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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 - S&T Edition

1. AVAILABILITY OF MEDICAL COUNTERMEASURES FOR BIOTERRORISM EVENTS:

US LEGAL AND REGULATORY OPTIONS: *"This article discusses legal and regulatory options for countermeasure distribution that address liability concerns and access to unapproved countermeasures during an emergency."*

2. GROUPS DISAGREE ABOUT GULF WAR ILLNESS RESEARCH: *"Those opposing views were on full display May 19 in the first of three congressional hearings about Gulf War Illness."*

3. APPLICATION OF DEADENYLASE ELECTROCHEMILUMINESCENCE ASSAY FOR RICIN TO FOODS IN A PLATE FORMAT: *"Signal-to-noise ratios for the plate-based assay were comparable to those for the bead-based assay for ricin in citrate buffer. but 2- to 4.5-fold higher when the plate-based assay was used for analysis of juice samples."*

4. NOVEL MYCOTOXIN FROM ACREMONIUM EXUVIARUM IS A POWERFUL INHIBITOR OF THE MITOCHONDRIAL RESPIRATORY CHAIN COMPLEX III: *"A novel mycotoxin named acrebol, consisting of two closely similar peptaibols (1726 and 1740 Da), was isolated from an indoor strain of the mitosporic ascomycete fungus Acremonium exuviarum."*

CB Daily Report

Chem-Bio News

AVAILABILITY OF MEDICAL COUNTERMEASURES FOR BIOTERRORISM EVENTS: US LEGAL AND REGULATORY OPTIONS

By C Maher and BD Lushniak
Clinical Pharmacology & Therapeutics
April 22, 2009

“Plans for mass distribution of medical countermeasures raise challenging problems, including legal and regulatory issues. Many in the distribution chain have expressed concerns over the potential for liability when countermeasures are distributed in accordance with large-scale response plans. This is of particular concern if the medical countermeasure involved has not been approved, cleared, or licensed by the US Food and Drug Administration (FDA). This article discusses legal and regulatory options for countermeasure distribution that address liability concerns and access to unapproved countermeasures during an emergency.”

The full article can be found at: <http://www.nature.com/clpt/journal/v85/n6/full/clpt200955a.html>

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GROUPS DISAGREE ABOUT GULF WAR ILLNESS RESEARCH

By Kelly Kennedy

Air Force Times

May 21, 2009

“The Pentagon and Department of Veterans Affairs say an Institute of Medicine study shows there is no Gulf War “syndrome,” and that there is nothing unique about the symptoms 1 in 4 Desert Storm veterans suffer.

But the congressionally mandated Research Advisory Committee on Gulf War Illness say that not only is there a series of symptoms that make up a definable illness, they know what caused that illness.

Those opposing views were on full display May 19 in the first of three congressional hearings about Gulf War Illness.

“We do believe that Gulf War illnesses are real — but there is no unique set of symptoms,” said Craig Postlewaite, deputy director of force readiness and health assurance under the assistant secretary of defense for health affairs.

He based that view on the IOM study that concluded veterans’ symptoms vary too much to be seen as unique and recommended no more epidemiological studies.

“We feel like their assessment is complete,” Postlewaite told the House Committee on Veterans’ Affairs’ subcommittee on oversight and investigations.

The Gulf War advisory committee disagreed. “They have the same types and patterns of excess symptoms,” Lea Steele, immediate past scientific director of the committee, told lawmakers. “Our review provides a clear conclusion.”

She said the research shows that veterans who took the most pyridostigmine bromide — anti-nerve-agent pills — and used the most insect repellent, including flea collars, were most likely to suffer from the cluster of symptoms of known as Gulf War illness.

Victims of the sarin gas attacks in Tokyo as well as animal studies produced the same cluster of symptoms, she said. The pills, pesticides and nerve agent are similar chemicals, so it appears that troops essentially overdosed."

The full article can be found at: http://www.airforcetimes.com/news/2009/05/military_gulf_war_illness_studies_052009w/

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APPLICATION OF DEADENYLASE ELECTROCHEMILUMINESCENCE ASSAY FOR RICIN TO FOODS IN A PLATE FORMAT

Food & Farm Week
May 21, 2009

"A recently developed bead-based deadenylase electrochemiluminescence assay for ricin is simple and sensitive in its ability to detect ricin, based on the catalytic activity of the toxin subunit, ricin A chain. The assay was modified to work in a 96-well plate format and evaluated by using juice samples. The plate-based assay, unlike the bead-based assay, includes wash steps that enable the removal of food particles."

"These steps minimize matrix effects and improve the signal-to-noise ratios and limits of detection (LOD). The LOD values for ricin in apple juice, vegetable juice, and citrate buffer by using the bead-based assay were 0.4, 1, and 0.1 $\mu\text{g/ml}$, respectively. In contrast, the LOD values for ricin by using the plate-based assay were 0.04, 0.1, and 0.04 $\mu\text{g/ml}$ in apple juice, vegetable juice, and citrate buffer, respectively. The plate-based assay displayed three- to 10-fold lower LOD values than did the bead-based assay."

"Signal-to-noise ratios for the plate-based assay were comparable to those for the bead-based assay for ricin in citrate buffer. but 2- to 4.5-fold higher when the plate-based assay was used for analysis of juice samples."

The full article can be found at: (C.Y. Cho, et. al., "Application of Deadenylase Electrochemiluminescence Assay for Ricin to Foods in a Plate Format". Journal of Food Protection, 2009; 72(4): 903-906). Link not available.

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NOVEL MYCOTOXIN FROM ACREMONIUM EXUVIARUM IS A POWERFUL INHIBITOR OF THE MITOCHONDRIAL RESPIRATORY CHAIN COMPLEX III

Life Science Weekly
May 19, 2009

"A novel mycotoxin named acrebol, consisting of two closely similar peptaibols (1726 and 1740 Da), was isolated from an indoor strain of the mitosporic ascomycete fungus

Acremonium exuviarum.”

"Acrebol inhibited complex III of the respiratory chain of isolated rat liver mitochondria (1 mg of protein mL(-1)) with an IC50 of similar to 80 ng mL(-1) (50 nM) after a short preincubation, and 350 ng mL(-1) caused immediate and complete inhibition. Acrebol thus is a complex III inhibitor almost as potent as antimycin A and myxothiazol but completely different in structure. Similarly to myxothiazol but in contrast to antimycin A, acrebol decreased the level of mitochondrial superoxide anion detectable by chemiluminescent probe 3,7-dihydro-2-methyl-6-(4-methoxyphenyl)imidazol[1,2-a]pyrazine-3-one. Unlike other peptaibols, acrebol in toxic concentrations did not increase the ionic and solute permeability of membranes of isolated rat liver mitochondria, did not induce disturbance of the ionic homeostasis or the osmotic balance of mitochondria, and did not release apoptogenic proteins like cytochrome c from the intermembrane space of mitochondria. In boar spermatozoa, acrebol inhibited the respiratory chain and caused ATP depletion by activation of the oligomycin-sensitive FOF1-ATPase, which resulted in the inhibition of the progressive movement. In mouse insulinoma MIN-6 cells, whose energy supply solely depends on oxidative phosphorylation, acrebol induced necrosis-like death.”

The full article can be found at: (A.G. Kruglov, et. al., “Novel Mycotoxin from Acremonium exuviarum Is a Powerful Inhibitor of the Mitochondrial Respiratory Chain Complex III”. Chemical Research in Toxicology, 2009; 22(3):565-573). Link not available.

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Steve Tesko: Steve.Tesko@anser.org

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