

18 September 2008

*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 S&T Supplement 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 – S&T Supplement**

### **1. AN IN VIVO PASSIVE PROTECTION ASSAY FOR THE EVALUATION OF IMMUNITY**

**IN AVA-VACCINATED INDIVIDUALS:** *"These results demonstrate a reliable in vivo neutralization method that correlates with standard in vitro measures of neutralizing antibody levels in plasma from individuals vaccinated with the standard anthrax vaccine."*

### **2. PRESSURE BIOSCIENCES AND USAMRIID SIGN RESEARCH AGREEMENT:**

*"Researchers at US Army Medical Research Institute of Infectious Diseases (USAMRIID) have recently shown that the use of the company's patented pressure cycling technology (PCT) with patent-pending chemical reagents has resulted in the simultaneous decontamination and extraction of macromolecules (DNA, RNA, proteins, lipids) as well as small molecules from samples containing infectious pathogens."*

**3. IS RE-EMERGING SUPERBUG THE NEXT MRSA?:** *".....the infection his mother probably had was of the NAP1 type of the bacteria Clostridium difficile, a virulent strain of a common intestinal bacteria currently plaguing hospitals that now rivals the superbug methicillin-resistant Staphylococcus aureus (MRSA) as one of the top emerging disease threats to humans."*

### **4. ENANTA PHARMACEUTICALS INITIATES PHASE IA STUDY OF ORAL**

**ANTIBIOTIC:** *"Enanta Pharmaceuticals, a developer of small molecule anti-infective drugs, has initiated a Phase Ia study on investigational oral antibiotic EDP-322, a methicillin-resistant Staphylococcus aureus-active Bicyclolide, a novel macrolide-related drug class with a distinct resistance profile."*

### **5. AN IMPROVED METHOD FOR DEVELOPMENT OF TOXOID VACCINES AND**

**ANTI TOXINS:** *"We describe here for the first time a simple, less time consuming, novel method for producing a non-toxic toxoid that is structurally and antigenically more similar to the native toxin."*

### **6. A NOVEL EXPOSURE SYSTEM FOR THE EFFICIENT AND CONTROLLED**

**DEPOSITION OF AEROSOL PARTICLES ONTO CELL CULTURES:** *"In most studies investigating these interactions in vitro, particle deposition differs greatly from the in vivo situation, causing controversial results."*

# CB Daily Report

## *Chem-Bio News*

---

### **AN IN VIVO PASSIVE PROTECTION ASSAY FOR THE EVALUATION OF IMMUNITY IN AVA-VACCINATED INDIVIDUALS**

Medical Letter on the CDC & FDA

September 21, 2008

Researchers at the US Army Medical Research Institute of Infectious Diseases have written:

"Samples of human plasma from anthrax vaccine adsorbed (AVA, BioThrax)-vaccinated individuals were used to demonstrate passive protection of A/J mice from a lethal challenge with the Sterne strain of anthrax bacteria. The maximum concentration of human anti-protective antigen IgG in mouse sera 24 h after injection of 260 microg of anti-PA IgG was 134 microg/ml, declining to 91 microg/ml at 72 h (half-life=101.7 h)."

"Mice showed significant survival ( $p \leq 0.001$ ) after injection of serial dilutions up to 1:4 of the standard plasma and challenged with 100 LD<sub>50</sub>. Similarly, mice injected with the standard anti-AVA plasma and challenged up to 5 days post-treatment also survived ( $p \leq 0.001$ ). Using a cohort of human plasma to measure passive protection, the best correlation between passive protection and an in vitro assay was found to be with the quantitative toxin neutralization assay (minimum fold increase in odds of survival: 2.71,  $p=0.0062$ ). These results demonstrate a reliable in vivo neutralization method that correlates with standard in vitro measures of neutralizing antibody levels in plasma from individuals vaccinated with the standard anthrax vaccine."

The full article can be found at: (J.F. Hewetson, et. al., "An in vivo passive protection assay for the evaluation of immunity in AVA-vaccinated individuals". *Vaccine*, 2008;26(33):4262-6). Link not available.

[Return to Top](#)

---

### **PRESSURE BIOSCIENCES AND USAMRIID SIGN RESEARCH AGREEMENT**

Pharmaceutical Business Review

September 12, 2008

"Researchers at US Army Medical Research Institute of Infectious Diseases (USAMRIID) have recently shown that the use of the company's patented pressure cycling technology (PCT) with patent-pending chemical reagents has resulted in the simultaneous decontamination and extraction of macromolecules (DNA, RNA, proteins, lipids) as well as small molecules from samples containing infectious pathogens."

The purpose of this cooperative research and development agreement (CRADA) is to adapt PCT into protocols for the development of medical countermeasures against dangerous pathogens that endanger the warfighter. The CRADA will allow scientists from Pressure BioSciences (PBI) and USAMRIID to combine resources, experiences, and expertise to help achieve this goal."

The full article can be found at: [http://www.pharmaceutical-business-review.com/article\\_news.asp?guid=C84FDC3F-99D4-4222-AC27-27CD47C1EF72](http://www.pharmaceutical-business-review.com/article_news.asp?guid=C84FDC3F-99D4-4222-AC27-27CD47C1EF72)

[Return to Top](#)

---

## **IS RE-EMERGING SUPERBUG THE NEXT MRSA?**

Infection Control Today Magazine

September 15, 2008

"She lost almost 55 pounds between July Fourth and Christmas in 2006," said Corboy, a resident of Wilmette, Ill. "She was so sick, so weak and despite the best care of her doctors, she was getting weaker. It was clear she was in big trouble."

Afraid that his mother was running out of time, Corboy called the Centers for Disease Control and Prevention (CDC) in Atlanta for advice. Dr. Clifford McDonald told him the infection his mother probably had was of the NAP1 type of the bacteria *Clostridium difficile*, a virulent strain of a common intestinal bacteria currently plaguing hospitals that now rivals the superbug methicillin-resistant *Staphylococcus aureus* (MRSA) as one of the top emerging disease threats to humans."

"Similar to MRSA, *C. diff* is an infection that is mainly acquired in a hospital or nursing home, although like MRSA there is some evidence that a community-acquired strain may be developing, according to the CDC.

"When a patient is in the hospital getting antibiotics for some type of infection, one of the potential complications is that the normal bacterium that lives in the colon is disturbed with that antibiotic. That makes you susceptible to an infection with *Clostridium difficile*," Johnson said. "The great majority of cases occur in people who have recently used antibiotics."

When *C. diff* is not actively dividing, it forms very tough spores that can exist on surfaces for months and years, making it very difficult to kill, Johnson said."

The full article can be found at: <http://www.infectioncontroltoday.com/hotnews/c-difficile-and-mrsa-infections,p3.html>

[Return to Top](#)

---

## **ENANTA PHARMACEUTICALS INITIATES PHASE IA STUDY OF ORAL ANTIBIOTIC**

Pharmaceutical Business Review

September 16, 2008

"Enanta Pharmaceuticals, a developer of small molecule anti-infective drugs, has initiated a Phase Ia study on investigational oral antibiotic EDP-322, a methicillin-resistant Staphylococcus aureus-active Bicyclolide, a novel macrolide-related drug class with a distinct resistance profile."

"The clinical development program for EDP-322 will include the treatment of hospital- and community-acquired gram-positive infections, including methicillin-resistant Staphylococcus aureus (MRSA)."

The full article can be found at: [http://www.pharmaceutical-business-review.com/article\\_news.asp?guid=59C3FDDF-6D40-4D38-9CE7-C1CC7967500B](http://www.pharmaceutical-business-review.com/article_news.asp?guid=59C3FDDF-6D40-4D38-9CE7-C1CC7967500B)

[Return to Top](#)

---

## **AN IMPROVED METHOD FOR DEVELOPMENT OF TOXOID VACCINES AND ANTITOXINS**

Medical Letter on the CDC & FDA  
September 21, 2008

"Whilst formaldehyde inhibits toxin activity, it induces so many structural changes in the molecule that immunisation often results in low levels of neutralising antibodies. We describe here for the first time a simple, less time consuming, novel method for producing a non-toxic toxoid that is structurally and antigenically more similar to the native toxin. Toxin is chemically inactivated by alkylation with iodoacetamide in the presence of reversibly denaturing conditions. This reduces neurotoxic activity by at least 7-orders of magnitude to undetectable levels. Following immunisation, in vivo neutralising antibody levels were 600-times higher than those produced with formaldehyde toxoid, despite generating equivalent ELISA antitoxin binding titres. These studies demonstrate that the new toxoid retains more of the native toxins structure and critical epitopes responsible for inducing life-saving neutralising antibody."

"Toxoid produced by the new method should substantially improve both antitoxin and vaccine production and be applicable to other toxins and immunogens."

The full article can be found at: (R.G. Jones, et. al., "An improved method for development of toxoid vaccines and antitoxins". Journal of Immunological Methods, 2008;337(1):42-8).  
Link not available.

[Return to Top](#)

---

## **A NOVEL EXPOSURE SYSTEM FOR THE EFFICIENT AND CONTROLLED DEPOSITION OF AEROSOL PARTICLES ONTO CELL CULTURES**

Biotech Week

September 17, 2008

"Epidemiologic studies have shown correlations between morbidity and particles  $\leq 2.5$  microm generated from pollution processes and manufactured nanoparticles."

"The interaction of particles with the lung, the main pathway of undesired particle uptake, is poorly understood. In most studies investigating these interactions in vitro, particle deposition differs greatly from the in vivo situation, causing controversial results. We present a nanoparticle deposition chamber to expose lung cells mimicking closely the particle deposition conditions in the lung. In this new deposition chamber, particles are deposited very efficiently, reproducibly, and uniformly onto the cell culture, a key aspect if cell responses are quantified in respect to the deposited particle number."

"In situ analyses of the lung cells, e.g., the ciliary beat frequency, indicative of the defense capability of the cells, are complemented by off-line biochemical, physiological, and morphological cell analyses."

The full article can be found at: (M. Savi, et. al., "A novel exposure system for the efficient and controlled deposition of aerosol particles onto cell cultures". Environmental Science & Technology, 2008;42(15):5667-74). Link not available.

[Return to Top](#)

---

**END** of CB Daily Report.

Send subscription requests, unsubscribing requests, questions and comments to:

**Steve Tesko:** [Steve.Tesko@anser.org](mailto:Steve.Tesko@anser.org)

Copyright 2008. *Analytic Services Inc.*

[Analytic Services Inc. DMCA Copyright Notice: http://www.homelandsecurity.org/bulletin/Draft\\_ANSER\\_DCMA\\_Copyright\\_Notice.htm](http://www.homelandsecurity.org/bulletin/Draft_ANSER_DCMA_Copyright_Notice.htm)

Use of these news articles does not reflect official endorsement.

In accordance with Title 17 (USC), Section 107, this material is distributed without profit or payment and is intended for nonprofit research and educational purposes only.

Reproduction for private use or gain is subject to original copyright restrictions.

#### **PRIVACY POLICY**

Content provided in the *CB Daily Report* does not reflect the viewpoint(s) of Analytic Services Inc. Analytic Services Inc. does not share, publish, or in any way redistribute subscriber email addresses or any other personal information.