

# The Point

U.S. Army Medical Research  
and Materiel Command  
Winter 2014



Five hundred *Aedes aegypti* mosquitoes in each container await release into two test chambers as researchers evaluate new bed nets designed to reduce Soldiers' exposure to diseases such as malaria, Japanese encephalitis, and dengue and yellow fever viruses. Photo courtesy of Merrie Aiken.

## Developing Better Bed Nets to Prevent Malaria

A long-lasting dual insecticide-impregnated bed net developed by the U.S. Army Medical Materiel Development Activity's Medical Support Systems Project Management Office at Fort Detrick, Md., scored high marks in effectiveness during recent chamber testing with uninfected mosquitoes.

Results showed that most mosquitoes will not survive exposure to the treated bed net fabric, thereby reducing Soldiers' exposure to diseases such as malaria, Japanese encephalitis,

and dengue and yellow fever viruses.

MSS PMO worked with Triton Systems, Inc., under the Army's Small Business innovation Research Program, and collaborated with Walter Reed Army Institute of Research to develop the treated bed net prototype, known as Egret.

When testing concluded, a computer program calculated the percent of three types of knockdown and dead mosquitos exposed to the dual insecticide-

treated bed net and an untreated control bed net over time.

"The Egret treated bed net passed all requirements," said Robin Todd, executive director of i2L Research, the Baltimore-area laboratory that conducted the tests.

Testing followed Environmental Protection Agency-approved protocols. Three separate series of tests were conducted on the treated Egret bed net and on

**BED NET continued on Page 4**



## Fighting Some of the Most Dangerous Animals on Earth

Historically, in every war and military conflict, combat power has been reduced more significantly by disease and non-battle injuries than from direct combat casualties, according to the Armed Forces Pest Management Board.

Mosquito-transmitted malaria has been recognized as a major cause of combatant illness, reducing the numbers of active military in theater. The tiny mosquito has been called the most dangerous animal on earth.

There's hope. Researchers are working on vaccines. Soldiers deployed in endemic areas plagued by malaria, Japanese encephalitis, dengue fever and yellow fever can help ward off mosquito-borne diseases by using protective measures such as insecticide-treated bed nets, uniforms and sprays. Prevention is easier than the cure, because some recommended treatments for these diseases can be difficult to endure for some patients.

Here is an introduction to some of the flying "bad guys" responsible for diseases in Afghanistan and Korea. Like the lioness, the females are the hunters.

The *Anopheles* is the oldest species of mosquito, dating from around 40 million years ago. The female *Anopheles* mosquito feeds during the day and at dusk in shady areas. It is found in sheds near rice paddies, particularly May through October, depending on species, according to Walter Reed Biosystematics Unit.

When cases and outbreaks of malaria do occur, they are generally due to non-compliance with indicated anti-malarial medications or personal protective measures, according to the Armed Forces Health Surveillance Center's January 2012 issue of the Medical Surveillance Monthly Report. Symptoms are flu-like: headache, fever, chills and vomiting, occurring 10-15 days after the mosquito bite. If the severe form of malaria, caused by the Plasmodium falciparum parasite, is not recognized and treated within 24 hours, the patient may die, according to the World Health Organization. Relapses of the milder form of malaria are common. Current preventative



Courtesy photo.

measures for malaria patients include use of DEET or picaridin insect repellent, recommended daily; daily use (wear) of permethrin-treated uniforms; daily doses of FDA-approved anti-malarial drugs; and prescribed therapy to prevent relapse.

Although malaria had been eliminated in South Korea in the 1970s, according to the Korean Sharing Movement responsible for malaria control, it re-emerged in 1993. Most malaria cases among U.S. military in Korea have been reported in the Demilitarized Zone.

Japanese encephalitis occurs mainly from the bite of *Culex* mosquitoes that breed in flooded rice paddies. *Culex* females feed mainly at night on water birds, pigs, and humans. The virus reproduces in pigs, and infects mosquitoes that take a blood meal. Rice paddies are extensive in South Korea, making chemical control ineffective. However, alternate wetting and drying may help destroy the eggs.

Outbreaks tend to occur during the monsoon season, typically June through September. In addition, the Korea Centers for Disease Control and Prevention said that a majority of the mosquitoes tested at the end of June 2013 in the southern port city of Busan (Pusan), South Korea, were found to be carrying the Japanese encephalitis virus.

The U.S. Food and Drug Administration has licensed a vaccine for Japanese encephalitis that is effective for one year; other vaccines, projected to be effective for up to five years, are in clinical studies in China, according to the World

Health Organization. Preventive measures, such as using bed nets and repellents, are encouraged.

*Aedes aegypti* mosquitoes, which can carry and transmit yellow fever and dengue fever viruses, are hard to control. These mosquitoes tend to live in households, in water containers and in dark, cool closets. They bite indoors at any time of day, with peak hours early in the morning and just before dusk. Dried eggs will hatch, even after many months, when they are flooded, such as after a rain. Outbreaks can occur after heavy rainfall and high temperatures. According to the Centers for Disease Control, *Aedes aegypti* is continually evolving, adapting to change.

While there is a vaccine for yellow fever, there is no vaccine for dengue fever. Symptoms of dengue fever include high fever, severe headache, pain behind the eye, joint and muscle pain, and rash, after an incubation period of 4-10 days. Sometimes dengue fever is a mild illness, but it can be severe and even cause dengue hemorrhagic (bleeding) fever, which can be fatal if not treated. CDC recommends supportive treatment for dengue fever, such as drinking fluids and taking acetaminophen for high fever, and avoiding aspirin or other pain killers that can exacerbate bleeding.

The message is clear: prevention of vector-borne disease is much easier on Soldiers than the cure.

Article by Merrie Aiken,  
USAMMDA MSS PMO

# Issue Highlights

Anti-plague chewing gum 6-7

Protecting Soldiers from hypothermia 8-9

mTBI clinical recommendations 12

Improving bone health 14-15

Regenerative medicine 20

Research to reduce military suicides 24

**NEW! 2013 Command Accomplishments**

**Available Online**

[https://mrmc.amedd.army.mil/assets/docs/media/2013\\_MRMC\\_Accomplishments.pdf](https://mrmc.amedd.army.mil/assets/docs/media/2013_MRMC_Accomplishments.pdf)

The Point is published quarterly. Its contents do not necessarily reflect the official views of the U.S. Government, the Department of Defense, or the U.S. Army. Editorial content is prepared by the U.S. Army Medical Research and Materiel Command Public Affairs Office; 301-619-7549 or DSN 343-7549. Story submissions should be emailed to [jennifer.e.crown.civ@mail.mil](mailto:jennifer.e.crown.civ@mail.mil)





**BED NET, from Page 1**

a control bed net with no insecticide treatment. Each test used three types of mosquitoes. The tests counted live, knocked down and dead mosquitoes for each test chamber.

Five hundred mosquitoes were released into a chamber containing a treated bed net prototype. Within 20 minutes, all were counted as knocked down or dead. The number of mosquitoes landing on the untreated bed net in a separate chamber actually increased over the two-hour test.

“The working prototype introduced a dual impregnation of deltamethrin and permethrin,” said Alan Harner, MSS PMO product manager.

According to Harner, various mosquito species show resistance to permethrin alone, potentially endangering Soldiers deployed in endemic regions such as Korea and Afghanistan.

“There is a critical need for the dual insecticide-impregnated bed nets in Korea,” said Steve Hawbecker, MSS PMO project manager. “This is due to mosquito-borne malaria in the demilitarized zone and Japanese encephalitis in southern regions.”

According to Hawbecker, more than 28,000 U.S. military are stationed in South Korea.

Malaria was eliminated in South Korea in the 1970s, but it re-emerged in 1993, according to the Korean organization responsible for mosquito control. As recently as June 2013, the Korea Centers for Disease Control and Prevention said that a majority of the mosquitoes tested in the southern port city of Busan (Pusan), South Korea, were found to be carrying the Japanese Encephalitis virus.

During a visit to the i2L Research lab, Harner observed chamber tests of the Triton Systems Egret bed net prototype, which had been washed 20 times following protocols.

The research laboratory grows its own uninfected mosquitoes in trays of water. The observed chamber test used uninfected *Aedes aegypti* mosquitoes, known for transmitting yellow fever and dengue fever viruses.

A volunteer inside each bed net was responsible for counting mosquitoes every 10 minutes as they landed on the bed net. Throughout the tests, the number of mosquitoes on the treated bed net dropped to zero, while the control bed net was unaffected.

The first count showed 162 mosquitoes on the control (untreated) bed net, and 139 on the Egret bed net.

Ten minutes later, the numbers changed dramatically: 209 mosquitoes on the control bed net, and 19 on the Egret.

At the end of the two-hour test, 230 mosquitoes remained on the control bed net, and none were on the Egret.

Kristine Styer, i2L study director and entomologist, collected the knocked down mosquitoes into a vial for counting.

“The mosquitoes that show any twitch won’t make it another day,” said Styer. “We collect them, and give them sucrose for 24 hours to give them every chance to survive, but they’re dead at the end of the time.”

Styer added that she didn’t see repellency with the treated bed net. “Mosquitoes are killed, not repelled, by the treatment,” she said. “It’s touch and die.”

The other kinds of uninfected mosquitoes required by EPA protocols for testing the bed net were *Anopheles* (malaria) and *Culex* (Japanese encephalitis).

“The *Culex* were more difficult to count, as they tend to prefer the walls [of the chamber],” said Styer. “At the end of one test, there were only three *Culex* mosquitoes knocked down in the control chamber.”

“It’s critically important the control nets show little or no mortality [dead or knocked down mosquitoes],” said Todd. The i2L laboratory used the same EPA protocols for testing other control bed nets against the Egret, with similar results.

“Efficacy testing shows that the Egret bed net meets EPA and World Health Organization guidelines for all three species,” said Arjan Giaya, vice president of technology for Triton Systems, Inc. “The Egret bed net is based on more breathable fabric and lower insecticide



MSS PMO worked with Triton Systems, Inc., under the Army’s Small Business innovation Research Program, and collaborated with Walter Reed Army Institute of Research to develop the treated bed net prototype, known as Egret. Photo by Merrie Aiken.

concentration than the current products used by the military. The bed net also has been tested effective against sand flies and other biting insects.”

Because of the dual insecticides used, the bed net must meet all the requirements for EPA registration. The next step is approval by the Armed Forces Pest Management Board to receive a National Stock Number, or NSN. Having an NSN means the Department of Defense can procure bed nets for deployed forces.

Many service members use permethrin-treated bed nets. These bed nets require poles to set up and frequent spraying with insecticide. Many military members say they feel claustrophobic due to the small size and tightly woven mesh.

The Egret bed net is simple in design, weighs little more than three pounds, allows the user to sit up on a standard or oversized cot and provides better

ventilation by using a larger mesh size. The bed net would be carried in a small pouch attached to a soldier’s backpack.

“The biggest issue is getting U.S. service members to use the products,” said Maj. Robert Lowen, WRAIR entomologist, who explained that the current bed nets are poorly ventilated and hot. “It’s important that our soldiers use these products to keep themselves safe and healthy. These are preventable diseases.”

History has shown that more service members have been taken out of combat from disease, caused by biting insects, and non-battle injuries than from direct combat casualties, according to the Armed Forces Pest Management Board Technical Guide. Use of the dual-insecticide treated bed net ultimately could prevent loss of deployment time.

Article by Merrie Aiken, USAMMDA MSS PMO



The Army is currently testing a new type of pharmaceutical-grade, anti-plaque chewing gum developed by the Dental and Trauma Research Detachment at the U.S. Army Institute of Surgical Research. The gum is designed to decrease dental plaque, reduce periodontal disease and prevent cavities. Photo by Tim Centers.

## Army Developing Anti-plaque Chewing Gum

A study funded by the U.S. Army Medical Research and Materiel Command is the first of its kind to use a pharmaceutical-grade, anti-plaque chewing gum for humans to test the feasibility of delivering a drug through chewing gum.

The compound, developed by the Dental and Trauma Research Detachment at the U.S. Army Institute of Surgical Research at Joint Base San Antonio-Fort Sam Houston, is known as KSL-W. It is a novel anti-microbial

peptide that kills bacteria and is designed to prevent the development of dental plaque and may reduce periodontal disease and cavities.

“The initial gum formulation was done with the School of Pharmacy at the University of Kentucky, in collaboration with Dr. Patrick DeLuca (Professor Emeritus),” said Dr. Kia Leung of the USAISR DTRD. “It took three years to characterize the formulation of the gum, the release and stability profiles of the peptide.

“Our oral cavity produces antimicrobial peptides as part of our innate defense,” Lueng said. “We modeled the naturally occurring antimicrobial peptides such as defensins and developed several synthetic peptides that exhibited similar or more potent antimicrobial activity. The pharmaceutical active, KSL-W peptide, is one of the more potent molecules showing stability in the oral cavity.”

“The peptide is designed to replenish and strengthen

the body’s innate defense mechanisms in the oral cavity,” added DTRD commander Col. (Dr.) Robert G. Hale. “Oral health is essential to warriors on the battlefield and could potentially save the military countless of hours and dollars in dental health.”

There were a few challenges associated with infusing an innocuous item like gum with a pharmaceutical-grade drug, Lueng said.

“The first was ensuring adequate release of the peptide within 20 minutes of chewing,” Lueng said. “Ideally, we would like to see more than 70 percent of the active ingredient to be released within that time. At present, we have accomplished this level of release using the current gum formulation developed by Fertin Pharma, the manufacturer of the clinical gum used in the trial. We’re also concerned about the stability of the peptide in the gum formulations and in saliva.”

Getting the gum approved by the Food and Drug Administration will be another major step in the evolution of the anti-plaque gum.

“There would be multiple steps including Phase II and III trials for larger scale of safety and efficacy trials to go through with the FDA,”

Lueng said. “We are currently conducting a small scale (Phase I) and proof-of-concept efficacy (Phase II) trials at the Oral Health Research Institute at Indiana University-Purdue University Indianapolis.”

In a year-long clinical study, the OHRI will administer the gum to 137 people between the ages of 18 and 64, focusing on the safety and tolerability of single and multiple doses of the compound. Further studies will be required to determine the extent to which the gum reduces periodontal disease and cavities.

The institute was chosen to administer the clinical study because it is one of the best oral health research institutes in the nation, Lueng said.

“The staff there has a lot of experience performing trial on oral health products,” he said. “The selection is through competitive application and selection by the Army Evaluation Board consisting of members from different branches of Medical Research and Materiel Command. The criteria used included technical competence, management, facilities, past performance and others.”

“Soldiers in the field just don’t spend a lot of time brushing their teeth,” said

**“Soldiers in the field just don’t spend a lot of time brushing their teeth,”**

*-- Dr. Domenick T. Zero, OHRI director, professor of preventive and community dentistry and principal investigator*

Dr. Domenick T. Zero, OHRI director, professor of preventive and community dentistry and principal investigator of the study.

“The hope is that the gum will reduce the amount of plaque buildup that occurs when soldiers aren’t brushing their teeth, reducing the risk of periodontal disease and dental decay.”

Will the anti-plaque gum ever make it to the public for general consumption and chewing?

“Because the FDA considers this a new drug entity, it will have to market as prescribed drugs initially prior to becoming over-the-counter after collection of more safety data after human use,” Lueng said. “This would be similar to the situation of nicotine gum.”

*Article by Steven Galvan, USAISR PAO, and Steve Elliott, JBSA-Fort Sam Houston*

## Army Researcher Looks for Cold Facts

David DeGroot, Ph.D., went looking for the cold facts, and, after years of study, he may have them.

DeGroot, who was a research physiologist in the Thermal and Mountain Medicine Division at the U.S. Army Research Institute of Environmental Medicine at Natick Soldier Systems Center, wanted to learn more about why four Soldiers died from hypothermia in 1995, during the final phase of Ranger School. His hope was to develop medical techniques to help prevent such tragedies.

Now with the Army Institute of Public Health's Injury Prevention Program, he and his team used data collected from eight Soldier volunteers, who were fitted with microdialysis fibers, muscle temperature probes and skin temperature sensors. They were then put into the 102-degree waters of an immersion tank, followed by a trip to an environmental chamber, where the air temperature was a relatively cool 66 degrees.

"The key part of the study was using microdialysis to 'pharmoco-dissect' the

mechanisms that control skin blood flow," DeGroot said. "Human skin is unique in that it is under dual neural control -- there is a vasoconstrictor system, as in all mammals, that functions to reduce blood flow through the vasculature. However, humans also have an active vasodilator system in the skin, which serves to increase blood flow, which as a result increases heat transfer to the environment."

DeGroot built upon the 1999 study by USARIEM's John Castellani, Ph.D. Castellani was part of a team that conducted the institute's initial study at Camp Rudder on Eglin Air Force Base, Fla., soon after the deaths. Castellani's work led to adjustments to the immersion and exposure tables Rangers use to determine what amount of exposure to cold is safe.

Castellani found that exposure to cold air after exercise led to a faster rate of decline in core temperature, higher skin temperature, and higher rate of heat transfer through the skin.

"The follow-up question to John Castellani's 1999 study was, what mechanism

was responsible for the increased skin heat flux and accelerated body core temperature decline that he reported when cold exposure was preceded by active heating, [such as] exercise in an immersion pool?" DeGroot said.

To answer that, DeGroot and his team used several pharmacological agents.

"By comparing the control site between the active and passive heating trials, we could demonstrate the effect of prior exercise on skin blood flow," DeGroot said. "During the passive heating trial, skin blood flow decreased 40 percent from baseline. However, during the active heating trial, it only decreased 28 percent, which is a statistically significant difference.

"These data indicate that prior exercise leads to higher skin blood flow during subsequent cold exposure. So, why?

Botox, which is typically used for cosmetic purposes, was used at one microdialysis site because it also stops vasodilation of skin blood vessels. Skin blood flow at this site decreased more than 50



**Maj. David DeGroot, Ph.D., has been studying why the human body cools down faster under certain conditions. His work could help protect future Soldiers from hypothermia. Photo by David Kamm, NSRDEC.**

percent during the cold exposure, bringing it in line with the passive heating trial.

"Based on the available data, we conclude that active vasodilation over-rode a competing vasoconstrictor signal and resulted in higher

skin blood flow," DeGroot said. "Using these data, researchers might be able to develop pharmacological agents to maintain the vasoconstrictor response to cold and thereby reduce the risk of hypothermia."

With a better understanding of the human body's response to cold, researchers are one step closer to helping future soldiers ward off hypothermia.

*Article by Bob Reinert, USAG-Natick PAO*



# USACEHR Research Facility Opens

U.S. Army Center for Environmental Health Research leadership unveiled a new vivarium Jan. 29.

A vivarium is a facility used to keep plants or animals for observation and research. This vivarium allows USACEHR researchers to bring in-house their rodent studies, which had previously been conducted at commercial facilities, as well as area hospitals and universities.

USACEHR now has about 3,500 square feet of vivarium space, including the lab's pre-existing fish facility. Researchers will use the new vivarium for studies focused on behavioral health, environmental exposures, and nutrition.

"The new state-of-the-art vivarium is twice as large as the center's previous capacity and supports a 100 percent recyclable and disposable cage system, allowing for

greater cost savings overall," said USACEHR's Integrated Systems Biology Program Director Dr. Marti Jett.

Turner Construction completed the project in 19 months.

A subordinate laboratory of the U.S. Army Medical Research Institute of Chemical Defense, USACEHR's mission is to develop surveillance capabilities to detect, prevent, and assess health effects from adverse environmental, physiological, psychological exposures. USAMRICD is one of 12 subordinate commands and six executive agencies supported by the U.S. Army Medical Research and Materiel Command, the Army's medical materiel developer focused on research, development and acquisition, and medical logistics management.

*Article by Ellen Crown, USAMRMC PAO*



(Top middle photo) Leadership cut the ribbon Jan. 29 unveiling a new vivarium at the U.S. Army Center for Environmental Health Research. Pictured (left to right) are Lt. Col. (Promotable) Tom Timmes, commander, U.S. Army Center for Environmental Health Research; Dr. Marti Jett, program director, Integrated Systems Biology, U.S. Army Center for Environmental Health Research; and Col. Bruce Schoneboom, commander, U.S. Army Medical Research Institute of Chemical Defense. (bottom left photo) Jett shows the new surgical area in the vivarium. (bottom right photo) Jett explains how the new disposable cage system works. Photos by Ellen Crown.





## Clinical Recommendations Released for Mild Traumatic Brain Injuries

The Defense and Veterans Brain Injury Center has released new clinical recommendations to help service members who have sustained a mild traumatic brain injury (mTBI), otherwise known as concussion, to progressively return to their normal activities following their injury. These clinical recommendations are available for military and civilian health care professionals.

“Progressive Return to Activity Following Acute Concussion/Mild Traumatic Brain Injury: Guidance for the Primary Care Manager and the Rehabilitation Provider in Deployed and Non-deployed Setting Clinical Recommendations” can be downloaded from DVVIC’s website at <http://dvbic.dcoe.mil/resources/progressive-return-to-activity>.

“The Progressive Return to Activity Following mTBI Clinical Recommendations’ are the first of its kind and are tailored for primary care managers and rehabilitation providers. These recommendations offer a standardized medical approach for service members who have sustained a mTBI to return to activity in a manner which facilitates optimal recovery,” said Army Col. Sidney Hinds, II, DVVIC national director. “We created these clinical recommendations because of a need identified by our Armed Services and Veterans Affairs stakeholders. The mTBI patient was our focus and we vetted these recommendations with our stakeholders before publication.”

These guidelines were developed with input from academic experts, sports concussion clinicians and military TBI experts and will assist health care providers as they monitor patients recovering from concussion.

“These recommendations will further improve and standardize the care provided to patients



Army photo.

with mild TBI and offer them useful information to become more actively involved in their recovery,” said the Director of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) Navy Capt. Richard Stoltz.

Since 2000, more than 287,000 U.S. service members have sustained a traumatic brain injury (TBI). These injuries have occurred both in training and combat. Eighty-three percent of TBIs are mTBIs, making it the most common form of brain injury for U.S. Armed Forces personnel.

“DVVIC has more than 20-years’ experience in researching, treating and developing clinical guidance for TBI patients. Our work benefits not only military medicine, but the entire medical community as well,” said Hinds, who is board certified in neurology and nuclear medicine.

*Press release by Landon Hutchens, DCoE PAO*

## CDMRP Hosts First Terry-Koroma Legacy Lecture

The Congressionally Directed Medical Research Programs hosted the first annual Barbara Terry-Koroma Legacy Lecture Dec. 4 at Fort Detrick.

The lecture marked a culmination of tributes made throughout the year in honor of the late CDMRP program manager Dr. Barbara Terry-Koroma and her 15 years of service to the program.

“This lecture is important because Barbara was very committed to what she did as a program manager for several military programs over the years and also as the program manager for the minority and underserved populations program,” said CDMRP science officer Dr. Theresa Miller, in her opening remarks.

Terry-Koroma passed away Jan. 23, 2013. She joined the CDMRP in January 1998 where she served as a special populations program manager, helping to develop new research funding mechanisms that incorporated the talents and resources of minority institutions in addressing cancer health disparities.

“Barbara believed in excellence. Inspired by the military personnel she interacted with, she knew that although they might have been impacted by injuries during their service they didn’t make excuses – so she didn’t make excuses in her work,” said Miller.

Guest speaker and Associate Director of the University of Florida Health Cancer Center Dr. Folakemi T. Odedina presented the inaugural lecture titled, “Addressing Prostate Health Disparities: The Core Elements.”

Throughout her discussion, Odedina frequently referred to her “BTK Recommendations,” which she noted were salient points Terry-Koroma had emphasized in her own work which she, in turn, had adopted. These recommendations highlighted the importance of consumer advocacy; the need to

address factors impacting disadvantaged populations; and mentoring the next generation of health disparities researchers.

Over her career at CDMRP, Terry-Koroma managed seven programs totaling more than \$1 billion in research funding. Her efforts were instrumental in finding and funding innovative research critical to the medical needs of service members and their families.

*Article by Heather McDowell Duong, USAMRMC PAO*



Dr. Folakemi T. Odedina with the University of Florida Health Cancer Center accepted a plaque as tribute to serving as the first featured speaker as part of the annual Dr. Barbara Terry-Koroma Legacy Lecture series Dec. 4, at Fort Detrick. Photo by Stan Niu.



## Army Conducting Study to Improve Bone Health

Researchers from the U.S. Army Research Institute of Environmental Medicine have teamed up with the Trainee Health Surveillance Flight 559th Medical Group's Basic Military Training Team at Joint Base San Antonio-Lackland, Texas, to determine whether increased vitamin D and calcium intake can improve bone health in military personnel.

Stress fractures and musculoskeletal injuries are among the leading causes of medical holdovers during basic military training, and often lead to attrition of military personnel early in their careers. As many as five percent of males and 20 percent of females may develop some sort of stress fracture during military training due to the novice warriors' inability to withstand unaccustomed, repeated stress to their bodies, such as marching with body armor.

"Optimizing bone health of military personnel is essential, especially during Basic Military Training and other military training activities," explained Dr. James McClung, a nutritional biochemist with USARIEM's Military Nutrition Division. "These injuries are costly to warfighters and to the military, as a significant portion of individuals that suffer from stress fracture leave military service and stress fracture

results in substantial health care costs associated with treatment and rehabilitation."

Recent studies have linked vitamin D and calcium to bone health and the prevention of stress fractures. In a 2008 study conducted by Creighton University, in conjunction with the Navy, more than 5,000 female recruits underwent a trial in which they consumed either a supplement containing vitamin D and calcium or a placebo over the eight weeks of Navy boot camp.

During the course of that study, 270 stress fractures were observed in the placebo group, but only 226 stress fractures were observed in the group receiving the vitamin D and calcium supplement. Advanced analysis showed that vitamin D and calcium supplementation may have reduced the risk of stress fracture by up to 20 percent.

"We say 'may have reduced the risk' because missing from that study were biochemical indicators of nutritional health or functional indicators of bone health," McClung said. "There were just not enough data to use this study as the sole basis for implementing policy changes affecting vitamin D and calcium levels in the warfighter diet."

So, McClung and his team of researchers, managed by

Dr. Erin Gaffney-Stomberg, a research fellow within the division, set out to explore the biochemical and functional basis for these findings, with the goal of providing Army and Air Force personnel with levels of vitamin D and calcium consistent with the Navy study. After conducting an initial study with the Army in 2012, McClung partnered with the team at JBSA-Lackland in October 2013, for more research.

Air Force recruits, both male and female, participated in a trial similar to the Navy study, but this time they were given a snack bar either fortified with vitamin D and calcium that was developed in collaboration with scientists from the Department of Defense Combat Feeding Directorate at the Natick Soldier Research, Development and Engineering Center, in Natick, Mass., or a placebo snack bar.

McClung's team of researchers collected physiological data from Airmen twice during their training, on day three of their reception phase of training and again immediately prior to graduation. Techniques included body composition assessment (using military standards), blood collection, a bone scan using a device called a peripheral quantitative computed tomography, and paper surveys. This round of collected data was sent to USARIEM's

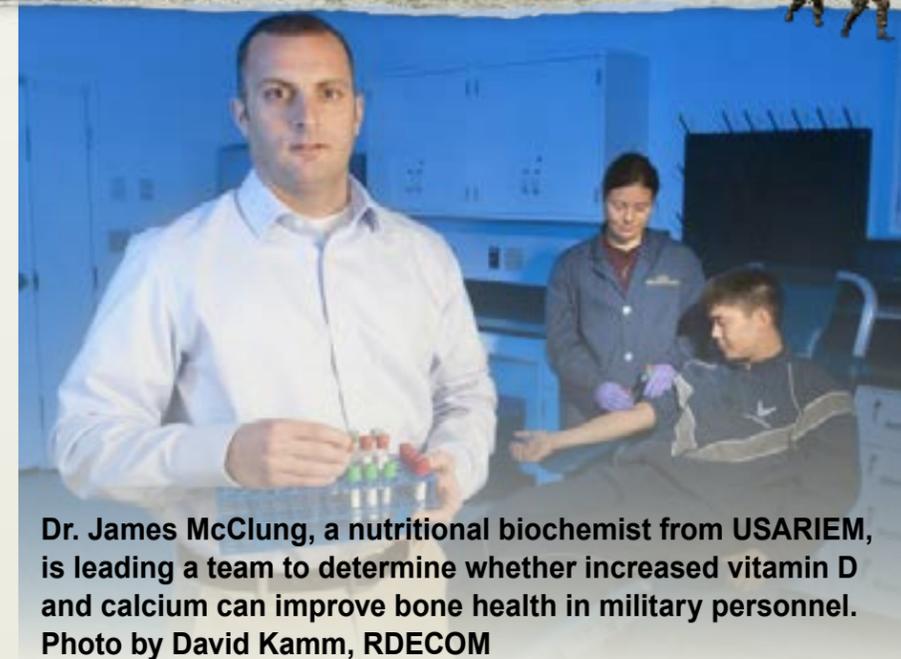
headquarters in Natick, Mass., as well Pennington Biomedical Research Institute, Baton Rouge, La., for assessment.

According to McClung, they had close to a 90 percent rate of compliance from Airmen in this study.

"We have had great support from everyone at Lackland for this study, from the leadership to the recruits," McClung said. "This is important because we have extended the scope of our knowledge beyond the Army, and we now have the basis to extend nutrition recommendations to the Air Force based upon data collected directly from their personnel."

The leadership at Lackland agrees that this collaboration is valuable and could not have been conducted in partnership with any other organization.

"As I reviewed the military literature on stress fractures and prevention, it was clear that Dr. McClung and the USARIEM team were the only assets in DoD who had published on nutrition and impacts on military training," said Thomas Leo Cropper, director of Trainee Health Surveillance Flight 559th Medical Group at Lackland. "We consulted them to gain access to the latest military science knowledge on nutrition and military performance to improve military training outcomes."



According to Cropper, stress fractures are costly because they can require multiple doctor visits and medical tests such as X-rays or MRIs, plus physical therapy, which can cost the Air Force more than \$6,000 per case. Added to that, trainees miss weeks to months of expensive military training while they wait to heal in medical hold and then exercise to regain fitness to meet military physical training standards required to graduate.

"Many trainees get demoralized after a stress fracture and quit," Cropper said. "If we can prevent stress fractures or other injuries, it is much better for all concerned."

McClung and his team plan to return to Lackland in spring 2014, to continue testing in the hopes of preventing future injuries. At the completion

of the study, scientists from USARIEM will share those data with senior leaders from the DOD's medical and training commands in an effort to determine whether providing vitamin D and calcium beyond the current recommended daily allowance may be beneficial for the optimization of bone health during military training.

"Military personnel represent a unique population faced with sometimes intense physical demands," McClung said. "Our goal is that findings from these studies will provide the information necessary to determine the optimal vitamin D and calcium requirement of military personnel for the maintenance of bone health and prevention of stress fractures to keep warfighters mission ready for the long haul."

Article by Kelly Sullivan, USARIEM PAO



## USAMMDA's Regulatory Operations Branch 'Goes Green'

The U.S. Army Medical Materiel Development Activity's Regulatory Operations branch continues to blaze the environmental sustainability trail at Detrick, saving money and time along the way.

In early 2013, RO, a branch within USAMMDA's Division of Regulated Activities and Compliance powered off printers and began enforcing its self-appointed mandate to become a paperless office. For RO's Document Control Group, this meant that they would refrain from generating or storing paper for any active product development efforts.

"So what's the big deal?" asked Regulatory Operations Chief Tracy Ulderich. "This move will eliminate thousands upon thousands of reams of paper annually. That's why folks should care," she explained.

DRAC comprises a multidisciplinary team of regulatory affairs and compliance professionals dedicated to supporting USAMMDA's mission of developing medical products for the warfighter. As the Office of the Surgeon General Sponsor's representative for the Army for medical materiel development, the division must adhere to Food and Drug Administration regulatory requirements in addition to DoD and Army regulations.

Ulderich explained how RO's work with the FDA led to the generation of vast amounts of documentation.

"Let's say you are creating a nasal spray," said Ulderich, as an example. "You submit a product application to the FDA. The initial application could be anywhere between 200 to 2,000 pages. As the product is further developed, paperwork requirements grow exponentially."

According to Ulderich, in addition to generating the paperwork required by the FDA, RO was also maintaining hard copy files of submitted documentation together with any associated internal paperwork. USAMMDA



With a proven process in place to successfully archive critical documentation, RO is working to eliminate piles of papers. Courtesy photo.

currently has approximately 80 active products.

In addition to saving trees, Document Control Specialist Sharon Reynolds noted that going paperless will save staff hours.

"An investigational new drug or new drug application submission can be up to 30 volumes," said Reynolds. "That's a lot of man-hours we will save, as we won't have to [quality control] mountains of paper, page by page, against the legacy electronic document management system and the sponsor's electronic regulatory file."

Spurred on, in part, by a new FDA requirement to

begin submitting applications electronically, and driven by raw frustration with a growing number of hard copy records, RO declared war on all unnecessary use of paper.

The FDA uses a regulatory information management platform called the Electronic Common Technical Document, or eCTD, for electronic regulatory submissions. According to Ulderich, RO acquired its own eCTD capability in 2012 with the help of the Enterprise Information Technology Program Management Office.

"Roll out, training and familiarization with the software took about a year," said Ulderich.

Now that the system is up and running, RO is able to not only reduce its carbon footprint but also streamline its entire submission process. eCTD allows RO to reference source documents from its Electronic Document Management System. EDMS maintains version control so that even documents created in the earliest stages of development are incorporated into the submission process before they are finalized. RO also maintains product records throughout the product's lifecycle, from the original application through post-approval maintenance.

"We will have accountability via an audit trail. This will ensure we maintain adherence to CFR 21 Part 11 and remain compliant with regulation," said Reynolds, explaining the program's compliance with federal regulations.

According to Ulderich, the office is saving time, space, money and manpower because of this initiative. Electronic submissions are instant.

"Before, our staff was investing time formatting PDFs, inserting bookmarks and hyperlinks. We undid all this effort the moment we then printed a hard copy of the document we so painstakingly formatted," said Ulderich.

Ulderich added that the office currently pays for storage space to house its archives dating back to the 1900s. Once all documentation has been successfully scanned and cataloged, RO will be able to eliminate contract storage, leading to additional cost savings.

With a proven process in place to successfully archive critical documentation, RO is working to eliminate piles of papers. With an eye on the future they are also working on system upgrades, including enhanced security features and watermarks.

*Article by Heather McDowell Duong, USAMRMC PAO*

## MHSRS Abstract Call

The Military Health System Research Symposium web site is now accepting abstracts through April 4 for the 2014 conference scheduled for Aug. 18-21.

Abstracts should be a maximum of 300 words (2,000 characters including spaces) and contain the following sections: background, methods, results, and conclusion.

Abstracts will be reviewed by a multidisciplinary committee.

The MHSRS 2014 conference will also feature a Young Investigators session that will highlight oral podium presentations from a limited number of junior clinicians and scientists. Requirements for submission to the Young Investigators category are available on the MHSRS website.

Learn more and submit abstracts online at <https://mhsrs.amedd.army.mil/SitePages/Home.aspx>



## USAMRIID Scientist Earns DoD Highest Civilian Honor

Leonard A. Smith, Ph.D., a senior scientist at the U.S. Army Medical Research Institute of Infectious Diseases at Fort Detrick, received the Department of Defense Distinguished Civilian Service Award Nov. 18 in a Pentagon ceremony. The recognition is the highest award given by the Secretary of Defense to career employees.

Smith, an internationally recognized expert on botulinum neurotoxins and ricin toxin, serves as the Senior Research Scientist for Medical Countermeasures Technology, U.S. Army Medical Research and Materiel Command and as the Acting Scientific Director for USAMRIID. He has more than 30 years of service to the institute.

“Len is a proven visionary and leader, and his selection for this award is a great honor for him, for USAMRIID, and for the USAMRMC,” said Col. Erin P. Edgar, USAMRIID commander. “He has made tremendous contributions to the development of biodefense medical countermeasures for the Armed Services and for the

entire nation.”

According to his official biography, Smith’s team is focused on translational medicine—developing vaccines and therapeutic drugs from concept and discovery, through early development, non-clinical and preclinical testing, and finally into clinical trials. His most recognized scientific contributions have been in the development of vaccine products to combat botulinum neurotoxins (BoNT) and ricin toxin.

He served as a key team member and later as leader in the development of a new generation of BoNT vaccines—designing novel recombinant botulinum toxin antigens, along with production processes for multiple toxin serotypes. Importantly, this approach offers the DoD the potential to develop a safe, effective, fully characterized vaccine that meets today’s cutting-edge industry standards. Smith also is spearheading the advanced development of a lead ricin vaccine candidate that is currently in phase I clinical trials.

Smith attended Georgetown University in Washington,

D.C., where he received his Ph.D. degree in biochemistry in 1978. He received a Bachelor’s degree in chemistry and zoology from the University of New Hampshire in 1972. He joined USAMRIID as a research chemist in 1982, having served in private industry and as a senior staff fellow at the National Cancer Institute. Prior to his 2008 appointment by the Secretary of the Army to the post of Senior Research Scientist, Smith headed USAMRIID’s Department of Molecular Biology within the Division of Integrated Toxicology.

Smith has authored or co-authored more than 150 scientific publications, reviews and book chapters, and holds several patents for his work. He is frequently invited to lecture at national and international meetings. He is Chair of NATO Human Factors and Medicine Task Groups 186 and 239. He is a member of the International Society on Toxinology, American Society for Microbiology, American Association of Pharmaceutical Scientists and PDA: An International Association for

Pharmaceutical Science and Technology. He also serves on the Board of Directors and is an Officer for the International Neurotoxin Association.

His previous awards and honors include the 2011 Department of the Army Research and Development Achievement Award for Technical Excellence, the 2007 Joel M. Dalrymple Award from the Association of Military Surgeons of the United States, and the 2007 Research Scientist of the Year Award from the Defense Threat Reduction Agency. He was a finalist in the 2007 Service to America Awards, and was elected to the faculty of the Neurotoxin Institute in New York City in 2007. He received the Order of Military Medical Merit award in 2006 and the Army Research and Development Achievement Award in 1999.

While Smith was joined at the ceremony by wife Olga Hernandez-Smith, daughter Kristen Smith and grandson Logan Cresswell, the event also was tinged with sadness for one family member who was conspicuously absent. His son, Marine Sgt. David Smith, died in January 2010 from injuries he sustained



Leonard A. Smith, Ph.D., a senior scientist at the U.S. Army Medical Research Institute of Infectious Diseases at Fort Detrick, received the Department of Defense Distinguished Civilian Service Award Nov. 18, in a Pentagon ceremony. Official photo.

during a suicide bombing in Afghanistan. He was 25.

“This award comes with sadness, as well as honor,” Dr. Smith said. “I have always tried to do the best that I could in support of our warfighters. They are the ones who work so hard and sacrifice so much. That’s what keeps me going—to support those who put themselves in harm’s way to keep us safe, as my son did for love of country, service and family. My son loved the U.S. Marine Corps and was extremely proud to serve his country.”

USAMRIID’s mission is to protect the warfighter from biological threats and to

be prepared to investigate disease outbreaks or threats to public health. Research conducted at USAMRIID leads to medical solutions—vaccines, drugs, diagnostics, and information—that benefit both military personnel and civilians. The institute plays a key role as the lead military medical research laboratory for the Defense Threat Reduction Agency’s Joint Science and Technology Office for Chemical and Biological Defense. USAMRIID is a subordinate laboratory of the U.S. Army Medical Research and Materiel Command.

*Article by Caree Vander Linden, USAMRIID PAO*



## AFIRM II Gathers Army, Academic Regenerative Medicine Experts

The U.S. Army Medical Research and Materiel Command leadership hosted a kick off meeting at Fort Detrick for the Armed Forces Institute of Regenerative Medicine: Warrior Restoration Consortium, known as AFIRM II, Dec. 16.

AFIRM II is led by the Wake Forest University School of Medicine (Wake Forest Baptist Medical Center) and funded through a cooperative agreement with USAMRMC, the Office of Naval Research, the Air Force Medical Service, the Office of Research and Development - Department of Veterans Affairs, the National Institutes of Health, and the Office of the Assistant Secretary of Defense for Health Affairs.

“Patriotism doesn’t come with a uniform. I believe we are all patriots here, with a single laser focus of helping our wounded warriors,” said USAMRMC and Fort Detrick Commander Maj. Gen. Joseph Carvalho Jr., at the kick off meeting.

The AFIRM II program is intended to continue the success of the original AFIRM program, which was first funded in 2008. AFIRM focused on limb repair, craniofacial repair, burn repair, scarless wound repair, and compartment syndrome. The AFIRM program emphasized getting projects through advanced development,



In his opening remarks at the AFRIM II kick off meeting Dec. 16, USAMRMC and Fort Detrick Commander Maj. Gen. Joseph Carvalho Jr., emphasized Army Medicine’s commitment to restoring wounded warriors. Photo by Sidney Hinds.

so that the innovations could be used for patients who need them. During the first program, more than 180 patients received treatment with AFIRM-funded technologies. The first AFIRM also achieved the first double hand transplant in the U.S.

“Everyone had a sense of wow of what was created during AFIRM,” said Dr. Kenneth Bertram, USAMRMC’s Principal Assistant for Acquisition. “Also, the exciting thing about what we do is that, generally, whatever we create for the warfighter can also help the American people, which is a great return on the investment.”

Dr. Anthony Atala, head of the Wake Forest Consortium, provided an overview of the 60 projects that will be completed in AFIRM II in five key areas, including extremity regeneration; craniomaxillofacial regeneration; skin regeneration; composite

tissue allotransplantation and immunomodulation; and genitourinary/lower abdomen reconstruction.

The goals of the program are to fund basic through translational regenerative medicine research, and to bring promising technologies and restorative practices into human clinical trials.

Added USAMRMC’s Principal Assistant for Research and Technology Dr. Frasier Glenn, “The bottom line is that we need to be able to fully restore our injured service members so they can either continue their military careers or go on to have long, successful civilian lives.”

Learn more about AFIRM II online at <http://www.afirm.mil>.

*Article by Ellen Crown, USAMRMC PAO*

## BRDSS Team Earns AMEDD Wolf Pack Award

The U.S. Army Institute of Surgical Research Burn Resuscitation Decision Support System Team was selected as the winner of the prestigious U.S. Army Medicine Wolf Pack Award for the first quarter of fiscal year 2014.

“The Institute of Surgical Research was recognized for their development of the Burn Navigator, a FDA-approved device that allows burn patients to be more safely managed,” Army Surgeon General and Commanding General of the Army Medicine Command Lt. Gen. Patricia D. Horoho stated in a message congratulating the winning team. “This technology is first-of-its-kind [and] assists clinicians with decision-making when managing fluid resuscitation of the severely burned patient.”

According to USAISR Director of Research David G. Baer, Ph.D., the Burn Navigator, also known as the Burn Resuscitation Decision Support System-Mobile, is the only medical device to ever start as a research project within the U.S. Army Medical Research and Materiel Command, and then go through advanced development, FDA clearance, and exit the decision gate process into fielding. Baer added the BRDSS-M fully has transitioned to Full Rate Production, which means the device has been

manufactured and deployed to the field.

“The Army will buy and field the first nine devices, with additional purchases to follow for outfitting all units and training centers,” added Baer. In addition to military use, several U.S. Burn centers are in the process of acquiring the device to assist in treating their most challenging patients.

“We are extremely proud of the efforts of this extraordinary team,” added Col. (Dr.) Michael A. Weber, commander USAISR. “This team truly supports our mission of optimizing combat casualty care through their dedication to a device that will help save lives of those wounded on and off the battlefield.”

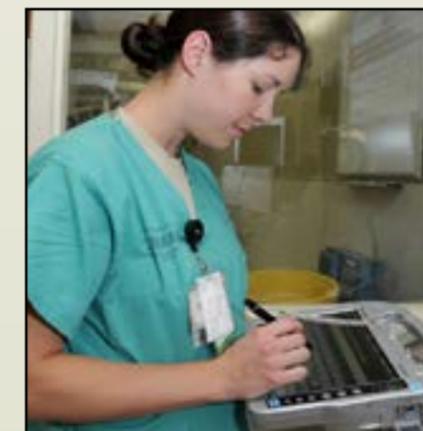
The original BRDSS technology was developed for use at the USAISR Burn Center Intensive Care Unit about seven years ago. USAISR Research Task Area Program Manager for Comprehensive Intensive Care Research Jose Salinas, Ph.D., helped develop the BRDSS algorithm that generates recommendations of fluid intake for burn patients. It was designed to assist in avoiding problems related to over- or under-resuscitating by medical care providers who do not routinely care for burn patients. The Burn Navigator offers the tool in a mobile tablet that

meets military specifications.

“This much needed medical capability represents a huge advancement in medical science that will benefit the Army Medical Department and the Nation well into the future,” stated Horoho. “Congratulations to Team ISR for its vision and outstanding achievement!”

The Wolf Pack Award is a quarterly award presented by the Army Surgeon General/Commanding General, U.S. Army Medical Command, and acknowledges the team work of Department of Defense civilian and military health care teams to significantly advance Army Medicine.

*Article by Steven Galvan, USAISR PAO*



Capt. Danielle Schaaf, a staff nurse at the U.S. Army Institute of Surgical Research Burn Center Intensive Care Unit, uses the Burn Navigator to input patient data. Photo by Steven Galvan.

## Navy Captain Donates Personal Painting to NMHM

A painting titled “Learning to Walk” depicts a moment of cooperation and compassion between two women from different parts of the world. Its artist, Navy Capt. Patricia L. McKay, has chosen to share that story with visitors to the National Museum of Health and Medicine (NMHM) by donating the work of art to the museum.

McKay created the painting for “Wounded in Action: An Art Exhibition of Orthopaedic Advancements,” an exhibit of art works inspired by individuals’ experiences with the wounds of war sponsored by the American Academy of Orthopaedic Surgeons. “Learning to Walk” was on display as part of the two-year exhibition that traveled to six U.S. cities, including an approximately year-long engagement at NMHM. Inspired by McKay’s experiences while deployed on the *USNS Comfort* in 2003, the acrylic painting is based on a photograph McKay took of an American physical therapist helping an 18-year-old Iraqi female amputee learn to walk on crutches. After spending several weeks working up a first draft of the painting, McKay said it only took her two nights to complete what would become the final version.

“When the ‘Wounded in Action’ project came out, this was the image that came to mind,” said McKay, who serves as Assistant



Navy Capt. Patricia L. McKay stands with her painting “Learning to Walk” that portrays a scene McKay witnessed while deployed with the *USNS Comfort* during Operation Iraqi Freedom. Photo by Matthew Breitbart.

Dean for Clinical Sciences at the Uniformed Services University of the Health Sciences (USU) in Bethesda, Md.

McKay said she was struck by the colors in the photograph and “the effort that she [the Iraqi girl] was making to learn to walk again.” She explained that she also saw a distinct contrast between the two women; the American physical therapist had the freedom to go anywhere and do anything, while the patient had very limited opportunities because of her nationality, gender and physical challenges.

“Yet, this physical therapist is taking care of these women who were absolutely convinced that their future held nothing more than being a beggar,” McKay said, adding the Iraqi girl in the picture, “saw no future for herself.”

In an effort to help the girl gain some practical skills, McKay said she taught her to use a sewing machine, which McKay had brought onto the ship to use in her spare time.

“I actually took the sewing machine down to the ward and

had her sit at the machine and learn to use it, thinking maybe she would be able to see she could still do so many things,” McKay said. “She had never seen a sewing machine before, but we had some fabric and some material and she just hemmed this hijab [the head covering she wears in the painting]—we gave her the fabric for that.”

McKay said the girl stayed on the hospital ship for approximately six weeks until the *Comfort* was given orders to return to the United States. She does not know what happened to the girl, but thinks it is possible she may have been able to obtain a prosthetic limb upon returning to Iraq.

“We all hope that her life has been better than she expected it would be,” McKay said.

McKay, who specializes in orthopedics and is also a hand surgeon at Walter Reed National Military Medical Center and Fort Meade, said she hopes that when people see the painting, they will walk away with a sense of how important it is to help others.

“For me, it’s about compassion for our fellow human beings, and the willingness to reach across cultures and try to raise each other up,” she said. “And I think that those of us who were the providers [on the ship] gained as much from that experience as we gave to the patients.”

*Article by Melissa Brachfeld,  
NMHM PAO*



Courtesy photo.

## 6th MLMC Tours Pentagon

Soldiers of the 6th Medical Logistics Management Center traveled to the Pentagon as part of a professional development program.

During a tour, about 30 soldiers had the opportunity to walk in the same corridors of the military and civilian personnel that work in the headquarters of the Department of Defense. During the tour of the Chiefs Corridor, soldiers had the chance to be in the office of the Army Chief of Staff and remember victims when they were in the 9/11 memorial room.

Throughout the trip they also grasped how the Department of Defense coordinated with other agencies at a strategic level.

“It’s a great experience to take a glimpse of the many symbolic moments in military history,” said Spc. Kaitlyn A. Arndt.

Added Spc. Ebony J. Johnson, “It’s comforting to see memorial quilts with faces of victims hang on the wall and reminds us that they may be gone, but they will never be forgotten.”

As the tour came to an end, they stopped by the Hall of Heroes that displayed all of the Medal of Honor recipients.

6th MLMC Commander Col. Anthony R. Nesbitt said, “We will continue to plan various activities as part of our professional development focused on the strategic environment. We will also visit White House and other government agencies.”

*Article by Capt. Seungho Kang,  
6th MLMC*



## Consortium Aims to Reduce Military Suicides

Researchers at the U.S. Army Medical Research and Materiel Command are working to increase soldier resiliency and reduce suicides.

USAMRMC's Military Operational Research Program manages the Military Suicide Research Consortium, an ongoing suicide prevention effort established and synchronized by the DoD, Department of Veterans Affairs, and Florida State University in 2010. This consortium continues to push the limits through cutting-edge research aimed at enhancing the military's ability to quickly identify the risks associated with suicidal behavior in the military.

"Suicide is a multiply-determined problem," explained Dr. Peter M. Gutierrez, a leading suicide expert and clinical/research psychologist with the Veterans Integrated Service Network 19 Mental Illness Research, Education and Clinical Center at the Denver VA Medical Center, "and despite decades of research, [it] is in some ways still poorly understood."

Suicides are not an issue that is unique to the military. More people die from suicide than from car accidents, according to the Centers for Disease Control and Prevention. According



to the latest reported CDC statistics, suicide is a leading cause of violent death in the United States, ranked 10th among persons 10 years and older, and accounting for 36,981 deaths.

To fight this issue in the military, the MOMRP program is managing an extensive portfolio of research initiatives aimed at developing effective countermeasures against stressors with the overall objective of maximizing the health, performance and well-being of soldiers throughout the deployment cycle. Including the work of the consortium, current research focuses on suicide screening, assessment, and clinical interventions for at-risk service members and veterans. The ten most recent studies happening within the MSRC include:

- "Development and Evaluation of a Brief, Suicide Prevention Intervention

Targeting Anxiety and Mood Vulnerabilities" -- N. Brad Schmidt, Ph.D.

- "Warning Signs for Suicide Attempts" -- Courtney Bagge, Ph.D. & Ken Conner, PsyD, MPH
- "Identifying Factors Associated with Future Suicidal Self-Directed Violence within a Sample of Mississippi National Guard Personnel" -- Michael Anestis, Ph.D.
- "Neuroimaging Correlates of Suicide Risk" -- Deborah Yurgelun-Todd, Ph.D. & Perry Renshaw, M.D., Ph.D.
- "Controlled Evaluation of a Computerized Anger-Reduction Treatment for Suicide Prevention" -- Jesse Cogle, Ph.D.
- "A Novel Approach to Identifying Behavioral and Neural Markers of Active Suicidal Ideation: Effects



## USAMMCE Team Trains on Logistical Process

USAMMCE warehouse personnel conducted professional development training Nov. 8, at Landstuhl Regional Medical Center. They visited the Intensive Care Unit and the storage and shipping warehouse to gain a better understanding of LPMC's logistical process, so USAMMCE staff can provide services that best fit LPMC's needs. Courtesy photo.

of Cognitive and Emotional Stress on Working Memory in OEF/OIF/OND Veterans" -- Beeta Homaifar, Ph.D. & Melissa Amick, Ph.D.

- "New Approaches to the Measurement and Modification of Suicide-Related Cognition" -- Matthew Nock, Ph.D.
- "A Taxometric Investigation of Suicide" -- Jill Holm-Denoma, Ph.D. & Tracy Witte, Ph.D.
- "Home-Based Mental Health Evaluation (HOME) to Assist Suicidal Veterans with the Transition from Inpatient to Outpatient Settings: A Multi-Site Interventional Trial" -- Bridget Matarazzo, Ph.D.

- "Effectiveness of a Virtual Hope Box Smartphone App in Enhancing Veteran's Coping with Suicidal Ideation: A Randomized Clinical Trial" -- Nigel Bush, Ph.D.

"The research being conducted by the MSRC is part of a larger strategy to address this [suicide] challenge, develop and test suicide-specific interventions, and provide a strong evidence base for screening, assessment, and prevention," explained Gutierrez.

The MSRC's infrastructure is designed to specifically support an Independent Scientific Peer Review Program and Military External Advisory Board, expediting the review of proposals being submitted

to the MSRC. External advisory boards, such as the MEAB, support the MSRC to identify gaps in current literature on military suicide.

The ISPRP provides the MSRC reviews within 30 days of receipt and scheduled meetings with the MEAB, allowing MSRC projects to be approved quicker compared to other funding options.

According to Project Coordinator Kelly Soberay, "The MSRC has worked very hard to rapidly move funding to the researchers conducting cutting-edge work."

For additional information on the MSRC, visit: <https://msrc.fsu.edu>

Article by Melissa Myers, USAMRMC PAO



## Future Scientists Yearn to Learn in GEMS Program

The U.S. Army Medical Research and Materiel Command's Gains in the Education of Mathematics and Science program wrapped up a successful year, hosting 1,508 student interns, 50 near-peer mentors, 30 assistant near-peer mentors, and 13 resource teachers.

In 2013, USAMRMC and its subcommands offered GEMS participants a variety of experiences. The U.S. Army Aeromedical Research Laboratory at Fort Rucker, Ala., hosted a physical science and forensics program, as well as a robotics program. At the U.S. Army Institute of Surgical Research, Joint Base San Antonio Fort Sam Houston, Texas, students conducted experiments to learn about electricity, cardiology, blood typing, types of bacteria, DNA, dentistry, and crime scene investigation techniques. The U.S. Army Medical Research Institute of Chemical Defense's program focused on medical and chemical topics.

The Armed Forces Medical Examiner System, in collaboration with Delaware State University, created a crime-solving program where students used blood typing, fingerprinting, bone identification, and DNA to solve fictional crimes. At the U.S. Army Research Institute



**A GEMS student watches his experiment. Courtesy photo.**

of Environmental Medicine, students investigated physics/forces of motion and forensics; others participated in a brain lab, microbiology tour, flame lab and robotics; a third team learned about physics, electrolysis and building a custom fuel car.

The Walter Reed Army Institute of Research offered a GEMS curriculum that involved both biomedical and engineering programs carried out in WRAIR's large teaching laboratory at the Forest Glen Annex in Silver Spring, Md., and at Wheaton High School in Wheaton, Md. The U.S. Army Medical Research Institute of Infectious Diseases hosted a "Crime Scene

Investigation" program and a Battlebots program, using LEGO® remote-controlled robots in a final challenge competition where they battled each other's bots in a GEMS arena.

GEMS, a national program that runs from early June through August, gives student interns opportunities to participate in age- and grade-appropriate, hands-on activities that enable them to experience science in actual laboratory settings. During USAMRMC's program, student interns attend four- to five-day classes designed to promote development and interest in science, technology, engineering, and

## GEMS Now Accepting Internship Applications

The U.S. Army Medical Research and Materiel Command's Gains in the Education of Mathematics and Science (GEMS) program is accepting applications for high school internships at Fort Detrick.

Week-long high school internships are available for junior and senior students interested in becoming Assistant Near-Peer Mentors for the GEMS program. Assistant Near-Peers serve as aides to resource teachers and more senior mentors. They help elementary, middle and other high school students in the program, while networking with scientists and professionals from USAMRMC laboratories.

The application deadline for Assistant Near-Peer Mentors is Mar. 21.

Students may select their week of choice on the application, with several options from June through August.

The goal of the GEMS program is to broaden students' interest in science, engineering, technology and math so that they may consider future careers in these fields.

Learn more and access applications online at [http://stem.amedd.army.mil/index.cfm/media/news/article/2013\\_opportunities\\_open\\_gems\\_program](http://stem.amedd.army.mil/index.cfm/media/news/article/2013_opportunities_open_gems_program)



mathematics.

"The kids [get] to see things here that they wouldn't be able to experience anywhere else," said Capt. Carrie Quinn, a research physiologist for Thermal and Mountain Medicine at USARIEM, Natick Soldier Systems Center, Mass. "They get to truly see how science and math are everywhere--even in the Army."

The student interns are taught by college-aged students called near-peer mentors who lead the GEMS programs and serve as role models for the students. Prior to the start of the program, near-peer mentors complete extensive

training in which they learn how to conduct and teach the GEMS experiments.

"This program introduces them [student interns] to totally new topics, giving them new ideas for future careers and areas of study," said Cecilia King, who is studying aerospace engineering at the University of Alabama, and served as a near-peer mentor at USAARL. "For example, I taught an interested student intern about the basic concepts of boundary layers, something that I did not even know about until college."

During the program, some of USAMRMC's labs also use

assistant near-peer mentors who are high school juniors or seniors. Resource teachers oversee the near-peer mentors, providing guidance and teaching instruction.

"The mentors [were] so great, nice and encouraging to us," said Jack Gagner, 14, a student intern at USARIEM. "I would definitely like to stay involved in this program and be a mentor for others."

Learn more about USAMRMC GEMS and applications for this year's program online at [stem.amedd.army.mil](http://stem.amedd.army.mil)

*Article by USAMRMC Educational Outreach Team*



## NICBR Board of Directors Visit USDA

Members of the U.S. Department of Agriculture, Agricultural Research Service's Foreign Disease-Weed Science Research Unit hosted a tour of their state-of-the-art insect containment facility. The tour was for the Board of Directors of the National Interagency Confederation for Biological Research, following their semi-annual meeting.

Doug Luster, who heads the ARS laboratory, hosted the tour. Prior to the tour, Dr. Steven Kappes, Acting Associate Administrator for National Programs for ARS, provided an overview of the agency, which is the USDA's chief intramural scientific research arm. Their insect containment facility was designed and constructed for the study of how pest species transmit diseases to crops, diminishing their yield and

quality. Caged colonies of aphids and nonnative pests, such as *Asian citrus psyllids*, which transmit citrus greening disease, are maintained at the facility. Members of the Board of Directors also received an external tour of the ARS laboratory's biosafety level-3 green-house building, where exotic plant pathogens can be securely studied on their crop and weed hosts.

Food and Drug Administration Chief Scientist and NICBR Board of Directors member Jesse L. Goodman, MD, MPH, said, "It was great to see the fascinating work that USDA scientists are doing to protect our nation from disease threats to our agricultural plants and to our forests. The Fort Detrick facility provides a unique capability to study important plant diseases - a capability that

is essential to our economy, our well-being and our national security. FDA is very pleased to be a partner in the NICBR, using science to keep our nation safe."

The Board of Directors provides oversight and strategic direction for the NICBR partner agencies-particularly in their development and transfer of new technologies, knowledge, and products to ensure the health and security of military personnel and the general public. "The tours afford an opportunity for NICBR leadership to learn first-hand about research being conducted by member agencies as well as meet the staff and identify potential areas for collaboration on future projects," said Luster.

*Article by NICBR, Public Affairs and Community Relations Subcommittee*

## USAMRICD Hosts Acting Deputy Assistant SECDEF for Chemical and Biological Defense

The U.S. Army Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, Md., started the new year hosting a visit on Jan. 10 from Dr. James "Ben" Petro, acting deputy assistant secretary of defense for chemical and biological defense.

Petro met with USAMRICD's commander, Col. Bruce Schoneboom, the deputy commander, Lt. Col. Kevin Pitzer, the executive officer, Maj. Michael Hartenstine, and the director of the Science Program Analysis and Integration Office, Dr. James Dillman. He toured the chemical surety area and received a briefing on the USAMRICD's program for handling such materials.

Petro said he was impressed not only with the existing facility, but also with the improved capabilities of the new facilities in the USAMRICD's replacement building.

"The demonstration of the [storage facilities] gives me high confidence that USAMRICD is at the pinnacle of safety and security of chemical materials," said Petro.

Petro's tour of the replacement facility also highlighted many of the unique, state-of-the-art



Col. Bruce Schoneboom (right) with Dr. James "Ben" Petro, acting deputy assistant secretary of defense for chemical and biological defense, at a USAMRICD site visit Jan. 10. Photo by Darrell Jensonis.

research features incorporated into the 526,000-square-foot building. According to Petro, the "impressive scope of capabilities that will be available to support the unique competencies of the USAMRICD staff" as well as their "commitment to the mission" augurs well for the continuing ability of the chemical biological defense program team "to address the most difficult strategic challenges facing our Nation's security." The replacement facility is nearing completion with its official ribbon cutting

currently scheduled for May 1.

In addition to the tours, Petro and USAMRICD's command group discussed the institute's research on new chemical threats, its participation in the Organization for the Prohibition of Chemical Weapons 4th Confidence Building Exercise, and issues related to the recruitment of talented young scientists to maintain the level of scientific expertise within the organization.

*Article by Cindy Kronman, USAMRICD PAO*

## Barquist Awardees

Three Army Medical Development personnel were recognized Dec. 6 for their service and presented with the order of Military Medical Merit at the Barquist Army Health Clinic. Barquist Commander Col. Mitchell Brew (right) presented the awards to Don Allen, Ivan Carbonell, and Anna Walsh, who have collectively contributed more than 100 years of service to AMEDD. Courtesy photo.





# USAMRMC Announces Retention NCO of Year

The U.S. Army Medical Research and Materiel Command named its top Retention Non-Commissioned Officer of the Year for 2013. Staff Sgt. Floretta G. Sample, a respiratory specialist (68V) at the U.S. Army Institute of Surgical Research Burn Center, was selected for this honor from among eight other retention NCOs from USAMRMC subordinate commands.

"I feel blessed to be considered for such an honor, let alone to be selected," said Sample.

Nominees from each command submitted a packet with their updated Enlisted Record Brief; physical fitness test results; a recommendation letter from their Commander, Sgt. Major, or Senior Enlisted Advisor; their biography and portrait; and an essay with a response to the question, "If I was able to make policy for retention, what is the one policy I would make and why?"

Sample, a 14-year Army veteran, has been at the Burn Center for four years where she has been assigned to the Clinical Operations and Education Office. For the last couple of years, Sample has also served as the USAISR Retention NCO "assisting Soldiers and civilians make life-changing decisions easier," she said.

During the last two years, Sample has processed 89 reenlistment packages with 34 of those packages being processed during FY2013. She said she enjoys her duties as the command retention NCO despite some of the challenges.

"Some challenges include changes in the Army's retention policies and the constant changes in Soldier's lives that affect their decisions," Sample said.



Staff Sgt. Floretta G. Sample, a respiratory specialist (68V) at the U.S. Army Institute of Surgical Research Burn Center, was selected as USAMRMC's top Retention Non-Commissioned Officer of the Year for 2013. Courtesy photo

Sample is scheduled to transfer in 2014 to the 115th Combat Support Hospital, Fort Polk, La., where she plans on continuing to work on her short- and long-term goals. "Some of my short-term goals include earning my registered respiratory therapist certification and master's degree in education," she said. "Some of long-term goals include retiring from the Army as a 1st Sgt. and becoming a college professor."

Article by Steven Galvan,  
USAISR PAO

## USAMRMC

## USAARL

## USAMRICD

## USAMRICD

### Commander's Award for Civilian Service

Darrin Good  
Dr. Tiberiu Tuzson  
Cynthia Barlow  
Jean White

### Army Achievement Medal

Sgt. George Lewis

### Achievement Medal for Civilian Service

Juan Flores

### 2013 General Maxwell Thurman Award

Lori DeBernardis

### The Order of Military Medical Merit

Ken Whittaker

### 5 Years of Service

Larry Tyson

### Acquisition Certification

Col. Jamie Blow  
Lt. Col. Lolita Burrell  
Maj. Clayton Carr  
John Carr  
Harry Coffey  
Douglas Gibson  
Juanita Grimsley  
Capt. Tracy Johnson  
Col. Daniel Kral  
Lt. Col. Cindy Landgren  
Sheila McFarland  
Daimen Michaels  
James Myers  
Dr. James B. Phillips  
Lorraine Scott  
Glenn Wilson  
Lt. Col. David Wright

### Decision Gate Award

Lt. Col. Eric Wagar

### Certificate of Appreciation

Matt Cox  
Justin Dailey  
Staff Sgt. David Lopez  
John Ramiccio  
Angus Rupert  
Elizabeth Stokes

### Certificate of Achievement

Spc. Roddricus Allen  
Sgt. Hosea Bickerstaff  
Spc. Dong Kim  
Jeff Miller  
Spc. Hilary Phillips  
John Ramiccio  
Capt. Stephanie Traynham

### Army Achievement Medal

Spc. Jinyong Bae  
Spc. Josue Sosa

### Distinguished Performance Award

Stacy Brunson

### Meritorious Service Medal

Maj. Antonio Blue  
Col. William Statz

### Soldier of the Quarter

Spc. Dong Kim

### NCO of the Quarter

Sgt. Hosea Bickerstaff

### 25 Years of Service

Brad Erickson

### 30 Years of Service

Mary Mayo

### Order of Military Merit

Dr. Michael Adler  
Dr. Benedict Capacio  
Dr. Douglas Cerasoli  
Dr. Robert K. Kan  
Tracey A. Hamilton  
Dr. Kimberly Whitten

### Meritorious Service Medal

Maj. Scott Willens

### Army Commendation Medal

Spec. Shea Weidman

### Army Achievement Medal

Staff Sgt. Marco Acevedo  
Spec. Lee Roberts

### Certificate of Achievement

Staff Sgt. Prince  
Sgt. Swails  
Spec. Hubbard  
Maj. Mary Sprangel  
Capt. Carl Smith  
Capt. Jeffrey Havens  
Sgt. 1st Class Johnatan Caseja  
Staff Sgt. Trenise Porch  
Staff Sgt. Danny Prince  
Staff Sgt. Elizabeth Vescovi  
Sgt. Alicia Swails  
Sgt. Stacey Swayze  
Spec. Elizabeth Babcock  
Spec. Kevin Laitipaya  
Spec. Cheryl Ramirez  
Spec. Lee Roberts  
Spec. Yiashira Vega-Conde  
Spec. Shea Weidman  
Pfc. Desmond Hamlet  
Erin O'Keefe  
Sgt. 1st Class Johnatan Caseja  
Sgt. 1st Class Travis Lindeblad  
Sgt. Stacey Swayze  
Spec. Elizabeth Babcock  
Spec. Kevin Laitipaya  
Spec. Cassandra Rousayne  
Jennifer Devorak  
Dr. Timothy Varney  
Dawn Watters

### Certificate of Appreciation

Jennifer Devorak

### Army Physical Fitness Award

Capt. Todd Jaszewski  
Sgt. Alicia Swails

### 5 Years of Service

Sandra Debus  
Patricia Mallory

### 15 Years of Service

Louis Gizara

### 25 Years of Service

James Apland  
Deborah Doctor  
Deborah Lee  
Joyce Twitty

### Superior Civilian Service Award

Erin O'Keefe

### Commander's Award for Civilian Service

Sharon Cullum  
Sofia Elgarresta  
Kathleen Housman  
Sandra Loukota  
Jade Makfinsky  
Melanie Murrow  
Jonathan Oyler  
Larry Presley  
Hugh Prestley  
Susan Schulz  
Gregory Smith  
Kelly Smith  
Austin Swift  
Jeremy Taylor

### Certificate of Appreciation and Commander's Coin

Susan Schultz  
Karen Clemens  
Melissa Jamison  
Theresa Nipwoda  
Steve Getlein  
Tracey Hamilton  
Kelly H. Smith  
Jennifer Devorak  
Robin Deckert  
Sandra DeBus  
Gary Rockwood  
Jonathan Oyler  
Sharon Norton  
Cristin Rothwell  
Tamara Otto|  
Erik Johnson  
Heidi Hoard-Fruchey  
Paula Adkins  
Jannitt Simons  
Austin Swift  
Kathleen Housman  
John Statham  
David Lendle  
Timothy Varney  
Robyn Lee



# Everyday Heroes in Healthcare

Caring for America's Sons and Daughters for 113 Years

