17 March 2009

This supplement has been prepared to present scientific and technical news items that may be of more interest to technical personnel at RDT&E activities and the labs, or the medics rather than the broader readership of the basic CB Daily. Due to the nature of the material, the articles, if available online, are usually only available through subscription services thus making specific links generally unavailable. Thus, usually only the bibliographic citation is available for use by an activity's technical library.

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Chem-Bio News – Pandemic Influenza Edition #52

1. QUARANTINE FOR PANDEMIC INFLUENZA CONTROL AT THE BORDERS OF SMALL ISLAND NATIONS: *"We predict that 95% and 99% effectiveness in preventing the release of infectious individuals into the community could be achieved with quarantine periods of longer than 4.7 and 8.6 days, respectively."*

2. ATCC DEVELOPS AND ISOLATES NOVEL AVIAN FLU MONOCLONAL ANTIBODIES: *"These antibodies could lead to a rapid diagnostic test for the infection, ATCC announced today."*

3. IMMUNOGENICITY, SAFETY, AND CROSS•REACTIVITY OF AN INACTIVATED, ADJUVANTED, PROTOTYPE PANDEMIC INFLUENZA (H5N1) VACCINE: A PHASE II, DOUBLE•BLIND, RANDOMIZED TRIAL: *"The inactivated, aluminum•adjuvanted, whole•virion H5N1 vaccine not only showed good immunogenicity and safety but also elicited significant cross•reactivity against heterologous H5N1 strains in clade 2."*

4. FACING PANDEMIC INFLUENZA THREATS: THE IMPORTANCE OF INCLUDING POULTRY AND SWINE WORKERS IN PREPAREDNESS PLANS: *"Mathematical modeling has demonstrated that such workers may accelerate the spread of pandemic viruses in their rural communities."*

5. MULTIPLEX ASSAY FOR SIMULTANEOUSLY TYPING AND SUBTYPING INFLUENZA VIRUSES BY USE OF AN ELECTRONIC MICROARRAY: *"The assay is a rapid, accurate, user-friendly method for simultaneously typing and subtyping influenza viruses."*

6. CAN SYNDROMIC THRESHOLDS PROVIDE EARLY WARNING OF NATIONAL INFLUENZA OUTBREAKS?: *"We recommend that age-group specific thresholds be developed for other clinical influenza surveillance systems in the UK and elsewhere."*

CB Daily Report

Chem-Bio News

QUARANTINE FOR PANDEMIC INFLUENZA CONTROL AT THE BORDERS OF SMALL ISLAND NATIONS

By Hiroshi Nishiura, Nick Wilson, Michael G Baker
BMC Infectious Diseases
March 11, 2009

“We predict that 95% and 99% effectiveness in preventing the release of infectious individuals into the community could be achieved with quarantine periods of longer than 4.7 and 8.6 days, respectively. If rapid diagnostic testing is combined with quarantine, the lengths of quarantine to achieve 95% and 99% effectiveness could be shortened to 2.6 and 5.7 days, respectively. Sensitivity analysis revealed that quarantine alone for 8.7 days or quarantine for 5.7 days combined with using rapid diagnostic testing could prevent secondary transmissions caused by the released infectious individuals for a plausible range of prevalence at the source country (up to 10%) and for a modest number of incoming travellers (up to 8000 individuals).

Conclusions
Quarantine at the borders of island nations could contribute substantially to preventing the arrival of pandemic influenza (or at least delaying the arrival date). For small island nations we recommend consideration of quarantine alone for 9 days or quarantine for 6 days combined with using rapid diagnostic testing (if available).”

The full article can be found at: http://www.biomedcentral.com/content/pdf/1471-2334-9-27.pdf

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ATCC DEVELOPS AND ISOLATES NOVEL AVIAN FLU MONOCLONAL ANTIBODIES

News-Medical.Net
March 16, 2009

“ATCC (American Type Culture Collection) researchers have developed a panel of novel monoclonal antibodies (mAbs) against avian influenza viruses. These antibodies could lead to a rapid diagnostic test for the infection, ATCC announced today. The organization has filed a patent covering the development of these novel antibodies.

These monoclonal antibodies (mAbs) specifically target the hemagglutinin molecule of three avian influenza A subtypes. Historically, these target viruses have caused lethal outbreaks in poultry. If they acquire the ability to be transmitted efficiently from human to human, they could potentially cause a worldwide pandemic.

"Given the potential for H5, H7 and H9 avian influenza to jump species and cause a public health crisis, we focused our efforts on developing reagents to detect avian influenza strains which have the potential to cause pandemic disease in humans," explained Cohava Gelber, PhD/MBA, ATCC Chief Science and Technology Officer.”

The full article can be found at: http://www.news-medical.net/?id=46922

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IMMUNOGENICITY, SAFETY, AND CROSS·REACTIVITY OF AN INACTIVATED, ADJUVANTED, PROTOTYPE PANDEMIC INFLUENZA (H5N1) VACCINE: A PHASE II, DOUBLE·BLIND, RANDOMIZED TRIAL

By Jiang Wu, Han•Hua Fang, Jiang•Ting Chen, Ji•Chen Zhou, Zi•Jian Feng, Chang•Gui Li, Yuan•Zheng Qiu, Yan Liu, Min Lu, Li•Ying Liu, Shan•Shan Dong, Qiang Gao, Xiao•Mei Zhang, Nan Wang, Wei•Dong Yin, and Xiao•Ping Dong

Clinical Infectious Diseases
March 12, 2009

"Results. All formulations were well tolerated, with no serious adverse events. Most local and systemic reactions were mild or moderate. Immune responses were induced after 1 dose in all vaccination groups. The highest immune response was seen after 2 doses of 15 •g of vaccine, with 90% and 100% seroconversion rates and 90% and 100% of participants having a titer of 1:40 for hemagglutination inhibition and microneutralization assays, respectively. Both the 10• and 15••g doses met or exceeded European Union licensure criteria. Generally, higher immune responses were elicited in participants vaccinated 28 days apart than those vaccinated 14 days apart. Cross•reaction assays showed that after 2 doses of 10 •g of vaccine, 98% and 87% of participants had a microneutralization titer of 1:40 against heterologous Indonesia and Anhui strains, respectively.

Conclusions. The inactivated, aluminum•adjuvanted, whole•virion H5N1 vaccine not only showed good immunogenicity and safety but also elicited significant cross•reactivity against heterologous H5N1 strains in clade 2."

The full article can be found at: http://www.journals.uchicago.edu/doi/abs/10.1086/597401

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FACING PANDEMIC INFLUENZA THREATS: THE IMPORTANCE OF INCLUDING POULTRY AND SWINE WORKERS IN PREPAREDNESS PLANS

By G.C. Gray and G. Kayali
Poultry Science
July 20, 2008

"Recent research has shown that poultry and swine workers, especially those with intense exposures, are at increased risk of zoonotic influenza virus infections. In multiple studies, US poultry workers and poultry veterinarians have evidence of previous infections with avian influenza virus. Similarly, US swine workers have strong evidence of previous and acute

infections with swine influenza viruses. Mathematical modeling has demonstrated that such workers may accelerate the spread of pandemic viruses in their rural communities. Because these workers may contribute to the novel generation of viruses and serve as a bridging population in the cross-species sharing of influenza viruses, it seems prudent to include poultry and swine workers in influenza preparedness programs. Possible preventive and control interventions include special education programs to increase workers' use of personal protective equipment such as gloves, increased surveillance for influenza viruses among workers and their animals, recommendations that workers seek medical attention should they develop influenza-like illness, and workers' priority receipt of annual and pandemic influenza vaccines."

The full article can be found at: http://ps.fass.org/cgi/content/abstract/88/4/880

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MULTIPLEX ASSAY FOR SIMULTANEOUSLY TYPING AND SUBTYPING INFLUENZA VIRUSES BY USE OF AN ELECTRONIC MICROARRAY
Medical Device Business Week
March 18, 2009

"We report on the use of an electronic microarray to simultaneously type influenza A and B viruses and to distinguish influenza A virus subtypes H1N1 and H3N2 from the potentially pandemic avian virus subtype H5N1. The assay targets seven genes: the H1, H3, H5, N1, and N2 genes of influenza A virus; the matrix protein M1 gene of influenza A virus; and the nonstructural protein (NS) gene of influenza B virus."

"By combining a two-step reverse transcription-multiplex PCR with typing and subtyping on the electronic microarray, the assay achieved an analytical sensitivity of 102 to 103 copies of transcripts per reaction for each of the genes. The assay correctly typed and subtyped 15 different influenza virus isolates, including two influenza B virus, five A/H1N1, six A/H3N2, and two A/H5N1 isolates. In addition, the assay correctly identified 8 out of 10 diluted, archived avian influenza virus specimens with complete typing and subtyping information and 2 specimens with partial subtyping information. In a study of 146 human clinical specimens that had previously been shown to be positive for influenza virus or another respiratory virus, the assay showed a clinical sensitivity of 96% and a clinical specificity of 100%."

"The assay is a rapid, accurate, user-friendly method for simultaneously typing and subtyping influenza viruses."

The full article can be found at: (Y. Huang, et. al., "Multiplex Assay for Simultaneously Typing and Subtyping Influenza Viruses by Use of an Electronic Microarray". Journal of Clinical Microbiology, 2009;47(2):390-396). Link not available.

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CAN SYNDROMIC THRESHOLDS PROVIDE EARLY WARNING OF NATIONAL INFLUENZA OUTBREAKS?
Biotech Week
March 11, 2009

“According to a study from Birmingham, the United Kingdom, "Influenza incidence thresholds are used to help predict the likely impact of influenza and inform health professionals and the public of current activity. We evaluate the potential of syndromic data (calls to a UK health helpline NHS Direct) to provide early warning of national influenza outbreaks."

"Time series of NHS Direct calls concerning 'cold/flu' and fever syndromes for U.K. and Wales were compared against influenza-like-illness clinical incidence data and laboratory reports of influenza. Poisson regression models were used to derive NHS Direct thresholds. The early warning potential of thresholds was evaluated retrospectively for 2002-06 and prospectively for winter 2006-07. NHS Direct 'cold/flu' and fever calls generally rose and peaked at the same time as clinical and laboratory influenza data. We derived a national 'cold/flu' threshold of 1.2% of total calls and a fever (5-14 years) threshold of 9%. An initial lower fever threshold of 7.7% was discarded as it produced false alarms. Thresholds provided 2 weeks advanced warning of seasonal influenza activity during three of the four winters studied retrospectively, and 6 days advance warning during prospective evaluation. Syndromic thresholds based on NHS Direct data provide advance warning of influenza circulating in the community.”

"We recommend that age-group specific thresholds be developed for other clinical influenza surveillance systems in the UK and elsewhere."

The full article can be found at: (D.L. Cooper, et. al., “Can syndromic thresholds provide early warning of national influenza outbreaks?”, Journal of Public Health, 2009;31(1):17-25). Link not available.

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