

1 December 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 #89

1. EPA ISSUES ALERT ABOUT UNAPPROVED FLU DISINFECTANT PRODUCTS: *“There are no products registered by EPA for use in residential settings that will disinfect or sterilize the air or a room by fogging. Claims for disinfecting carpeting, drapes and other porous surfaces are also false.”*

2. STRUCTURES OF RECEPTOR COMPLEXES FORMED BY HEMAGGLUTININS FROM THE ASIAN INFLUENZA PANDEMIC OF 1957: *“The viruses that caused the three influenza pandemics of the twentieth century in 1918, 1957, and 1968 had distinct hemagglutinin receptor binding glycoproteins that had evolved the capacity to recognize human cell receptors. We have determined the structure of the H2 hemagglutinin from the second pandemic, the “Asian Influenza” of 1957.”*

3. SALICYLATES AND PANDEMIC INFLUENZA MORTALITY, 1918-1919 PHARMACOLOGY, PATHOLOGY, AND HISTORIC EVIDENCE: *“If these recommendations were followed, and if pulmonary edema occurred in 3% of persons, a significant proportion of the deaths may be attributable to aspirin.”*

4. THE AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE: *“These findings suggest that while prior season's influenza vaccine may not prevent infection or developing illness once infected, it certainly appears to protect against more severe outcomes. We may also be seeing a cross-protective effect resulting from natural influenza infections and/or prior influenza immunization in the military setting,” says Dr. Sanchez. “This may play a role in conferring a certain degree of ‘immunological priming.’”*

5. PRESTIGE AMERITECH REOPENING FORMER KIMBERLY-CLARK SURGICAL MASK FACTORY TO FIGHT H1N1, CREATE US JOBS: *“Besides supplying America's hospitals with their normal supplies of masks and respirators, the center will help the US and other countries build surgical mask and N95 respirator stockpiles for use during the H1N1 and future pandemics.”*

6. U.S. FINDS PANDEMIC H1N1 VIRUS IN TURKEY FLOCK: *“The pandemic H1N1 flu virus was confirmed in a flock of breeder turkeys in Virginia -- the first U.S. case involving turkeys, the U.S. Agriculture Department said on Monday.”*

CB Daily Report

Chem-Bio News

EPA ISSUES ALERT ABOUT UNAPPROVED FLU DISINFECTANT PRODUCTS

Infection Control Today Magazine

November 30, 2009

"The U.S. Environmental Protection Agency (EPA) is warning consumers to beware of unscrupulous vendors who may market ineffective and unregistered products or services that claim to disinfect surfaces or entire rooms against the H1N1 influenza virus. In the current flu-conscious climate, heightened anxiety about the spread of the H1N1 virus has bred false claims in the marketplace."

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"EPA registers disinfectants for use on hard surfaces, and when used according to label directions, such products will be effective against influenza A viruses, including the 2009 H1N1 pandemic strain. There are no products registered by EPA for use in residential settings that will disinfect or sterilize the air or a room by fogging. Claims for disinfecting carpeting, drapes and other porous surfaces are also false. The products approved by EPA are for use on hard surfaces only, and the label must state that the product is registered for the influenza A virus."

The full article can be found at: <http://www.infectioncontroltoday.com/hotnews/unapproved-flu-disinfectant-products.html>

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STRUCTURES OF RECEPTOR COMPLEXES FORMED BY HEMAGGLUTININS FROM THE ASIAN INFLUENZA PANDEMIC OF 1957

Health Risk Factor Week

December 1, 2009

"The viruses that caused the three influenza pandemics of the twentieth century in 1918, 1957, and 1968 had distinct hemagglutinin receptor binding glycoproteins that had evolved the capacity to recognize human cell receptors. We have determined the structure of the H2 hemagglutinin from the second pandemic, the "Asian Influenza" of 1957."

"We compare it with the 1918 "Spanish Influenza" hemagglutinin, H1, and the 1968 "Hong Kong Influenza" hemagglutinin, H3, and show that despite its close overall structural similarity to H1, and its more distant relationship to H3, the H2 receptor binding site is closely related to that of H3 hemagglutinin. By analyzing hemagglutinins of potential H2 avian precursors of the pandemic virus, we show that the human receptor can be bound by avian hemagglutinins that lack the human-specific mutations of H2 and H3 pandemic

viruses, Gln-226Leu, and Gly-228Ser. We show how Gln-226 in the avian H2 receptor binding site, together with Asn-186, form hydrogen bond networks through bound water molecules to mediate binding to human receptor. We show that the human receptor adopts a very similar conformation in both human and avian hemagglutinin-receptor complexes. We also show that Leu-226 in the receptor binding site of human virus hemagglutinins creates a hydrophobic environment near the Sia-1-Gal-2 glycosidic linkage that favors binding of the human receptor and is unfavorable for avian receptor binding."

The full article can be found at: (J.F. Liu, et. al., "Structures of receptor complexes formed by hemagglutinins from the Asian Influenza pandemic of 1957". Proceedings of the National Academy of Sciences of the United States of America, 2009;106(40):17175-17180). Link not available.

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SALICYLATES AND PANDEMIC INFLUENZA MORTALITY, 1918-1919 PHARMACOLOGY, PATHOLOGY, AND HISTORIC EVIDENCE

Drug Week

November 27, 2009

"The high case-fatality rate-especially among young adults-during the 1918-1919 influenza pandemic is incompletely understood. Although late deaths showed bacterial pneumonia, early deaths exhibited extremely "wet," sometimes hemorrhagic lungs."

"The hypothesis presented herein is that aspirin contributed to the incidence and severity of viral pathology, bacterial infection, and death, because physicians of the day were unaware that the regimens (8.0-31.2 g per day) produce levels associated with hyperventilation and pulmonary edema in 33% and 3% of recipients, respectively. Recently, pulmonary edema was found at autopsy in 46% of 26 salicylate-intoxicated adults. Experimentally, salicylates increase lung fluid and protein levels and impair mucociliary clearance. In 1918, the US Surgeon General, the US Navy, and the Journal of the American Medical Association recommended use of aspirin just before the October death spike."

"If these recommendations were followed, and if pulmonary edema occurred in 3% of persons, a significant proportion of the deaths may be attributable to aspirin."

The full article can be found at: (K.M. Starko, et. al., "Salicylates and Pandemic Influenza Mortality, 1918-1919 Pharmacology, Pathology, and Historic Evidence". Clinical Infectious Diseases, 2009;49(9):1405-1410). Link not available.

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THE AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE: MILITARY STUDY SHOWS PREVENTION OF NOVEL A/H1N1 VIRUS INFECTION IS VACCINE- TYPE AND AGE-DEPENDENT

Medical Letter on the CDC & FDA
December 6, 2009

"Immunization with either live attenuated influenza vaccine (LAIV, also known as FluMist®), or trivalent inactivated influenza vaccine (TIV), appears to offer a protection (~ 45%) against the novel A/H1N1 virus, the cause of the present influenza pandemic. However, the benefit was largely attributed to the youngest age group. The finding emerges from an evaluation of medical encounters and seasonal influenza immunization of U.S. military service members."

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"The increasing momentum of the H1N1 pandemic underscores the need for vaccination, yet there is a wide variance in vaccine effectiveness depending on the strain-match for a particular season," comments Col. (Ret.) Jose L. Sanchez, MD, MPH, of the Armed Forces Health Surveillance Center (AFHSC) in Silver Spring, Maryland.

Dr. Sanchez and colleagues conducted a case control analysis of influenza-related medical encounter data of U.S. military service members, compared to a control group of personnel with acute, non-respiratory illnesses. For the period of April-October 2009, a total of 1,205 cases of pandemic H1N1 2009 infections were reported, of which 966 (80%) were among males and more than one-half (58%) were among those younger than 25 years. The overall vaccine effectiveness (VE) for service members was found to be 45% (95% confidence interval [CI], 33% to 55%). Immunization with prior season's TIV (VE=37%; 95% CI, 23% to 49%) as well as LAIV (VE=22%; 95% CI, 1% to 38%), were found to be protective.

Interestingly, and unexpectedly, the investigators observed a U-shaped relationship of VE with age stratification. VE was high in the youngest (< 25 yo) and oldest (> 39 yo) service members (50% and 55% respectively), while there was noVE for those 25 to 39 years of age."

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"These findings suggest that while prior season's influenza vaccine may not prevent infection or developing illness once infected, it certainly appears to protect against more severe outcomes. We may also be seeing a cross-protective effect resulting from natural influenza infections and/or prior influenza immunization in the military setting," says Dr. Sanchez. "This may play a role in conferring a certain degree of 'immunological priming.'"

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**PRESTIGE AMERITECH REOPENING FORMER KIMBERLY-CLARK SURGICAL MASK
FACTORY TO FIGHT H1N1, CREATE US JOBS**

Business Wire

November 06, 2009

"Prestige Ameritech is turning a vacant, former Kimberly-Clark surgical mask factory into a Global Pandemic Preparedness and Response Center. The 220,000 square foot facility, on 17 acres in North Richland Hills, Texas, will open by January 31, 2010. Besides supplying America's hospitals with their normal supplies of masks and respirators, the center will help the US and other countries build surgical mask and N95 respirator stockpiles for use during the H1N1 and future pandemics."

The full article can be found at: http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20091106005713&newsLang=en

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U.S. FINDS PANDEMIC H1N1 VIRUS IN TURKEY FLOCK

By Charles Abbott

Reuters

November 30, 2009

"The pandemic H1N1 flu virus was confirmed in a flock of breeder turkeys in Virginia -- the first U.S. case involving turkeys, the U.S. Agriculture Department said on Monday.

The virus also has been found in hogs, three house cats, pet ferrets and a cheetah in California. USDA said infections of turkeys have been reported in Canada and Chile."

The full article can be found at: http://www.reuters.com/article/internal_ReutersNewsRoom_ExclusivesAndWins_MOLT/idUSTRE5AT5P720091130

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