

## Annual Report 2012-2013

HKU-Pasteur Research Center Dexter HC Man Building 8, Sassoon Road Hong Kong SAR

# Roberto Bruzzone, CEO Malik Peiris, Scientific Director

## INDEX

## **1. Executive Summary**

## 2. Overview of the Programs

- 2.1 Research
- 2.2 Teaching
- 2.3 International Activity

## 3. Progress Report

- 3.1 Suki Lee Lab
- 3.2 Chris Mok Lab
- 3.3 Sumana Sanyal Lab
- 3.4 Teaching and Education
- 3.5 International Activity

## 4. Scientific Output 2012-2013

- 4.1 Publications cited in PubMed
- 4.2 List of Posters presented at Meetings
- 4.3 Seminars, Invited Lectures and Oral Presentations
- 4.4 Active Grants in 2012-present

## 5. Annexes

- 5.1 Annex 1: List of Staff
- 5.2 Annex 2: Budget for the year ending June 2013
- 5.3 Annex 3: Posters of HKU-Pasteur Courses
- 5.4 Annex 4: Major International Meetings co-organized by HKUPRC
- 5.5 Annex 5: List of Public Lectures organized by HKU-PRC

## 1. Executive Summary

HKU-Pasteur Research Centre (HKU-PRC) is a joint partnership between The University of Hong Kong (HKU) and Institut Pasteur (IP), which has been established with the aim to develop a program of excellence in the study of infectious diseases. Ongoing research projects are dealing with infectious diseases that may have devastating effect on public health and the economy of the community. Our vision is to generate biological knowledge to better understand and treat infectious diseases by bringing together scientists with an interdisciplinary mind.

*Research.* The scientific output of HKU-PRC has been of the highest quality, with 28 papers published over this period. We have re-organized the structure of the lab, which now consists of three Group Leaders - one of which has been recruited in 2013, and have secured several independent extramural grants to continue our research focus on respiratory infections and the mosquito borne disease of dengue. With respect to influenza research, we have continued our exploration of virus-host interaction and host response to viral infection and have uncovered the role of cell cycle regulators, innate immune sensors and viral proteins as determinants of avian influenza pathogenesis, including the novel influenza A that was first detected in China in 2013. We are actively engaged in research on the newly identified Middle East respiratory syndrome coronavirus (MERS-CoV) and have developed a novel, spike pseudoparticle neutralization assay for seroepidemiological studies on MERS-CoV. The newly developed assay does not require Biosafety Level 3 containment and is thus a relatively high-throughput assay, well suited for large-scale seroepidemiology studies which are needed to better understand the ecology and epidemiology of MERS-CoV. With respect to dengue research, we have identified a crucial cellular factor that is necessary for the virus to exit from the infected cell. This is the first characterization of a host intracellular receptor that is necessary for trafficking and secretion of progeny virus.

**Teaching.** Our program of courses for postgraduate students and young scientists has become a reference beyond the Asia region, drawing an increasing number of highly qualified applications from around the world. This educational program has established a worldwide network of trainees, who seek our mentorship well after the course. A Scientific Symposium to celebrate the 10<sup>th</sup> anniversary of the Virology Course was held in 2013, with participation of alumni from over 12 countries. In addition, we have started in 2012 collaboration with the Pasteur Institute of Ho Chi Minh City (Vietnam) to establish an annual international course on epidemiology and public health.

**Perspectives.** HKU-PRC has developed a strong identity that is contributing to promote the presence and image of HKU, as well as of IP and its international network, in the region through research, teaching and public health activities. In order to ensure a long-term continuation of this successful partnership HKU-Pasteur Research Centre Limited will be transformed into the HKU-Pasteur Research Pole (HKU-PRP), a laboratory integrated into the new Center of Influenza Research (CIR) of the School of Public Health in the Li Ka Shing Faculty of Medicine. HKU-PRP will continue its focus on the Cell Biology of Infections and will expand its current strength on respiratory diseases by developing programs that will tackle neglected tropical diseases, such as arboviroses, as well as basic cell biology that is relevant to the advancement of our understanding of pathogenetic mechanism. HKU-PRP will also maintain its position as a regional reference for postgraduate training and will be firmly engaged also in undergraduate reaching with the School of Public Health and the new Bachelor in Biomedical Sciences launched in 2012.

In summary, the results obtained over the past two years are clearly in line with our strategic objectives and represent a solid foundation to develop the new HKU-Pasteur Research Pole as a cluster of excellence within the Center of Influenza Research of the School of Public Health.

## 2. Overview of the Programs

#### 2.1 Research

We focus on burden of diseases in the region, with a major emphasis on influenza and other viruses that are both global and regional threats. Three questions are of particular interest to us:

- 1. *How do viruses invade, replicate and escape infected cells?* This question encompasses both the cellular view of the infectious process –by understanding which molecules, compartments and machinery of the host cells are utilized during the vital life cycle, as well as the virus point of view to dissect novel functions of viral genes.
- 2. *What makes a microbe pathogenic?* This question addresses the genetic determinants of virulence in the context of emerging threats from zoonotic viruses and the acquisition of traits that favor crossing of species barriers.
- 3. *How do pathogens withstand the host immune response?* This question zooms in on the first lines of defense of the host and the complex strategies devised by viruses to foil them through specific molecular switches.

We view these as central biological questions that need to be addressed to define how viruses function and interact with their hosts in the cellular environment that constitutes their battleground. We also keep in mind that progress in research is rapid and strategies need to be reviewed and adapted to respond to the agenda of stakeholders and society. The scientific activity of HKU-PRC has been significantly re-organized in order to prepare its integration into the School of Public Health of the LKS Faculty of Medicine as HKU-PRP. The lab now consists of three groups headed by Junior Group Leaders with demonstrated ability to obtain independent grants and a convincing track record of productivity. Dr. Suki Lee was recruited in 2012 from the Department of Microbiology, whereas Dr. Chris Mok was promoted to Research Assistant Professro in 2013. Dr. Suman Sanyal was recruited from The Whitehead Institute – MIT and joined us at the end of 2013. All groups are actively engaged in the Teaching and Training program.

Research in the Suki Lee lab focuses on virus-host interaction and host response to viral infection, with the major aim to investigate the underlining mechanisms of influenza virus pathogenesis and to explore the potential novel therapeutic targets for the treatment of important and topical diseases caused by these viruses. The lab of Chris Mok uses a combination of in vitro and in vivo models to understand the behavior and pathogenicity of avian influenza viruses (H7N9, H5N1 and H9N2) in mammalian hosts and investigates new therapeutic approaches to treat the disease and is setting up clinical studies to further explore the mechanisms underlying severity of influenza infection. The main objectives of the Sumana Sanyal lab are to combine methods of cell biology and immunology to address aspects of host-pathogen interactions. Using influenza and dengue as model systems, the lab wishes to determine the identity and function of specific host factors that are exploited by these viruses to complete their intracellular life cycle. They also investigate counterstrategies employed by the host – either through upregulation of immune signaling pathways or expression of virus restriction factors - in order to prevent virus infection at various steps, including replication, assembly and release. Ongoing research that had been initiated by staff that has since left the lab, has being coordinated by Roberto Bruzzone. We have obtained several results that contribute to the understanding of host-pathogens interactions that are necessary for the successful continuation of the infectious process, using enveloped viruses as experimental model. Several projects were completed with four manuscripts published in the process and three additional publications are in press, submitted or being finalized.

#### 2.2 Teaching and Education

Our program of courses for postgraduate students and young scientists is drawing an increasing number of highly qualified applications from around the world. We offer courses that are very competitive and of the highest quality, comparable to established benchmarks such as EMBO and Cold Spring Harbor courses.

In 2013 we celebrated the 10<sup>th</sup> anniversary of the HKU-Pasteur Virology Course, an annual event that has become a reference for postgraduate students in virology from all over the world. Over this decade we have received more than 600 applications and trained more than 250 students, who are now continuing their own professional careers in science, education and more. On this occasion we held a Scientific Symposium in the presence of Professor Francoise Barre-Sinoussi, the 2008 Nobel Prize in Physiology or Medicine, who spent also one week with the students of the course and gave several lectures.

We have expanded the number of subscriptions to the HKU-Pasteur Courses Series Newsletter, which now totals 465, and our groups in social media have grown, reaching 231 and 226 members for LinkedIn and Facebook, respectively.

In addition, we have launched an annual international training program in epidemiology in collaboration with the Pasteur Institute of Ho Chi Minh City, Vietnam. The first two workshops were very well received with 80-100 applications each year from all countries in South East Asia and China. All our educational programs are self-funded with *ad hoc* grants. We are actively engaged in postgraduate training in our lab with two students (2 PhD and 1 MPhil) having defended their thesis in 2012.

#### 2.3 International Activity

We are actively engaged in a number of network projects with a major focus on viral respiratory infections. Professor Roberto Bruzzone is a member of the Executive Committee of the International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC), is a global initiative aiming to ensure that clinical researchers have the open access protocols and data-sharing processes needed to facilitate a rapid response to emerging diseases that may turn into epidemics or pandemics. ISARIC is a Consortium of over 70 networks and individuals involved in research related to the outbreaks of diseases such as avian influenza, SARS, and MERS-CoV, the consortium is trying to understand the causes of severe acute respiratory diseases, discover how illnesses develop and progress in patients, and identify the most efficient treatments and the best way to prevent further transmission.

Professor Malik Peiris is the Coordinator of the 8-year research program "**Control of Pandemic and Inter-pandemic Influenza**" that has been awarded a HK\$76M by the University Grants Committee in the fourth round of its Areas of Excellence scheme. He continues to serve on a number of WHO working groups in relation to both avian and swine origin influenza virus. Moreover, we are part of an EU-funded consortium (Funding scheme: Large-scale integrating project) supported through the 7<sup>th</sup> Framework Program with Malik Peiris as coordinator of our work package.

We have organized in Hong Kong the first Gordon Research Conference on "Infections of the nervous system: Pathogenesis and worldwide impact". This new series aims to address the current gaps in knowledge and establish an international community of world-leading sciences that will set the agenda for confronting this group of diseases in the coming years.

## 3. Progress Report

### 3.1 SUKI LEE LAB

#### **Main Objectives and Strategy**

Influenza virus infections remain one of the major causes of mortality in the developing world and of morbidity worldwide. Animal influenza A viruses that have zoonotically transmitted to humans include H5N1, H9N2 and the lately H7N9 virus, whereas those that have adapted to sustained human transmission are pandemic influenza viruses include the 2009 pandemic H1N1 virus. These viruses demonstrated with capacity to give rise to emerging respiratory infections of public health importance. In severe influenza cases, a rapidly progressing primary viral pneumonia leading to acute respiratory distress syndrome is the primary cause of death in patients. The viral load in the lung, tissue tropism and the differential host responses to influenza viruses, individually or in combination, have been proposed as mechanism to explain the virulence of influenza virus, whilst the exact mechanisms remain obscure. Currently, antiviral drugs such as adamantanes and neuraminidase inhibitors are the mainstay for treating influenza patients. However, development of antiviral drug resistance is becoming an important concern. For example, survival of patients infected by highly pathogenic influenza viruses such as H5N1 viruses who are treated with oseltamivir within the first 4 days of illness is still less than 50%. Taken together, there is a clear need for adjunctive treatment modalities that may synergize with conventional antiviral therapies. My research focuses on virus-host interaction and host response to viral infection, with the major aim to investigate the underlining mechanisms of influenza virus pathogenesis and to explore the potential novel therapeutic targets for the treatment of important and topical diseases caused by these viruses. More specifically, we are developing three related research projects.

#### Role of TLR10 in influenza A pathogenesis

Toll-like receptors (TLRs) are an important group of pattern recognition receptors (PRRs), their activation leads to the induction of interferons, cytokines and chemokines, and play a major role in host defense and pathogenesis. TLRs are expressed on a variety of cell types including macrophages, and subserve essential functions in the innate immune recognition of viruses, e.g. influenza viruses. Presently there are ten known TLR members, TLRs 1-10, identified in humans. Of the 10 human TLRs, the function of TLR10 is still poorly understood. We have obtained experimental data suggesting that TLR10 is important in the host response to influenza A virus infection. We hypothesize that it may be a yet unrecognized but key component of our immune defense against many viruses. The major objective of this study is to investigate the role of TLR10 in influenza infections as an initial step in unraveling the role of this receptor in overall host defenses.

## Investigation of the effect of Chinese herbal compound in treatment of influenza diseases

We have recently identified a purified compound (C3) isolated from a Chinese medical herb through library screening, and demonstrated that C3 has a protective effect on human neuronal cells in response to oxidative stress. Previous studies have revealed an antiviral effect of C3 against HIV-1 and HBV infection. Our preliminary data suggest that C3 also inhibits influenza A virus replication. We hypothesize that C3 may exert beneficial effects against influenza infection and should be further investigated as an antiviral molecule. The objective of this study is to investigate the mechanism(s) of C3 in host response to influenza

virus infection and the potential use of C3 in treatment of influenza disease, including diseases caused by fatal H5N1 and the lately emerging H7N9 virus.

Investigation of the role of  $PGE_2$  in influenza A virus replication and the potential use of  $PGE_2$  receptor antagonists for the therapy of  $H_5N_1$  disease

We previously demonstrated that COX-2 plays a regulatory role in induction of H5N1mediated pro-inflammatory responses. Such cytokine dysregulation is believed to be one of the major contributors to the pathogenesis of H5N1 disease in humans. We showed that the H5N1-hyperinduced cytokine responses can be significantly suppressed by selective COX-2 inhibitors in vitro. We further demonstrated a novel finding that selective COX-2 inhibitors have a direct antiviral effect on H5N1 replication in human primary macrophages and alveolar epithelial cells. Although these findings suggest the therapeutic potential of targeting COX-2 in the treatment of H5N1 disease, there are concerns regarding potential adverse effects of selective COX-2 inhibitors for treatment of severe pneumonia, especially the need for COX-2 signaling in the resolution of inflammation. This has prompted the search for more specific strategies downstream of COX-2 signaling as therapeutic targets. We hypothesize that COX-2 and PGE<sub>2</sub> mediated signaling plays a role enhancing H5N1 virus replication. The objective of this study is to investigate the role of PGE2 in influenza A virus replication and to explore the use of PGE2 receptor antagonists for treating H5N1 disease.

### **Collaborations (local and international)**

**Ben Cowling** (School of Public Health, HKU, Hong Kong): Association between basal leukocyte transcriptome profile and symptom development & disease severity after influenza virus infection in humans.

**Nancy Y Ip** and **Yu Pong Ng** (HKUST, Hong Kong): Investigation of the neuropathogenicity of influenza A viruses and of the signaling pathways that are activated in response to virus infection in human brain cells.

**Robert EW Hancock** (University of British Columbia, Canada): Investigation of the immunomodulatory effect and anti-viral activity of the host peptides on influenza A virus infection.

### Funding

A potential new therapeutic option in treatment of influenza disease (**Principal Investigator**; Health and Medical Research Fund – Ends:12/2014)

Role of Prostaglandin E2 (PGE2) in influenza A virus replication and the potential use of PGE2 receptor antagonists for the therapy of H5N1 disease (**Principal Investigator**; Health and Medical Research Fund – Ends: 10/2014)

Determining the ligand and function of an orphan receptor: Toll like receptor 10 (**Principal Investigator**; Area of Excellence Control of Pandemic and Inter-pandemic Influenza – Ends: 12/2015)

## Personnel

Name	Position
Suki Lee	Research Assistant Professor
Tsz Fung Yip	MPhil Student
Ping Hung Li	Research Technician
Kelvin Ip	Research Assistant
Shuting Li	Research Assistant
Christie Tam	Student Intern
Sharon Tse	Student Intern

### 3.2 CHRIS KA PUN MOK LAB

### **Main Objectives and Strategy**

Incidents of human infection by avian influenza viruses are frequently reported. Whereas the highly pathogenic H5N1 influenza virus has evolved into multiple genetic clades and spread globally, resulting in approximately 600 human infections with a 60% case fatality rate and compromising the poultry industry, the recent H7N9 outbreak in China causes a novel threat to the human population. The typical clinical manifestation of human H5N1 and H7N9 infection is that of a severe pneumonia that may progress to acute respiratory distress syndrome. However, the viral determinants and the detailed mechanism that lead to fatal outcome after infection are not fully characterized. In addition, the role of the avian H9N2 subtypes on the pathogenicity in human is also highly concerned due to its popularity in the poultry farm. The main objectives of our lab are to understand the behavior and pathogenicity of avian influenza viruses (H7N9, H5N1 and H9N2) in mammalian hosts and investigate new therapeutic approaches to treat the disease.

### **Collaborations (local and international)**

**PC Shaw** (CUHK): Structural analysis of the Q591K mutation of influenza polymerase basic 2 protein.

**RWY Wong** (HKBU): Anti-inflammatory and anti-viral effects of indirubin derivatives in H5N1-infected primary macrophages and pneumocytes.

L Chen and ZF Yang (Guangzhou Institute of Respiratory Diseases & State Key of Respiratory Diseases): Surveillance of influenza A H7N9 in outpatients with influenza-like illness and hospitalized patients with severe acute respiratory illness (SARI) in Guangzhou.

### Funding

Viral genetic determinants of pathogenicity of avian H9N2 influenza viruses for mammalian species (**Principal Investigator**; Health and Medical Research Fund – Ends: 09/2014)

Role of indirubin-3'-oxime as an antiviral and immunomodulatory agent in the treatment of severe human influenza virus infection (**Co-Investigator**; Health and Medical Research Fund – Ends: 02/2015)

Surveillance and serology studies of influenza A H7N9 infection in GuangZhou (**Principal Investigator**; Area of Excellence Control of Pandemic and Inter-pandemic Influenza – Ends: 12/2015).

The role of influenza PA-X protein on the virus replication and cytokine induction in human lung epthielial cells (**Principal Investigator**; Seed Funding for basic research – Ends: 03/2016).

Surveillance of influenza A including subtype H7N9 in outpatients with influenza-like illness and hospitalized patients with severe acute respiratory illness (SARI) presenting at The First Affiliated Hospital of Guangzhou Medical University (**Co-Investigator**; Commissioned Health and Medical Research Fund – Ends: 05/2015)

Molecular determinants of H9N2 virus haemagglutinin and neuraminidase affecting virus tropism for the human and swine respiratory tract (**Co-Investigator**; Health and Medical Research Fund – Ends: 10/2015)

## Personnel

Name	Position
Chris Ka Pun Mok	Research Assistant Professor
Horace Lee	PhD student
Gannon Mak	PhD student
Ying Fan	PhD student
Maxime Lestra	French International Volunteer
Jane Tse	Research Technician
Sihua Pan	Research Assistant

### 3.3 SUMANA SANYAL LAB

#### **Main Objectives and Strategy**

The main objectives of our lab are to combine methods of cell biology and immunology to address aspects of host-pathogen interactions. Using influenza and dengue as model systems, we wish to determine the identity and function of specific host factors that are exploited by these viruses to complete their intracellular life cycle. We also investigate counterstrategies employed by the host – either through upregulation of immune signaling pathways or expression of virus restriction factors – in order to prevent virus infection at various steps, including replication, assembly and release. Amongst other factors, we are particularly interested in ubiquitin and ubiquitin like small modifiers such as ISG15 that play a significant role in modulating different pathways, not the least of which are innate signaling pathways such as RIG-I, TLR7 and inflammasome activation. More specifically, we are developing three related research projects.

#### Host factors involved in dengue infection: role of Aup1

A molecular understanding of host cellular factors involved in dengue infection is crucial not only to provide novel insights into pathways hijacked by flaviviruses, but also for development of effective antimicrobials against the pathogen. Identification of host factors that can be targeted for developing novel anti-viral compounds has the additional benefit of avoiding potential resistance acquired in viruses by mutation and selection. The complexity of the assembly and release of dengue virus provides a potentially rich source of host targets for interference. The modus operandi of propagation of dengue virus (DENV), West Nile (WNV) and other members of the family appears to involve extensive remodeling of the endoplasmic reticulum (ER) to facilitate virus replication, trafficking, assembly and egress. However, we have been severely limited in our understanding of the role of fundamental biological pathways typically hijacked by flaviviruses. We recently identified Aup1 – a lipid droplet associated protein – is heavily expressed upon dengue infection. Preliminary results suggest that overexpression of Aup1 alone is sufficient to cause increased secretion of dengue virus like particles. The goal of this project is to investigate interactions between host factors such as Aup1 and dengue virus in order to understand their functional relevance.

Development of therapeutic strategies against viral infections by targeting the ubiquitylation machinery and its modulation of the host innate immune response Influenza virus is responsible not only for annual epidemics, but also for frequent outbreaks of pathogenic avian flu strains that have become a serious public health issue worldwide. The ubiquitylation machinery is frequently exploited by a number of pathogens either to masquerade as host proteins or to inhibit immune signaling cascades. We propose to investigate the role of deubiquitylating enzymes (DUB) specifically expressed during influenza infection. We have employed a chemoenzymatic strategy to identify three DUBs that are expressed upon influenza infection. Our current studies involve characterization and pharmacological intervention of these DUBs in order to attenuate influenza infection. Our preliminary data in macrophages and dendritic cells support the hypothesis that influenza takes advantage of DUBs to suppress signaling pathways such as RIG-I and inflammasome activation that require ubiquitin modification for recruitment of downstream effectors. We also propose to test two specific drugs that target these DUBs both in vitro and in vivo.

Role of Tsg101 and its regulation by ISG15 during virus assembly and release A major response of mammalian cells to viral infections is through upregulation of the interferon type I and II pathways. Viruses in turn counter this pathway through either the inhibition of IFN response or by activation of proteins that inhibit the function of interferon-stimulated genes (ISGs). The primary antagonist of the host immune response for influenza is NS1. A key interaction documented for NS1 is the dynamics of interaction with the interferon-stimulated gene 15 (ISG15). Upon type-I interferon treatment or virus infection, ISG15 is one of the immediate responders and is expressed in abundance. Based on limited proteomic analysis, the targets of ISGylation have been found to be of the order of a hundred or more genes. We have identified Tsg101 as one of the targets of ISG15 modification. We are currently exploring the functional relevance of this modification during influenza infection and how NS1 counteracts it. We find that there is a strong correlation between the pathogenicity of the virus and the effectiveness of NS1 in preventing ISG15 mediated inhibition of Tsg101 function.

### **Collaborations (local and international)**

Hui-Ling Yen (School of Public Health, LKS Faculty of Medicine of HKU): Engineering influenza neuraminidase for sortase catalyzed modification.

**Adolfo Garcia-Sastre** (Mont Sinai School of Medicine, New York, NY, USA): Studying the function of lsg15 and its mode of restricting influenza virus trafficking, specifically, the efficacy of influenza NS1 in preventing ISG15 activity.

**Hidde Ploegh** (The Whitehead Institute for Biomedical Research, MIT, Cambridge, MA, USA): Studying host factors and their mechanism of function during influenza virus biogenesis centered on Tsg101.

### Funding

Development and application of novel technologies to elucidate mechanism of influenza trafficking and assembly in vivo and in vitro (**Co-Investigator**; NIH-RO1 – Ends: 12/2016)

Elucidating the role of Tsg101 in influenza virus assembly and release (**Principal Investigator**; Area of Excellence Control of Pandemic and Inter-pandemic Influenza – Ends: 12/2015)

Mechanism of Influenza NS1 mediated inhibition of interferon type-I response: effect on Isg15 (**Principal Investigator**; Seed Funding for basic research – Ends: 06/2016).

## Personnel

Name	Position
Sumana Sanyal	Research Assistant Professor
Ming Yuan Li	PhD student
Lewis Siu	Research Technician
Akhee Jahan	Research Assistant
Tami Zhang	Research Assistant

### 3.4 Teaching and Education

#### Postgraduate teaching

Our flagship program of HKU-Pasteur courses for postgraduate students and young scientists has become a reference beyond the Asia region, drawing an increasing number of highly qualified applications from around the world. The quality of our programs has been widely praised and is comparable to that of established benchmarks, such as EMBO and Cold Spring Harbor courses. Each course includes a full-time senior faculty member of HKU, as well as of Institut Pasteur in the organizing committee, thereby strengthening the ties between the two institutions. The establishment of the Teaching Center has contributed to make HKU-PRC the regional hub of the Pasteur Network and represents an additional pillar through which HKU can extend its international influence and reputation. It should be noted that an added value of this series is the possibility to offer many seminars open to the scientific community of HKU and HK (see Annex 12 for a complete list of the 2012-2013 speakers).

In 2013 we had two special events linked to our courses. To mark the 30th anniversary of the identification of the virus by the Institut Pasteur team led by Françoise Barré-Sinoussi and Luc Montagnier, who received the 2008 Nobel Prize for their discovery, the program of the HKU-Pasteur Virology course was entirely focused on HIV/AIDS. We have invited leading scientists from around the world to discuss the current gaps in knowledge and challenges that are lie ahead in this field of research. We were honored by the presence of Professor Françoise Barré-Sinoussi, who spent a whole week with the students and also delivered a special lecture open to the general public, in partnership with the Hong Kong Advisory Committee on AIDS.

To celebrate the 10<sup>th</sup> birthday of the HKU-Pasteur Virology Course, we organized a Scientific Symposium that featured alumni of the course coming from more than ten different countries. Over this decade we have received more than 600 applications and trained more than 250 students, who are now continuing their own professional careers in science, education and more. The symposium was opened in the presence of Professor Paul Tam, Vice-President and Pro-Vice-Chancellor (Research) of HKU, Mr. Arnaud Fontanet, Consul General of France in Hong Kong and Macau, and Mr. Leo Kung, Chairman of HKU-PRC. There were almost 80 people in attendance and the scientific session was closed by Professor Françoise Barré-Sinoussi.

HKU-Pasteur courses are supported with external grants that are received, on a competitive basis, from Institut Pasteur International Network, the Li Ka Shing Faculty of Medicine at HKU, the Croucher Foundation, the French Consulate and other private donations. Our funds cover advertising costs, travel and accommodation for all lecturers and students (except from industry). Selected students are expected to pay for their travel costs, but a small number of travel grants may be available at the discretion of the course directors. These basic guidelines have been modeled after those set for years by EMBO Global Exchange Courses. The courses are, therefore, self-sustained and do not draw from other intramural funds. The full programs and course reports are added as appendices (Annexes 5-10).

Dr. Suki Lee has started to teach in Problem-based learning (PBL) sessions for MBBS students. In these PBL sessions she takes part in small-group discussions in which students are given a series of medical "problems"- short accounts of possible real-life situations. Dr. Lee facilitates students to think and guide the students to understand and analyze the medial "problems" by asking questions and stimulating discussion. In addition, Dr. Lee was also a Visiting Scientist in The Tianjin Institute of Industrial Biotechnology (TIB) of the Chinese Academy of Sciences in December 2013. She provided consultation on research projects to professionals and talked in seminars to share ideas on research studies.

We have completed supervision of two students who defended their PhD thesis in 2011 and one who obtained an MPhil degree. Dr. Jason Ma is now a postdoctoral fellow in the laboratory of Professor Bali Pulendran at Emory University. Isabelle Dutry is now Senior Scientist at Sanwa BioTech Ltd. Daniel Li is now Channel Account Executive at Belden – Hong Kong successfully completing his MPhil requirements. Overall, these results attest of the quality of research supervision and career mentoring that have been a core value of HKU-PRC.

### Additional teaching and training

We have obtained a Knowledge Exchange (KE) Fund Allocation for a project entitled "From Plague to New Emerging Infectious Diseases". The main deliverable of this project is to organize an exhibition that will look at historical, sociological and scientific aspects of infectious diseases in Hong Kong in order to raise public awareness about infectious diseases, promote science careers to young audiences and to showcase medical and scientific achievements from HKU in the fight against infectious diseases. It will be an event for all ages and for the general public curated by Drs. Isabelle Dutry and Francois Kien. The exhibition will encompass three major themes: Alexandre Yersin, his life and achievements; Infectious diseases. The exhibition will be advertised through media channels of the different partners and in particular the annual French May festival, one of the major arts festivals in Hong Kong and Macau organized by the Consulate General of France.

The Centre is a regular contributor of educational programs in science sponsored by the Victor Segalen French International School. In 2012 and 2013 we welcomed two students from the French International School for a one-week traineeship during which they interacted closely with their tutors and the HKU-PRC's staff, and discovered various aspects of research work in a virology lab.

### **Epidemiology Workshops at Pasteur Institute of Ho Chi Minh City** (Vietnam)

Infectious disease is the single biggest cause of death worldwide. New infectious agents, such as the recent novel coronavirus in the Arab Peninsula, and new strains of avian influenza in China, continually emerge and require new investigations. Effective control and prevention of disease outbreaks depend on early detection, rapid on-site investigation and timely and appropriate interventions. In line with the regional training needs in the Asian-Pacific Region, we have launched with the Pasteur Institute of Ho Chi Minh City and the support of the Institut Pasteur International Network and the French Regional Scientific Cooperation a series of international workshops for epidemiologists and public health personnel involved in surveillance activities. Our programs have met an incredible success with an average of 90 applications from all countries in South East Asia, including Myanmar, and China. Our overarching goal is to establish the foundation of a top training program for epidemiologists working in research and public health in the region, in order to strengthen that ability to react to acute infectious threats. We are planning to organize thematic workshops on an annual basis to further enhance the visibility and impact of the Pasteur Network in the region. The full programs and course reports are added as appendices (Annexes 13-14).

## 3.5 International Activity

HKU-PRC exerts a leadership role in a number of network projects with a major focus on viral respiratory infections.

### International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC)

Roberto Bruzzone has been on the Executive Committee of ISARIC since its official launching in 2012. ISARIC - is a global initiative aiming to ensure that clinical researchers have the open access protocols and data-sharing processes needed to facilitate a rapid response to emerging diseases that may turn into epidemics or pandemics. ISARIC has become a Consortium of over 70 networks and individuals involved in research related to the outbreaks of diseases such as avian influenza, SARS, and MERS-CoV The vision of the International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC) is to implement a successful strategy for global collaborative patientoriented research between and during epidemics of severe acute respiratory infections and other rapidly emerging public health threats in order to generate new knowledge, maximize the availability of clinical information, and thereby save lives. One of the main aims and strengths of ISARIC lies in its openness and inclusive operational structure, which aims to ensure global data-sharing and the necessary credit and acknowledgement given to all partners and collaborating networks and individuals. Among its achievements in 2012-2013, it is worth mentioning that ISARIC has developed and shared a Protocol and Case Report Form (CRF) for observational studies with or without additional collection of biological samples for patients with novel Coronavirus infection and for Severe Acute Respiratory Illness of any cause. This CRF and protocol are freely available for download on ISARIC's website. To develop a mechanistic understanding of disease processes, such that risk factors for severe illnesses can be identified and treatments be developed, ISARIC has prepared in collaboration with WHO a Biological Sampling Protocol to enroll patients, contacts and health workers with suspicion, diagnosis or high risk of infection from avian influenza viruses, novel coronavirus and emerging pathogens causing severe acute respiratory illness.

# Area of Excellence "Control of Pandemic and Inter-pandemic Influenza"

Malik Peiris is the Coordinator of the 8-year research program "Control of Pandemic and Inter-pandemic Influenza", which has been funded through the Areas of Excellence (AoE) scheme implemented by the University Grants Committee. The program represents a multi-disciplinary and multi-institutional approach with strong links to international networks and collaborators to address a single disease of global relevance. It is based on a highly integrated research program of basic AND applied research, encompassing laboratory, clinical and epidemiological expertise and spanning the animal-human interface. HKU-PRC takes an active part in this program and we have secured several grants since 2008 to successfully implement specific research areas and strengthen our scientific collaborations with many groups at HKU and other universities in Hong Kong.

# 7th Framework Programme: Pathogenesis and transmission of influenza in pigs (FLUPIG)

HKU-PRC has entered into a collaborative project (Funding scheme: Large-scale integrating project) supported through the 7<sup>th</sup> Framework Program of the European Union.

FLUPIG aims at a better understanding of the role of pigs in influenza pandemics. Pandemic influenza viruses come from wild birds, but they must adapt to efficient replication and transmission in humans to cause a pandemic. Malik Peiris is coordinating the involvement of the Centre in this project.

### Gordon Research Conference on "Infections of the Nervous System: Pathogenesis and worldwide impact", Hong Kong 2013

The inaugural Gordon Research Conference on "Infections of the nervous system: Pathogenesis and worldwide impact", chaired by Roberto Bruzzone, was attended by scientists from all over the world. One of the most positive aspects of the conference was that it put in contact a number of researchers who, despite working on similar research topics, had not found an appropriate forum for scientific exchanges. The goal was to address the current gaps in knowledge and establish an international community of worldleading sciences that will set the agenda for confronting this group of diseases in the coming years. This new meeting featured an opening evening of keynote lectures that were delivered by three leading scientists who gave an overview of the main challenges from the clinical, molecular and bioinformatics perspective. They set the tone for the rest of the conference, emphasizing our goals to encompass both clinical focus and technological innovation as pillars that will generate new knowledge to bridge the gap of unmet patient needs. Speakers in subsequent sessions addressed in details both the clinical and basic research aspect on: (1) how ways of invading the nervous system vary between pathogens; (2) what are the specific neural target cells and their receptors for neurotropic pathogens; (3) what are the characteristics of the immune and neural responses to invading pathogens; (4) how clinical and pathogenesis studies can elucidate the nature of the nervous system damage caused by different pathogens; (5) what are the new prospects for therapies and diagnostic in some of the diseases covered.

### **Options VIII – Options for the Control of Influenza, Cape Town,** 2013

Held every 3 years, **Options for the Control of Influenza** is the largest international scientific conference exclusively devoted to influenza. Malik Peiris was part of the Scientific Committee of the last meeting, which was held in Cape Town (September 2013).

## 4. Scientific Output

### 4.1 Publications cited in PubMed

- Chan RW, Leung CY, Nicholls JM, Peiris JS, Chan MC (2012) Proinflammatory Cytokine Response and Viral Replication in Mouse Bone Marrow Derived Macrophages Infected with Influenza H1N1 and H5N1 Viruses. *PLoS One* 7:e51057.
- Chao B, Tong XK, Tang W, Li DW, He PL, Garcia JM, Zeng LM, Gao AH, Yang L, Li J, Nan FJ, Jacobs M, Altmeyer R, Zuo JP, Hu YH (2012) Discovery and Optimization of 2,4-Diaminoquinazoline Derivatives as a New Class of Potent Dengue Virus Inhibitors. *J Med Chem* 55:3135-3143.
- 3. Chiu SS, Chan KH, So LY, Chen R, Chan EL, Peiris JS (2012) The population based socioeconomic burden of pediatric influenza-associated hospitalization in Hong Kong. *Vaccine* **30**:1895-1900.
- Chu DK, Leung CY, Perera HK, Ng EM, Gilbert M, Joyner PH, Grioni A, Ades G, Guan Y, Peiris JS, Poon LL (2012) A novel group of avian astroviruses in wild aquatic birds. *J Virol* 86:13772-13778.
- 5. Fouchier RA, García-Sastre A, Kawaoka Y, Barclay WS, Bouvier NM, Brown IH, Capua I, Chen H, Compans RW, Couch RB, Cox NJ, Doherty PC, Donis RO, Feldmann H, Guan Y, Katz J, Klenk HD, Kobinger G, Liu J, Liu X, Lowen A, Mettenleiter TC, Osterhaus AD, Palese P, Peiris JS, Perez DR, Richt JA, Schultz-Cherry S, Steel J, Subbarao K, Swayne DE, Takimoto T, Tashiro M, Taubenberger JK, Thomas PG, Tripp RA, Tumpey TM, Webby RJ, Webster RG (2012) Pause on Avian Flu Transmission Research. *Science* 335:400-401.
- 6. Jaume M, Yip MS., Kam YW, Cheung CY, Kien F, Roberts A, Li PH, Dutry I, Escriou N, Daeron M, Bruzzone R, Subbarao K, Peiris JS, Nal B, Altmeyer R (2012) SARS CoV subunit vaccine: antibody mediated neutralisation and enhancement. *Hong Kong Med* **Suppl 2**:31-36.
- 7. Kudelko M, Brault JP, Kwok K, Li MY, Pardigon N, Peiris JS, Bruzzone R, Desprès P, Nal B, Wang PG (2012) Class II ADP-ribosylation factors are required for efficient egress of dengue viruses. *J Biol Chem* **287**:767-777.
- 8. Lai JC, Garcia JM, Dyason JC, Böhm R, Madge PD, Rose FJ, Nicholls JM, Peiris JS, Haselhorst T, von Itzstein M (2012) A Secondary Sialic Acid Binding Site on Influenza Virus Neuraminidase: Fact or Fiction? *Angew Chem Int Ed Eng*/**51**:2221-2224.
- 9. Lee SMY, Dutry I, Peiris JS (2012) Editorial: Macrophage heterogeneity and responses to influenza virus infection. *J Leukoc Biol* **92**:1-4.
- 10. Lee SMY, Yen HL (2012) Targeting the host or the virus: current and novel concepts for antiviral approaches against influenza virus infection. *Antiviral Res* **96**:391-404.
- Mesel-Lemoine M, Millet J, Vidalain PO, Law H, Vabret A, Lorin V, Escriou N, Albert ML, Nal B, Tangy F (2012) A human coronavirus responsible for the common cold massively kills dendritic cells but not monocytes. *J Virol* 86:7577-7587.
- 12. Millet JK, Kien F, Cheung CY, Siu YL, Chan WL, Li H, Leung HL, Jaume M, Bruzzone R, Peiris JS, Altmeyer RM, Nal B (2012) Ezrin interacts with the severe acute respiratory syndrome coronavirus spike protein and negatively modulates host cell susceptibility to infection. *PLoS One* **7**:e49566.
- Qiao C, Liu Q, Bawa B, Shen H, Qi W, Chen Y, Mok CK, García-Sastre A, Richt JA, Ma W (2012) Pathogenicity and transmissibility of reassortant H9 influenza viruses with genes from pandemic H1N1 virus. J Gen Virol 93:2337-2345.
- Sanyal S, Claessen JHL, Ploegh H (2012) A viral deubiquitylating enzyme restores dislocation of substrates from the endoplasmic reticulum (ER) in semi-intact cells. J. Biol. Chem 287:23594-23603.

- Tang DJ, Lam, YM, Siu YL, Lam CH, Chu SL, Peiris JS, Buchy P, Nal B, Bruzzone R (2012) A single amino acid substitution in the 130-loop of the receptor-binding domain of H5N1 hemagglutinin is critical for efficient packaging into pseudotyped lentiviral particles. *PLoS One* 7:e43596.
- 16. Wang XL, Yang L, Chan KP, Chiu SS, Chan KH, Peiris JS, Wong CM (2012) Model selection in time series studies of influenza-associated mortality. *PLoS One* **7**:e39423.
- 17. Wong CM, Yang L, Chan KP, Chan WM, Song L, Lai HK, Thach TQ, Ho LM, Chan KH, Lam TH, Peiris JS (2012) Cigarette smoking as a risk factor for influenza-associated mortality: evidence from an elderly cohort. *Influenza Other Respir Viruses* **7**:531-539.
- Wong DD, Choy KT, Chan RW, Sia SF, Chiu HP, Cheung PP, Chan MC, Peiris JS, Yen HL (2012) Comparable fitness and transmissibility between oseltamivir-resistant pandemic 2009 and seasonal H1N1 influenza viruses with the H275Y neuraminidase mutation. *J Virol* 86:10558-10570.
- Yang L, Chan KP, Lee RS, Chan WM, Lai HK, Thach TQ, Chan KH, Lam TH, Peiris JS, Wong CM (2012) Obesity and influenza associated mortality: Evidence from an elderly cohort in Hong Kong. *Prev Med* 56:118-123.
- Yang L, Wang X, Chan K, Cao P, Lau H, Peiris J, Wong C (2012) Hospitalisation associated with the 2009 H1N1 pandemic and seasonal influenza in Hong Kong, 2005 to 2010. *Euro Surveill* 17:20309.
- 21. Yen HL, Peiris JS (2012) Virology: bird flu in mammals. Nature 486:332-333.
- 22. Bethell D, Saunders D, Jongkaewwattana A, Kramyu J, Thitithayanont A, Wiboon-ut S, Yongvanitchit K, Limsalakpetch A, Kum-Arb U, Uthaimongkol N, Garcia JM, Timmermans AE, Peiris M, Thomas S, Engering A, Jarman RG, Mongkolsirichaikul D, Mason C, Khemnu N, Tyner SD, Fukuda MM, Walsh DS, Pichyangkul S (2013) Evaluation of In Vitro Cross-Reactivity to Avian H5N1 and Pandemic H1N1 2009 Influenza Following Prime Boost Regimens of Seasonal Influenza Vaccination in Healthy Human Subjects: A Randomised Trial. *PLoS One* 8:e59674.
- 23. Chan MC\*, Chan RW\*, Chan LL\*, Mok CK\*, Hui KPY, Fong JHM, Tao KP, Poon LL, Nicholls JM, Guan Y, Peiris JS (2013) Tropism and innate host responses of a novel avian origin influenza A (H7N9) virus in *ex vivo* and *in vitro* cultures of the human respiratory tract. *Lancet Resp Med* 1:534-542 (\*equal contribution).
- 24. Garcia JM, Lai JC, Haselhorst T, Choy KT, Yen HL, Peiris JS, von Itzstein M, Nicholls JM (2013) Investigation of the binding and cleavage characteristics of N1 neuraminidases from avian, seasonal, and pandemic influenza viruses using saturation transfer difference nuclear magnetic resonance. *Influenza Other Respir Viruses* 8:235-242.
- 25. Hemida M, Perera R, Wang P, Alhammadi M, Siu L, Li M, Poon L, Saif L, Alnaeem A, Peiris M (2013) Middle East Respiratory Syndrome (MERS) coronavirus seroprevalence in domestic livestock in Saudi Arabia, 2010 to 2013. *Euro Surveill* **18**:20659.
- 26. Mok CK, Lee HH, Chan MC, Sia SF, Lestra M, Nicholls JM, Zhu H, Guan Y, Peiris JS (2013) Pathogenicity of the novel A/H7N9 influenza virus in mice. *MBio* **4**:e00362-13.
- Mok CK, Lee HH, Lestra M, Nicholls JM, Chan MC, Sia SF, Zhu H, Poon LL, Guan Y, Peiris JS (2013) Amino-acid substitutions in polymerase basic protein 2 gene contributes to the pathogenicity of the novel A/H7N9 influenza virus in mammalian hosts. J Virol 88:3568-3576.
- 28. Perera RA, Wang P, Gomaa MR, El-Shesheny R, Kandeil A, Bagato O, Siu LY, Shehata MM, Kayed AS, Moatasim Y, Li M, Poon LL, Guan Y, Webby RJ, Ali MA, Peiris JS, Kayali G (2013) Seroepidemiology for MERS coronavirus using microneutralisation and pseudoparticle virus neutralisation assays reveal a high prevalence of antibody in dromedary camels in Egypt, June 2013. *Euro Surveill* 18:pii=20574.

- Reiling JH, Olive AJ, Sanyal S, Carette JE, Brummelkamp TR, Ploegh HL, Starnbach MN, Sabatini DM (2013) A CREB3–ARF4 signalling pathway mediates the response to Golgi stress and susceptibility to pathogens. *Nat Cell Biol* 15:1473-1485.
- Sanyal S, Ashour J, Maruyama T, Altenburg AF, Cragnolini JJ, Bilate A, Avalos AM, Garcia-Sastre A, Ploegh HL (2013) Type-I interferon imposes a Tsg101/ISG15 checkpoint at the Golgi for glycoprotein trafficking during influenza virus infection. *Cell Host Microbe* 14:510-521.
- 31. Tafesse FG, Sanyal S, Ashour J, Guimaraes CP, Hermansson M, Somerharju P, Ploegh H (2013) Intact sphingomyelin biosynthetic pathway is essential for intracellular transport of Influenza virus glycoproteins. *Proc Natl Acad Sci USA* **110**:6406-6411.
- 32. Walther T, Karamanska R, Chan RW, Chan MC, Jia N, Air G, Hopton C, Wong MP, Dell A, Malik Peiris JS, Haslam SM, Nicholls JM (2013) Glycomic analysis of human respiratory tract tissues and correlation with influenza virus infection. *PLoS Pathog* **9**:e1003223.
- 33. Claessen JHL, Sanyal S, Ploegh H (2014) The chaperone Bag6 captures dislocated glycoproteins in the cytosol. *PloS One* **9**:e90204.
- 34. Dunning J, Merson L, Rohde GG, Gao Z, Semple MG, Tran D, Gordon A, Olliaro PL, Khoo SH, Bruzzone R, Horby P, Cobb P, Longuere KS, Kellam P, Nichol A, Brett S, Everett D, Hien TT, Yu H, Zambon M, Ruiz-Palacios G, Lang T, Akhvlediani T, ISARIC Working Group 3, ISARIC Council, Hayden F, Marshall J, Webb S, Angus DC, Shindo N, van der Werf S, Openshaw PJ, Farrar J, Carson G, Baillie JK (2014) Open source clinical science for emerging infections. *Lancet Infect Dis* 14:8-9.
- 35. Lee SMY, Kok KH, Jaume M, Cheung TK, Yip TF, Lai JC, Guan Y, Webster RG, Jin DY, Peiris JSM (2014) Toll-like receptor 10 is involved in induction of innate immune responses to influenza virus infection. *Proc Natl Acad Sci USA* **111**:3793-3798.
- Mok CK, Peiris JS, Chan MC (2014) Anti-inflammatory and anti-viral effects of indirubin derivatives in H5N1-infected primary macrophages and pneumocytes *Antiviral Res* 106C:95-104.
- 37. Valkenburg SA, Li OT, Mak PW, Mok CK, Nicholls JM, Guan Y, Waldmann TA, Peiris JS, Perera LP, Poon LL (2014) IL-15 adjuvanted multivalent vaccinia-based universal influenza vaccine requires CD4+ T cells for heterosubtypic protection. *Proc Natl Acad Sci USA* **111**:5676-5681.
- 38. Yip MS, Leung NH, Cheung CY, Li PH, Lee HH, Daëron M, Peiris JS, Bruzzone R, Jaume M (2014) Antibody-dependent infection of human macrophages by SARS coronavirus. *Virol J*, in press.

NB. Papers highlighted in grey are from Sanyal's previous laboratory.

### 4.2 Presentations at Meetings

- 1. SMY Lee, YP Ng, JSM Peiris, NY Ip (2012) **Pandemic influenza A H1N1 viruses elicit** weak cytokine responses in human astrocytic and neuronal cells. *10th Joint Meeting of the International Cytokine Society and the International Society for Interferon and Cytokine Research*, Geneva, Switzerland (Poster).
- MY Li, M Grandadam, L Siu, M Kudelko, R Bruzzone, PG Wang (2012) Dengue virus requires KDEL receptor for exit from ER. 5<sup>th</sup> European Congress of Virology, Lyon, France (Oral).
- 3. Y Fan, N Lagarde, R Bruzzone, F Kien (2014) Cyclin D3 restricts influenza infection by interacting with M2 ion channel protein. *Keystone Symposium: Innate immunity to viral infections*, Keystone, CO, USA (Poster).
- MY Li, M Grandadam, KTH Kwok, T Lagache, LYL Siu, K Sayteng, M Kudelko, JC Olivo-Marin, R Bruzzone, PG Wang (2014) Dengue virus requires KDEL receptors to exit the endoplasmic reticulum. 33th Meeting of the American Society for Virology, Fort Collins, CO, USA (Oral).
- Chris KP Mok (2014) Pathogenicity and viral determinants of the novel A/H7N9 influenza virus in mice. 9<sup>th</sup> Conference Louis Pasteur: Emerging Infectious Diseases, Paris, France (Poster).
- 6. S Sanyal, H Ploegh (2014) Viral exploitation of host intracellular trafficking pathways upon interferon induction. *Keystone Symposium: Innate immunity to viral infections*, Keystone, CO, USA (Oral).
- 7. S Sanyal (2014) **Role of Tsg101 in influenza virus assembly and release**. 9<sup>th</sup> Conference Louis Pasteur: Emerging Infectious Diseases, Paris, France (Poster).
- 8. O Teng, SL Hsieh, TL Hsu, R Bruzzone, M Peiris, HL Yen. (2014) **CLEC5A is involved in the influenza virus pathogenesis by modulating the cytokine secretion**. *33th Meeting of the American Society for Virology*, Fort Collins, CO, USA (Oral).

### 4.3 Seminars, Invited Lectures and Oral Presentations

- 1. Roberto Bruzzone (2012) International Workshop on Infectious Encephalitis in South-East Asia. Phnom Penh, Kingdom of Cambodia.
- Roberto Bruzzone (2012) Keynote Lecture, 1st Scientific Council Meeting of the International Severe Acute Respiratory Infections Consortium (ISARIC). Fondation Mérieux, Annecy, France.
- 3. Roberto Bruzzone (2013) *Hong Kong Pharmacology Society*. LKS Faculty of Medicine of HKU, Hong Kong.
- 4. Roberto Bruzzone (2013) *Keynote Lecture, Scientific Conference of Southern Preventive Medicine.* Pasteur Institute of Ho Chi Minh City, Ho Chi Minh City, Vietnam.
- 5. Suki Lee (2013) *Molecular Mechanisms of Innate Immunity 2013*. Croucher Foundation Conference, Hong Kong.
- 6. Sumana Sanyal (2013) *Ubiquitin and ubiquitin like proteins: From structure to function*. EMBO Conference, Lucca, Italy.
- 7. Sumana Sanyal (2013) Virus Host interactions: A Brief overview. HKUST, Hong Kong.
- 8. Sumana Sanyal (2014) *Area of Excellence on Control of Pandemic and Inter-Pandemic Influenza*. HKU, Hong Kong.
- 9. Sumana Sanyal (2014) University of Massachusetts, Amherst, MA, USA.
- 10. Sumana Sanyal (2014) *Alumni Seminar*. The Whitehead Institute for Biomedical Research, MIT, Cambridge, MA, USA.

### 4.4 Active Grants 2012-Present

#### **Research Fund for the Control of Infectious Diseases**

Principal Investigator: Amount: Period: Dr Huiling Yen HK\$819,442.00 01/Jan/2010 to 30/Jun/2012

#### **Research Fund for the Control of Infectious Diseases**

Principal Investigator:	Dr Peigang Wang
Amount:	HK\$962,504.00
Period:	01/Sept/2010 to 31/Aug/2012

#### **Research Fund for the Control of Infectious Diseases**

Dr Francois Kien
HK\$955,648.00
01/Nov/2011 to 31/Oct/2013

#### **Research Fund for the Control of Infectious Diseases**

Principal Investigator:	Dr Suki Lee
Amount:	HK\$991,404.00
Period:	01/Jan/2012 to 31/Oct/2014

#### Research Fund for the Control of Infectious Diseases

Principal Investigator: Amount: Period: Dr Suki Lee HK\$998,544.00 01/Jan/2013 to 31/Dec/2014

#### **Research Fund for the Control of Infectious Diseases**

Principal Investigator:Dr Chris MokAmount:HK\$696,067.00Period:01/Oct/2012 to 30/Sep/2014

#### Health and Medical Research Fund (HMRF)

Principal Investigator: Co-Investigator: Amount: Period: Dr John Nicholls Dr Chris Mok HK\$794,000.00 01/Nov/2013 to 31/Oct/2015

#### Health and Medical Research Fund (HMRF)

Principal Investigator:	Dr Michael Chan
Co-Investigator:	Dr Chris Mok
Amount:	HK\$978,704.00
Period:	01/Mar/2013 to 28/Feb/2015

#### Commissioned Health and Medical Research Fund (HMRF)

Co-Investigator: Amount: Period: Dr Chris Mok HK\$360,000.00 01/Jun/2013 to 31/May/2015

#### European Commission (FP7)

Principal Investigator: Amount: Period: Dr Malik Peiris/Dr John Nicholls €375,150.00 01/Jul/2010 to 30/Jun/2015

#### Institut Pasteur International Network (ACIP-3)

Principal Investigator: Amount: Period: Dr Peigang Wang €23,000.00 01/Sep/2010 to 31/Aug/2012

#### Area of Excellence, Control of Pandemic and Inter-pandemic Influenza

Principal Investigator: Amount: Period: Dr Francois Kien HK\$511,320.00 01/Jan/2012 to 31/Dec/2012

#### Area of Excellence, Control of Pandemic and Inter-pandemic Influenza

Principal Investigator: Amount: Period: Dr Martial Jaume HK\$200,000.00 01/Jan/2012 to 31/Dec/2012

#### Area of Excellence, Control of Pandemic and Inter-pandemic Influenza

Principal Investigator: Amount: Period: Dr Suki Lee HK\$248,400.00 01/May/2014 to 31/Dec/2015

#### Area of Excellence, Control of Pandemic and Inter-pandemic Influenza

Principal Investigator:Dr Chris MokAmount:HK\$250,000.00Period:01/May/2014 to 31/Dec/2015

#### Area of Excellence, Control of Pandemic and Inter-pandemic Influenza

Principal Investigator:	Dr Sumana Sanyal
Amount:	HK\$300,000.00
Period:	01/May/2014 to 31/Dec/2015

#### **BNP**-Paribas

Principal Investigator: Amount: Period: Dr Roberto Bruzzone HK\$600,000.00 01/Jan/2012 to 31/Dec/2014

#### Knowledge Exchange Funds, University of Hong Kong

Principal Investigator: Amount: Period: Dr Francois Kien HK\$85,000.00 01/Jul/2013 to 30/Jun/2014

#### UGC-Matching Fund Scheme (6<sup>th</sup> Phase)

Principal Investigator: Amount: Period: Dr Roberto Bruzzone HK\$723,027.00 01/Apr/2014 to 31/Mar/2016

#### Seed Fund, University of Hong Kong

Principal Investigator: Amount: Period: Dr Chris Mok HK\$120,000.00 01/Apr/2014 to 31/Mar/2016

#### Seed Fund, University of Hong Kong Principal Investigator:

Principal Investigator: Amount: Period: Dr Sumana Sanyal HK\$120,000.00 01/Jul/2014 to 30/Jun/2016

#### *L'Oreal Scholarship* Principal Investigator:

Principal Investigator: Amount: Period: Dr Roberto Bruzzone HK\$700,000.00 01/Jan/2013 to 31/Dec/2014

## 5. Annexes

## 5.1 List of Staff

Research Team

#### Director PEIRIS, Malik **Co-Director BRUZZONE**, Roberto Research Assistant Professor LEE, Man Yan Suki Research Assistant Professor MOK, Ka Pun Chris Research Assistant Professor SANYAL, Sumana **Post-Doctoral Fellow** LAI, Chun Cheong Jimmy Research Technician LI, Ping Hung Research Technician SIU, Yu Lam Lewis Research Technician TSE, Kong San Jane **Research Assistant** IP, Ka Kay Kelvin **Research Assistant** JAHAN, Akhee **Research Assistant** LESTRA, Maxime **Research Assistant** LI, Shuting **Research Assistant** PAN, Sihua **Research Assistant** ZHANG, Jingshu Tami PhD Student FAN, Ying PhD Student LEE, Hok Yeung Horace PhD Student Ll, Mingyuan PhD Student TENG, Ooiean PhD Student (Part-time) MAK, Ganon YIP, Tsz Fung Mphil Student

Name

#### <u>Administration:-</u>

Administrative Assistant	LI, Suk Yin Anne
Laboratory Attendant	CHAU, Man Hao
Laboratory Attendant	CHEUNG, Wai Sze

## 5.2 Budget for the year ending 31 June 2013

#### FUNDING:

Central Fund	3,063,947.02	
Institut Pasteur	1,010,680.00	
Endowment Fund & Private Donation	2,722,803.34	
External Grants	2,464,115.90	
Teaching / Training	<u>1,315,362.90</u>	10,576,909.16

#### **EXPENSES:**

BALANCE CARRY FORWARD TO 2013/2014 (HKU-PRC)		56,583.63
BALANCE CARRY FORWARD TO 2013/2014 (POLE)		3,571,838.76
General	909,721.51	<u>6,948,486.77</u>
Teaching / Training	1,062,439.73	
Research	1,741,142.78	
Salary	3,235,182.75	

## 5.2 Posters of HKU-Pasteur Courses



## 4<sup>th</sup> HKU-PASTEUR CELL BIOLOGY COURSE

FOR RESEARCH POSTGRADUATE STUDENTS

## CELL BIOLOGY SEMINAR SERIES



 香港大學 - 巴斯德研究中心 <u>HKU-Pasteur Research Centre</u> THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE を意大手を高減費を応

## CELL DIVISION & CANCER BIOLOGY

	LECTURERS A. ECHARD (France)	TITLE Cell division: cytoskeleton and membrane traffic	DATE 17 Apr 2012	TIME 09:00 - 11:00	VENUE MTC
	P. SICINSKI (USA)	Targeting cell cycle machinery in cancer treatment	18 Apr 2012	09:00 - 11:00	мтс
S	S. MA (Hong Kong)	Cancer stem cells: implications in cancer biology and therapy		11:30 - 13:00	мтс
10manik	R. BASTO (France)	Contribution of centrosomes and chromosomes to turnourgenesis	20 Apr 2012	09:00 - 11:00	SR5
States -	K. RYAN (UK)	Apoptosis and autophagy in cell death and cancer	23 Apr 2012	09:00 - 11:00	MTC
	JP. THIERY (Singapore)	EMT in development and diseases		11:30 - 13:00	MTC
aller .		Adhesion mechanisms; implication for EMT		14:00 - 15:30	MTC
	G. E. JONES (UK)	The regulation of cell motility	24 Apr 2012	09:00 - 11:00	MTC
1	P. CHAVRIER (France)	Cell biology of turnor cell invasion		11:30-12:30	MTC
	J. POUYSSEGUR (France)	Hypoxia-signalling angiogenesis and cancer	25 Apr 2012	10:30 - 12:30	SR7
		Cancer metabolism and therapeutic approaches		13:30 - 15:00	SR7
-		MTC: 2/F, William N Ms Chen Yang SR5: Seminar Roor SR7: Seminar Roor	4 W Mong Block, Fac 5 Foo Oi Telemedicin m 5, G/F, Laboratory m 7, G/F, Laboratory	ulty of Medicine Build e Centre Block, Faculty of Medi Block, Faculty of Medi	ing, cine Building cine Building
1-	-/	1 alter	- ban	ALL ARE WEL	COME
0	1		(D)		

SPONSORS: International network

Centre for Cancer Research



5<sup>th</sup> HKU-PASTEUR CELL BIOLOGY COURSE

## **14 - 26 April 2013** HKU-Pasteur Research Pole, Hong Kong



子香港大學 - 巴斯德研究中心 HKU-Pasteur Research Pole



# Imaging Host-Pathogens Interactions

**COURSE PROGRAMME** 



THE UNIVERSITY OF HONG KONG



## 5<sup>th</sup> HKU-PASTEUR CELL BIOLOGY COURSE

FOR RESEARCH POSTGRADUATE STUDENTS

## CELL BIOLOGY SEMINAR SERIES



香港大學・巴斯德研究中心
HKU-Pasteur Research Pole



### IMAGING HOST-PATHOGENS INTERACTIONS

	LECTURERS	TITLE	DATE	TIME	VENUE
	T. KIRCHIHAUSEN (USA)	Dynamics of endocytosis	16 Apr 2013	09:00 - 12:00	HKJC-52
a allassa	L. JOHANNES (France)	Clathrin-independent endocytosis and retrograde transportt	16 Apr 2013	13:30 - 16:30	нкјс-52
San Andrew State	U. CREBER (Switzerland)	Imaging viruses in entry & egress	18 Apr 2013	09:30 - 12:30	нкјс-52
A MERICE	R. PARTON (Australia)	Modern EM methods: application to lipid localization and endocytic trafficking	19 Apr 2013	09:30 - 12:30	нкјс-51А/В
36	M. MHLANGA (South Africa)	Sub-diffraction limited detection of central dogma molecules	22 Apr 2013	09:00 - 11:00	нкјс-52
1	C. ZURZOLO (France)	Turneling nanotubes and the spreading of prions and prion-like diseases	22 Apr 2013	11:30 - 13:00	нкјс-52
1	M. MARSH (UK)	The ins and outs of virus-cell interactions	25 Apr 2013	09:30 - 12:30	нкјс-52
		HKJC-STA/B, R S HKJC-S2: R S	oom G01-02, The HK) Sassoon Road, Pokful Som G03, The HK)C 8 Sassoon Road, Pokful	C Building for Intendis am uilding for Intendiscipi am	iplinary Research nary Research
-	_/	1 il	1 ala	ALL ARE W	IELCOME
du	1			E	
AND DESCRIPTION OF THE OWNER OF T			A STATE OF THE OWNER OF		

SPONSORS:



## 9<sup>th</sup> HKU-PASTEUR VIROLOGY COURSE

FOR RESEARCH POSTGRADUATE STUDENTS

## **11 - 27 July 2012** HKU-Pasteur Research Centre, Hong Kong

Institut Pasteur

香港大學 · 巴斯德研究中心 HKU-Pasteur Research Centre



## **COURSE PROGRAMME**



## 9<sup>th</sup> HKU-PASTEUR VIROLOGY COURSE

FOR RESEARCH POSTGRADUATE STUDENTS

## VIROLOGY SEMINAR SERIES



香港大學・巴斯德研究中心
HKU-Pasteur Research Centre

THE UNIVERSITY OF HONG KONG LI KA SHING FACILITY OF MEDICINE 各 市 大 寺 市 高 減 田 寺 南 曲

## VIRAL ZOONOSES

LECTURERS	ΠΠΕ	DATE	TIME	VENUE
T. GOLDBERG (USA)	Ecology and epidemiology of emerging viral disease in the developed and developing world	11 July 2012	14:30 - 16:30	мтс
G. GABRIEL (Germany)	Molecular determinants of influenza virus host adaptation and pathogenesis	19 July 2012	09:00 - 11:00	SR6
M. PEIRIS (Hong Kong)	Yin & Yang of the innate immune response to influenza	20 July 2012	09:30 - 11:00	SR6
E. DOMINGO (Spain)	Viral quasispecies and antiviral designs	24 Apr 2012	09:30 - 11:30	<b>SR5</b>
H. FELDMANN (USA)	High containment viruses	24 Apr 2012	14:00 - 16:00	SR5
M. ALBERT (France)	My adventures with dendritic cells (a tribute to Ralph M STEINMAN)	25 July 2012	10:00 - 12:00	MTC
	Biomarkers lie: new insights into HCV disease pathogenesis and treatment	26 July 2012	12:00 - 14:00	SR6

MTC: 2/F, William M W Mong Block, Faculty of Medicine Building, Ms Chen Yang Foo Ol Telemedicine Centre SR5: Seminar Room S, G/F, Laboratory Block, Faculty of Medicine Building SR6: Seminar Room 6, G/F, Laboratory Block, Faculty of Medicine Building

ALL ARE WELCOME



#### **10<sup>th</sup> HKU-PASTEUR VIROLOGY COURSE** FOR RESEARCH POSTGRADUATE STUDENTS

## 14 - 26 July 2013 **HKU-Pasteur Research Centre, Hong Kong**

Institut Pasteu

香港大學 - 巴斯德研究中心 HKU-Pasteur Research Pole

THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE

# HIV/AIDS

## **COURSE PROGRAMME**



**SPONSORS:** 

THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE Y

Institut P

FRIENDS OF INSTITUT PASTEUR HONG KONG LIMITED

RANCE

## **HKU-PASTEUR VIROLOGY COURSE**

## 26 July 2013

HKU-Pasteur Research Pole, Hong Kong



## **Anniversary Scientific Symposium**

#### **GONE WITH THE VIRUSES**

Discussion Leaders: Huong Thi Que VU (Vietnam) Peter CHEUNG (Hong Kong)

Speakers:

Veasna DUONG (Cambodia) Myung-Jin KIM (Korea) Mateusz KUDELKO (Hong Kong) Kim-Tat TEOH (Singapore)

#### **ALL ABOUT FLU**

Discussion Leaders: Olive LI (Hong Kong) Benjamin BAILLY (China)

Speakers:

Vinod BALASUBRAMANIAM (Malaysia) Renee CHAN (Hong Kong) Chris MOK (Hong Kong) Wei WANG (China)

#### THE BEST VIRUSES OF OUR LIVES

Discussion Leaders: Yong Ping LIN (China) Harsha PERERA (Hong Kong)

Speakers:

limmy LAI (Hong Kong) Richard NJOUOM (Cameroon) Vijaya PANDEY (India) Shanny TANG (China)

#### A VIRUS FOR ALL SEASONS

Discussion Leaders: Ying FAN (Hong Kong) Philippe BUCHY (Cambodia)

Speakers:

lason KAM (Singapore) Inez MEDADO (Philippines) My Vu Tra PHAN (Vietnam) Jin SUN (China)

#### **ABOUT THE EVENT**

Date: Friday 26 July 2013. Time: 8:00 - 18:30. Venue: Seminar Room 1 A/B, HKJC Building for Interdisciplinary Research, 5 Sassoon Road.

#### FREE REGISTRATION

Online registration at http://hkuems1.hku.hk/hkuems/hkuevent.aspx?guest=Y&service=23720.

#### FOR MORE INFORMATION, PLEASE CONTACT

Anne LI at +852 2816 8403 or hku-pasteur@hku.hk. Check www.hkupasteur.hku.hk for programme updates.





## CHALLENGES OF HIV / AIDS PREVENTION, CARE & TREATMENT IN THE 21<sup>st</sup> CENTURY

A Public Lecture by :

### Professor Françoise Barré-Sinoussi

Recipient of Nobel Prize in Physiology or Medicine in 2008

24 JULY 2013

Lecture Theatre 1 Cheung Kung Hai Conference Centre William MW Mong Block 21 Sassoon Road, Pokfulam, Hong Kong



REGISTRATION: http://hkuems1.hku.hk/hkuems/hkuevent.aspx?guest=Y&service=24110.

FOR MORE INFORMATION, PLEASE CONTACT: Anne Li at +852 2816 8403 or <u>hku-pasteur@hku.hk</u>. Check <u>www.hkupasteur.hku.hk</u> for updates.

CME /CNE ACCREDITATION: In progress.

> Y 香港大學 · 巴斯德研究中心 HKU-Pasteur Research Pole





## 10<sup>th</sup> HKU-PASTEUR VIROLOGY COURSE

## VIROLOGY SEMINAR SERIES



 香港大学 - 巴斯博研究中心 HKU-Pasteur Research Pole 

HIV / AIDS

LECTURERS	TITLE	DATE	TIME	VENUE
C. CHENG-MAPER (USA)	HIV, AIOS pathogenesis and prevention	15 July 2013	09:00 - 11:00	HKJCB-S2
P. ZHOU (PR-CNine)	Genome organization and replication of HWV (Part I) Genome organization and replication of HWV (Part II)	15 July 2013 15 July 2013	11:30 - 12:30 14:00 - 15:00	HKJCB-S2 HKJCB-S2
T. HEIOMANN (France)	Endogenous retroviruses	15 July 2013	15:30 - 17:30	HKJCB-52
Q. SATTENTAU (UK)	HIV-1 cell-to-cell spread and the virological synapse	17 July 2013	09:00 - 11:00	HKJCB-S2
5. MORENO (Spain)	HIV treatment & future therapeutic strategies	18 July 2013	09:00 - 11:00	HKJCB-52
S. LEWIN (Australia)	Toward an HEV Cure - tackling HEV latency and other strategies (Part I) Toward an HEV Cure - tackling HEV latency and other strategies (Part II)	18 july 2013 18 july 2013	11:30 - 12:30 14:00 - 15:00	HKJCB-S2 HKJCB-S2
8. KORBER (USA)	Evolution of HEV, a Highly Variable Virus, and Vaccine Design	19 July 2013	09:00 - 12:30	HKJCB-52
P. CHARNEAU (France)	Lantiviral vectors: principles and biomedical applications	19 July 2013	14:00 - 16:00	HKJCB-S2
Z. CHEN (Hong Kong)	Vaccination strategies	22 July 2013	09:00 - 10:30	HKJCB-S3
F. BARRE-SINOUSSI (France)	Host Control of HIV infection	22 July 2013	11:00 - 13:00	HKJCB-53
M. MULLER-TRUTWIN (Namor)	Acute phase of HIV/SIV infections and AIDS pathogenesis	22 July 2013	14:30 - 16:00	HKJCB-52
N. NGO-GUNG-HUONG (Thatave)	Mother to child transmission of HIV: From risk factors to prevention	22 July 2013	16:30 - 18:00	HKJCB-S2
F. BARRE-SINOUSSI (France)	Special lecture: The discovery of HIV	23 July 2013	09:00 - 11:00	HKJCB-52
L. MONTANER (USA)	HW pathogenesis & innate Immunity Innate Immunity as a focus of HW Immunotherapy?	23 July 2013 23 July 2013	11:30 - 13:00 14:30 - 15:30	HKJCB-52 HKJCB-52
R. SHATTOCK (UK)	AIDS vaccine clinical trials: what have we learnt and where are we headed	23 July 2013	16:00 - 17:30	HKJCB-52
F. BARRE-SINGUSSI (France)	Challenges of HIV/JADS prevention, care and treatment in the 21 <sup>18</sup> century	24 July 2013	13:15 - 14:45	UT 1
ALLINN	10 Years of the HKU-Pasteur Virology Course Anniversary Scientific Symposium	24 My 2013	0830-1830	HKICB-51

### ALL ARE WELCOME

HQCB-S1: Seminar Room 1 A and 8 (G01-02), G/F, HQC Building for Interdisciplinary Research, 5 Sessoon Road, Poldulam HQCB-S2: Seminar Room 2 (G03), G/F, HQC Building for Interdisciplinary Research, 5 Sessoon Road, Poldulam HQCB-S3: Seminar Room 3 (G04), G/F, HQC Building for Interdisciplinary Research, 5 Sessoon Road, Poldulam LR1: Lecture Theatre 1, Cheung Kung Hai Conference Centre, William MW Mong Block, 21 Sessoon Road, Poldulam







EDT3 | EDT | HEALTH Image No.: 1/1 Image Size: 252.9cm-sq(9.4cm x 26.9cm) Ad-Value: HKD29,193

South China Morning Post Highlight of the day

2013-08-06 Author: Emily Tsang Circulation / Reach: 108,047 Word Count .: 519

Gays search for HIV-positive sex partners on web



cation

cation". The phenomenon is largely confined to the UK and US. Barré-Sinoussi, who was in Hong Kong to deliver a speech at the University of Hong Kong Pas-feur Research Centre, recently, said: "Of course: most patients said: "Of course, most patients who are on treatment are doing

Source: Wisers electronic service. This content, the trademarks and logos belong to Wisers, the relevant organizations or copyright owners. All rights reserved. Any content provided by user is the responsibility of the user and Wisers is not responsible for such content, copyright clearance or any damage/loss suffered as a result. 本內容經驗料的電子服務提供,以上內容、磁標的幅感料、相關機構或版欄擁有人所有,並保留一切權利,使用者提供的任何內容由使用者自行負責,戀科 不會對發導內容。版懂許可或由此引起的任何損害/損失事實質任。 Print out of Wisers electronic service 慧科電子服務列印本

35



THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE

CITY2 | CITY | health. Image No.: 1/1 Image Size: 181.4cm-sq(9.7cm x 18.7cm) Ad-Value: HKD20,941

South China Morning Post Highlight of the day

2013-08-06 Author: Emily Tsane Circulation / Reach: 108,047 Word Count .: 374

Making a life sentence a little easier to swallow



Being diagnosed with an HIV infection may no longer be seen as a "death sentence", but it is still a "life sentence" from which researchers should help patients break free, a French virologist who was pivotal in identifying the virus says.

Francoise Barre-Sinoussi cautions that now is not the time to rejoice over the success of treatments that keep HIV infections in check.

The next challenge for scien-tists was to reduce the dosage of nests was to reduce the obsage of preventive and treatment drugs from once a day to once a month in order to allow HIV-positive pa-tients more "freedom", she said. "When one has to take the pill

every day and for the rest of their-life, they will feel that they have lost freedom," she said. Barre-Sinoussi was awarded

the Nobel Prize in Physiology or Medicine in 2008, together with her former mentor Luc Montagnier, for the groundbreaking dis-covery of the human immuno-

deficiency virus that causes Aids. According to the World Health Organisation, 34 million people are living with HIV. At the end of last year 9.7 million of them were undergoing antiretro-viral therapy to stop the virus damaging their bodies.

Hong Kong knows of 6,000 HIV cases, with more than 100 new cases reported each quarter.

fected patient takes about 10 years on average to develop Aids.

On a visit to the University of Hong Kong-Pasteur Research Centre to mark the 10th anniversary of its virology course last month, Barre-Sinoussi pointed out that the HIV epidemic was very limited in the city. The government should focus

its preventive efforts on homosexuals, who were considered a high-risk group, she said. She



#### They will feel they have lost their freedom

FRANCOISE BARRE-SINOUSSI ON A THE NEED TO TAKE A PILL EVERY DAY FOR LIFE

suggested the use of a new pre-ventive pill, Truvada, which could cut the risk of transmission to between 42 and 75 per cent if taken before or after intercourse.

But the virologist, who is used at the Pasteur Institute in Paris, admitted the drug might not be popular among homosexuals in France as they considered it "too much trouble" to take it so

frequently. Those living with HIV rely on antiretroviral therapy to live longer and healthier lives, but they must take the drugs every day for the rest of their lives.

Source: Wisers electronic service. This content, the tradewarks and logos belong to Wisers, the relevant organizations or copyright owners. All rights reserved, Any content provided by user is the responsibility of the user and Wisers is not responsible for such content, copyright clearance or any damage/loss suffered as a result. 本內容經證料的電子服務提供。以上內容。確得和標記屬整料、相關機構或版確擁有人所有,並保留一切權利,使用書提供的任何內容由使用者自行負責,整料 不會對該等內容、版權許可或由此引起的任何損害 / 損失承擔責任。 Print out of Wisers electronic service 聽料電子服務別印本



FOR RESEARCH POSTGRADUATE STUDENTS

## 18 - 30 November 2012 HKU-Pasteur Research Centre, Hong Kong



音差大単 - 巴斯德研究中心 HKU-Pasteur Research Centre THE UNIVERSITY OF HONG KONG

## Adaptive Immunity

## **COURSE PROGRAMME**

SPONSORS:





ALL FRANCE

### 5<sup>th</sup> HKU-PASTEUR IMMUNOLOGY COURSE FOR RESEARCH POSTGRADUATE STUDENTS

## 18 - 30 November 2012 **HKU-Pasteur Research Centre, Hong Kong**



P 香港大學·巴斯德研究中心 **HKU-Pasteur Research Centre**  THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE 参阅大学学品演算学院

## IMMUNOLOGY SEMINAR SERIES

#### ADAPTIVE IMMUNITY

LECTURERS	TITLE	DATE & TIME	VENUE
O. ACUTO (UK)	Lymphocyte antigen receptors: structure and signaling	20 Nov 2012 09:30-11:30	SR4
J. VILLADANGOS (Australia)	Antigen processing and presentation via classical MHC molecules of antigen presenting cells	20 Nov 2012 14:00-17:00	SR5
B. MALISSEN (France)	Genetic tool for imaging and dissecting innate and adaptive immune responses	26 Nov 2012 09:00-12:00	мтс
S. PELLEGRINI (France)	Type I interferon signaling and complex effects on immune response	28 Nov 2012 09:00-11:00	SR7
O. SCHWARTZ (France)	Virological and immunological aspects of HIV replication and cell-to-cell spread (Part I)	28 Nov 2012 11:30-12:30	SR7
	(Part II)	14:00-15:00	SR7

#### VENUE

MTC: Ms Chen Yang Foo OI Telemedicine Centre, 2/F William MW Mong Block, Faculty of Medicine Building.

SR4: Seminar Room 4, G/F Laboratory Block, Faculty of Medicine Building. SR5: Seminar Room 5, G/F Laboratory Block, Faculty of Medicine Building. SR7: Seminar Room 7, G/F Laboratory Block, Faculty of Medicine Building.

#### FOR MORE INFORMATION, PLEASE CONTACT:

Anne LI at +852 2816 8403 or hku-pasteur@hku.hk. Check www.hkupasteur.hku.hk for programme updates.

#### ALL ARE WELCOME

SPONSORS:





THE CATERNEYS OF BOAC LOAC

6<sup>th</sup> HKU-PASTEUR IMMUNOLOGY COURSE FOR RESEARCH POSTGRADUATE STUDENTS

## 17 - 29 November 2013 **HKU-Pasteur Research Pole, Hong Kong**



香港大學·巴斯德研究中心 HKU-Pasteur Research Pole

# Innate Immunity

And Inflammation

## **COURSE PROGRAMME**











THE UNIVERSITY OF HONG KONG LI KA SHING FACULTY OF MEDICINE

大

季 孝 高 就 贺 季 院

## 6<sup>th</sup> HKU-PASTEUR IMMUNOLOGY COURSE

FOR RESEARCH POSTGRADUATE STUDENTS

## 17 - 29 November 2013 HKU-Pasteur Research Pole, Hong Kong

Institut Pasteur

香港大學 · 巴斯德研究中心 HKU-Pasteur Research Pole THE UNIVERSITY OF HONG KONG LI KA SHING FACILITY OF MEDICINE 6 8 2 9 9 8 8 8 9 9 8

## IMMUNOLOGY SEMINAR SERIES

#### INNATE IMMUNITY AND INFLAMMATION

#### LECTURERS TITLE

DATE & TIME VENUE

	J-M. CAVAILLON (France)	An introduction to innate immunity and the cytokine network	18 Nov 2013 09:30-12:00	HKJCB-S7
۱	J. DI SANTO (France)	NK cells and innate lynphoid cells	18 Nov 2013 14:00-16:30	HKJCB-S7
I	T. FUJITA (Japan)	The interferon system	19 Nov 2013 15:30-16:30	HKJCB-S7
	T. FUJITA (Japan)	Sensing viral RNA and activation of antiviral response	19 Nov 2013 17:00-18:00	HKJCB-S7
	S. K. BIWAS (Singapore)	Macrophages and innate immunity	20 Nev 2013 10:30-12:30	HKJCB-S1A
	S. ABRAHAM (Singapore)	Mast cells: critical regulators of immunity to pathogens and vaccines	21 Nov 2013 08:30-10:00	HKJCB-S1A
	F. GINHOUX (Singapore)	Dendritic cells immunobiology	21 Nov 2013 11:00-12:00 (Part I) 13:00-14:00 (Part II)	HKJCB-S1A
	R. HANCOCK (Canada)	Cationic host defence (antimicrobial) peptides	22 Nov 2013 11:30-13:30	HKJCB-S2
	P. B. MORGAN (UK)	Complement and inflammation	26 Nev 2013 09:30-12:00	HKJC8-52
	L. ULLOA. (USA)	Control of inflammation by the nervous system	26 Nev 2013 13:30-16:00	HKJCB-S2
	A. ZYCHUNSKY (Germany)	Neutrophil and NETs	27 Nov 2013 09:30-12:00	HKJCB-S1A
	P. MIOSSEC	IL-17, Th17 cells and inflammation	27 Nev 2013 13:30-16:00	HKJCB-S1A

#### VENUE

HKJCB-S1A: Seminar Room 1A, Hong Kong Jockey Club Building for Interdisciplinary Research, 5 Sassoon Road, Pokfulam HKJCB-S2: Seminar Room 2, Hong Kong Jockey Club Building for Interdisciplinary Research, 5 Sassoon Road, Pokfulam HKJCB-S7: Seminar Room 7, Hong Kong Jockey Club Building for Interdisciplinary Research, 5 Sassoon Road, Pokfulam

#### FOR MORE INFORMATION, PLEASE CONTACT:

Anne LI at +852 2831 5516 or hku-pasteur@hku.hk. Check www.hkupasteur.hku.hk for programme updates.

#### ALL ARE WELCOME

SPONSORS:





THE CASE BOTH OF HISK LOAC

## 5.4 International Meetings co-organized by HKUPRC

#### Infections of the Nervous System

#### Pathogenesis and Worldwide Impact

July 7-12, 2013 The Chinese University of Hong Kong Hong Kong, China

> Chair: Roberto Bruzzone Vice Chair: Lisa FP. Ng







創新科技署

Innovation and Technology Commission

NIH National Institutes of Health

#### SUNDAY

2:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm	Dinner
7:30 pm - 7:40 pm	Welcome / Introductory Comments by GRC Site Staff and Chairs <b>Roberto</b> Bruzzone (HKU-Pasteur Research Pole) & Lisa FP Ng (Singapore Immunology Network - A*STAR)
7:40 pm - 9:30 pm	Challenges in infections of the nervous system
7:40 pm - 8:00 pm	Discussion Leader: <b>Diane Griffin</b> (Johns Hopkins School of Public Health) "Overview to session"
8:00 pm - 8:35 pm	Avindra Nath (NINDS) "Challenges in the eradication of HIV from the brain"
8:35 pm - 8:45 pm	Discussion
8:45 pm - 9:20 pm	<b>Jun Wang</b> (BGI Shenzhen) "Explore the unexplored Omics world"
9:20 pm - 9:30 pm	Discussion

MONDAY	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Ways of invading the nervous system
	Discussion Leader: Giampietro Schiavo (Cancer Research UK)
9:00 am - 9:20 am	Giampietro Schiavo (Cancer Research UK) "Signaling endosomes: a main gateway for the spreading of pathogens in the nervous system"
9:20 am - 9:30 am	Discussion
9:30 am - 9:55 am	Beate Sodeik (Institute of Virology, Hannover) "Nuclear targeting of herpes simplex virus in epithelial and neuronal cells"
9:55 am - 10:05 am	Discussion
10:05 am - 10:20 am	Christoph Konradt (University of Pennsylvania) "Breaching the blood-brain barrier during toxoplasmosis"
10:20 am - 10:30 am	Discussion
10:30 am	Group Photo / Coffee Break
11:00 am - 11:25 am	Chiara Zurzolo (Institut Pasteur) "Tunneling nanotubes and spreading of prions and prion-like proteins in neurodegenerative diseases"
11:25 am - 11:35 am	Discussion
11:35 am - 12:00 pm	<b>Paul R. Gorry</b> (Burnet Institute) "Macrophage tropic HIV-1 variants from brain demonstrate alterations in the way their envelope glycoproteins engage CD4 and CCR5"
12:00 pm - 12:10 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:30 pm - 9:30 pm	Target cells of the nervous system and host-pathogen interactions
	Discussion Leader: Marina Bentivoglio (University of Verona)
7:30 pm - 7:50 pm	Marina Bentivoglio (University of Verona) "Glia and infection"
7:50 pm - 7:55 pm	Discussion
7:55 pm - 8:20 pm	Alexander Khromykh (University of Queensland) "The role of noncoding viral RNAs in West Nile virus-host interactions and pathogenesis"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:45 pm	<b>Dawn Weir</b> (Uniformed Services University) "Tropism and host factor dependence of virus entry mediated by Australian bat lyssavirus G glycoproteins"
8:45 pm - 8:55 pm	Discussion

8:55 pm - 9:20 pm	Chris Hunter (University of Pennsylvania) "Imaging immunity to infection"
9:20 pm - 9:30 pm	Discussion
TUESDAY	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Immune responses of the CNS to invasion by pathogens
	Discussion Leader: Carol Reiss (New York University)
9:00 am - 9:20 am	<b>Carol Reiss</b> (New York University) "Tetherin is an IFN-inducible transmembrane protein which restricts VSV infection in neurons"
9:20 am - 9:30 am	Discussion
9:30 am - 9:55 am	Christopher Broder (Uniformed Services University) "Combating the Hendra and Nipah virus encephalitic zoonoses by passive and active immunization"
9:55 am - 10:05 am	Discussion
10:05 am - 10:20 am	<b>Anita Koshy</b> (University of Arizona) "Astrocytic TGFβ signaling fine tunes the brain's immune response to <i>Toxoplasma gondii</i> "
10:20 am - 10:30 am	Discussion
10:30 am	Coffee Break
11:00 am - 11:25 am	Roland Martin (University of Zurich) "Virus-host interactions in JC polyoma virus infection"
11:25 am - 11:35 am	Discussion
11:35 am - 11:50 am	Wei Wang (Wuhan Institute of Virology) "Japanese encephalitis virus activates autophagy as a viral immune evasion strategy"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:25 pm	<b>Olaf Rotzschke</b> (Singapore Immunology Network - A*STAR) "Immunogenetics of multiple sclerosis"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner
7:30 pm - 9:30 pm	Mechanisms of pathogenesis: Cellular features
	Discussion Leader: Mark T. Heise (University of North Carolina)
7:30 pm - 7:50 pm	Mark T. Heise (University of North Carolina) "Alphavirus determinants of neurovirulence"
7:50 pm - 7:55 pm	Discussion

7:55 pm - 8:20 pm	Xavier Nassif (INSERM) "Mechanism of the crossing of a bacterial pathogen, <i>Neisseria meningitidis</i> , through the blood brain barrier"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:45 pm	Alan Jackson (University of Manitoba) "Rabies virus infection is a mitochondrial disorder"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:20 pm	Dorian McGavern (NIH) "Dynamic insights into sterile and microbial immunity in the living brain"
9:20 pm - 9:30 pm	Discussion
WEDNESDAY	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Mechanisms of pathogenesis: Clinical features
	Discussion Leader: Laurent Renia (Singapore Immunology Network - A*STAR)
9:00 am - 9:20 am	Laurent Renia (Singapore Immunology Network - A*STAR) "Mysteries at the blood-brain barrier"
9:20 am - 9:30 am	Discussion
9:30 am - 9:55 am	<b>Tom Solomon</b> (University of Liverpool) "Lessons from the clinical features and pathogenesis of encephalitis"
9:55 am - 10:05 am	Discussion
10:05 am - 10:20 am	Lauren O'Donnell (Duquesne University) "Neuroprotective and cytotoxic roles for proinflammatory mediators in neonatal CNS infections"
10:20 am - 10:30 am	Discussion
10:30 am	Coffee Break
11:00 am - 11:25 am	<b>Robert Wilkinson</b> (Imperial College) "Pathogenesis, presentation and management of neurological HIV-tuberculosis immune reconstitution inflammatory syndrome"
11:25 am - 11:35 am	Discussion
11:35 am - 11:50 am	Victoria Baxter (Johns Hopkins School of Public Health) "Neurological sequelae in a mouse model of alphavirus encephalomyelitis"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:25 pm	Kum-Thong Wong (University of Malaya) "Enterovirus 71 infection and neuropathogenesis"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm	Dinner

7:30 pm - 9:30 pm	Experimental models of infections of the nervous system
	Discussion Leader: John Fazakerley (The Pirbright Institute)
7:30 pm - 7:50 pm	John Fazakerley (The Pirbright Institute) "Semliki Forest virus infection of the mouse, a model of acute virus encephalitis and virus induced demyelination"
7:50 pm - 7:55 pm	Discussion
7:55 pm - 8:20 pm	Krister Kristensson (Karolinska Institutet) "Entry and growth control of African trypanosomes in the brain"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:45 pm	<b>Carla Claser</b> (Singapore Immunology Network - A*STAR) "Role of interferon regulatory factor 3 (IRF3) in immunopathology and protection against experimental cerebral malaria"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:20 pm	Georges Grau (University of Sydney) "Novel cellular cross-talks at the blood-brain barrier: microparticles as effectors of immunopathology"
9:20 pm - 9:30 pm	Discussion
THURSDAY	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Business Meeting
	Nominations for the next Vice Chair; Fill out Conference Evaluation Forms; Discuss future Site & Scheduling preferences; Election of the next Vice Chair
9:00 am - 12:30 pm	Pathogen discovery in infections of the nervous system
	Discussion Leader: Christian Drosten (University of Bonn)
9:00 am - 9:20 am	Christian Drosten (University of Bonn) "Overview to session"
9:20 am - 9:30 am	Discussion
9:30 am - 9:55 am	Paul Newton (Mahosot Hospital) "CNS infections in Laos"
9:55 am - 10:05 am	Discussion
10:05 am - 10:20 am	<b>Eugene Major</b> (National Institute of Neurological Disorders and Stroke) "Presence of JC virus DNA in immune and nervous system cells in PML patients"
10:20 am - 10:30 am	Discussion
10:30 am	Coffee Break
11:00 am - 11:25 am	Antoine Gessain (Institut Pasteur) "Search for viral etiology in tropical CNS diseases: A long way from HTLV-1 associated myelopathy to varied encephalitis"
11.25 am - 11.35 am	Discussion

96

11:35 am - 11:55 am	Marc Eloit (Institut Pasteur) "Pathogen identification by high throughput sequencing in human encephalitis of unknown origin"
11:55 am - 12:05 pm	Discussion
12:05 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Ways to control infections of the nervous system: from field to bench to bed
	Discussion Leader: Ben Berkhout (University of Amsterdam)
4:00 pm - 4:20 pm	Ben Berkhout (University of Amsterdam) "HIV-1 studies and how to control gene expression in the brain"
4:20 pm - 4:30 pm	Discussion
4:30 pm - 4:45 pm	<b>Pierre Talbot</b> (Institut Armand-Frappier) "Novel treatment with neuroprotective and antiviral properties against a neuroinvasive human respiratory virus"
4:45 pm - 4:55 pm	Discussion
4:55 pm - 5:10 pm	Marc Lecuit (Institut Pasteur) "The threat of infectious encephalitis in Southeast Asia - Improved diagnosis for improved management of infectious encephalitis"
5:10 pm - 5:20 pm	Discussion
5:20 pm - 5:45 pm	Ronald J. Ellis (UCSD) "New frontiers in the Neurology of HIV Infection"
5:45 pm - 6:00 pm	Discussion
6:00 pm	Dinner
FRIDAY	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Research reported in the publication was supported by the National Institute of Neurological Disorders and Stroke of the National Institutes of Health under Award number 1R13NS084525. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

### 5.5 List of Public Lectures organized by HKU-PRC

#### 17-Apr-12

"Cell division: cytoskeleton and membrane traffic" by Dr Arnaud Echard, Institut Pasteur, France

#### 18-Apr-12

"Targeting cell cycle machinery in cancer treatment" by Dr Peter Sicinski, Harvard Medical, School, USA

#### 18-Apr-12

"Cancer stem cells: implications in cancer biology and therapy" by Dr Stephanie Ma, HKU-Pathology, Hong Kong

#### 20-Apr-12

"Contribution of centrosomes and chromosomes to tumourigenesis" by Dr Renata Basto, Institut Curie, France

#### 23-Apr-12

"Apoptosis and autophagy in cell death and cancer" by Dr Kevin Ryan, Beatson Institute, UK 23-Apr-12

"EMT in development and diseases" by Dr Jean-Paul Thiery, IMCB-Singapore, Singapore **23-Apr-12** 

"Adhesion mechanisms; implication for EMT" by Dr Jean-Paul Thiery, IMCB-Singapore, Singapore

#### 24-Apr-12

"The Regulation of Cell Motility" by Dr Gareth E. Jones, King's College, UK

#### 24-Apr-12

"Cell biology of tumor cell invasion" by Dr Philippe Chavrier, Institut Curie, France

#### 25-Apr-12

"Hypoxia-Signalling Angiogenesis and Cancer" by Dr Jacques Pouyssegur, IBDC-Nice, France **25-Apr-12** 

"Cancer Metabolism and therapeutic approaches" by Dr Jacques Pouyssegur, IBDC-Nice, France

#### 11-Jul-12

"Ecology and epidemiology of emerging viral disease in the developed and developing world" by Dr Tony Goldberg, University of Wisconsin, USA

#### 20-Jul-12

"Yin & Yang of the Innate Immune Response to Influenza" Prof Malik Peiris, University of Hong Kong, Hong Kong

#### 24-Jul-12

"Viral quasispecies and antiviral designs" by Dr Esteban Domingo, CSIC-Barcelona, Spain **25-Jul-12** 

"My adventures with Dendritic Cells (a tribute to Ralph M Steinman)" by Dr Matthew Albert, Institut Pasteur, France

#### 25-Jul-12

"High Containment Viruses" by Dr Heinrich Feldmann, NIH, USA

#### 26-Jul-12

"Biomarkers Lie: new insights into HCV disease pathogenesis and treatment" by Dr Matthew Albert, Institut Pasteur, France

#### 20-Nov-12

"Lymphocyte antigen receptors: structure and signaling" by Dr Oreste Acuto, University of Oxford, UK

#### 20-Nov-12

"Antigen Processing and Presentation via Classical MHC molecules of Antigen Presenting cells" by Dr Jose Villadangos, University of Melbourne, Australia

#### 26-Nov-12

"Genetic tool for imaging and dissecting innate and adaptive immune responses" by Dr Bernard Malissen, INSERM-CNRS-Marseille, France 28-Nov-12

"Type I interferon signaling and complex effects on immune response" by Dr Sandra Pellegrini, Institut Pasteur, France

#### 28-Nov-12

"Virological and immunological aspects of HIV replication and cell-to-cell spread" by Dr Olivier Schwartz, Institut Pasteur, France

#### 16-Apr-13

"Dynamics of endocytosis" by Dr Tom Kirchhausen, Harvard Medical School, USA 16-Apr-13

"Clathrin-independent endocytosis and retrograde transport" by Dr Ludger Johannes, Institut Curie, France

#### 18-Apr-13

"Imaging Viruses in Entry & Egress" by Dr Urs Greber, University of Zurich, Switzerland 19-Apr-13

"Modern EM methods: application to lipid localization and endocytic trafficking" by Dr Rob Parton, University of Queensland, Australia

#### 22-Apr-13

"Sub-diffraction limited detection of central dogma molecules" by Dr Musa Mhlanga, CSIR, South Africa

#### 22-Apr-13

"Tunneling nanotubes and the spreading of prions and prion-like diseases" by Dr Chiara Zurzolo, Institut Pasteur, France

#### 25-Apr-13

"The ins and outs of virus-cell interactions" by Dr Mark Marsh, University College, London **15-Jul-13** 

"HIV, AIDS pathogenesis and prevention" by Dr Cecilia Cheng-Mayer, ADARC, USA

#### 15-Jul-13

"Genome organization and replication of HIV" by Dr Paul Zhou, Institut Pasteu Shanghai, PR China

#### 16-Jul-13

"The cell biology of HIV: receptor-binding and cell entry" by Dr Fernando Arenzana Seisdedos, Institut Pasteur, France

#### 16-Jul-13

"The cell biology of HIV: endocytosis, assembly and budding" by Dr Mark Marsh, University College London, UK

#### 16-Jul-13

"Imaging viral replication in live cells using fluorescence microscopy" by Dr James Munro, Yale School Med, USA

#### 17-Jul-13

"HIV-1 cell-to-cell spread and the virological synapse" by Dr Quentin Sattentau, Oxford University, UK

#### 17-Jul-13

"Cellular restriction factors of HIV-1" by Dr Jean-Pierre Vartanian, Institut Pasteur, France 17-Jul-13

"Molecular mechanisms of HIV-1 post-integration latency" by Dr Carine Van Lint, ULB, Belgium

#### 18-Jul-13

"HIV treatment & future therapeutic strategies" by Dr Santiago Moreno, Hospital Ramon y Cajal, Spain

#### 18-Jul-13

"Toward an HIV Cure - tackling HIV latency and other strategies" by Dr Sharon Lewin, Monash University, Australia

#### 18-Jul-13

"HIV-1 and antibody responses in human" by Dr Linqi Zhang, Tsinghua University, P R China

19-Jul-13

"Evolution of HIV, a Highly Variable Virus, and Vaccine Design" by Dr Bette Korber, Los Alamos National Laboratory, USA

19-Jul-13

"Lentiviral vectors: principles and biomedical applications" by Dr Pierre Charneau, Institut Pasteur, France

19-Jul-13

"The emergence of the H7N9 virus in China" b Dr Huachen Zhu, University of Hong Kong, Hong Kong

#### 22-Jul-13

"Vaccination strategies" by Dr Zhiwei Chen, Univesity of Hong Kong, Hong Kong 22-Jul-13

"Host Control of HIV infection" by Prof Françoise Barré-Sinoussi, Institut Pasteur, France **22-Jul-13** 

"Acute phase of HIV/SIV infections and AIDS pathogenesis" by Dr Michaella Muller-Trutwin, Institut Pasteur, France

#### 22-Jul-13

"Mother to child transmission of HIV: From risk factors to prevention" by Dr Nicole Ngo-Giang-Huong, IRD Thaïland & Harvard

#### 23-Jul-13

"Special lecture: The discovery of HIV" by Dr Francoise Barre-Sinoussi, Institut Pasteur, France 23-Jul-13

"HIV pathogenesis & innate Immunity" by Dr Luis Montaner, Wistar Institute, USA 23-Jul-13

#### 23-Jul-1

"Innate immunity as a focus of HIV Immunotherapy?" by Dr Luis Montaner, Wistar Institute, USA

#### 23-Jul-13

"AIDS vaccine clinical trials: what have we learnt and where are we headed" by Prof Robin Shattock, Imperial College, UK

#### 24-Jul-13

"Challenges of HIV / AIDS preventioin, care and Treatment in the 21st Century" by Prof Francoise Barre-Sinoussi, Institut Pasteur, France

#### 26-Jul-13

"10 Years of the HKU-Pasteur Virology Course: Anniversary Scientific Symposium"

#### 18-Nov-13

"An introduction to innate immunity and the cytokine network" by Dr Jean-Marc Cavaillon, Institut Pasteur, France

#### 18-Nov-13

"NK cells and innate lymphoid cells" by Dr James Di Santo, Institut Pasteur, France

#### 19-Nov-13

"Pathogen associated molecular patterns and introduction to their sensors" by Dr Jean-Marc Cavaillon, Institut Pasteur, France

#### 19-Nov-13

"The Interferon System" by Dr Takashi Fujita, Kyoto University, Japan

#### 19-Nov-13

"Sensing viral RNA and activation of antiviral response" by Dr Takashi Fujita, Kyoto University, Japan

#### 20-Nov-13

"Macrophages and innate immunity" by Dr Subhra K Biswas, SIgN, Singapore

#### 20-Nov-13

"New therapies for antibiotic resistant infections" by Dr Robert Hancock, Centre for Microbial Diseases and Immunity Research, Canada

#### 21-Nov-13

"Mast cells: Critical Regulators of Immunity to Pathogens and Vaccines" by Dr Soman Abraham, Duke, Singapore 21-Nov-13

"Dendritic Cells (DCs) Immunobiology" by Dr Florent Ginhoux, SIgN, Singapore **22-Nov-13** 

"Cationic host defence (antimicrobial) peptides" by Dr Robert Hancock, Centre for Microbial Diseases and Immunity Research, Canada

#### 26-Nov-13

"Complement and Inflammation" by Dr Paul B. Morgan, Cardiff University, UK

#### 26-Nov-13

"Control of inflammation by the nervous system" by Dr Luis Ulloa, Rutgers University, USA **27-Nov-13** 

"Neutrophil and NETs" by Dr Arturo Zychlinsky, Max Planck Institute for Infection Biology, Germany

#### 27-Nov-13

"IL-17, Th17 cells and inflammation" by Dr Pierre Miossec, University Lyon 1, France