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Learning to Care for Those in Harm's Way

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**On the cover**

Students in *The Domestic Disaster Management and Response* course attend a panel on chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) disaster response. Learn more on pg. 5. (photo by Christopher Austin)

Shiga Toxin Rapid Diagnostic Assay Earns USU-HJF Third Consecutive Tech Transfer Award

by Sharon Holland, deputy vice president for external affairs/ managing editor



Dr. Louis Teel (left) and Dr. Alison O'Brien (right) display the "Shiga Toxin Quick Check." (photo by Christopher Austin)

For an astounding third consecutive year, F. Edward Hébert School of Medicine faculty, in conjunction with the Uniformed Services University and The Henry Jackson Foundation (HJF) technology transfer team, have been selected as recipients of the Federal Laboratory Consortium's (FLC) Award for Technology Transfer.

Dr. Alison O'Brien, professor and chair of the SOM's Department of Microbiology and Immunology, and Dr. Louise Teel, associate professor in the Department of Microbiology and Immunology, were selected as this year's award recipients.

The award was presented based on the development of monoclonal antibodies by O'Brien to two immunologically distinct types of Shiga toxin, Stx1 and Stx2, which are responsible for numerous disease manifestations from the consumption of undercooked meat, raw milk and milk products, unpasteurized juices, lettuce, spinach, chili peppers, etc. The monoclonal antibodies were then used by O'Brien and Teel to develop a Shiga toxin diagnostic assay that pro-

vides a method to detect the Shiga toxins produced by *Escherichia coli* (STEC).

The development of two Shiga toxin diagnostic assays, "Shiga Toxin Chek" and "Shiga Toxin Quik Check," provide rapid tests that are able to detect and differentiate Stx1 and Stx2 toxins from STEC, allowing for the timely diagnosis of STEC and for the implementation of an appropriate treatment plan.

Drs. O'Brien and Teel join last year's recipient, Dr. George Peoples and 2013 recipient, Dr. Christopher Broder as award winners.

Dr. Peoples, a professor of surgery in the School of Medicine at USU, and chief of surgical oncology at the San Antonio Military Medical Center, received the FLC award for work to license a promising vaccine to reduce breast cancer recurrence rates.

Dr. Broder, professor of Microbiology and Immunology, along with his USU team and collaborators, developed the first treatment for and the first vaccine against the deadly Hendra and Nipah viruses.

GSN Celebrates The Army Nurse Corps' 114th Birthday

by Christopher Austin, editor/ layout design



In Army Nurse Corps tradition, the most junior Army Nurse Corps officer in the room, Army Capt. Mark Benito (left), and the most senior, Army Col. Paul C. Lewis (right), use a saber to cut the cake at the Army Nurse Corps 114th Anniversary celebration. (photo by Army Sgt. Jeffrey Dillon)

The Daniel K. Inouye Graduate School of Nursing celebrated the Army Nurse Corps 114th birthday in lecture hall F of building E at Uniformed Services University on Feb. 3.

“The Army Nurse Corps talks about embracing the past, engag-

ing the present and envisioning the future,” said Dr. Carol A. Romano, the dean of the Daniel K. Inouye Graduate School of Nursing. “When you embrace the past, you’re celebrating what’s gone before us. When we engage the present, we think about what we’re

doing today in Army nursing and in our lives. But we also envision the future happy birthdays for another 114 years.”

The event began with a brief history of the Army Nurse Corps, highlighting its origins in 1898 with the announcement of the Spanish-American War when female nurses were hired by the government for \$30 per month and a daily ration, and being formally established on Feb. 1, 1901 by a congressional bill.

“Go back and read your Army Nurse Corps history. It is replete with firsts for the Army. We set the standard in so many ways for the Army Nurse Corps because we are built of such wonderful individuals,” said Army Col. (Dr.) Paul C. Lewis, an assistant professor at the GSN. “You’re all driven, you’re all professionals and we strive for the best that we can possibly do. That’s what makes the Army Nurse Corps the best corps in the army.”

SAVE THE DATE

10th Annual Amygdala, Stress and PTSD Conference: Of Mice and Man

April 21, 2015, USU, Sanford Auditorium

The Amygdala, Stress and PTSD Conference at the Uniformed Services University brings together scientists and clinicians working toward solving the biological basis of stress, fear, and posttraumatic stress disorder. The conference is sponsored by Center for the Study of Traumatic Stress (CSTS) of the Uniformed Services University in collaboration with the USU Department of Psychiatry, USU Neuroscience Program, USU Department of Family Medicine, and the Walter Reed National Military Medical Center, Department of Psychiatry.

To learn more and to register please visit: <http://www.amygdalaptsdconference.org>.

Registration will remain open through 14 April 2015. This event is free and open to the public. Continuing Education credits will be offered.

Research links shift work, increased cancer risk

by Mass Communications Specialist 3rd Class, writer and photographer

Dr. Melannie Alexander, a research associate at Uniformed Services University gave a lecture in January titled “Occupational Exposures and Epigenetic Alterations,” highlighting her research on the possible link between shift-work, one of many occupational exposures, and the increased risk of developing cancer.

“It is believed that there are certain genes within the deoxyribonucleic acid sequence that when turned off, will stop the processes in the body that prevent cancer,” said Alexander. “Genes are turned on and off by attaching chemical tags.”

Chemical tags could be produced as a result of occupational exposures and attach to the DNA sequence, and control the level of products produced in the body, she said. While the DNA sequence itself stays the same, the chemical tags attaching themselves to the sequence become mutable. These are known as epigenetic alterations and this effects one’s risk for developing cancer.

“So when you attach these chemical tags to a gene that is considered a tumor suppressor, you’re turning that gene off,” said Alexander. “That’s when a person’s risk for cancer is theoretically increased.”

In contrast, oncogenes, which promote cancer, can be turned on and their activity increased, she added.

While other factors such as diet and exercise, family history, etc., must be considered, linking shift work and increased cancer risk can be backed up by science.

Those who engage in shift work sleep during the day and work at night, she said. That means they spend less time in the sunlight and

therefore may produce less melatonin than a non-shift worker.

“Melatonin follows a circadian pattern,” said Alexander. “It has also been shown that melatonin has some anti-cancer effects, but if you’re not waking up at proper times to receive sunlight during the day, it effects the circadian pattern. Pretty much every system inside the body follows a 24-hour rhythm and when you mess that up, it sort of predisposes one’s risk to cancers.”

Shift workers, in particular, may have an increased risk of developing cancer because they lack enough melatonin in the body to aid in the bodily processes that ward off cancer, and there are other studies that back up this theory, she said.

The International Agency for Research on Cancer published a press release Dec. 5, 2007, that said they considered shift work a probable carcinogen to humans.

In separate studies, researchers looked at the epigenetic patterns in both shift workers and non-shift workers and found differences in the genes that regulate body rhythms. Compelling research findings show tumors growing faster in shift workers than they do in day workers. In the article, “Night-shift work and risk of colorectal cancer in the nurses health study” published June 2003 in the Journal of the National Cancer Institute, data suggests that shift work of at least three nights per month for 15 or



Melannie Alexander, a research associate at the Uniformed Services University, who holds a doctorate in public health, gives a lecture on Occupational Exposures and Epigenetic Alterations at USU, Jan. 22. (photo by MC3 Laura Bailey)

more years may increase the risk of colorectal cancer in women.

Researchers continue to investigate the possible link between shift work and cancer risk, but it is a study still in its youth, according to Alexander.

“More experimentation is needed,” she said. “Epigenetics in relationship to cancer is a lot more complicated than what we first realized. At some point I would really like to see a dose response effect in terms of how much shift work could exert these changes in DNA.”

While doing so may not necessarily show damage to the sequence, it could possibly reveal epigenetic alterations, she added. Maybe then they could figure out how much shift work could be considered appropriate and influence policy changes.

“There needs to be better protection for shift workers against occupational exposures,” said Alexander. “I would hope we’re not doing all of this for nothing. It’s up to us, to researchers, to work with policy makers. We need to talk with people in evaluation, people who are in prevention. It’s a team effort.”

Experts Lead Panel to Prepare Students for Managing Disasters

by Christopher Austin, editor/layout design

The Domestic Disaster Management and Response course is an elective course in the Graduate Public Health Program being taught at Uniformed Services University this year to better prepare students for handling domestic disasters.

Led by Navy Capt. (ret.) (Dr.) Kenneth Schor, and Navy Lt. Cmdr. Tifani Grizzell, the course featured a chemical, biological, radiological, nuclear, and high explosives (CBRNE) response panel on Jan. 23 that provided testimony on some of the realities that go into disaster management.

“The challenge for us is to be extraordinarily energetic and enthusiastic about planning for that which will likely never come,” Schor told the class. “Keeping that enthusiasm every single day is a challenge because the taxpayers will, hopefully, never need to see a return on this preparedness. We don’t ever expect an improvised explosive device going off, and everybody dismisses it as never going to happen.

“But what if it does?” Schor continued. “And they look at us as the people who should have had a really good plan to mitigate its impact and it’s awfully hard to do that when all the experience you have is from national exercises and tabletop exercises and discussions about the what-ifs.”

The uncertain nature of disasters was a constant theme through the discussion with emphasis placed on the importance of exercises and introducing surprises into them to improve their authenticity.

Navy Lt. Cmdr. (ret.) James Area, an industrial hygienist, environmental health officer and



Navy Lt. Cmdr. (ret.) James Area, Navy Capt. (ret.) (Dr.) Kenneth Schor, Army Col. (Dr.) Mark Kortepeter, and Army Col. (Dr.) Neil Page lead the CBRNE panel for the Domestic Disaster Management and Response course. (photo by Christopher Austin)

a speaker during the class, talked about how he ran viral response exercises and changed the criteria for the exercise in the middle of it so that the participants had to drive to another state at a moment’s notice and perform the exercise there.

“I’m never worried about our guys being able to move rocks, being able to decontaminate people or work their equipment,” Area said. “I’m more worried that if something were to happen in the middle of getting there it would be a game stopper. Our guys would be stopped in the road never being able to move anywhere.”

“Murphy’s Law applies, anything that can go wrong will go wrong,” said Army Col. (Dr.) Mark Kortepeter, the associate dean of Research at USU’s F. Edward Hébert School of Medicine. Kortepeter was there to speak as an army consultant in bio-defense.

Another topic focused on the panel was the importance of flexibility in working with CBRNE, particularly in terms of how the effects of one event can require a response normally associated with another.

“When we talk about CBRNE, any disaster you might have – whether it be a ten kiloton nuclear bomb going off or some sort of bio event – they’re all going to run

together. They’re all going to relate in some way,” said Area. “Every nuclear incident is a huge chemical disaster as well. We look at all those separate elements and put them together and that’s CBRNE.”

All topics covered dealt with preparing for CBRNE disasters by having a plan that can be altered. Students were encouraged to build a relationship with the civilian areas around their bases so that they can cooperate in an event; know their role in the chain of command including those who report to them; and know there will be times when they will be limited in what they can do to help.

“The things we talked about weren’t surprising but you don’t think about them as much,” said Navy Lt. Hadley Sulpizio, a Master of Public Health student. “They’re all intuitive so nothing’s coming as a surprise. Last class we talked about mental health and disasters. Our speaker talked about after Hurricane Katrina about people who stayed there. Drug addicts and so forth. I had never thought about that; those people who were staying there because their dealers were there. So it’s something to keep in mind.”

Romano, DeJong named University of Maryland School of Nursing Visionary Pioneer Award Recipients

by Sharon Holland, deputy vice president for external affairs/ managing editor

Dr. Carol A. Romano, dean of the Daniel K. Inouye Graduate School of Nursing, and Air Force Col. Marla DeJong, interim GSN dean of Research, are among 25 University of Maryland School of Nursing (UMSON) alumni named as Visionary Pioneers in nursing for 2015.

As part of its 125th anniversary celebration, UMSON will honor outstanding alumni, both living and deceased, as Visionary Pioneers who have become expert clinicians, educators and leaders in Maryland, the nation and around the world. Those selected have made a significant impact on and contributions to the nursing profession based on their leadership, innovation or entrepreneurship.

“We are excited to announce our inaugural Visionary Pioneer Award winners during this momentous year in the School of Nursing’s history. All of these outstanding alumni have had an impact on the nursing profession and health care, and we are extremely proud of them,” said Dr. Jane M. Kirschling, dean of the School of Nursing.

Romano, who earned her Bachelor of Science in nursing in 1977, her Master’s degree in 1985, and her Ph.D. in 1993 from UMSON, is recognized as a pioneer in nursing informatics. She helped design and implement one of the first computerized medical information systems in 1976, which provided electronic medical orders and clinical



Dr. Carol A. Romano, dean of the Daniel K. Inouye Graduate School of Nursing. (photo by Thomas Balfour)



Col. Marla DeJong, interim dean of Research at the Daniel K. Inouye Graduate School of Nursing. (photo by Thomas Balfour)

documentation for physicians and nurses in ambulatory and hospital environments. She was co-architect of the world’s first graduate curriculum in nursing informatics at UMSON. Romano served as advisor to the World Health Organization on the management of manpower and health information in developing countries. She has served in a variety of leadership positions in the U.S. Public Health Service in the Office of the Surgeon General (OSG), including acting Deputy Surgeon General, acting Chief of Staff OSG, director of the Office of Reserve Affairs, and Chief Nursing Officer.

De Jong, who earned her Master of Science degree from UMSON in 1996, has had a stellar 25-year career in the Air Force. She has held numerous leadership positions and her extraordinary skills have

been recognized through early promotions to the ranks of Lieutenant Colonel and Colonel. Her contributions have shaped military and civilian nursing clinical practice, the delivery of health care, nursing education and management, research, and health policy. DeJong previously served as director of the Tri-Service Nursing Program at USU, and dean, United States Air Force School of Aerospace Medicine.

“USU is enormously proud of this recognition of two of our outstanding nursing scholars,” said Dr. Charles L. Rice, president of USU. “They are superb leaders of the Daniel K. Inouye Graduate School of Nursing.”

Romano and DeJong will be honored at the UMSON’s 125th Anniversary Gala, April 18, in Baltimore, Md.

SAVE THE DATE

31st Packard Award Lecture

March 11, 2015, 3:00pm, USU, Sanford Auditorium

Honored Guest Speaker: Dr. Thomas R. Frieden, Director, Centers for Disease Control and Prevention
Sponsored by the USU Faculty Senate

Research Shows Stress Linked to Increased Risk of Heart Disease

by Mass Communications Specialist 3rd Class Laura Bailey, writer and photographer

Current studies at the Uniformed Services University indicate that stress can have short term as well as lasting effects on overall heart health and hospitalizations for heart problems.

It's no wonder then, that mental health is at the heart of many military campaigns, education and training objectives, said Dr. David Krantz, a professor for the Department of Medical and Clinical Psychology at USU. Encouraging mental well-being among service members could possibly improve heart health and offset health costs associated with heart diseases in the long term.

"Right now the problems having to do with psychological health and deployment are getting a lot of attention and they warrant this attention because of the psychological consequences of deployment and of war and of combat," said Krantz. "An area of increased interest is the increased risk of cardiovascular disease (CVD) associated with post-traumatic stress disorder."

A project that he and other individuals at USU – in radiology, cardiology and psychiatry – are getting involved in looks at the short and long term cardiovascular effects of both PTSD and traumatic brain injury. As it turns out, one of the links between PTSD and CVD is the same link between stress and coronary artery disease (CAD), he added.

"It's this repeated stress, anxiety and "fight or flight" activation of the sympathetic nervous system that causes damage to coronary arteries and promotes the devel-

opment of coronary artery disease or CAD," said Krantz. "CAD is the largest cause of death in the country, but I believe it is also the largest cause of death among military dependents and retirees as well. To the extent that it is the largest cause of death, it's relevant to TRICARE and the overall military health care system."

Another type of heart disease that is of concern is heart failure, he said. Heart failure occurs when the heart tissue gets damaged, usually after a heart attack, to the point that the heart is unable to pump the blood that it needs. As a result, symptoms manifest in shortness of breath or the inability to walk. Heart failure usually occurs in older individuals and results in many hospitalizations.

"This particular heart problem is not so much a particular problem for military readiness, it's a problem for care of military dependents and retirees," said Krantz. "Heart failure is a major cause of cost – excessive cost, because patients with heart failure get hospitalized repeatedly."

While there is mounting evidence supporting the link between stress and heart disease, stress alone is not the cause of heart disease.

"Age is a big risk factor, along with elevated cholesterol, blood pressure, and smoking and then stress puts it over the edge to where heart symptoms develop," said Krantz. "You hear of ticking time bomb situations where somebody has all of these risk factors and they have this underlying heart disease, but they may not know it.



Dr. David Krantz, a professor for the department of medical and clinical psychology at USU. (photo by Mc3 Laura Bailey)

Then suddenly they encounter a stressful situation and they either have a heart attack or they die suddenly. It's not because the stress caused the entire disease process. It's because they had a fuse and it just needed to be lit."

Various non-drug treatments such as meditation, yoga and regular exercise can be very effective for reducing stress. Doing things that you find enjoyable can also be helpful, he said.

As part of a comprehensive prevention plan, stress management can effectively reduce one's risk for heart disease, he said. The military realizes this and that's why stress management and successful coping are emphasized regularly. It's not just a gimmick.

"A healthy lifestyle, stopping smoking, controlling your blood pressure, exercising and reducing stress," said Krantz, "is the best way to ensure heart health throughout one's life."

Final Frame



Navy Lt. Lindsay McQuade, family nurse practitioner student at the Daniel K. Inouye Graduate School of Nursing, examines a child at the Val G. Hemming Simulation Center. (photo by Thomas Balfour)