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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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Notes:

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Scientific Tracks & Abstracts

(Day 1)

Tracks: 1, 3, 5, 7 & 9

Track 1: Influenza Vaccines: Designs and Developments
Track 3: Influenza: Causes, Symptoms and Treatment
Track 5: Influenza Vaccines : Safety and Effectiveness
Track 7: Advances in Viral Detection and Identification Technologies
Track 9: Host Genetics of Infection and Immunology

Session Chair
Palayakotai Raghavan
Nanorx Inc, USA

Session Co-Chair
Jerzy Radecki
Polish Academy of Science, Poland

Session Introduction

Title: **CiFlu®: Development of a novel subunit influenza vaccine candidate based on the ciliate performance expression system**
Marcus Hartmann, Cilian AG, Germany

Title: **Global recognition of influenza-like severe respiratory illness**
Sherwin Morgan, University of Chicago Medicine, USA

Title: **Electrochemical immunosensors: Universal tools for rapid detection of viruses**
Hanna Radecka, Polish Academy of Science, Poland

Title: **Electrochemical genosensors based on redox active monolayers: Characterization and applications**
Jerzy Radecki, Polish Academy of Science, Poland

Title: **DIVA tests for avian influenza, which antigen must be chosen**
Farhid Hemmatzadeh, The University of Adelaide, Australia

Title: **Multivalent influenza hemagglutinin promotes the immundominance of non-neutralizing antibody responses through reptatively constrained orientation**
Daniel Lingwood, The Ragon Institute of MGH, MIT and Harvard University, USA

Title: **Challenges in development of chitosan-based adjuvants for influenza vaccines**
Yuri M Vasiliev, Mechnikov Research Institute of Vaccines & Sera, Russia

Marcus Hartmann, J Infect Dis Ther 2016, 4:6(Suppl)
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CiFlu®: Development of a novel subunit influenza vaccine candidate based on the ciliate performance expression system

Marcus Hartmann
Cilian AG, Germany

The critical annual manufacturing process for seasonal influenza vaccine based on embryonated chicken eggs, involves numerous steps and takes on average 6 to 8 months to complete. This often means that vaccine is only available late into the flu season. The timely availability of an effective influenza vaccine, at or before the flu season starts, is even more acute for vulnerable highest risk groups such as persons 65 years of age and older. The lack of timely availability of seasonal/pandemic vaccine has raised significant questions about the utility of the current, antiquated, cumbersome, expensive and unsafe manufacturing platform involving chicken eggs. Safety concerns about cell culture based virus proliferation processes called also alternative flu vaccines production processes into question. Now new recombinant antigen manufacturing platforms were postulated to reduce production time and costs. Cilian's flu vaccine CiFlu® is a cost-effective subunit vaccine based on the heterologous expression of recombinant Influenza hemagglutinin (rHA) in the ciliate Tetrahymena. Utilizing its CIPEX-System as such a manufacturing platform, Cilian has successfully demonstrated repeated expression of rHA at high yield: Four subunit vaccines has been expressed and shown to be functionally active. Mice were first immunized with the monovalent rHA. HA antibodies were harvested and its ability to inhibit the respective influenza strain was tested. The results demonstrated comparable or better efficacy (in vivo inhibitory immunogenicity) to monovalent vaccine from chicken eggs. Cilian meanwhile received a positive scientific advice from the German Paul Ehrlich Institute for CiFlu® and is developing a comprehensive clinical plan.

Biography

Marcus Hartmann has spent his scientific career investigating protozoan organisms, particularly Ciliates. He has worked for the Central Research Department of Aventis, Frankfurt, Germany and was a Post doctorate in an academic working group at the University of Munster. His Postdoctoral study dealt with research in the field of commercial applications of protozoan organisms. Based on his extensive scientific experience in the field Ciliate biotechnology, he founded Cilian and since then he has headed the Company's R&D team. He is the author of numerous scientific publications, recitations and patents in the area of Ciliate biotechnology. One of the main breakthrough of his team was the first-ever production of therapeutically usable proteins in Ciliates.

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Global recognition of influenza-like severe respiratory illness

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Clinical recognition of severe respiratory illness (SRI) is difficult. Influenza-like respiratory illness often masquerades as asthma, especially in patients with and without pre-morbid pulmonary disease. Because the initial differential diagnosis includes asthma, this can lead to treatment confusion and an underestimation for the primary cause for SRI. Viral bronchosplasm is difficult to ameliorate air-flow obstruction (AFO) with bronchodilator therapy that is refractory to beta-agonist and steroid therapy. This may lead to patients requiring supportive respiratory care. Viral SRI is now documented to come from multiple viral sources and appear in different packages. These viruses are high pathogenic and attack the bronchial wall structure causing hypercarbic respiratory failure. These viral infections are now documented as being the etiology of global epidemics and pandemics. In August 2014, there was an increase in SRI that was associated with *Enterovirus* EV-68 which was reported in 41 states across the United States. The Center for Disease and Control (CDC) received over 2600 samples, 36% positive for EV-68. Viral illnesses have a huge impact on global resources and finances. Clinical diagnoses via respiratory viral panel and chest radiography may be relevant. Newer treatment plans for SRI include the use of high flow nasal cannula (HFNC) and heliox. Failure to recognize SRI may lead to hypercarbic respiratory failure where the support therapy is ventilator, pruning, nitric oxide, ECMO. This can lead to complications such as; ARDS, kidney and other organ failure and severe acute respiratory syndrome. More study is needed to understand the relationship between SRI-AFO.

Biography

Sherwin Morgan has completed his respiratory care training from Malcolm X College of Respiratory Care in Chicago, IL. He is an advanced respiratory care practitioner with the National Board for Respiratory Care in the United States. He is in Clinical Practice and Development /Educator/Research Coordinator for the Department of Respiratory Care Services, Section of Pulmonary and Critical Care Medicine at the University of Chicago Medicine. He has published more than 25 peer review papers in multiple medical journals. He has designed, engineered and collaborated with a number of research studies with the pulmonary medicine department.

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Electrochemical immunosensors: Universal tools for rapid detection of viruses

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Here, we report examples of successful developing of several type of immunosensors destined for the detection of Highly-Pathogenic Avian Influenza type H5N1 virus (HPAI) spreading among wild and domestic birds. The immunosensor were developed by the successive modification of gold as well as glassy carbon electrodes. The whole antibody or their fragments have been applied as the sensing elements. The complex between virions and specific antibody adsorbing on a surface of an electrode forms an insulating layer. This phenomenon, which is a base of ion-channel mimetic type of immunosensors, can be monitored by the electrochemical impedance spectroscopy (EIS) in the presence of $[Fe(CN)6]^{3-/4-}$ as a redox marker. The another type of immunosensors are based on redox active layers incorporated di-pyrromethene-Cu(II). The changes of electrochemical parameters of redox centers upon target analyte binging are the base of analytical signal generation. The both type of immunosensors displayed better sensitivity towards viruses as well as antibodies in comparison to ELISA; they are also very selective. The matrix from hen sera has no influence on the immunosensors performance. In addition, very small analyzed sample volumes (10 µl) are needed. After miniaturization, they keep excellent analytical parameters. Therefore, immunosensors presented could be recommended for the direct electrochemical detection of viruses as well as antibodies in the natural physiological samples.

Biography

Hanna Radecka was graduated from the Department of Chemistry of Nicolaus Copernicus University in Torun in 1978. She was a Visiting Scientist at the Hokkaido University in Sapporo and at the University of Tokyo. Since 1998, she is working at Department of Biosensors of the Polish Academy of Sciences in Olsztyn. In 2011 she has received the title of Professor of Analytical Chemistry and was nominated as the Head of Laboratory of Bioelectroanalysis. Currently she is working on the development of the new biosensors for determination of avian influenza viruses, possible biomarkers of Alzheimer's and other neurodegenerative diseases present in human plasma.

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Notes:

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Electrochemical genosensors based on redox active monolayers: Characterization and applications

Jerzy Radecki
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Here we report on electrochemical genosensors devoted for detection of influenza virus H5N1 gene sequence. Using ssDNA decorated with redox active units such as Co(II)-porphyrin or 3-iron bis (dicarbiollide), the detection limit in the fM range has been achieved. The strategies based on dipyrromenthene Cu(II) redox active monolayer or phenanthroline-Epoxy-Fe(III) complexes have been also applied for the development genosensors destined for detection of DNA as well for RNA derived from Avian Influenza viruses. They have been working based on the new "ion barrier switch-off" mechanism of analytical signal generation. To face of the need of systems for simultaneous determination of few markers of one disease coming from medical diagnosis, we have developed a novel dual DNA electrochemical sensor with "signal-off" and "signal-on" architecture for simultaneous detection of two different sequences of DNA derived from Avian Influenza Virus type H5N1 by means of one electrode. Two sequences of ssDNA characteristic for hemagglutinin decorated with ferrocene and characteristic for neuraminidase decorated with methylene blue were immobilized covalently together on the surface of one gold electrode. Taking into account the excellent analytical parameters of genosensors presented such as good sensitivity, selectivity and very low sample consumption, they could be recommended for future wide application for medical diagnostic as well as environmental control.

Biography

Jerzy Radecki is the Professor of Analytical Chemistry and currently working as Head of Department of Biosensors of IARFR PAS in Olsztyn. His research interest concerns the developing of new sensors and biosensors based on the intermolecular recognition processes occurring at the border of the aqueous and organic phase. Particularly, he is interested in functionalization of surface of solid electrodes with "host" molecules, which are responsible for "guest" molecules (analytes) recognitions. He is working on not only analytical aspects of developed sensors but on the elaboration of the mechanism of analytical signal generation as well.

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Notes:

Farhid Hemmatzadeh et al., J Infect Dis Ther 2016, 4:6(Suppl)
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DIVA tests for avian influenza, which antigen must be chosen?

Farhid Hemmatzadeh, Noor Haliza Hasan, Anne Peaston and **Jagoda Ignjatovic**
The University of Adelaide, Australia

In last 15 years, numbers of ELISA test were developed to differentiate influenza infected from vaccinated animals (DIVA). In most of the test the either viral associated infection antigens or heterologous neuraminidase antigens were used to develop DIVA tests. One of the first attempts was non-structural 1 protein (NS1). The NS1-based ELISA was shown reliable results as a DIVA test in young chickens but the accuracy of NS1-based DIVA test decreases by the time and numbers of vaccination produces non-specific reactions. Nucleoprotein (NP) and conserved HA274-288 epitope were the others candidates for DIVA test but these two antigens did not show any values as DIVA ELISAs. By now the best antigen to develop DIVA-ELISA test is ectodomain of matrix 2 (M2e) protein. Relatively invariable nature of M2e protein across AIV strains and high level of expression of M2e protein on the surface of infected cells despite being low in copy number in mature virions are the main properties that make M2e a suitable candidate for DIVA tests. Our studies on structure of M2e showed the tetramer form of M2e shows higher sensitivity and specificity to discriminate M2e antibodies in sera of infected birds from vaccinated or non-vaccinated birds.

Biography

Farhid Hemmatzadeh has joined The University of Adelaide as a Senior Lecturer of Virology at the School of Animal & Veterinary Sciences in 2009. Previously, he was employed by Melbourne University since 2005 and Tehran University as an Associate Professor since 1997. He has over 20 years experience in research and teaching at the field of animal viral diseases including herpesviruses, pestiviruses, retroviruses, parvoviruses and influenza viruses. He has been involved in research, development and assessment of diagnostic test for animal viral diseases specially DIVA tests for poultry and large animals.

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Multivalent influenza hemagglutinin promotes the immundominance of non-neutralizing antibody responses through repetitively constrained orientation

Daniel Lingwood
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Much of the influenza virion surface is occupied by a dense array of trimeric hemagglutinin (HA) that functions to engage sialyl-oligosaccharide on a target cell. This dense packing of spike protein is also thought to restrict antibody access to the conserved HA stem epitope, a weak immunogenic target for broadly neutralizing antibody (bnAb) responses against this virus. However, recent cryo-EM studies, have suggested that stem-directed bnAbs do not have restricted access to this site. To functionally define the source of weakened immunogenicity to the stem epitope, we compared stem specific antibody responses to three structurally-defined presentations of HA: Soluble trimer and ferritin nanoparticle 8mers displaying either the full-length trimer or stem/stalk region alone. Surprisingly, we found that while the nanoparticles were more immunogenic, only the soluble trimeric format elicited detectable stem-epitope directed antibodies upon initial exposure to antigen. We propose that antigen multivalency, a cornerstone of both vaccine design and viral architecture, imposes not only repetitive array to increase immunogenicity but also restricted antigen orientation, which can limit exploration of antigenic space, insuring that immunodominant non-neutralizing responses are non-linearly amplified during this process. Repetitive exposure to the soluble HA trimer eliminates reactivity to stem due to amplification of immunodominant non-stem responses; our work shows that multivalent HA display can achieves the same result within a single encounter. These data highlight a previously unrecognized mode of immune distraction and delineate the relationship between antigen valency and the target-specificity of the humoral response.

Biography

Daniel Lingwood is an Assistant Professor at The Ragon Institute of MGH, MIT and Harvard and is a Faculty Member in the Virology Program at Harvard Medical School. He has received his PhD from the Max Planck Institute for Molecular Biology and Genetics and conducted Postdoctoral work at the Vaccine Research Center at NIH. He has garnered international recognition for his discovery that humans possess genetically-encoded antibody sequences that when properly oriented as germline B cell receptors, naturally engage conserved sites of viral vulnerability and serve as substrates upon which broadly neutralizing antibodies can be developed.

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Notes:

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Challenges in development of chitosan-based adjuvants for influenza vaccines

Yuri M Vasiliev
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Chitosan-based formulations combine effectiveness, safety and economic feasibility and have been studied as vaccine adjuvants and gene delivery systems. However, chitosan is an umbrella term for a very diverse group of glucosamine based substances and their derivatives as well as adjuvants (e.g. solutions, particles). Lack of consensus on nomenclature and standardization approaches renders juxtaposition and reproduction of data across various studies nearly impossible and underlying mechanisms of action for chitosan-based adjuvants remain largely unknown. Panels of chitosan substances and chitosan-based adjuvants (currently exceeding 50) have been created and characterized extensively using distinct methods (HPLC, NMR, etc.). Datasets generated from large-scale preclinical studies in various animal models demonstrate that principal chitosan characteristics (molecular weight and deacetylation degree) determine adjuvant properties through a very complex interaction. No single characteristic is responsible for high or low immunogenicity, effectiveness (lethal challenge model) and safety. Levels of serum and lung antibodies, IgG subclasses and certain cytokines and thus, Th polarization also varied for different chitosans. Certain chitosans and derivatives (e.g., succinylated) were not immunogenic at all. Impurities (e.g., endotoxins, proteins) were challenging to evaluate due to interference from chitosan, however, did not have a critical effect on adjuvant properties. A universal chitosan-based adjuvant has been developed and successfully evaluated with various vaccines against influenza (subunit, cold-adapted, etc.) and other human and animal infections as well as in comparison with other adjuvants (aluminium-based, oil-in-water emulsions, etc.). Chitosan-based adjuvants tailored for certain types of influenza vaccines (100-fold increase of immunogenicity) and complex formulations are also being studied.

Biography

Yuri M Vasiliev has completed his PhD from the Moscow Medical University in Prepandemic Avian Influenza Vaccines and did Postdoctoral Research at the Mechnikov Research Institute of Vaccines and Sera, Russia. He was the Head of Laboratory of Experimental Immunology and currently working as the Head of R&D for adjuvants at the Mechnikov Institute, Russia. He has more than 50 publications to his credit.

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Scientific Tracks & Abstracts

(Day 2)

Day 2 September 13, 2016

Track 2: Pathogenicity of Influenza Virus
Track 6:Antiviral Drug Development and Treatment Strategies, Including Vaccination
Track 10: Influenza Lung Immunology: Major Aspects
Track 11: Animal Flu-Ecology

Session Chair
Reza Nassiri
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Session Co-Chair
Hanna Radecka
Polish Academy of Science, Poland

Session Introduction

Title: **Influenza in Russia in 2014-2016**
Tatyana Ilyicheva, Vector State Research Center of Virology and Biotechnology, Russia

Title: **Kallikrein-related peptidase 5 contributes to H3N2 influenza virus infection in human lungs**
Melia Magnen, Institut National de la Santé et de la Recherche Médicale, France

Title: **The clinical characteristics and outcome of H1N1 pneumonia patients with and without acute renal injury**
Essam Saad Abdel Rahim Badawy, Minia University, Egypt

Title: **Types of human influenza virus among patient at Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), Bauchi, Nigeria**
Jacob A Dunga, ATBU Teaching Hospital, Nigeria

Title: **Study on the circulation of influenza A virus in swine populations in Kazakhstan**
Nailya Klivleyeva, Institute of Microbiology and Virology, Kazakhstan

Title: **Herbal immune boosters: Valuable preventive means for international travelers flu**
Mohammad Ali Daneshmehr, Iran University of Mediccal Sciences, Iran

Tatyana Ilyicheva et al., J Infect Dis Ther 2016, 4:6(Suppl)
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Influenza in Russia in 2014-2016

Tatyana Ilyicheva, A Durymanov, V Marchenko, I Susloparov, N Kolosova, N Goncharova, S Svyatchenko, O Petrova, O Gureeva, V Mikheev and **A Ryzhikov**
Vector State Research Center of Virology and Biotechnology, Russia

In total 3888 blood serum samples were collected in October-November, 2014 in Russia, including 1939 samples collected from poultry farm workers. The presence of antibodies to influenza viruses in the sera was tested in hemagglutination inhibition test. None of the samples produced positive results with influenza A(H5N1), A(H5N8) and A(H7N9) viruses. 41% of the samples are positive to A/California/07/09 (H1N1pdm09), 36% of the samples are positive to A/Texas/50/2012 (H3N2), 40% of the samples are positive to B/Brisbane/60/2008 (Victoria lineage) and 47% of the samples are positive to B/Massachusetts/2/2012 (Yamagata lineage). Only 40% (±7%) of 1383 sera positive to vaccine strain A/Texas/50/2012 (H3N2) had significant titers with A/Switzerland/9715293/2013-like virus. In 2014-2015, fifteen influenza A(H3N2), two A(H1N1pdm09) and one B (Yam) virus strains were isolated from autopsy and clinical material from individuals with severe course of influenza-like disease. In 2015-2016, we isolated 105 influenza A(H1N1pdm09), one influenza A(H3N2) viruses from autopsy material and 226 influenza A(H1N1pdm09) and four influenza A(H3N2) viruses from nasopharyngeal swabs. Virus A/Khabarovsk/6/2015 (H3N2) showed reduced sensitivity to oseltamivir (18-fold below normal). All other viruses exhibited normal inhibition by oseltamivir and zanamivir. A(H1N1pdm09) viruses were antigenically characterized as A/California/07/2009-like. Their HA gene sequences fell into genetic group 6B, the predominant genetic group. H3N2 isolated viruses were characterized as A/Hong Kong/4801/2014-like and A/Switzerland/9715293/2013-like, their HA gene sequences belong to genetic groups 3C.2a and 3C.3a, respectively. Influenza B virus was antigenically similar to B/Phuket/3073/2013, its HA sequence belongs to genetic group Y3. In 2014, we isolated influenza A(H5N8) virus from a Eurasian wigeon (*Anas penelope*) in Eastern Siberia. The strain A/wigeon/Sakha/1/2014 (H5N8) was shown to be pathogenic for mammals. It is similar to the strains that caused outbreaks in wild birds and poultry in Southeast Asia and Europe in 2014. In spring 2015, we isolated three influenza A(H5N1) viruses from wild birds in the South of Western Siberia. All strains were pathogenic for mammals and showed reduced anti-neuraminidase drug sensitivity.

Biography

Tatyana Ilyicheva has completed her PhD from Lobachevsky State University of Nizhni Novgorod and Postdoctoral studies from Vector State Research Center of Virology and Biotechnology. She is the Head of Influenza Laboratory of Vector Center and Associate Professor of Novosibirsk State University. She has published more than 20 papers in reputed journals.

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Notes:

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Kallikrein-related peptidase 5 contributes to H3N2 influenza virus infection in human lungs

Melia Magnen[1, 2], **Fabien Gueugnon**[1, 2], **Antoine Guillon**[1, 2], **Thomas Baranek**[1, 2], **Agnes Petit-Courty**[1, 2], **Alison A Humbles**[3], **Mustapha Si-Tahar**[1, 2] and **Yves Courty**[1, 2]
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The cleavage of the influenza A virus hemagglutinin (HA) by host serine-proteases is essential for viral infectivity. Several serine proteases of the kallikrein-related peptidase (KLK) family are produced and secreted by the airways and we investigated whether KLK1, 5 and 14 were involved in seasonal IAV infection. Expression of KLK1, 5 and 14 was assessed at the protein levels, in human tracheal aspirates from flu patients in intensive care unit, using ELISA. Primary human bronchial epithelial cells (hBEC) cultured at the Air-liquid interface were infected with IAV and the expression of KLKs was analyzed by RT-qPCR and flow cytometry. We also investigated in vitro if KLK1, 5 and 14 were able to cleave HA precursors. Finally, inactivated virions (mouse adapted A/Scotland20/74, H3N2) were treated with KLKs and the infectiveness was determined in MDCK cells and in mice. Flu infection selectively increased expression of KLK5 in hBEC and its secretion in the human airways. KLK1, 5 and 14 were able to cleave in vitro HA precursor from several subtypes of influenza viruses. Furthermore, only the KLK5 treatment of H3N2 virions promoted IAV infection in MDCK cells. In mice, the treated virus led to severe infection with KLK5 treatment and to moderate one with KLK14 treatment. KLK1 virus treatment did not result in infection. Expression and secretion of KLK5 is specifically induced in airways upon flu. This induction likely contributes to the propagation of the virus in favoring its multi-cycle replication through activation of the HA precursor.

Biography

Melia Magnen is currently pursuing her PhD at the CEPR, Tours, France, working under Dr. Yves Courty, Centre d'Étude des Pathologies Respiratoires (INSERM U1100). Her research interest mainly focuses on influenza and other respiratory viruses.

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The clinical characteristics and outcome of H1N1 pneumonia patients with and without acute renal injury

Essam Saad Abdel Rahim Badawy
Minia University, Egypt

Currently, little information exists about the impact of kidney injury and resource utilization in the form of renal replacement therapy in critically ill patients with H1N1 infections. 40 patients who were living in or visitors to Makkah region, admitted to the hospital and revealed confirmatory H1N1 infection, pneumonia and acute renal injury, were submitted to rRT-PCR. Severity of illness was assessed by using APACHE II, SOFA score, MOD score XR Chest score, PaO2/FIO2 and co-morbidities were recorded. Acute renal injury is an adding impact of increasing the mortality rate of H1N1 pneumonia patients and may be related directly to the infection by this virus or complication to it which may be explained by severe hypoxia secondary to severe lung injury, multiorgan dysfunction. A high mortality in middle and old-aged patients with underlying medical co-morbidities was associated with higher symptoms severity, APACHE II, SOFA, MODS and XRC scores. Early recognition of the disease as well as prompt medical attention to provide opportunities aim to limit the progression of the illness and to reduce the mortality. Prospective and controlled clinical trials are needed for clarifying the effectiveness of the early treatment and protection by using H1N1 vaccine.

Biography

Essam Saad Abdel Rahim Badawy has completed his MD from Minia University, Egypt and thesis studies from Cairo University School of Medicine. He is the Director of Emergency Department, Hera General Hospital, JCI-Accredited Governmental Hospital, MOH, KSA. He is a Senior Consultant of Internal Medicine & Professor of Internal Medicine & Immunology, Faculty of Medicine, Minia University. He has published more than 24 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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Types of human influenza virus among patient at Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), Bauchi, Nigeria

Jacob A Dunga, Jafiada M J, Aishatu B, Binta L and **Shamsudeen A**
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Human influenza is an acute respiratory illness resulting from infection with an influenza virus, it is a highly infectious virus and can spread rapidly from person to person,and some strains are more pathogenic than others. Nigeria suffered waves of Highly Pathogenic Avian Influenza (HPAI) outbreaks that peaked twice in February 2006 and February 2007.The burden of Influenza is likely to be under estimated in Nigeria. This study is expected to monitor the occurrence of influenza in this part of the country, with the aim of providing a foundation for detecting outbreaks and pandemics, mapping out common strains or emergence of a novel strain of influenza so as to create an early warning system to trigger a rapid public health response and specific vaccine for common strains.

This study is a cross sectional survey, our target populations were all adult and pediatric patient admitted at the pediatrics and internal medicine department of ATBUTH who has met the criteria for Cough, fever (>37°C), nasal congestion and dyspnea.

Samples collected over 12 months were analyzed using the polymerase chain reaction (PCR) at national influenza reference laboratory (NIRL).Detection and subtyping of influenza viruses in respiratory specimens was done. Overall 49% female samples and 51% males samples were collected, 5% of the samples collected tested positive for human influenza type A and B, 60% of the positive result were among the female samples where as 40% from the male samples, among the positive sample about 80% were positive for Human Influenza type A (Flu A), whereas 20% where positive for Human Influenza type B (Flu B). There were more cases of human influenza among the age group 1 - 5 years equals 3% of total samples collected compared to 1% each for 6 – 25 years and 26 – 45 years, the incidence were found to be less or absent among those > 45 years.

Biography

Jacob A Dunga has completed his MBBS at the age of 24 years from University of Maiduguri Teaching Hospital, Borno state and postgraduate fellowship in Pulmonology at National postgraduate medical college of Nigeria. He also has postgraduate diploma in management and master's degree in health planning and management. He is senior consultant Physician (Pulmonologist) at ATBU Teaching Hospital and a visiting senior lecture with Gombe state University medical college. He is a member of ATS, ERS, PATS, and NTS. He has published more than 10 papers and has served as research coordinator for National Influenza surveillances and PMTCT.

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Notes:

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Study on the circulation of influenza A virus in swine populations in Kazakhstan

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Emergence of influenza virus A (H1N1)pdm in humans which is a complex reassortant of the swine-origin genotypes, emphasized the importance of worldwide surveillance for influenza virus in swine. 1293 biosamples (893 nasopharyngeal swabs and 400 blood serums) have been collected from swine in the small and large pig farms of the Almaty, Aktobe, Karaganda, Kostanay, Pavlodar and North-Kazakhstan oblasts in 2014-2015. Primary screening of 893 biosamples (nasopharyngeal swabs), carried out in RT-PCR using AmliSens PCR test system produced by the Central Research Institute for Epidemiology (Moscow) showed the presence of genetic material of the influenza virus in 171 samples (19.15% of the total number of examined samples). Influenza A/H1 virus RNA was detected in 111 samples (12.43%), A/H3 virus RNA in 10 samples (1.12%). These data indicate circulating influenza virus of mixed etiology in the swine population with a predominance of influenza A/H1 virus. As a result of primary infection of chicken embryos with 893 biosamples collected from swine in various regions of Kazakhstan, 22 infectious agents were isolated with the hemagglutination titers of 1:2-1:32 and infectious activity of 3.47-9.45 lgEID50/0.2 ml. Identification in HAI and NAI assays of seven isolates from the Almaty (06/14 and 10/14), Karaganda (04/14 and 16/14) and Kostanay (12/14, 23/14 and 24/14) oblasts enabled to attribute them to influenza A virus with the H1N1 antigenic formula. Serological analysis of 400 blood serums collected from healthy and sick swine in the pig-breeding farms to detect antibodies against influenza A/H1N1 and A/H3N2 virus was carried out with IEA and HAI assay. The greatest number of specific antibodies was detected against the influenza virus subtype A/H1N1. Thereby, the findings confirm the circulation of influenza A/H1N1 virus in the swine population on the territory of Kazakhstan, which indicates the need for a permanent virological examination of swine with the aim of the earliest detection of the potential pandemic influenza virus strain.

Biography

Nailya Klivleyeva is presently working in Institute of Microbiology and Virology" CS MES, Republic of Kazakhstan.

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Herbal immune boosters: Valuable preventive means for international travelers' flu

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Acute respiratory tract infections are account for millions of lost effective work or school days, healthcare clinic visits, antibiotic prescriptions, hospital admissions and eventually morbidity or even mortalities. International tourism including religious pilgrimage to overcrowded destinations considerably increases the chance for dissemination of such contaminations. As an example, Hajj is a worldwide ceremony that can affect every country with Muslim sub-population regarding surge of multi-microbial and drug resistant respiratory tract infections. Therefore disease prevention in the involved societies would be highly life and cost saving. Besides use of common antibiotics that has major drawbacks, natural immune boosters are viable and accredited options in this field. *Echinacea* supplements are well-known for immune-modulation and anti-flu effects. They have all characteristics that recommended by CDC to fight flu: Immune augmentation, evidence-based preventive value and anti-viral (microbial) properties without promoting any resistance or life-threatening adverse reactions. *Echinacea* vastly grows in different geographical territories, is reasonably affordable and easily accessible almost all over the world just like in Iran. As we published in a recent review article, there is a huge amount of evidence that shows promising results for Echinacea in both prevention and treatment of respiratory tract infections especially in high risk populations and would be potentially useful in susceptible travelers. There will be a great opportunity to prevent respiratory tract infections related to international gatherings and their infectious adverse consequences with standard protocols for supplementation of natural products like *Echinacea* after adequate examinations via goal-directed clinical trials.

Biography

Mohammad Ali Daneshmehr has studied Pharmacy at Tehran University of Medical Sciences (TUMS) and graduated in 1990. He has started his career in Shahid Beheshti University of Medical Sciences (SBMU) as an Instructor. In 1993 he pursued his studies in University of Manchester, UK in Medicinal Chemistry and received PhD in 2001 on ligands in DNA minor groove. He has been working since, in different parts of Iran as Founder of a number of pharmacy schools including Hamadan (UMSHA), Kermanshah (KUMS) and currently Iran University of Medical Sciences (IUMS). His field of interest includes natural products as lead compounds to find new drugs.

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