 O25 – Spread of avian influenza virus within and beyond a wholesale market in Guangzhou – *Dr Jianjian Wei*

15:15 – 15:30 Discussion and Closing Remarks – *Prof Malik Peiris*

15:30 – 16:00 Refreshments available

Oral Presentations

Day 1 - Monday, 19 June 2017

I16: A historical perspective of influenza transmissibility
Robert Webster
Department of Infectious Diseases, St. Jude Children's Research Hospital, USA

I2: Transmission of influenza and rhinovirus infections: How traditional concepts developed and changed
Arnold Monto
School of Public Health, University of Michigan, USA

I3: Quantifying human and animal interactions in South East Asia
John Edmunds
John Edmunds and Jon Read on Behalf of the SMILI Investigators

I4: Aerosol spread of RSV & models to investigate the earliest time points of infection
Chris O'Callaghan
Respiratory and Paediatric Medicine Institute of Child Health, University College London, UK

I5: RSV transmission in the community: uncovering the pathway to infant infection
James Nokes
KEMRI-Wellcome Trust Research Programme, Kenya and School of Life Sciences, University of Warwick, UK

O1: Identifying household transmission of RSV through subtyping and sequencing
Emily T. Martin, Amy Callear, Andreea Taran, Ryan E. Malosh, Arnold S. Monto
University of Michigan School of Public Health, Ann Arbor, Michigan

O2: The genomic and epidemiological dynamics of respiratory syncytial virus in New South Wales, Australia between 2010-2016

Marian A Fernandez (1,2), Jen Kok (3), Dominic E Dwyer (3), Ian Carter (3), Edward C Holmes (2) & John-Sebastian Eden (1,2)
1.The Westmead Institute of Medical Research, NSW 2145, Australia,
2.Marie Bashir Institute for Infectious Diseases and Biosecurity, Charles Perkins Centre, School of Life and Environmental Sciences and Sydney Medical School, the University of Sydney, Sydney, New South Wales 2006, Australia
3.Centre for Infectious Diseases and Microbiology Laboratory Services, Institute of Clinical Pathology and Medical Research, New South Wales Health Pathology, Westmead Hospital and the University of Sydney, Westmead NSW 2145 Australia

O3: Household transmission of seasonal influenza from HIV-infected and -uninfected individuals in South Africa, 2013-2014

Cheryl Cohen1,2, Akhona Tshangela1, Preetha Iyengar3, Claire von Mollendorf1,2, Ziyaad Valley-Omar1, Sibongile Walaza1,2, Orienka Hellferscee1,4, Marietjie Venter1,5, Neil Martinson6, Gethwana Mahlase7, Meredith McMorrow8,9, Ben Cowling10, Adam L. Cohen8,9, Stefano Tempia1,8,9

1 Centre for Respiratory Diseases and Meningitis, National Institute for Communicable Diseases of the National Health Laboratory Service, Johannesburg, South Africa;
2 School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa;
3 District of Columbia Department of Health, Washington, DC, USA;
4 School of Pathology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa;
5 Centre for Viral Zoonoses, Department of Medical Virology, University of Pretoria
6 Perinatal HIV Research Unit (PHRU), Klerksdorp-Tshepong Hospital, North West Province, South Africa;
7 Pietermaritzburg Metropolitan, KwaZulu-Natal, South Africa;
8 Influenza Division, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America (USA);
9 Influenza Program, Centers for Disease Control and Prevention, Pretoria, South Africa;
10 WHO Collaborating Centre for Infectious Disease Epidemiology and Control, School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong Special Administrative Region

O4: Community burden of acute respiratory viruses: Results from the Flu Watch study

Ellen Fragaszy 1 Maria Zambon 2, Andrew Hayward 1 on behalf of the Flu Watch Group
1 Univeristy College London, Institute of Health Informatics, London, UK;
2 Respiratory Virus Unit, Centre for Infections, Public Health England, Colindale, UK

O5: Uncovering the epidemiological dynamics of influenza from serological data

Adam J Kucharski (1), Justin Lessler (2), Derek Cummings (3), Steven Riley (4)
1) London School of Hygiene & Tropical Medicine
2) Johns Hopkins University
3) University of Florida
4) Imperial College London

O6: Construction of the influenza A virus transmission tree in a college-based population: co-transmission and interactions between influenza A viruses

Zhang XS1,2, De Angelis D1,3
1 Centre for Infectious Disease Surveillance and Control, Public Health England, 61 Colindale Avenue, London, NW9 5EQ, UK. xu-sheng.zhang@phe.gov.uk.
2 Medical Research Council Centre for Outbreak Analysis and Modelling, Department of Infectious Disease Epidemiology, Imperial College School of Public Health, Norfolk Place, London, W2 1PG, UK.
3 Medical Research Council Biostatistics Unit, University Forvie Site, Robinson Way, Cambridge, CB2 0SR, UK.

O7: Influenza virus transmission modulated by ambient humidity along with other seasonal forces in Hong Kong

Sheikh Taslim Ali 1, Peng Wu 1, Vicky J. Fang 1, Daihai He 3, Simon Cauchemez 2, Benjamin J. Cowling 1
1 The University of Hong Kong, Hong Kong
2 The Institute of Pasteur, Paris
3 The Hong Kong Polytechnic University, Hong Kong

I6: Towards improved animal models for transmission of human and zoonotic respiratory viruses

Sander Herfst, Mathilde Richard, Jasmin Kutter, Bernadette G. van den Hoogen, Rik L. de Swart and ***Ron A.M. Fouchier***
Department of Viroscience, Erasmus MC Rotterdam, The Netherlands

I7: Applying aerobiological techniques to improve models of influenza virus infection

Jessica Belser
Influenza Division, Centers for Disease Control and Prevention, USA

O8: Detection of infectious influenza virus in airborne droplets
Ruth Elderfield, Anika Singanayagam, Rebecca Frise, and Wendy S Barclay
Imperial College London

O9: Seasonal, pandemic, and emerging influenza viruses transmit with similar efficiency over sequential rounds of airborne contact in ferrets
Troy C Sutton, Elaine W Lamirande, Rita Czako, and Kanta Subbarao
Laboratory of Infectious Diseases NIAID, NIH

O10: Airborne-transmissible influenza A viruses are expelled from the upper respiratory tract of ferrets
Sander Herfst1, Mathilde J. Richard1, Theo M. Bestebroer1, Pascal Lexmond1, Dennis de Meulder1, Anice C. Lowen2, Judith M.A. van den Brand1, Ron A.M. Fouchier1
1 Department of Viroscience, Postgraduate School Molecular Medicine, Erasmus MC, Rotterdam, The Netherlands
2 Department of Microbiology and Immunology, Emory University School of Medicine, Atlanta, GA 30322, USA.

Day 2 – Tuesday, 20 June 2017

I8: Morbillvirus transmission determinants: learning from the best
Veronika von Messling
Veterinary Medicine, Paul Ehrlich Institut, Germany

I9: Defining particle sizes that mediate airborne transmission of influenza A virus in ferrets
Jie Zhou[1], Jianjian Wei[2*], Ka-Tim Choy[1], Sin Fun Sia[1], Dewi K Rowlands[3], William G Lindsley[4], James McDevitt[5], Malik Peiris[1], Yuguo Li[2],* ***Hui-Ling Yen***[1]
1 School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China;
2 Department of Mechanical Engineering, The University of Hong Kong, Hong Kong SAR, China;
3 Laboratory Animal Services Centre, The Chinese University of Hong Kong, Hong Kong SAR, China;
4 Allergy and Clinical Immunology Branch, Health Effects Laboratory Division, National Institute for Occupational Safety and Health, West Virginia, United States;
5 Department of Environmental Health, Harvard School of Public Health, Boston, MA, United States

I10: Insights into influenza virus biology, host-pathogen interactions and interventions from airborne transmission studies in ferrets

Kanta Subbarao
WHO Collaborating Centre for Reference and Research on Influenza at the Peter Doherty Institute for Infection and Immunity, Melbourne, Australia

O11: Impact of Highly Pathogenic Avian Influenza Virus Strain on Generation and Transmission of Bioaerosols during Slaughter Processing of Infected Chickens and Ducks

David E. Swayne, Kateri Bertran, Charles Balzli, Yong-Kuk Kwon, Terrence M. Tumpey, Andrew Clark
Exotic and Emerging Avian Viral Diseases Research Unit, Southeast Poultry Research Laboratory, US National Poultry Research Center, Agricultural Research Service, US Department of Agriculture, 934 College Station Rd, Athens, GA, 30605 USA (DES, KB, CB, DHL); Immunology and Pathogenesis Branch, Influenza Division, National Center for Immunization and Respiratory Diseases (NCIRD), Centers for Disease Control and Prevention, Atlanta, GA, 30333 USA (TMT); International Veterinary Consultant, Pendleton, OR, 97801 USA (AC)

O12: Restricted MERS-CoV replication in the upper respiratory tract is associated with limited receptor expression

W. Widagdo, Lidewij C.M. Wiersma, Debby Schipper, V. Stalin Raj, Albert D.M.E. Osterhaus, Judith M.A. van den Brand, Bart L. Haagmans
Department of Viroscience, Erasmus Medical Center, Rotterdam, the Netherlands (all authors) Center for Infection Medicine and Zoonoses Research (RIZ), University of Veterinary Medicine, Hannover, Germany (Albert D.M.E. Osterhaus)

O13: Evaluation of bioaerosol samplers in a ferret model of influenza virus infection

Christian Bekking (1,2), Lily Yip (2), Nathan Doggett (1,2), Mairead Finn (2), Samira Mubareka (1,2)
1: University of Toronto, Toronto, Canada
2: Sunnybrook Research Institute, Toronto, Canada

O14: Transmission of Human Respiratory Syncytial Virus in Ferrets

Koert Stittelaar 1, Leon de Waal 1, Geert van Amerongen 1, Marie Pohl 1, Edwin Veldhuis Kroeze 1, Albert Osterhaus 1 2
1 Viroclinics Biosciences BV, 3029 AK Rotterdam, The Netherlands
2 Research Centre for Emerging Infections and Zoonoses, University of Veterinary Medicine, 30559 Hannover, Germany

I11: Flu-vision: total imaging systems for analyzing influenza virus infection
Yoshihiro Kawaoka
University of Tokyo; Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin-Madison, International Research Center for Infectious Diseases and Division of Virology, Department of Microbiology and Immunology, Institute of Medical Science

I12: The emergence, evolution and spread of the H3N8 and H3N2 canine influenza viruses as models for host range variant respiratory pathogens
Colin R Parrish[1], Ian E.H. Voorhees[1], Edward C. Holmes[2], Pablo Murcia[3]
1) Baker Institute for Animal Health, Department of Microbiology and Immunology, College of Veterinary Medicine, Cornell University, Ithaca, NY, USA.
2) Marie Bashir Institute for Infectious Diseases and Biosecurity, University of Sydney, Sydney, NSW, Australia
3) University of Glasgow Centre for Virus Research, College of Medical, Veterinary and Life Sciences, University of Glasgow, Glasgow, UK.

I13: Mechanisms of RNA virus evolution affecting epidemics and virulence
Raul Andino
Department of Microbiology and Immunology
University of California, San Francisco

I14: Quantifying influenza virus transmission bottlenecks in humans
Leo Poon
Public Health Laboratory Sciences, School of Public Health, The University of Hong Kong, Hong Kong, China

O15: Next generation sequencing of influenza viruses in a household cohort reveals an effective transmission bottleneck of close to one
Adam S. Lauring, John T. McCrone, Ryan Malosh, Rachel Truscon, Emileigh Johnson, Emily T. Martin, Arnold S. Monto
Departments of Internal Medicine, Microbiology and Immunology, and Epidemiology
University of Michigan

I15: Ortho- and para-myxovirus transmission: from bioluminescence imaging to pandemic potential
Charles Russell
Department of Infectious Diseases, St. Jude Children's Research Hospital, USA

O16: The molecular basis of mammalian transmissibility of avian H1N1 influenza viruses and their pandemic potential

Mark Zanin 1, Sook-San Wong 1, Subrata Barman 1, Challika Kaewborisuth 1, Peter Vogel 2, Adam Rubrum 1, Daniel Darnell 1, Atanaska Marinova-Petkova 1, Scott Krauss 1, Richard Webby 1, Robert Webster 1
1 Department of Infectious Diseases, St. Jude Children's Research Hospital, Memphis, Tennessee 38105, USA. 2Veterinary Pathology Core, St. Jude Children's Research Hospital, Memphis, Tennessee 38105, USA

O17: Genomic variations and underrepresented mutations in seasonal influenza A viruses obtained from infected individuals

*Leonardo Almonacid1,2, Aldo Barrera1,3, David Wentworth4, Raveen Rathnasinghe1, Karla Tapia1, Marcela Ferres1, Francisco Melo2, Adolfo García-Sastre5 and Rafael A. Medina1,3,5**
1 Department of Pediatric Infectious Diseases and Immunology, Escuela de Medicina,
2 Molecular Bioinformatics Laboratory, Pontificia Universidad Católica de Chile, and
3 Millennium Institute on Immunology and Immunotherapy, Santiago, Chile;
4 J. Craig Venter Institute, Maryland, USA;
5 Department of Microbiology, Icahn School of Medicine at Mount Sinai, New York, NY 10029, USA

O18: Mammalian pathogenesis and transmission of novel H1 swine-origin influenza viruses recently isolated from humans

Joanna A. Pulit-Penaloza, Jessica A. Belser, Nicole Brock, Xiangjie Sun, Yunho Jang, C. Todd Davis, Terrence M. Tumpey and Taronna R. Maines.
Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Day 3 – Wednesday, 21 June 2017

I1: Disease and Temporal and Geographic Patterns of Respiratory Virus Transmission

Larry Anderson
Professor and Marcus Chair of Infectious Diseases, Division of infectious Diseases, Department of Pediatrics, Emory University School of Medicine

I17: Transmission and evolution of the A(H7N9) influenza viruses in China

Huachen Zhu
School of Public Health, The University of Hong Kong, Hong Kong SAR, China

O19: Risk assessing influenza A virus for tropism to the human respiratory tract using ex vivo explant cultures

Michael CW Chan1, Kenrie PY Hui1, John M Nicholls2, JS Malik Peiris1
1 School of Public Health, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, PRC;
2 Department of Pathology, LKS faculty of Medicine, Queen Mary Hospital, The University of Hong Kong, Hong Kong SAR, PRC

O20: Environmental Sampling for the Surveillance of Influenza A Virus Infection in Swine

Dr. Karren Prost, DVM, MPH (1), Dr. Samira Mubareka, MD, FRCPC (1,2), Dr. Shamir Nizar Mukhi, BSc, MASc, PhD, PEng, SMIEEE (3), Dr. Harold Kloeze, DVM, DVSc (4), Dr. Davor Ojkic, DVM, MSc, PhD (5), Dr. Zvonomir Poljak, DVM, MSc, PhD (6)
(1)Sunnybrook Research Institute
(2)University of Toronto
(3)Public Health Agency of Canada
(4)Canadian Food Inspection Agency
(5)Animal Health Laboratory-University of Guelph
(6)Ontario Veterinary College-University of Guelph

O21: Differences in genetic and phenotypic characteristics of MERS coronaviruses may explain the lack of zoonotic MERS in West Africa

Malik Peiris1, Kenrie Hui1, Daniel Chu1, Mahen Perera1, Christian Drosten2, Stanley Perlman3, JM Nicholls1, J Oladipu1, MC Chan1, Leo Poon1, Veronique Chevalier4.
1 School of Public Health, The University of Hong Kong;
2 University of Bonn,
3 Dept of Microbiology, University of Iowa,
4 AGIRs Research Unit, CIRAD, Montpellier, France

I18: Environment modeling studies of respiratory infection

Yuguo Li
Department of Mechanical Engineering, The University of Hong Kong, Hong Kong SAR, China

I19: Lessons for virus transmission from the human-to-guinea pig TB transmission model

Edward Nardell
Department of Global Health & Social Medicine, Harvard Medical School, USA

I20: Can we define a contagious phenotype?

Donald Milton
School of Public Health, University of Maryland, USA

O22: Optimization and comparison of different air-samplers to collect infectious aerosolized respiratory viruses from the air

Jasmin Kutter, Theo M. Bestebroer, Dennis de Meulder, Ard Mulders, Ron A.M. Fouchier, Sander Herfst
Department of Viroscience, Postgraduate School Molecular Medicine, Erasmus MC, Rotterdam, The Netherlands

O23: Exhaled air leakage during application of a jet nebulizer in an isolation room with floor versus ceiling level exhaust

David SC Hui
Department of Medicine and Therapeutics, The Chinese University of Hong Kong Benny Chow, Stanely Ho Center for Emerging Infectious Diseases, The Chinese University of Hong Kong Yuguo Li, Department of Mechanical Engineering, University of Hong Kong Thomas Lo, Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong Tony Gin, Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong Matthew TV Chan, Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong

O24: Broadly reactive T cell activating vaccine does not provide sterilizing immunity enabling secondary transmission of influenza in ferrets

Sophie A Valkenburg1, Rebecca Fan1, K.-Terry. Choy1, S.F. Sia1, John M Nicholls2, Liyanage P Perera3, JS Malik Peiris1, Hui Ling Yen1, and Leo LM Poon1
1 Centre of Influenza Research and School of Public Health, The University of Hong Kong, Hong Kong.
2 Department of Pathology, The University of Hong Kong, Hong Kong.
3 Metabolism Branch, Center for Cancer Research, National Cancer Institute, NIH, Bethesda, MD, USA.

I21: Prevention of exhaled air leakage during aerosol-generating procedures

David Hui
Department of Medicine & Therapeutics, The Chinese University of Hong Kong, Hong Kong SAR, China

O25: Spread of avian influenza virus within and beyond a wholesale market in Guangzhou

Jianjian Wei1, Jie Zhou2, Hui-Ling Yen2, Yuguo Li1
1Department of Mechanical Engineering, The University of Hong Kong, Pokfulam, Hong Kong SAR, China
2School of Public Health, The University of Hong Kong, Sassoon Road, Hong Kong SAR, China

Poster Presentations

P101	Seasonality of Influenza and Respiratory Syncytial Viruses and the Effect of Climate Factors in Subtropical–Tropical Asia, Using Influenza-Like Illness Surveillance Data (2010 –2012) *Taro Kamigaki, Liling Chaw, Alvin G. Tan, Raita Tamaki, Portia P. Alday, Jenaline B. Javier, Remigio M. Olveda, Hitoshi Oshitani, Veronica L. Tallo*
P102	Clinical and Epidemiological Characterization of Influenza Virus in Children with Severe Acute Respiratory Infection in Maputo, Mozambique: results from implementation of sentinel surveillance, 2014 - 2016 *Neuza Nguenha, Loira Machalele, Almiro Tivane, Mirela Pale, Afonso Nacoto, Germano Pires, Edirsse Mationane, Judite Salência, Felix Gundane, Delcio Muteto, Josina Chilundo, Sandra Mavale, Cynthia Semá-Baltazar, Orvalho Augusto, Eduardo Samo Gudo and Tufária Mussá*
P103	Influenza like Illness outbreak in rural and prison settings of south Gondar, northwest Ethiopia, February 2016 *Hagos M.Addisalem, J. Daddi, Alemayehu B, Desalegn. B*
P104	Spatial-temporal transmission of hand, foot and mouth disease in China *Bingyi Yang, Fengfeng Liu, Qiaohong Liao, Peng Wu, Zhaorui Chang, Jiao Huang, Lu Long, Li Luo, Yu Li, Gabriel M. Leung, Benjamin J. Cowling, Hongjie Yu*
P105	Influenza virus transmission and ambient air pollution in Hong Kong *Sheikh Taslim Ali, Peng Wu, Vicky J. Fang, Benjamin J. Cowling, Linwei Tian*
P106	Indirect contact transmission of influenza A virus: a review *Jingyi Xiao, Nancy Hiu Lan Leung, Yuguo Li, Benjamin Cowling*
P107	Epidemiology of influenza B viruses in China from 2005 to 2016 *Yiu Chung Lau, Peng Wu, Benjamin J. Cowling*
P108	Supersaturation in the airways. Why viral transmission among humans has the highest probability during cold season *Aleksandr N Ishmatov*
P109	Epidemiology of influenza A/B virus infection: a hospital-based descriptive study in Thailand *Pakwimon Subhaluksuksakorn, Anucha Pornsopin*

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