31 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 #54

1. [UK] PANDEMIC FLU GUIDANCE FOR BUSINESSES: RISK ASSESSMENT IN THE OCCUPATIONAL SETTING: *The UK has issued guidance to businesses for dealing with a pandemic influenza epidemic.*

2. AVIAN INFLUENZA VIRUS (H5N1): EFFECTS OF PHYSICO-CHEMICAL FACTORS ON ITS SURVIVAL: *"Soap (lifebuoy(R)), detergent (surf excel(R)) and alkali (caustic soda) destroyed infectivity after 5 min at 0.1, 0.2 and 0.3% dilution."*

3. A LIVE ATTENUATED H9N2 INFLUENZA VACCINE IS WELL TOLERATED AND IMMUNOGENIC IN HEALTHY ADULTS: *"The vaccine was well tolerated; vaccine shedding was minimal."*

4. 'MX' GENE IN INDIGENOUS CHICKENS KEEPS THE FLU AWAY: STUDY: *"At least 62 percent of chickens indigenous to Indonesia are resistant to bird flu, thanks to a gene in their body called Mx, the Indonesian Institute of Science (LIPI) revealed Monday."*

5. HLA [HUMAN LEUKOCYTE ANTIGEN] CLASS I MOLECULES CONSISTENTLY PRESENT INTERNAL INFLUENZA EPITOPES: *"These data demonstrate an emerging pattern whereby class I HLA reveal a handful of internal viral ligands and whereby CTL recognize consistently presented influenza ligands."*

6. ON THREE-DIMENSIONAL HOLOGRAPHIC VECTOR OF ATOMIC INTERACTION FIELD ANALYSIS FOR INFLUENZA NEURAMINIDASE INHIBITORS: *"Good results, R = 0.885, SD = 0.848, R-CV = 0.858 (the maximum) and SDCV = 0.934 (the minimum), showed that holographic vector of atomic interaction field analysis can be applicable to molecular structural characterization and biological activity prediction and quantitative structure-activity relationship model had favorable stability and prediction capability."*

CB Daily Report

[UK] PANDEMIC FLU GUIDANCE FOR BUSINESSES: RISK ASSESSMENT IN THE OCCUPATIONAL SETTING

Department of Health and Health Protection agency in collaboration with the Health and Safety Executive, Department for Business, Enterprise and Regulatory Reform and Cabinet Office
March 27, 2009

“This booklet explains how businesses can help reduce the spread of flu in the event of a pandemic.

It provides information to allow businesses to assess the types of measures that may be used in their particular occupational setting.”

The full report can be found at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_097137?IdcService=GET_FILE&dID=189550&Rendition=Web

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AVIAN INFLUENZA VIRUS (H5N1): EFFECTS OF PHYSICO-CHEMICAL FACTORS ON ITS SURVIVAL

By Muhammad AKBAR Shahid, Muhammad Abubakar Sajid Hameed and Shamsul Hassan
Virology Journal
March 28, 2009

“Present study was performed to determine the effects of physical and chemical agents on infective potential of highly pathogenic avian influenza (HPAI) H5N1 (local strain) virus recently isolated in Pakistan during 2006 outbreak. H5N1 virus having titer 108.3 ELD50 /ml was mixed with sterilized peptone water to get final dilution of 4HA units and then exposed to physical (temperature, pH and ultraviolet light) and chemical (formalin, phenol crystals, iodine crystals, CID 20, virkon(R)-S, zeptin 10%, KEPCIDE 300, KEPCIDE 400, lifebuoy, surf excel and caustic soda) agents. Harvested amnio-allantoic fluid (AAF) from embryonated chicken eggs inoculated with H5N1 treated virus (0.2 ml/egg) was subjected to haemagglutination (HA) and haemagglutination inhibition (HI) tests. H5N1 virus lost infectivity after 30 min at 56degreesC, after 1 day at 28degreesC but remained viable for more than 100 days at 4degreesC. Acidic pH (1, 3) and basic pH (11, 13) were virucidal after 6 h contact time; however virus retained infectivity at pH 5 (18 h), 7 and 9 (more than 24 h). UV light was proved ineffectual in inactivating virus completely even after 60 min. Soap (lifebuoy(R)), detergent (surf excel(R)) and alkali (caustic soda) destroyed infectivity after 5 min at 0.1, 0.2 and 0.3% dilution. All commercially available disinfectants inactivated virus at recommended concentrations. Results of present study would be helpful in implementing bio-security measures at farms/ hatcheries levels in the wake of avian influenza virus (AIV) outbreak.”

The full article can be found at: http://www.virologyj.com/content/pdf/1743-422x-6-38.pdf.

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A LIVE ATTENUATED H9N2 INFLUENZA VACCINE IS WELL TOLERATED AND IMMUNOGENIC IN HEALTHY ADULTS
Vaccine Weekly
April 1, 2009

"Development of live attenuated influenza vaccines (LAIV) against avian strains with pandemic potential is an important public-health strategy. Either 1 or 2 10(7)-TCID50 doses of H9N2 LAIV A/chicken/Hong Kong/G9/97 were administered intra-nasally to 50 adults in isolation; 41 participants were H9N2 seronegative, 24 of whom received 2 doses."

"The vaccine was well tolerated; vaccine shedding was minimal. After 2 doses, 92% of H9-seronegative participants had >= 4-fold increases in hemagglutination-inhibition antibody, and 79% had >= 4-fold increases in neutralizing antibody; 100% had responses detected by at least 1 assay."

The full article can be found at: (R.A. Karron, et. al., "A Live Attenuated H9N2 Influenza Vaccine Is Well Tolerated and Immunogenic in Healthy Adults". Journal of Infectious Diseases, 2009;199(5):711-716). Link not available.

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'MX' GENE IN INDIGENOUS CHICKENS KEEPS THE FLU AWAY: STUDY
By Theresia Sufa
The Jakarta Post
March 25, 2009

"At least 62 percent of chickens indigenous to Indonesia are resistant to bird flu, thanks to a gene in their body called Mx, the Indonesian Institute of Science (LIPI) revealed Monday.

"Genetically, the indigenous chickens [to Indonesia] have a gene that is immune to avian influenza," said head of the institute Umar

Anggara Jenie, in an exposé of a biological study she gave at the Cibinong Sciences Center in Bogor, West Java.

Sri Sulandari, a gene researcher at the institute's biological research center who studied the genes of indigenous chickens, said her institute carried out the first ever gene study focusing on how humans coped when contracting the virus and on the vaccination process."

The full article can be found at: http://www.thejakartapost.com/news/2009/03/25/%E2%80%98mx%E2%80%99-gene-indigenous-chickens-keeps-flu-away-study.html

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HLA [HUMAN LEUKOCYTE ANTIGEN] CLASS I MOLECULES CONSISTENTLY PRESENT INTERNAL INFLUENZA EPITOPES
Virus Weekly
March 31, 2009

"Cytotoxic T lymphocytes (CTL) limit influenza virus replication and prevent morbidity and mortality upon recognition of HLA class I presented epitopes on the surface of virus infected cells, yet the number and origin of the viral epitopes that decorate the infected cell are unknown. To understand the presentation of influenza virus ligands by human MHC class I molecules, HLA-B*0702-presented viral peptides were directly identified following influenza infection."

"After transfection with soluble class I molecules, peptide ligands unique to infected cells were eluted from isolated MHC molecules and identified by comparative mass spectrometry (MS). Then CTL were gathered following infection with influenza and viral peptides were tested for immune recognition. We found that the class I molecule B*0702 presents 3-6 viral ligands following infection with different strains of influenza. Peptide ligands derived from the internal viral nucleoprotein (NP418-426 and NP473-481) and from the internal viral polymerase subunit PB1 (PB1329-337) were presented by B*0702 following infection with each of 3 different influenza strains; ligands NP418-426, NP473-481, and PB1329-337 derived from internal viral proteins were consistently revealed by class I HLA. In contrast, ligands derived from hemagglutinin (HA) and matrix protein (M1) were presented intermittently on a strain-by-strain basis. When tested for immune recognition, HLA-B*0702 transgenic mice responded to NP418-426 and PB1329-337 consistently and NP473-481 intermittently while ligands from HA and M1 were not recognized."

These data demonstrate an emerging pattern whereby class I HLA reveal a handful of internal viral ligands and whereby CTL recognize consistently presented influenza ligands."

The full article can be found at: (A. Wahl, et. al., "HLA class I molecules consistently present internal influenza epitopes". Proceedings of the National Academy of Sciences of the United States of America, 2009;106(2):540-545). Link not available.

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ON THREE-DIMENSIONAL HOLOGRAPHIC VECTOR OF ATOMIC INTERACTION FIELD ANALYSIS FOR INFLUENZA NEURAMINIDASE INHIBITORS
Drug Week
March 27, 2009

"These proteins [neuraminidase and hemagglutinin] are essential for infection. Neuraminidase has been found to be a potential target to control influenza virus. Here, we

have developed three-dimensional holographic vector of atomic interaction field analysis as a new method of quantitative structure-activity relationships for different sets of compounds to understand chemical-biological interactions governing their activities toward influenza neuraminidase."

Good results, R = 0.885, SD = 0.848, R-CV = 0.858 (the maximum) and SDCV = 0.934 (the minimum), showed that holographic vector of atomic interaction field analysis can be applicable to molecular structural characterization and biological activity prediction and quantitative structure-activity relationship model had favorable stability and prediction capability."

The full article can be found at: (Z.S. Li, et. al., "On Three-Dimensional Holographic Vector of Atomic Interaction Field Analysis for Influenza Neuraminidase Inhibitors". Chemical Biology & Drug Design, 2009;73(2):236-243).

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END of CB Daily Report.

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