

3 November 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.

Should you wish to be removed from this Pandemic Influenza Edition address group, just send an email to one of the people listed at the bottom of this message. This will not affect your continued receipt of the CB Daily.

Chem-Bio News - Pandemic Influenza Edition #85

1. SCIENTISTS PROPOSE NEW EXPLANATION FOR FLU VIRUS ANTIGENIC DRIFT:

"The findings in mice, using a strain of seasonal influenza virus first isolated in 1934, also suggest that antigenic drift might be slowed by increasing the number of children vaccinated against influenza."

2. TRIPLE-COMBO DRUG SHOWS PROMISE AGAINST ANTIVIRAL-RESISTANT

SWINE FLU: *"In laboratory testing, the triple combination of oseltamivir (Tamiflu), amantadine Symmetrel) and ribavirin showed a significant capacity to stop flu-virus growth, says Mark Prichard, PhD, who serves on the board of directors of the International Society for Antiviral Research. The combo drug works better in the test tube than currently recommended single or double antiviral therapies used to treat both seasonal and swine flu strains, he says."*

3. ICE ON THE LOOKOUT FOR COUNTERFEIT FLU VACCINES:

"However, thus far ICE has found "no evidence of the illicit production or dissemination of counterfeit antiviral medications in the United States," the officials noted, emphasizing that ICE will "remain diligent" and will "continue to conduct investigative and interdiction activity targeting counterfeit 2009 H1N1 vaccines and other associated pharmaceuticals."

4. TWO-PRONGED PROTEIN ATTACK COULD BE SOURCE OF SARS VIRULENCE:

"Their results show that copies of this viral protein, known as nsp1, directly interferes with the tiny cellular machines called ribosomes, which make the proteins, such as interferon beta, that are crucial for immune defense."

5. FLU-WARY TELECOMMUTERS MAY CLOG WEB NETWORKS, GAO SAYS:

"The Government Accountability Office reported earlier this week that if the flu reaches a pandemic, a surge in telecommuting and children accessing video files and games at home could bog down local networks."

6. WHO EXPERTS FAVOR SINGLE-DOSE H1N1 VACCINE REGIMEN:

"The level of evidence in October is much higher than July, and the recommendations are much more precise than July," she said."

7. UKRAINE IMPOSES SOCIAL DISTANCING STEPS AMID FLU SURGE:

"Ukrainian

officials today shuttered schools and banned public meeting for the next 3 weeks in the wake of a spike in pandemic flu and the country's first H1N1 deaths, which have sparked speculation that the disease has become worse in some patients or that another pathogen is circulating."

8. SAUDIS TO BEGIN MASS FLU VACCINATIONS AS HAJJ NEARS: "Saudi Arabia said Monday it is to vaccinate all its residents attending the hajj against swine flu, pressing ahead with plans to host millions of the world's Muslims despite a heightened pandemic alert."

9. MOST H1N1 PATIENTS WITH RESPIRATORY FAILURE TREATED WITH OXYGENATING SYSTEM SURVIVE ILLNESS: "Despite the severity of disease and the intensity of treatment, most patients in Australia and New Zealand who experienced respiratory failure as a result of 2009 influenza A(H1N1) and were treated with a system that adds oxygen to the patient's blood survived the disease, according to a study to appear in the November 4 issue of JAMA."

CB Daily Report

Chem-Bio News

SCIENTISTS PROPOSE NEW EXPLANATION FOR FLU VIRUS ANTIGENIC DRIFT

Infection Control Today Magazine

October 29, 2009

"Influenza viruses evade infection-fighting antibodies by constantly changing the shape of their major surface protein. This shape-shifting, called antigenic drift, is why influenza vaccines—which are designed to elicit antibodies matched to each year's circulating virus strains—must be reformulated annually.

Now, researchers from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, have proposed a new explanation for the evolutionary forces that drive antigenic drift. The findings in mice, using a strain of seasonal influenza virus first isolated in 1934, also suggest that antigenic drift might be slowed by increasing the number of children vaccinated against influenza."

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"We propose a model for antigenic drift in which high- and low-affinity influenza virus mutants alternate," says Yewdell. In adults—who have been exposed to many strains of influenza in their lifetime and, correspondingly, have a wide range of antibody responses—the virus is pressured to increase its receptor affinity to escape antibody neutralization.

When such high-affinity mutants are passed to people—such as children—who have not been exposed to many influenza strains or who have not been vaccinated against flu, receptor affinity decreases. People who have not been exposed to multiple influenza virus strains or who have never been vaccinated against influenza are said to be immunologically naïve.

"Our model predicts that decreasing the immunologically naïve population—by increasing the number of children vaccinated against influenza, for example—could slow the rate of antigenic drift and extend the duration of effectiveness of seasonal influenza vaccines," he says.

Reference: SE Hensley et al. Hemagglutinin receptor binding avidity drives influenza A virus antigenic drift. *Science*. DOI: 10.1126/science.1178258 (2009)."

The full article can be found at: <http://www.infectioncontrolday.com/hotnews/flu-virus-antigenic-drift.html>

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TRIPLE-COMBO DRUG SHOWS PROMISE AGAINST ANTIVIRAL-RESISTANT SWINE FLU

Infection Control Today Magazine
October 27, 2009

"An experimental drug cocktail that includes three prescriptions now widely available offers the best hope in developing a single agent to treat drug-resistant H1N1 swine flu, says a virology researcher in the University of Alabama Birmingham (UAB) Division of Pediatric Infectious Diseases.

In laboratory testing, the triple combination of oseltamivir (Tamiflu), amantadine (Symmetrel) and ribavirin showed a significant capacity to stop flu-virus growth, says Mark Prichard, PhD, who serves on the board of directors of the International Society for Antiviral Research. The combo drug works better in the test tube than currently recommended single or double antiviral therapies used to treat both seasonal and swine flu strains, he says.

Prichard presented his data in September at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy held in San Francisco. The triple-combo testing is led by Adamas Pharmaceuticals, Inc. based in Emeryville, Calif.

"These findings suggest strongly that the triple combo is highly synergistic against virus replication, meaning it strikes multiple targets within H1N1 flu and other strains," Prichard says. "Only human testing will determine for sure, but this combo has the potential to be the antiviral therapy of choice for serious flu infection and to address Tamiflu resistance."

The full article can be found at: <http://www.infectioncontrolday.com/hotnews/antiviral-resistant-swine-flu-drug-combo.html>

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ICE ON THE LOOKOUT FOR COUNTERFEIT FLU VACCINES

By Louis Chunovic

Government Security Newswire

October 29, 2009

"ICE and its partners at the National Intellectual Property Rights Coordination Center (IPR Center), which is the focal point of the anti-counterfeit-drug effort, have "projected a potential influx of counterfeit influenza products," according to the testimony. And they have "proactively initiated undercover activity targeting individuals and websites that were offering potential counterfeit influenza treatment products for sale."

However, thus far ICE has found "no evidence of the illicit production or dissemination of counterfeit antiviral medications in the United States," the officials noted, emphasizing that ICE will "remain diligent" and will "continue to conduct investigative and interdiction activity targeting counterfeit 2009 H1N1 vaccines and other associated pharmaceuticals."

The full article can be found at: <http://www.gsnmagazine.com/cms/features/news-analysis/2878.html>

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TWO-PRONGED PROTEIN ATTACK COULD BE SOURCE OF SARS VIRULENCE

Infection Control Today Magazine

October 29, 2009

"Now, UTMB researchers have uncovered what they believe could be the major factor contributing to the SARS virus' virulence: the pathogen's use of a single viral protein to weaken host cell defenses by launching a "two-pronged" attack on cellular protein-synthesis machinery.

Their results show that copies of this viral protein, known as nsp1, directly interferes with the tiny cellular machines called ribosomes, which make the proteins, such as interferon beta, that are crucial for immune defense. (If the word "ribosome" sounds familiar, it's probably because the three scientists who first determined what the miniature protein factories look like and how they function won the 2009 Nobel Prize for Chemistry.) Nsp1 is also involved in degrading the biochemical messages that are decoded by these ribosomes to produce such proteins.

"This SARS virus protein, nsp1, binds to ribosomes to inactivate them and also modifies messenger RNA molecules to make them unreadable," said UTMB professor Shinji Makino,

senior author of a paper on the discovery appearing in the online edition of Nature Structure and Molecular Biology. "We think that this property of nsp1 could be a major player in the virulence of SARS."

The full article can be found at: <http://www.infectioncontroltoday.com/hotnews/ribosomes-viral-protein-sars-virulence.html>

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FLU-WARY TELECOMMUTERS MAY CLOG WEB NETWORKS, GAO SAYS

By Cecilia Kang

The Washington Post

October 28, 2009

"The Government Accountability Office reported earlier this week that if the flu reaches a pandemic, a surge in telecommuting and children accessing video files and games at home could bog down local networks."

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"The Department of Homeland Security is in charge of communications networks during times of national emergency. But it doesn't have a strategy to deal with overloaded Internet networks -- an essential resource to keep the economy humming, and residents informed and connected during a pandemic, the GAO said. Furthermore, the DHS hasn't coordinated with agencies such as the Federal Communications Commission to create guidelines for how telecom, cable and satellite providers can minimize congestion."

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"Network operators such as Comcast, AT&T, Cox and Verizon are limited in their options. They could add bandwidth capacity and lay down private lines for essential workers, but that is expensive and would take too long. Shutting down certain Web sites or prioritizing traffic could run into technical and regulatory hurdles, the report said."

The full article can be found at: <http://www.washingtonpost.com/wp-dyn/content/article/2009/10/27/AR2009102703743.html>

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WHO EXPERTS FAVOR SINGLE-DOSE H1N1 VACCINE REGIMEN

By Lisa Schnirring

CIDRAP News (Center for Infectious Disease Research & Policy – University of Minnesota)

October 30, 2009

"The level of evidence in October is much higher than July, and the recommendations are

much more precise than July," she said.

After examining clinical trial data for all versions of the vaccine, the group recommended a single dose for everyone aged 10 and older, as long as such use in line with national regulatory authorities. Though the group said immunogenicity data are more limited for young children, it also recommended that countries that have children as a high-priority group administer one dose so that as many children can be vaccinated as possible."

The full article can be found at: <http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/oct3009sage.html>

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UKRAINE IMPOSES SOCIAL DISTANCING STEPS AMID FLU SURGE

By Lisa Schnirring

CIDRAP News (Center for Infectious Disease Research & Policy – University of Minnesota)

October 30, 2009

"Ukrainian officials today shuttered schools and banned public meeting for the next 3 weeks in the wake of a spike in pandemic flu and the country's first H1N1 deaths, which have sparked speculation that the disease has become worse in some patients or that another pathogen is circulating.

Prime Minister Yulia Tymoshenko announced that the spikes in virus activity were affecting three parts of western Ukraine where large number of respiratory illnesses have been reported since the middle of October, Reuters reported today."

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"The report identified the hardest hit areas as the Ternopil, Ivano-Frankivsk, and Lviv regions."

The full article can be found at: <http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/oct3009ukraine.html>

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SAUDIS TO BEGIN MASS FLU VACCINATIONS AS HAJJ NEARS

Agence France-Presse on Google News

November 02, 2009

"Saudi Arabia said Monday it is to vaccinate all its residents attending the hajj against swine flu, pressing ahead with plans to host millions of the world's Muslims despite a heightened pandemic alert.

The kingdom has received the first tranche of 11 million vaccine doses it has ordered for the A(H1N1) flu.

Authorities were to begin vaccinating hundreds of thousands of health and other hajj workers as well as domestic pilgrims against swine flu from next week, said a senior Saudi health official.

Anyone working on the annual Muslim hajj pilgrimage to Mecca and Medina was being strongly urged to get vaccinated, said Dr Ziad Memish, the assistant deputy health minister for preventive medicine.

"The priority is for local pilgrims," he told AFP, referring to the estimated one-million plus Saudis and residents of the country who will embark on the hajj."

The full article can be found at: <http://www.google.com/hostednews/afp/article/ALeqM5iCMtbri8Vh4wV9o79q6Siju7ZKKg>

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MOST H1N1 PATIENTS WITH RESPIRATORY FAILURE TREATED WITH OXYGENATING SYSTEM SURVIVE ILLNESS

NewsRx Health

November 1, 2009

"Despite the severity of disease and the intensity of treatment, most patients in Australia and New Zealand who experienced respiratory failure as a result of 2009 influenza A(H1N1) and were treated with a system that adds oxygen to the patient's blood survived the disease, according to a study to appear in the November 4 issue of JAMA. This study is being published early online because of its public health importance.

The influenza A(H1N1) pandemic affected Australia and New Zealand during the 2009 southern hemisphere winter, causing an epidemic of critical illness. Some patients developed severe acute respiratory distress syndrome (ARDS) and were treated with extracorporeal membrane oxygenation (ECMO), according to background information in the article."

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"The Australia and New Zealand Extracorporeal Membrane Oxygenation (ANZ ECMO) Influenza Investigators in collaboration with the Australian and New Zealand Intensive Care Research Centre at Monash University in Melbourne, conducted an observational study of patients with 2009 influenza A(H1N1)-associated ARDS treated with ECMO in 15 intensive care units (ICUs) in Australia and New Zealand between June 1 and August 31, 2009. The researchers looked at incidence, clinical features, the degree of lung dysfunction, technical characteristics, the duration of ECMO, complications, and survival.

The study found that 68 patients with severe influenza-associated ARDS were treated with ECMO, including 53 with confirmed 2009 influenza A(H1N1). An additional 133 patients with

influenza A received mechanical ventilation, but not ECMO, in the same ICUs. The 68 patients who received ECMO had a median (midpoint) age of 34.4 years and half were men.

"Affected patients were often young adults, pregnant or postpartum, obese, had severe respiratory failure before ECMO, and received prolonged mechanical ventilation and ECMO support," the authors write.

The median duration of ECMO support was ten days. At the time of reporting, 54 of the 68 patients had survived and 14 (21 percent) had died. Six patients remained in ICU, including two who were still receiving ECMO. Sixteen patients were still hospitalized, but out of ICU, and 32 had been discharged from the hospital."

Link not available.

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