

22 October 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 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 Edition

1. TMTI INDUSTRY DAY: *“TMTI Industry Day will be held as an ancillary workshop during the Defense Threat R[edu]ction Agency's Chemical and Biological Defense Science and Technology (CBD S&T) Conference on November 18-19, 2009 at the Hyatt Regency in Dallas, TX.”*

2. DOD'S DTRA TO ISSUE \$500 MILLION IN GRANTS FOR FUNDAMENTAL RESEARCH TO COUNTER WMD: *“The Department of Defense's Defense Threat Reduction Agency (DTRA) has begun a half-billion dollar grant program, and seeks white-paper proposals from accredited colleges and universities, as well as from commercial businesses and non-profit organizations, on ways to “reduce, eliminate and counter” biological, chemical, nuclear and other weapons of mass destruction (WMD) threats to the U.S.”*

3. PIONEERING WORK ON CELL-PHONE IMAGING COULD TRANSFORM GLOBAL HEALTH CARE: *“In Ozcan's lab, a prototype cell phone diagnostic unit has been constructed that utilizes LUCAS, an innovative lens-free, high-throughput imaging platform. LUCAS (Lensless Ultra-wide-field Cell Monitoring Array platform based on Shadow imaging) first uses a light source to illuminate a sample of blood, saliva or other fluid. Then, with a sensor array, a “shadow image” - essentially a diffraction pattern - is obtained of the microparticles in the sample, such as red blood cells.”*

4. EBOLA VIRUS VP35 ANTAGONIZES PKR ACTIVITY THROUGH ITS C-TERMINAL INTERFERON INHIBITORY DOMAIN: *“Moreover, we show that PKR activation is not only blocked but reversed by Ebola virus infection.”*

5. EBOLAVIRUS GLYCOPROTEIN GP MASKS BOTH ITS OWN EPITOPES AND THE PRESENCE OF CELLULAR SURFACE PROTEINS: *“In this study, we demonstrated the molecular mechanism responsible for the downregulation of surface markers caused by EBOV GP expression.”*

6. NEUTRALIZING ANTIBODIES OF BOTULINUM NEUROTOXIN SEROTYPE A SCREENED FROM A FULLY SYNTHETIC HUMAN ANTIBODY PHAGE DISPLAY LIBRARY: *“It also proved that it was a quick method to obtain human therapeutic antibodies by selecting from the fully synthetic human antibody phage display library.”*

CB Daily Report

Chem-Bio News

TMTI INDUSTRY DAY

DTRA through CBRNIAC E-mail Announcement
October 19, 2009

"TMTI Industry Day will be held as an ancillary workshop during the Defense Threat Reduction Agency's Chemical and Biological Defense Science and Technology (CBD S&T) Conference on November 18-19, 2009 at the Hyatt Regency in Dallas, TX. Professionals from government, academia, biotechnology, and pharmaceutical industries are invited to attend to learn about TMTI and discuss collaborative opportunities with the program, the current state of medical countermeasure preparedness, and plans for enhancing national capabilities to respond to emerging and novel biological threats. Visit www.tmti-cbdefense.org for more details."

Link not available.

[Return to Top](#)

DOD'S DTRA TO ISSUE \$500 MILLION IN GRANTS FOR FUNDAMENTAL RESEARCH TO COUNTER WMDS

By Louis Chunovic
Government Security News
October 19, 2009

"The Department of Defense's Defense Threat Reduction Agency (DTRA) has begun a half-billion dollar grant program, and seeks white-paper proposals from accredited colleges and universities, as well as from commercial businesses and non-profit organizations, on ways to "reduce, eliminate and counter" biological, chemical, nuclear and other weapons of mass destruction (WMD) threats to the U.S.

The DTRA is looking to "identify, adopt and adapt emerging, existing and revolutionary sciences" with the potential to counter the WMD threats. Individual grants are expected to range from \$150,000 to \$300,000 per year, and to be typically for three years, with an additional two options years."

.....

"The specific title of the DTRA's Broad Agency Announcement is Fundamental Research to Counter Weapons of Mass Destruction (FRCWMD). The funding opportunity number for this program is HDTRA1-09-14-FRCWMD-BAA.

The current closing date for applications is September 30, 2014, although there are various phases and windows within that period."

The full article can be found at: <http://www.gsnmagazine.com/cms/features/news-analysis/2814.html>

[Return to Top](#)

PIONEERING WORK ON CELL-PHONE IMAGING COULD TRANSFORM GLOBAL HEALTH CARE

Medical News Today

October 05, 2009

"In Ozcan's lab, a prototype cell phone diagnostic unit has been constructed that utilizes LUCAS, an innovative lens-free, high-throughput imaging platform. LUCAS (Lensless Ultra-wide-field Cell Monitoring Array platform based on Shadow imaging) first uses a light source to illuminate a sample of blood, saliva or other fluid. Then, with a sensor array, a "shadow image" - essentially a diffraction pattern - is obtained of the microparticles in the sample, such as red blood cells.

Because red blood cells and other microparticles have a distinct diffraction pattern, they can be identified and counted virtually instantaneously by LUCAS using a custom-developed "decision algorithm" that compares the captured shadow images to a library of images. Data collected by LUCAS can then be sent to a hospital for analysis and diagnosis using the cell phone, or transferred by USB to a computer for transmission to a hospital.

The compact, lightweight and portable nature of LUCAS makes the potential impact of Ozcan's mobile lab very exciting. Currently, microscopes and advanced medical lab equipment, like flow cytometers, represent the standard for examining, identifying and counting cells. But they are bulky, cost tens of thousands of dollars and require trained technicians to operate.

"With LUCAS, we were able to simplify the imaging device. And because LUCAS does not require a lens, we were also able to increase the visual field to a few hundred times larger than the area that can be seen under a microscope," Ozcan said. "LUCAS really provides a capability that doesn't exist today."

The full article can be found at: <http://www.medicalnewstoday.com/articles/166165.php>

[Return to Top](#)

EBOLA VIRUS VP35 ANTAGONIZES PKR ACTIVITY THROUGH ITS C-TERMINAL INTERFERON INHIBITORY DOMAIN

Drug Week

October 23, 2009

"Ebola virus VP35 contains a C-terminal cluster of basic amino acids required for double-stranded RNA (dsRNA) binding and inhibition of interferon regulatory factor 3 (IRF3). VP35 also blocks protein kinase R (PKR) activation; however, the responsible domain has remained undefined."

"Here we show that the IRF inhibitory domain of VP35 mediates the inhibition of PKR and enhances the synthesis of coexpressed proteins. In contrast to dsRNA binding and IRF inhibition, alanine substitutions of at least two basic amino acids are required to abrogate PKR inhibition and enhanced protein expression."

"Moreover, we show that PKR activation is not only blocked but reversed by Ebola virus infection."

The full article can be found at: (M. Schumann, et. al., "Ebola Virus VP35 Antagonizes PKR Activity through Its C-Terminal Interferon Inhibitory Domain". Journal of Virology, 2009; 83 (17):8993-8997). Link not available.

[Return to Top](#)

EBOLAVIRUS GLYCOPROTEIN GP MASKS BOTH ITS OWN EPITOPES AND THE PRESENCE OF CELLULAR SURFACE PROTEINS

Blood Weekly

October 22, 2009

"The spike glycoprotein (GP) is believed to be one of the major determinants of virus pathogenicity. In this study, we demonstrated the molecular mechanism responsible for the downregulation of surface markers caused by EBOV GP expression."

"We showed that expression of mature GP on the plasma membrane results in the masking of cellular surface proteins, including major histocompatibility complex class I. Overexpression of GP also results in the masking of certain antigenic epitopes on GP itself, causing an illusory effect of disappearance from the plasma membrane."

The full article can be found at: (O. Reynard, et.al., "Ebola Virus Glycoprotein GP Masks both Its Own Epitopes and the Presence of Cellular Surface Proteins". Journal of Virology, 2009; 83 (18):9596-9601). Link not available.

[Return to Top](#)

NEUTRALIZING ANTIBODIES OF BOTULINUM NEUROTOXIN SEROTYPE A SCREENED FROM A FULLY SYNTHETIC HUMAN ANTIBODY PHAGE DISPLAY LIBRARY

Genomics & Genetics Weekly

October 23, 2009

"Using purified Hc fragments of botulinum neurotoxin serotype A (BoNT/A-Hc) as antigen, 2 specific neutralizing antibodies mapping different epitopes were selected from a fully synthetic human antibody library. The 2 antibodies can effectively inhibit the binding between BoNT/A-Hc and differentiated PC-12 cells in vitro, and the neutralization was evaluated in vivo. Although no single mAb completely protected mice from toxin, they both could prolong time to death when challenged with 20 LD(50). (50% lethal doses) of BoNT/A. When used together, the mAbs completely neutralized 1000 LD(50)./mg Ab, suggesting their high neutralizing potency in vivo. The results would lead to further production of neutralizing antibody drugs against BoNT/A."

"It also proved that it was a quick method to obtain human therapeutic antibodies by selecting from the fully synthetic human antibody phage display library."

The full article can be found at: (R. Yu, et. al., "Neutralizing antibodies of botulinum neurotoxin serotype A screened from a fully synthetic human antibody phage display library". Journal of Biomolecular Screening, 2009; 14(8): 991-8). 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

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.