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2nd International Conference on

Influenza

September 12-13, 2016 Berlin, Germany

Keynote Forum

(Day 1)

Kevin Downard, J Infect Dis Ther 2016, 4:6(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.013

Kevin Downard

University of New South Wales, Australia

Improved molecular surveillance and new therapeutic responses to the influenza virus using mass spectrometry

The influenza virus is one of the deadliest pathogens known to man, responsible for the death of the equivalent of 1 in 1000 humans who have ever lived. Seasonal influenza accounts for about 3 to 5 million cases of severe illness requiring hospitalization and 250,000 to 500,000 deaths worldwide each year. A worldwide surveillance network, overseen by the WHO, assesses circulating strains and makes recommendations for the annual vaccine formulation ahead of the flu season in both the northern and southern hemisphere. Yet unforeseen evolutionary events, and growing resistance to current antiviral inhibitors, can lead the population unprotected. Furthermore, limitations in current screening technologies can delay and negatively impact on the implementation of effective infection controls. New molecular based surveillance technologies employing advanced mass spectrometry and bioinformatic approaches offer advantages for the characterization of circulating strains, the study of viral evolution and the identification and development of new antiviral inhibitors, including those based on natural products. This presentation will review these approaches that have attracted interest from global surveillance laboratories and have broader application to the study of other biopathogens which threaten human health.

Biography

Kevin Downard has obtained his Postdoctoral studies and held a subsequent academic position at the Massachusetts Institute of Technology after completing his PhD degree from the University of Adelaide, Australia. For the past 18 years he has held Professorial academic positions in the USA and Australia. He has over 100 publications including two books and is internationally recognized in his field.

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Notes:

Ian A Wilson, J Infect Dis Ther 2016, 4:6(Suppl)
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Ian A Wilson

The Scripps Research Institute, USA

Broad neutralization of influenza viruses and progress towards a universal vaccine and therapy

The major surface antigen, the hemagglutinin (HA) of influenza virus is the main target of neutralizing antibodies. However, until recently, most antibodies were thought to be strain-specific and protect only against highly related strains within the same subtype. However, in the past few years, many human antibodies have been isolated that are much broader and neutralize across subtypes and groups of influenza A and B viruses through binding to functionally conserved sites. We have determined structures of many broadly neutralizing antibodies with HAs and determined that their epitopes map to highly conserved sites on the HA fusion domains (stem) and receptor binding sites (head). The identification and characterization of the epitopes and mode of binding of these antibodies have elucidated recognition motifs and conserved sites of vulnerability that provide exciting new opportunities for structure-assisted vaccine design as well as for design of therapeutics that afford greater protection against influenza viruses.

Biography

Ian A Wilson has received his BSc in Biochemistry from Edinburgh University, DPhil in Molecular Biophysics from Oxford University and did Postdoctoral research at Harvard University. He has been a Professor at The Scripps Research Institute since 1982 and is Hansen Professor of Structural Biology and Chair of the Department Integrative Structural and Computational Biology. His laboratory focuses on recognition of microbial pathogens by the immune system and structure-based design of vaccines and therapeutics. He is a Fellow of the Royal Society, Fellow of the Royal Society of Edinburgh, Member of the American Academy of Arts and Sciences and has a DSc degree from Oxford University and published over 665 papers.

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Notes:

Palayakotai Raghavan, J Infect Dis Ther 2016, 4:6(Suppl)
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Palayakotai Raghavan

Nanorx Inc., USA

Controlling viral infection with Metadichol

Metadichol (US patent 8,722,093) is a nano-emulsion of long-chain alcohols found in many foods. It is commonly called Policosanol and is present in foods such as rice, sugar cane, wheat, peanuts. Metadichol acts on Nuclear Vitamin D receptors (VDR) (US patent 9,006,292) that are present in cells throughout the body to stimulate the immune system and inhibit a variety of disease processes, resulting from viral infections. We tested for antiviral activity of Metadichol® in Vero and MDCK cells infected with Influenza A, H1N1, Human Respiratory Syncytial virus, Dengue, Chikungunya and Ebola, Marburg. In addition, we tested the efficacy of Metadichol® in preventing cell death caused by Adenovirus, Tacaribe Mammarena virus, Rift Valley Fever virus, *SARS coronavirus*, Japanese Encephalitis virus, *West Nile virus*, and Yellow Fever virus. In the in vitro assays, Metadichol showed no cytotoxicity and strongly inhibited cell death caused by each of the viruses tested. Metadichol is a safe and effective inhibitor of enveloped viruses in humans. Since it is known to bind to the vitamin D receptor (VDR) (US patent 9,006,292), its mechanism of action likely involves the competitive displacement of virus particles from VDR's on host cell membranes. Because it consists of natural components of common foods and has no known negative side effects, Metadichol has the potential to serve as a novel, broad-spectrum antiviral treatment for Dengue, Ebola, Zika, H1N1, SARS, Chikungunya and other enveloped viruses.

Biography

Palayakotai Raghavan is the CEO and Founder of Nanorx Inc., New York, USA. He has completed his PhD in Organic Chemistry from Oregon State University in 1979 and MS in Chemistry in 1972 from IIT Mumbai, India. He has worked on drug discovery for over 25 years at Columbia University, Max-Planck Institute, Germany, Ciba-Geigy (now Novartis) and Boehringer Ingelheim. He has over 12 patents and another 15 pending patent applications.

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Workshop

(Day 1)

Reza Nassiri, J Infect Dis Ther 2016, 4:6(Suppl)
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Reza Nassiri

Michigan State University, USA

One Health and pandemic flu

About 75 recently emerging infectious diseases that affect humans are caused by various zoonotic pathogens including influenza viruses such as H1N1, H5N1 and H7N9. Pandemic influenza outbreaks significantly highlights about the role of One Health (OH) approach where expertise in human, animal and environmental health combines together with multidisciplinary strategies solve interrelated problems to adapt effective collaboration, communication, management and evidenced-based preventive measures. Avian and Swine flu are examples of global health concern that justify exploring the role of OH enhancing optimal preventive outcome and to promptly disseminate epidemiologic data sharing among various stakeholders including academic institutions that are traditionally well equipped to collaborate with the internal and external stakeholders, especially in areas such as human, veterinary and laboratory surveillance practices. The human-animal-ecosystem interface plays a critical role in spread of emerging and re-emerging infectious disease including influenza viruses. As the world population is raising especially urban populations, we are facing an increase in poultry and swine populations globally by necessity and therefore, increased in the frequency of zoonotic influenza viruses' infections among human populations are more likely. One Health approach which is formulated to mitigate and curb public health best practice for the triple threats can result in direct benefits in human health. Furthermore, adaptation and incorporation of such approach will significantly impact preventive measures as well as identification of risk factor and risk assessment. Major health organizations, such as the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), the US Institute of Medicine (IOM) and the European Centers for Disease Control have unanimously concluded that that more action and information on influenza transmission and prevention is internationally critical to pandemic planning and management. Human health is directly and inextricably linked to the health of animals and ecosystem and influenza viruses are no exception to this pivotal link. One Health collaborations and implementations can help to effectively minimize the burden of disease including economic burden. Therefore, improving international public health infrastructure for zoonotic disease control and prevention through OH approach provides advantages and benefits in controlling zoonotic diseases caused by influenza viruses.

Biography

Reza Nassiri is an Associate Dean of Global Health, Director of Institute of International Health, Professor of Clinical Pharmacology, Professor of Family and Community Medicine and Lecturer in Global Health, Infectious Diseases and Tropical Medicine at Michigan State University College of Osteopathic Medicine. His research interests focuses on Clinical Pharmacology of HIV/AIDS & TB, prevention and control of infectious diseases, neglected tropical diseases, community health, global health and socio-ethical determinants of health. He works on international public health issues and has expertise in global health education, research, policy and governance. He has made contributions in various fields of medical sciences including clinical investigation and health education. On the basis of his extensive experience and expertise in HIV/AIDS and TB, he developed Clinical Research Programs in Brazil, South Africa, Haiti, Dominican Republic and Mexico.

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Keynote Forum

(Day 2)

Ilya B Tsyrlov, J Infect Dis Ther 2016, 4:6(Suppl)
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Ilya B Tsyrlov

XENOTOX Inc., USA

A decade later, another look at what role in global spread of H5N1 played up-regulation by host cell dioxin of gene encoding type A influenza virus NS1 binding protein

Cognate DRE sites within DNA enhancer epitomizes wide range of mammalian genes expression mediated via the Ah receptor pathway. Earlier we postulated the same for DRE-containing viral genes transactivation caused by dioxin in human cells infected with HIV-1, HBV and HCMV. Here, such mechanistic concept applied to type A influenza virus NS1 binding protein in human and avian (*G. gallus gallus*) host cells. The NS1 is known to prevent transcriptional induction of antiviral interferons to inhibit splicing and dsRNA-mediated signal transduction in target cells. Presenting data range from the cellular to population levels. It was shown that gene encoding the NS1 possessed multiple DREs (core nucleotide sequence 3' A-CGCAC 5'), two of which were identified within the promoter area, namely at positions -7942 and -687. SITECON, an established computational tool for detecting transcriptional factor binding site recognition, proved the above sites as potentially active. SITECON-selected adjacent variable sequences were used to detect properties of the DRE site and conformational similarity score threshold of 0.95 was utilized to rank identified DRE. On the cellular level, Western blot analysis of lysates of infected or DNA-transfected confluent HeLa cells pretreated with 10 ppt dioxin for 36 hours revealed several-fold increase of NS1-specific polypeptide. As the NS1 promoter contains two potentially active DRE, an extrapolation from the data on HIV-1 (1 DRE) and HCMV (10 DRE) also suggests that concentration of dioxin up-regulating NS1 gene should be moderately above current dioxin levels in general population (~4 ppt).Presumably, elevated dioxin level in the host cells might lead to enhanced ability of NS1 to diminish antiviral interferons. That can bring new insights to the fact that resistance of highly virulent H5N1 to antiviral effects of IFN-β and TNF-alpha directly associated with the NS1. On the population level, the data on wild birds and domestic poultry (*G. gallus gallus*) dying from H5N1 in Guangdong province of China and Long An, Tieng Giang and Ben Tre provinces of Vietnam, all relate to the fact that water and soil in these regions are highly contaminated with dioxin-like compounds. Eventually, human cohorts from the above regions of China and Vietnam are exposed to elevated concentrations of dioxin, which might serve as a promotional factor for seasonal influenza outbreaks. Moreover, the sub-nanomolar body burden dioxin might strongly facilitate spreading of the H5N1 in case avian flu pandemic were to occur.

Biography

Ilya B Tsyrlov has completed his PhD from Novosibirsk University and Postdoctoral studies from Leningrad Academy of Medical Sciences. He is the President and Chief Scientific Officer of XENOTOX, Inc., an American premier biomedical innovation organization. He has published 4 monographs and about 250 papers in reputed journals and has been serving as an Editorial Board Member of several journals.

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Notes:

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Reza Nassiri

Michigan State University, USA

Management and prevention of pandemic flu: One Health approach

About 75 recently emerging infectious diseases that affect humans are caused by various zoonotic pathogens including influenza viruses such as H1N1, H5N1 and H7N9. Pandemic influenza outbreaks significantly highlights about the role of One Health (OH) approach where expertise in human, animal and environmental health combines together with multidisciplinary strategies solve interrelated problems to adapt effective collaboration, communication, management and evidenced-based preventive measures. Avian and Swine flu are examples of global health concern that justify exploring the role of OH enhancing optimal preventive outcome and to promptly disseminate epidemiologic data sharing among various stakeholders including academic institutions that are traditionally well equipped to collaborate with the internal and external stakeholders, especially in areas such as human, veterinary and laboratory surveillance practices. The human-animal-ecosystem interface plays a critical role in spread of emerging and re-emerging infectious disease including influenza viruses. As the world population is raising especially urban populations, we are facing an increase in poultry and swine populations globally by necessity and therefore, increased in the frequency of zoonotic influenza viruses' infections among human populations are more likely. One Health approach which is formulated to mitigate and curb public health best practice for the triple threats can result in direct benefits in human health. Furthermore, adaptation and incorporation of such approach will significantly impact preventive measures as well as identification of risk factor and risk assessment. Major health organizations, such as the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), the US Institute of Medicine (IOM) and the European Centers for Disease Control have unanimously concluded that that more action and information on influenza transmission and prevention is internationally critical to pandemic planning and management. Human health is directly and inextricably linked to the health of animals and ecosystem and influenza viruses are no exception to this pivotal link. One Health collaborations and implementations can help to effectively minimize the burden of disease including economic burden. Therefore, improving international public health infrastructure for zoonotic disease control and prevention through OH approach provides advantages and benefits in controlling zoonotic diseases caused by influenza viruses.

Biography

Reza Nassiri is an Associate Dean of Global Health, Director of Institute of International Health, Professor of Clinical Pharmacology, Professor of Family and Community Medicine and Lecturer in Global Health, Infectious Diseases and Tropical Medicine at Michigan State University College of Osteopathic Medicine. His research interests focuses on Clinical Pharmacology of HIV/AIDS & TB, prevention and control of infectious diseases, neglected tropical diseases, community health, global health and socio-ethical determinants of health. He works on international public health issues and has expertise in global health education, research, policy and governance. He has made contributions in various fields of medical sciences including clinical investigation and health education. On the basis of his extensive experience and expertise in HIV/AIDS and TB, he developed Clinical Research Programs in Brazil, South Africa, Haiti, Dominican Republic and Mexico.

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