NAVAL MEDICAL R&D NEWS

MILITARY HEALTH SYSTEM RESEARCH SYMPOSIUM

AUGUST 27-30 | KISSIMMEE, FLORIDA

SPECIAL EDITION

SEPTEMBER 2017

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ABOUT MHSRS

MHSRS is the Department of Defense's (DoD) premier scientific meeting; a unique collaborative opportunity for military medical care providers, DoD scientists, academia and industry to exchange information on research advancements and health care developments in the areas of combat casualty care, military operational medicine, clinical and rehabilitative medicine and military infectious disease research program.

ABOUT THE R&D ENTERPRISE

Navy Medicine's research and development laboratories are engaged in a broad spectrum of activity from basic science in the laboratory to field studies at sites in remote areas of the world to operational environments. The capabilities and the geographical locations of the laboratories reflect the broad mission of Navy Medicine's Research and Development Enterprise. With a cadre of scientific leadership and technical expertise focusing on force health protection and enhancing deployment readiness, the research teams represent years of experience in science, medicine and the military.

In support of the Navy, Marine Corps, and joint U.S. warfighters, researchers study infectious diseases; biological warfare detection and defense; combat casualty care; environment health concerns; bone marrow registry; aerospace and undersea medicine; medical modeling, simulation and operational mission support; and epidemiology and behavioral sciences.

The goal is to deliver high-value, high-impact research products to support and protect today's deployed warfighters. At the same time researchers are looking to the readiness and well-being of future forces.

NAVY MEDICINE R&D LABORATORIES

Silver Spring, MD

San Diego, CA

Dayton, OH

San Antonio, TX

Groton, CT

Singapore, Asia

Lima, Peru

Cairo, Egypt

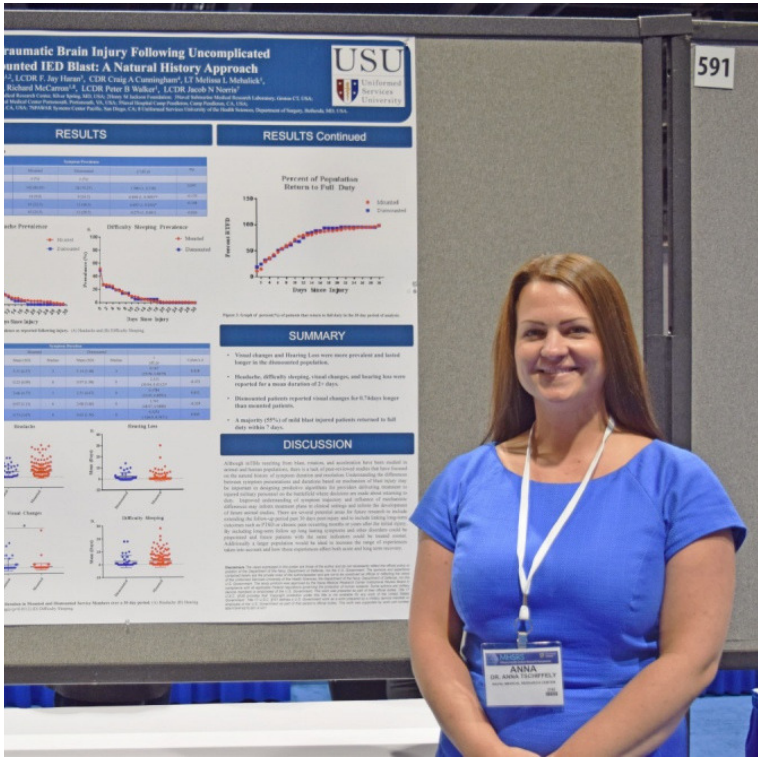
NMRC Presents Research on Recovery from Mild TBI Following Uncomplicated Mounted and Dismounted IED Blast at MHSRS

KISSIMMEE, Florida – A researcher from the Naval Medical Research Center (NMRC) shared findings on the effects of mild traumatic brain injury (mTBI) on service members during the first 30 days following an improvised explosive device (IED) blast.

"The purpose of this study was to utilize a natural history approach to describe and understand symptom recovery in injured military personnel diagnosed with a blast related mTBI," said Dr. Anna Tschiffely, Research Psychologist, Neurotrauma Department, NMRC. The findings were presented during a poster session at the Military Health System Research Symposium (MHSRS), August 27 – 30.

Tschiffely, along with other NMRC researchers, focused on examining the first 30 days following injury in a cohort of service members injured by an IED related blast. The study focused on examining personnel injured in a dismounted (on foot) patrol vs. a mounted (in vehicle) patrol.

"Clinicians and patients alike may be interested in our findings to understand how the brain recovers following a blast exposure injury. The more we understand about what the days, weeks, and months following blast exposure look like in injured service members, the better we can treat them in the short-term and the long-term," said Tschiffely.... (cont.)



Dr. Anna Tschiffely shared findings on the effects of mild traumatic brain injury (mTBI) on service members during the first 30 days following an improvised explosive device (IED) blast during the Military Health System Research Symposium (MHSRS) August 28 (U.S. Navy Photo/Katie Berland/Released)

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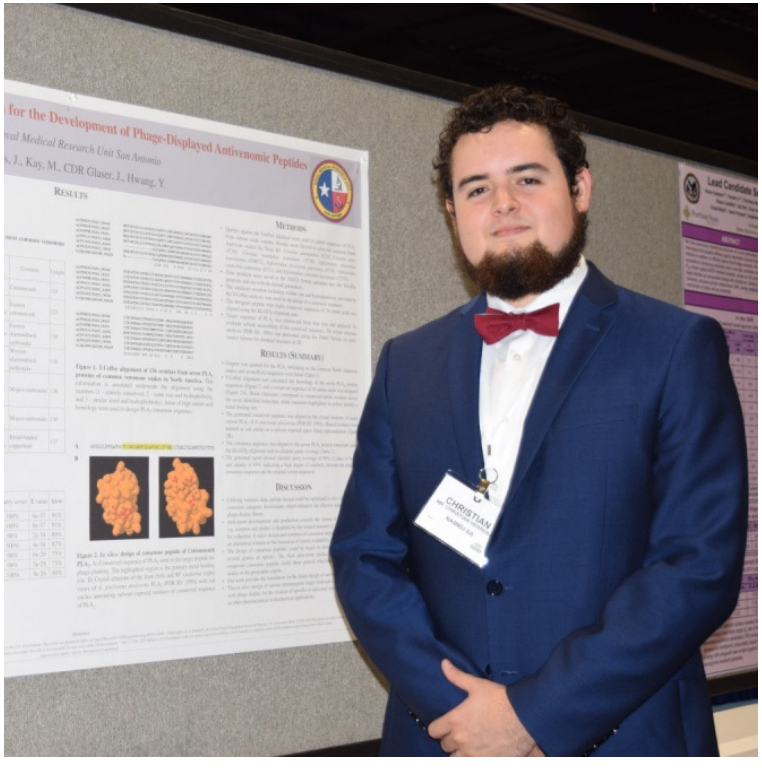
NAMRU-SA Researcher Presents on Development of a Novel Antivenom Using Phage-Displayed Short Peptides at MHSRS

KISSIMMEE, Florida – A researcher from the Naval Medical Research Unit – San Antonio (NAMRU-SA) shared findings on the application of phages display technology expressing antivenom peptides for the treatment of envenomation during the Military Health System Research Symposium (MHSRS), August 27 – 30.

"Snakebite envenomation (bite/sting) is an important public health concern," said Cmdr. Jacob Glaser, Principal Investigator, Department Head, Expeditionary and Trauma Medicine Department, Combat Casualty Care Directorate. "The current standard treatment approach relies on antibody based antisera, which is expensive, not universally available and is occasionally associated with adverse effects."

To combat this, Glaser and a team of researchers, including Dr. Yoon Hwang, lead researcher for the phage-based antivenom project, conducted a study on venom-specific phage that can effectively neutralize the toxicity of target snake venom components and expand to include additional snake venoms. While further research is needed, their long term plan is to create a universal antivenom, using selected venom-specific phage, that offers a highly effective, cost efficient, easy to administer, and practical alternative to existing antibody based antivenoms....(cont.)



Mr. Christian Herrera from Naval Medical Research Unit-San Antonio presented a poster on behalf of Dr. Yoon Hwang on the application of phages display technology expressing antivenom peptides for the treatment of envenomation during the Military Health System Research Symposium (MHSRS), August 29 (U.S. Navy Photo/Katie Berland/Released)

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NAMRU-D Collaborative Military Medical Research Evaluates Aircrew Laser Eye Protection

Researchers from Naval Medical Research Unit – Dayton (NAMRU-D) presented collaborative findings on the evaluation of aircrew low-intensity threat laser eye protection (LIT-LEP) during the Military Health System Research Symposium (MHSRS), August 29 (U.S. Navy Photo/Megan Mudersbach/Released)

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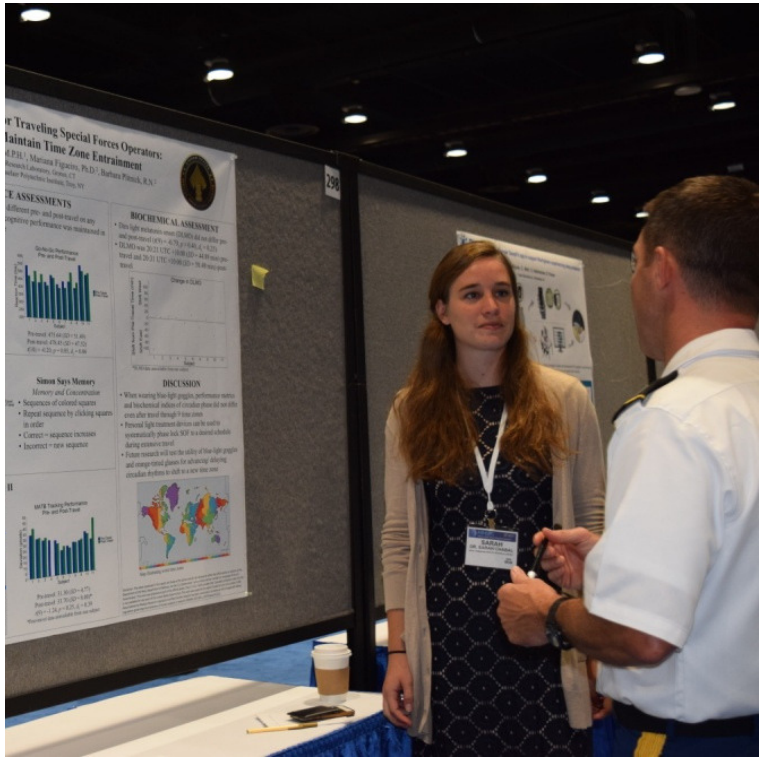
KISSIMMEE, Florida – Researchers from Naval Medical Research Unit – Dayton (NAMRU-D) presented collaborative findings on the evaluation of aircrew low-intensity threat laser eye protection (LIT-LEP) during the Military Health System Research Symposium (MHSRS), August 29.

“Cross-service collaboration is an essential ingredient for LIT-LEP development and acquisition success,” said Dr. Michael Reddix, senior research psychologist and lead on the project.

NAMRU-D is collaborating with the United States Air Force Research Laboratory, Materials and Manufacturing Directorate, Photonic Materials Branch (AFRL/RXAP) to develop LEP spectacles that meet the U.S. Coast Guard (USCG) requirements. Working together, the researchers at NAMRU-D and AFRL/RXAP are looking to design, manufacture and evaluate low-cost, low-intensity threat laser eye protection for use in military aviation operating environments.

“An additional key to success in this program was AFRL’s well defined links to industry support for LEP product manufacturing using U.S. Air Force proprietary dyes and already-approved-for-flight materials,” said Reddix....(cont.)

NSMRL Researcher Presents Findings on Circadian Rhythms at MHSRS



Dr. Sarah Chabal, Warfighter Performance Directorate, Naval Submarine Medical Research Laboratory in Groton, Connecticut, speaks to a Military Health System Research Symposium (MHSRS) attendee, August 28, Kissimmee, Florida. (U.S. Navy Photo/Katie Berland/Released)

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KISSIMMEE, Florida – Can performance deficits be reduced by locking operators to a circadian phase through the use of controlled light exposures? This was the subject of findings presented by researchers from the Naval Submarine Medical Research Laboratory (NSMRL) at the Military Health System Research Symposium (MHSRS), August 27 – 30.

Circadian rhythms are basically a biological 24-hour clock that cycles between sleepiness and alertness at regular intervals and tracks physical, mental and behavioral changes responding primarily to light and darkness in an environment.

“Service members must be prepared to deploy and perform complex operations during times that are out of sync with their circadian rhythms. Evidence suggests operational performance during circadian misalignment could lead to dangerous or costly errors,” said Dr. Sarah Chabal, NSMRL Warfighter Performance Directorate.

Chabal and other military and industry collaborators completed the first phase of their research demonstrating how light can be used to manage traveling operators’ circadian rhythms and optimize performance. By regulating circadian rhythms through the use of carefully-scheduled light exposure, the study sought to eliminate the traveling operators’ performance decrements....(cont.)

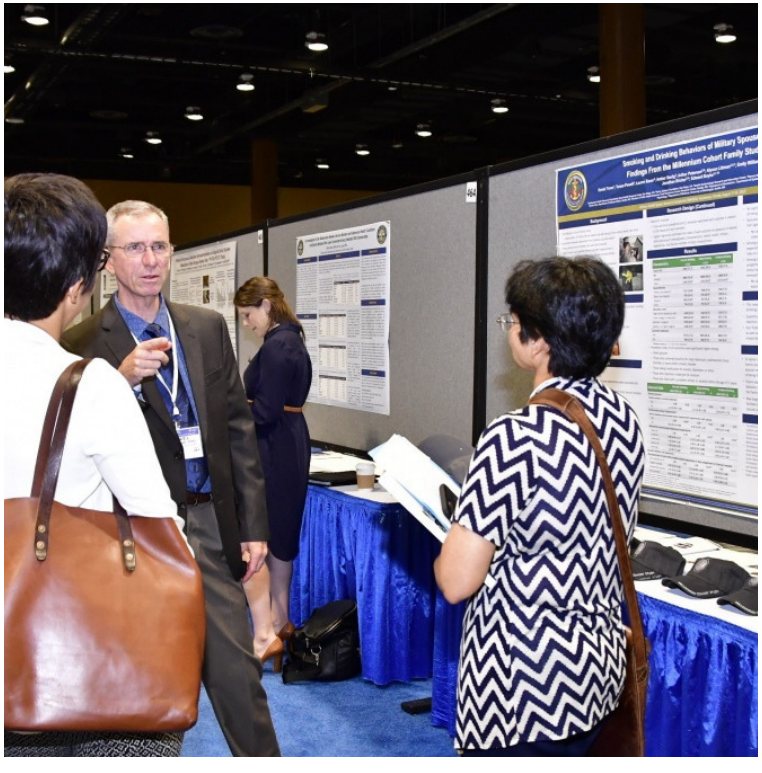
NHRC Shares Research that Supports Warfighter Readiness at MHSRS

KISSIMMEE, Florida – Scientists from the Naval Health Research Center (NHRC) attended the 2017 Military Health System Research Symposium (MHRSRS), Aug. 27-30, to share their latest research that supports the readiness and health of U.S. warfighters.

MHSRS is a scientific meeting focused on the unique medical research needs of the U.S. armed forces. Scientists from across the Department of Defense (DoD), share information about current research initiatives for new treatments and prevention measures for injuries and diseases that improve mission readiness and protect the health of warfighters on and off the battlefield.

“I assumed command two weeks ago and this symposium was the perfect opportunity to learn more about our researchers and their work,” said Capt. Marshall Monteville, NHRC’s commanding officer. “The presentations on NHRC’s current studies provided valuable insight about the readiness questions and challenges our lab is answering. Our warfighters are operating in an uncertain world and they need to be prepared for whatever threat comes their way. It’s our job, as researchers, to anticipate the threats to their health and readiness to support their preparedness.”

Among the keynote speakers was Dr. David Smith, acting principle deputy assistant secretary of defense for health affairs...(cont.)



Daniel Trone, Ph.D., an epidemiologist at the Naval Health Research Center (NHRC), presented research findings during a poster session at the 2017 Military Health System Research Symposium. Trone is part of NHRC’s military population health team that seeks to understand the impact military service has on warfighters and their families. (U.S. Navy photo by Regena Kowitz/Released)

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NMRC Researchers Present Research on Aeromedical Evacuation of Combat Casualties at MHSRS

KISSIMMEE, Florida – Researchers from the Naval Medical Research Center (NMRC) shared findings on the effects of hypobaria during aeromedical evacuation on systemic and neurologic physiology in a laboratory model of traumatic brain injury (TBI) and hemorrhagic shock (HS) during the Military Health System Research Symposium (MHSRS), August 27 – 30.

"The rapid aeromedical evacuation of combat casualties to definitive care is current standard practice in the military, but little is known about the effects of long range aeromedical evacuation in hypobaric environments on trauma patients," said Dr. Anke Scultetus, Senior Scientist, NMRC.

Scultetus, along with Dr. Richard McCarron, Department Head, Neurotrauma Department, NMRC, and other military collaborators conducted their research on the effects of long-range aeromedical evacuation in hypobaric environments on trauma patients – specifically the effects of hypobaria on TBI and HS.

"Injured patients or combat casualties may be more vulnerable than healthy passengers to the physiological challenges of altitude," said McCarron.

"While there has been no loss of life during transport of patients during the recent wars in Afghanistan and Iraq, there is increasing evidence that...(cont.)

Naval Medical Research Center researchers presented a poster on aeromedical evacuation of combat casualties at the Military Health System Research Symposium, August 28, Kissimmee, Florida. Pictured from left to right, Dr. Richard McCarron, Department Head, Neurotrauma Department, Naval Medical Research Center (NMRC), Dr. Anke Scultetus, Senior Scientist, NMRC, and United States Air Force Col. Debra Malone. (U.S. Navy Photo/Released/Katie Berland)

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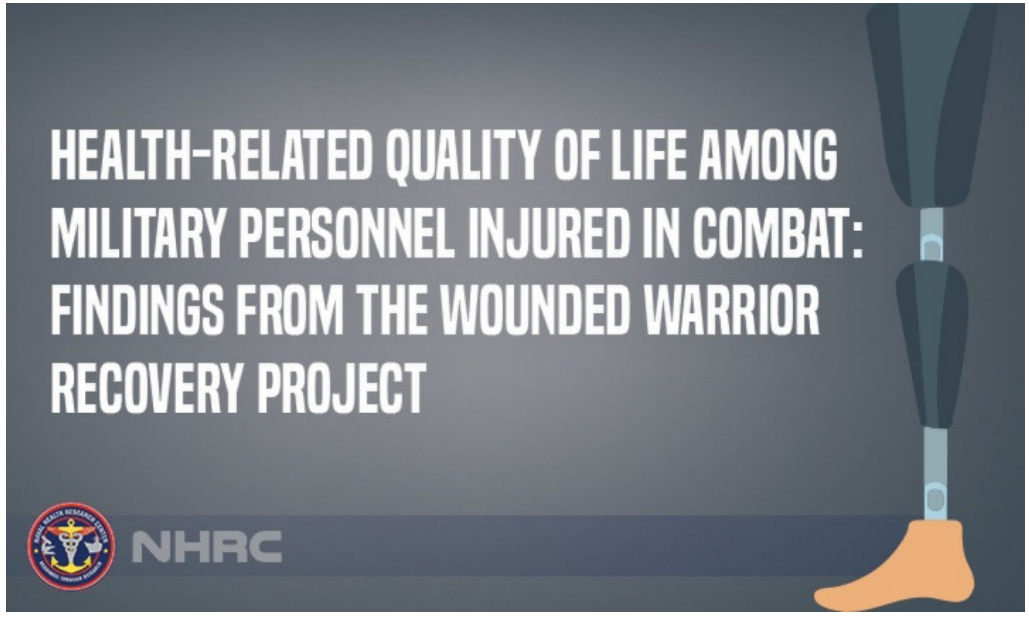
NHRC Researchers Investigate Unique Factors Associated with Quality of Life for Combat-Injured Warfighters

KISSIMMEE, Fla. – Researchers from the Naval Health Research Center (NHRC) shared study findings about unique factors associated with combat-injured service members' long-term quality of life, an emerging area of research, during the Military Health System Research Symposium (MHSRS) Aug. 28.



"To date, over 52,000 service members have been injured post-9/11," said Michael Galarneau, director of operational readiness at NHRC and principal investigator for the Wounded Warrior Recovery Project (WWRP) that led the study. "Little is known about the longer-term, health-related quality of life following combat injury, which is why the WWRP was initiated."

The WWRP is a 15-year, population-based study designed to examine the long-term impact of mild to severe injuries on health-related quality of life (HRQoL) among U.S. service members. WWRP researchers have been investigating how demographic, military service-related, injury, and mental health factors contribute to overall HRQoL among injured service members....(cont.)

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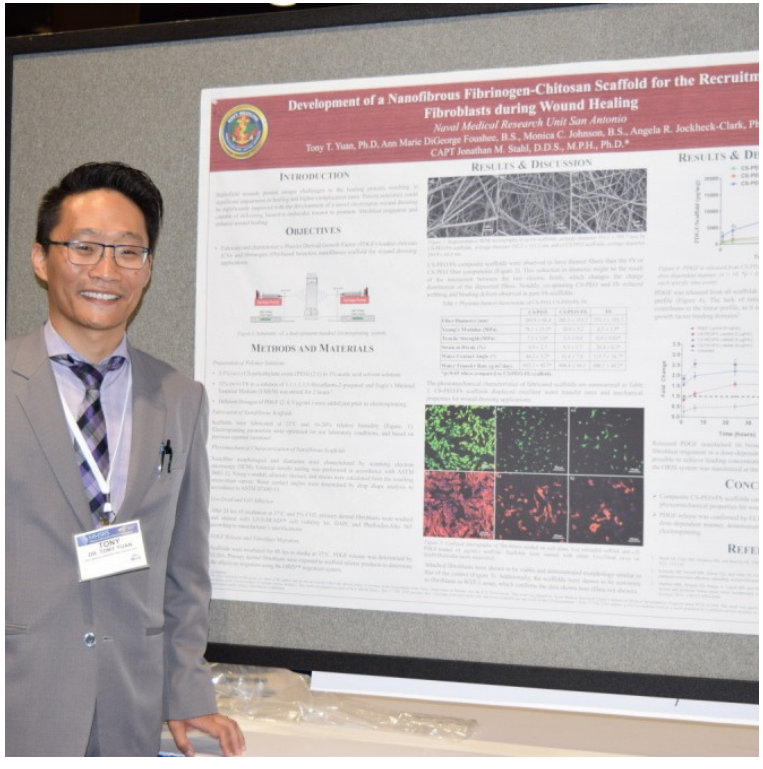
NAMRU-SA Presents on Development of a Nanofibrous Scaffold for the Recruitment of Fibroblast During Wound Healing



Dr. Tony Yuan from Naval Medical Research Unit - San Antonio presented a poster on the development of a nanofibrous fibrinogen-chitosan scaffold for the recruitment of fibroblasts during wound healing at the Military Health Systems Research Symposium, Kissimmee, Florida, August 29. (U.S. Navy Photo/Released/Katie Berland)

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KISSIMMEE, Florida – A researcher from the Naval Medical Research Unit – San Antonio (NAMRU-SA) shared findings on the fabrication and characterization of a novel nanofibrous scaffold that could potentially improve wound healing by enhancing wound closure, promoting hemostasis, and acting as a temporary physical barrier against debris and microbial pathogens during the Military Health System Research Symposium (MHSRS), August 27 – 30.

"Combat wounds are a unique challenge to the military health system," said Capt. Jonathan Stahl, Principal Investigator, Craniofacial Health and Restorative Medicine, Biomaterials and Epidemiology Department. "Extended evacuation times, unique infections, and the complexity of wound injuries can greatly complicate the wound healing process and significantly worsen patient prognosis."

Stahl and a team of researchers developed a polymer nanofiber scaffold produced from naturally available polymers by using a high-voltage fabrication technique called electrospinning. In addition to the nanofibrous scaffold, a biological functional growth factor was incorporated as a method to improve cellular recruitment during wound healing. Through the results of the research, it was demonstrated that it was possible to significantly improve cell function and recruitment by using the scaffold.... (cont.)

NHRC Research Protects U.S. Military Recruits from Respiratory Illness

KISSIMMEE, Fla. – Researchers from the Naval Health Research Center (NHRC) discussed ongoing surveillance for adenovirus, a contagious pathogen that causes respiratory illness, among U.S. military recruits during basic training at the Military Health System Research Symposium (MHSRS), Aug. 27.

In the mid-1990s, the adenovirus vaccine was discontinued at military recruit training commands throughout the Department of Defense (DoD), resulting in frequent respiratory illness outbreaks. Adenovirus was the most prevalent and widely spread virus in military training environments, infecting up to 80 percent of recruits and resulting in lost training time and increased medical care.

In 2011, the adenovirus vaccine was reinstated for military recruits after NHRC and the Walter Reed Army Institute of Research conducted a clinical trial that demonstrated its safety and efficacy. According to researchers with NHRC's operational infectious diseases team, after the live, oral vaccine for adenovirus types 4 and 7 was resumed, rates of adenovirus among recruits declined dramatically—cases went from 250 each week to two, on average. To date, other adenovirus serotypes—3, 14, and 21—that had previously caused illness in recruits have not reemerged....(cont.)

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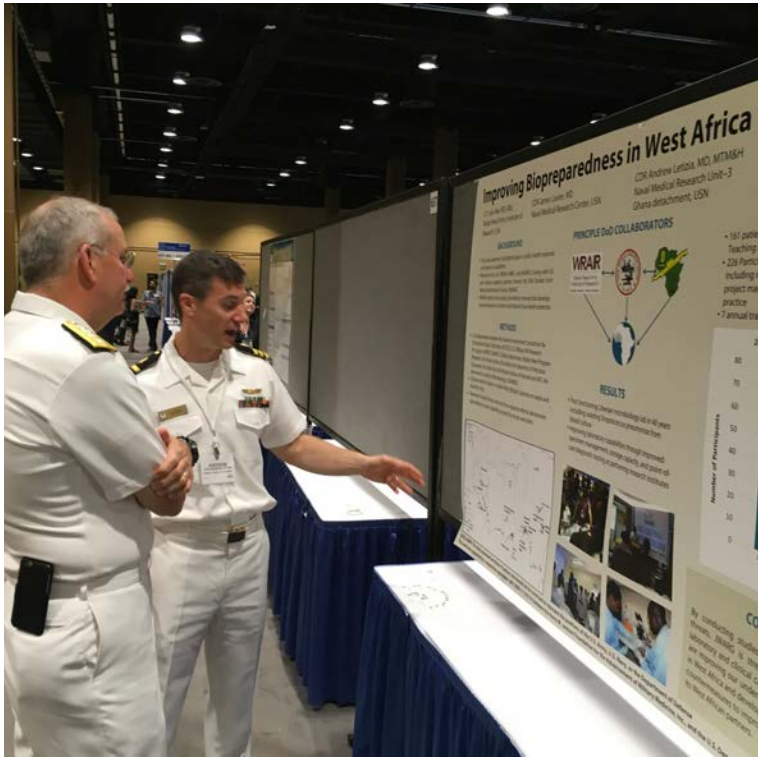
Improving Bioprepardness in West Africa

KISSIMMEE, Florida – A Navy Commander from the U.S. Naval Medical Research Unit. No. 3 – Cairo (NAMRU-3) Ghana Detachment presented a poster highlighting capacity building in Nigeria, Ghana, and Liberia at the Military Health System Research Symposium (MHSRS), August 27 – 30.

The team also includes collaborators from NAMRU-3 in Cairo and the Naval Medical Research Center (NMRC) and the Walter Reed Army Institute of Research (WRAIR) in Maryland as well as other military, government, and academic intuitions.

The collaborators formed the Joint West Africa Research Group (JWARG) to help bridge a gap that was highlighted by the 2014 Ebola epidemic by building on established local relationships, as well as partnerships in academia.

“The poster highlights work done to improve the ability of Ghana, Liberia. and Nigeria to detect and deter infectious disease threats,” said Cmdr. Andrew Letizia, Officer in Charge, Ghana Detachment, NAMRU-3. “This is accomplished through training of personnel, capacity building and the implementation of two research projects. A study examining what causes fever and a second study currently ongoing that examines what makes patients very sick in West Africa and how we can better treat them.”...(cont.)



Cmdr. Andrew Letizia from the U.S. Naval Medical Research Unit. No. 3 – Cairo (NAMRU-3) Ghana Detachment presented a poster highlighting capacity building in Nigeria, Ghana, and Liberia at the Military Health System Research Symposium (MHSRS), August 27 – 30. (Photo courtesy of NAMRU-3 Public Affairs)

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NHRC Researchers Investigate the Link Between Injury and Fitness

KISSIMMEE, Florida – Dr. Karen Kelly, a physiologist with the Naval Health Research Center (NHRC), discussed her recent work examining the relationship between training requirements, fitness, and musculoskeletal injuries, during a breakout session at the Military Health System Research Symposium (MHSRS) Aug. 30.

"Musculoskeletal injuries cost the Marine Corps millions of dollars and approximately 35,000 lost duty days each year," said Kelly, who is part of NHRC's Warfighter Performance Department. "Previous epidemiological studies have found a significant association between injuries and low fitness levels; however the causation is not well understood. Identification of modifiable risk factors of injury which include body composition and fitness levels may help to reduce injuries which translates into improved readiness."

To examine the relationship between musculoskeletal injuries and fitness test, Kelly and her team examined archival data from 2011 to 2016 for 28,829 male Marine recruits at Marine Corps Recruit Depot (MCRD) San Diego. The injury data sorted by injury type—stress fracture, fracture, and soft tissue injuries—and how the injury was classified—traumatic, new/overuse, or pre-existing overuse injury. The injury data were studied in relation to each physical fitness test conducted at MCRD...(cont.)

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NMRC Presents Research On Advanced Modeling to Predict Pnuemonia in Combat Trauma Patients at MHSRS

KISSIMMEE, Florida – A researcher from the Naval Medical Research Center (NMRC) shared findings on efforts to develop a tool to assist clinicians in predicating pneumonia in combat trauma patients during a plenary session at the Military Health System Research Symposium (MHSRS), August 27-30.

"Pneumonia is the most common hospital acquired infection in trauma patients. Identifying predictors and using advanced modeling to develop clinical decision support tools could lead to a further decline in the incidence of morbidity associated with pneumonia," said Cmdr. Matthew Bradley, Department Head, Regenerative Medicine Department, Operational Undersea Medicine Directorate.

Bradley, along with other military and industry collaborators collected data on casualties with combat extremity wounds and analyzed the incidences of pneumonia. After analyzing data and utilizing serum to measure inflammatory biomarkers, a series of algorithms were created to allow for the identification of factors predictive of pneumonia with high accuracy.

"Advanced modeling allowed for the identification factors predicative of pneumonia in a number of combat trauma patients, this is a huge step forward in continuing to care for the warfighter," said Bradley...(cont.)

Cmdr. Matthew Bradley, Department Head, Regenerative Medicine Department,Operational Undersea Medicine Directorate, Naval Medical Research Center, shared findings on efforts to develop a tool to assist clinicians in predicating pneumonia in combat trauma patients during a plenary session at the Military Health System Research Symposium (MHSRS), August 27-30. (U.S. Navy Photo/Released/Katie Berland)

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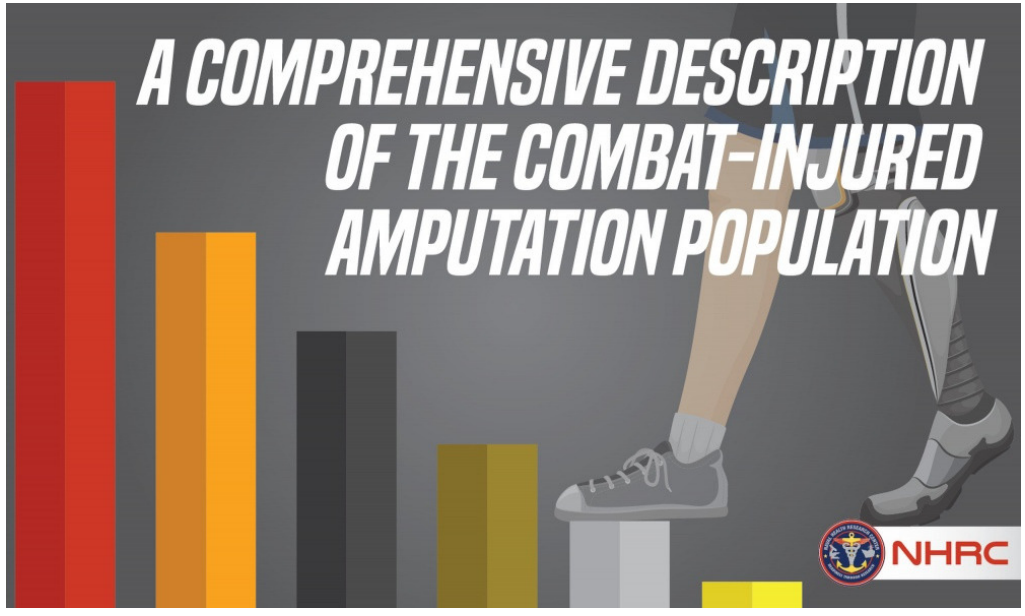
NHRC Researchers Use Data to Understand Long-Term Health Outcomes for Combat-Injured Amputees

KISSIMMEE, Florida – During the Military Health System Research Symposium (MHSRS) Aug. 29, researchers from the Naval Health Research Center (NHRC) shared findings from a recent report that described quality of life outcomes for combat-injured amputees.



The combination of advances in combat medicine and the use of improvised explosive devices in the recent conflicts in Iraq and Afghanistan has resulted in not only the highest battlefield survival rate in military history, but also increasing numbers of U.S. military personnel with amputation of one or more limbs. These seriously injured service members have unique physical and medical challenges that may have long-term consequences for their quality of life.

To better understand these potential consequences and the impact on the health and well-being of military personnel, NHRC researchers with the Wounded Warrior Recovery Project (WWRP), a long-term study examining injury effects on wounded service members' quality of life, conducted an investigation to learn more about the characteristics of this combat-amputee population and examine differences between them and injured service members without amputation....(cont.)

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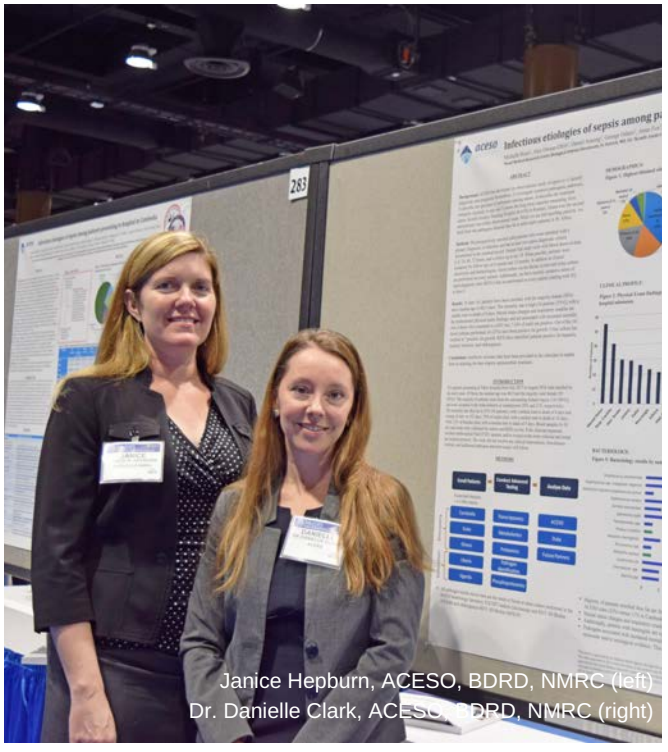
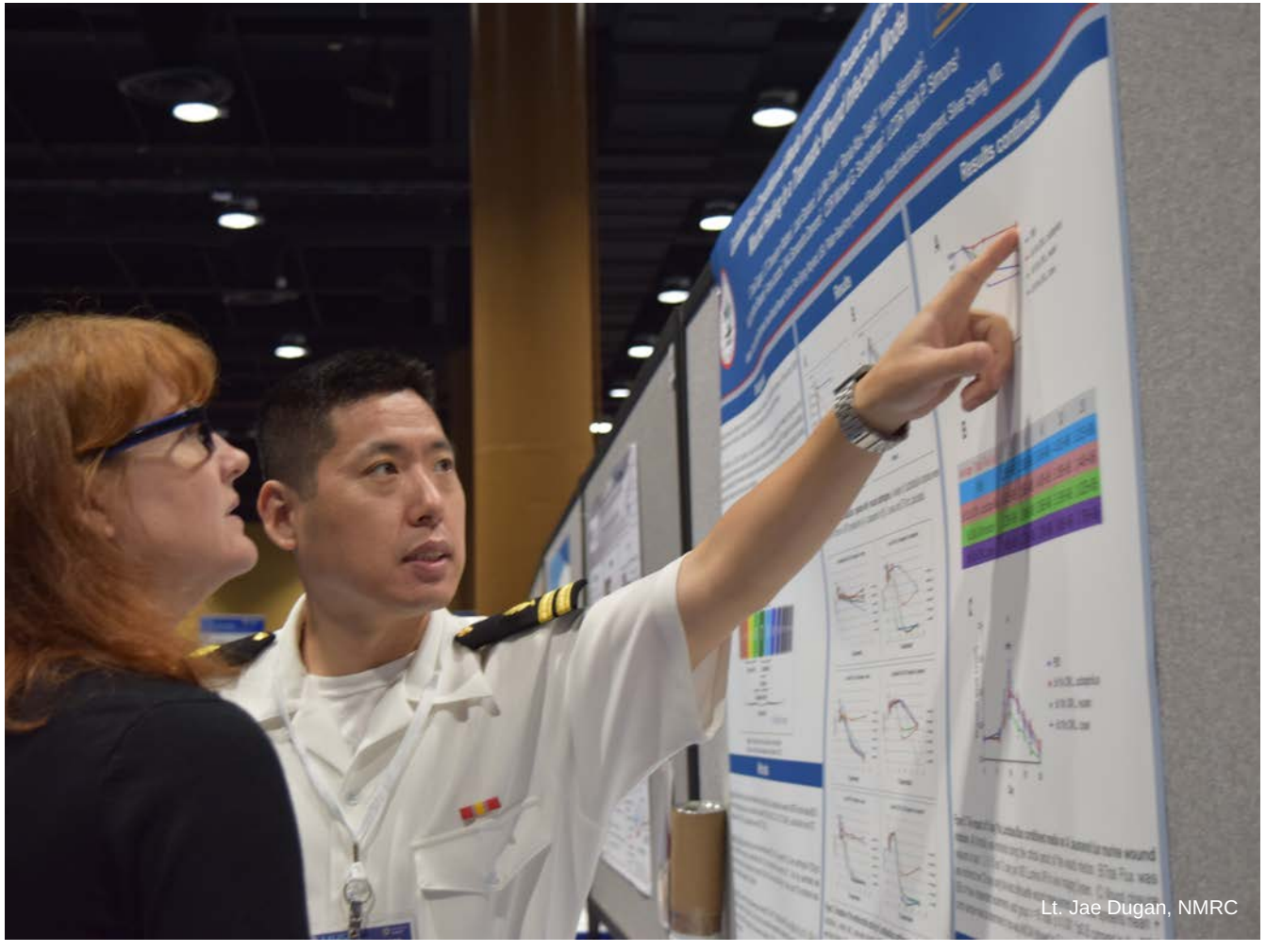
Photo Courtesy NMRC Public Affairs

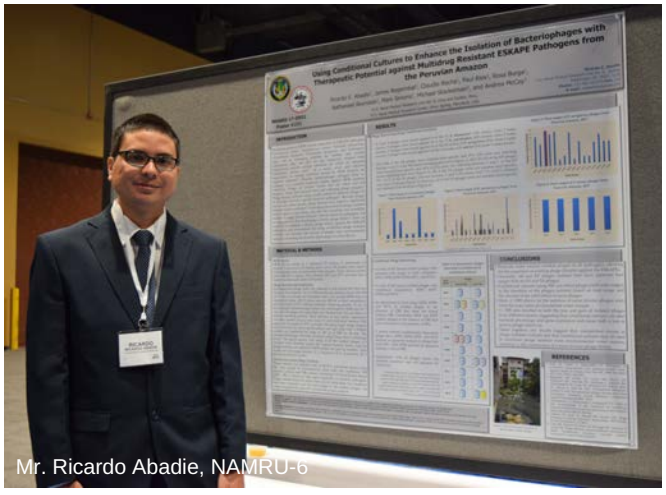


Janice Hepburn, ACESO, BDRD, NMRC (left)
Dr. Danielle Clark, ACESO, BDRD, NMRC (right)


Lt. Jae Dugan, NMRC


Capt. Judith Epstein, NMRC

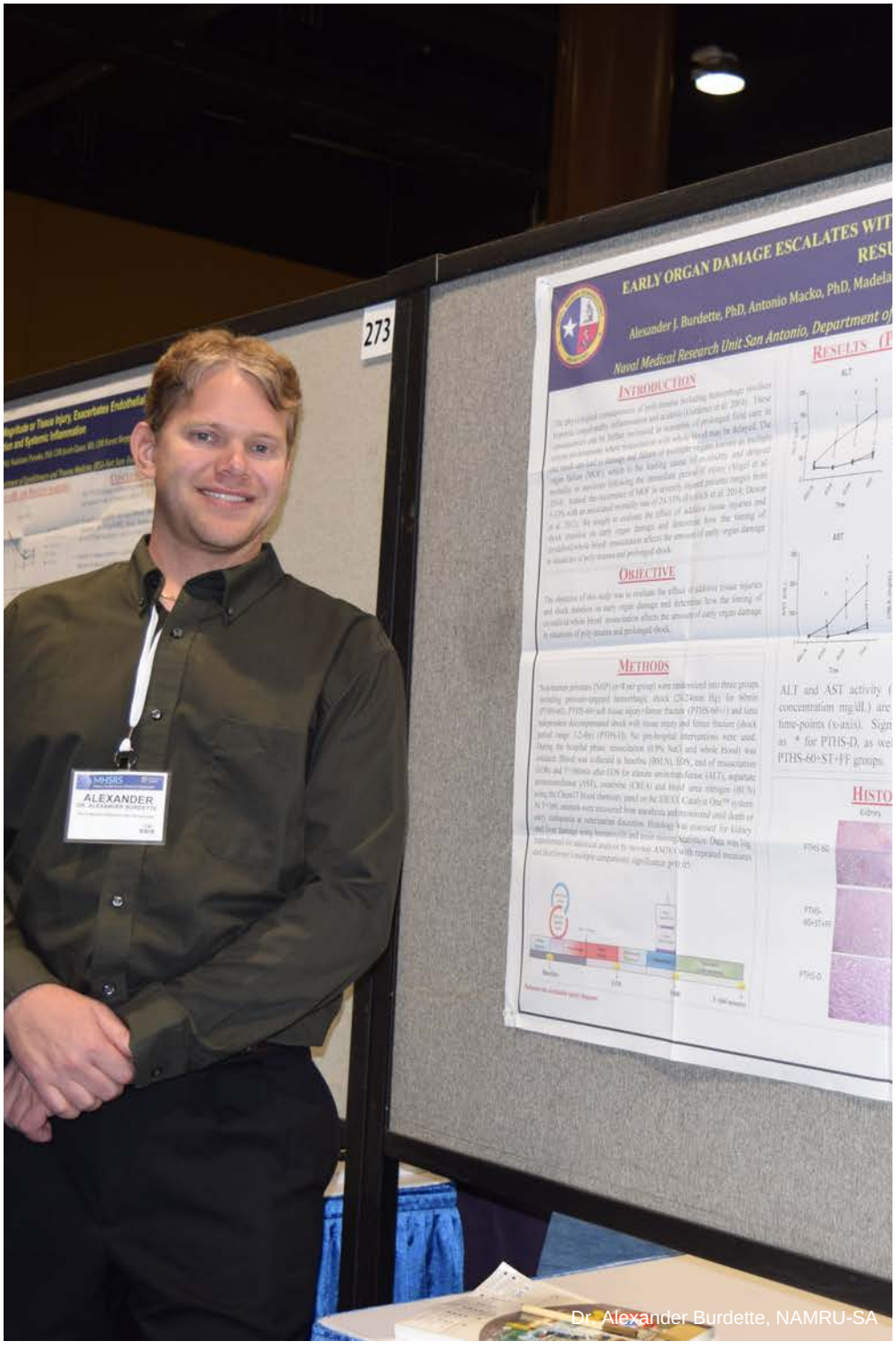
Brig. Gen. Mark Koeniger, Commander, 711 Human Performance Wing, Wright-Patterson Air Force Base (left)
Rear. Adm Paul Pearigen, Commander, Navy Medicine West, Chief, Navy Medical Corps (right)



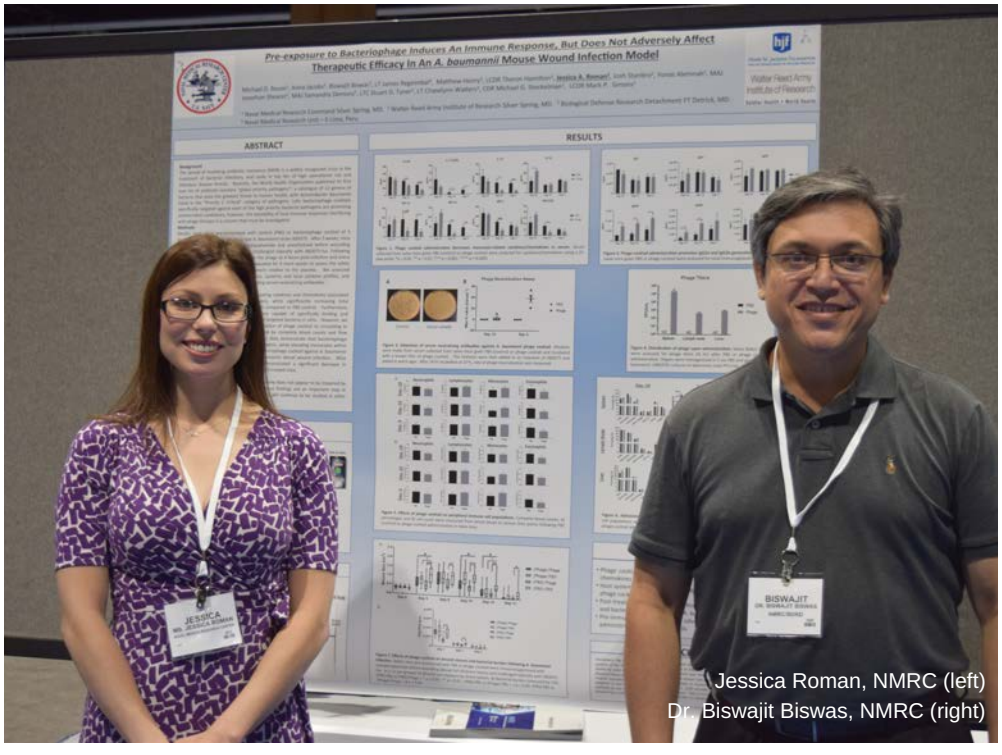
Mr. Ricardo Abadie, NAMRU-6

Capt. Rees Lee, Commanding Officer, NAMRU-D (left)
Rear. Adm. Bruce Gillingham, Deputy Chief, BUMED (right)

Dr. David Smith
Deputy Ast. Secretary of Defense for Health Affairs
Photo Courtesy NHRC Public Affairs



Dr. Alexander Burdette, NAMRU-SA



Jessica Roman, NMRC (left)
Dr. Biswajit Biswas, NMRC (right)

Capt. Adam Armstrong, Commanding Officer, NMRC (left)
Capt. Rees Lee, Commanding Officer, NAMRU-D (right)

Defense Health Agency Video Highlights

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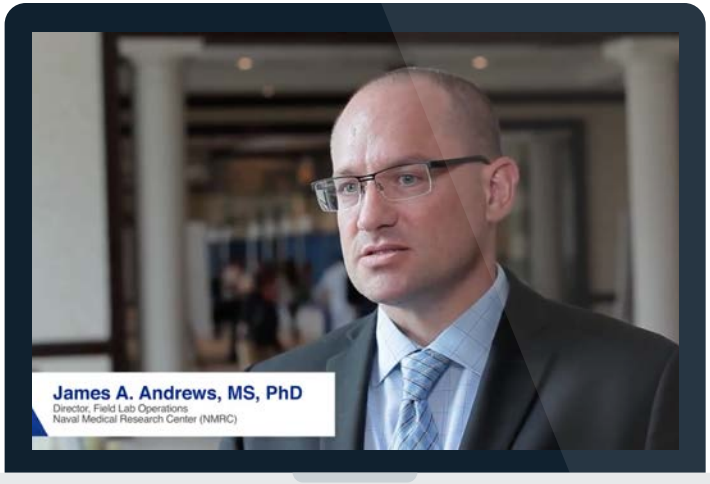

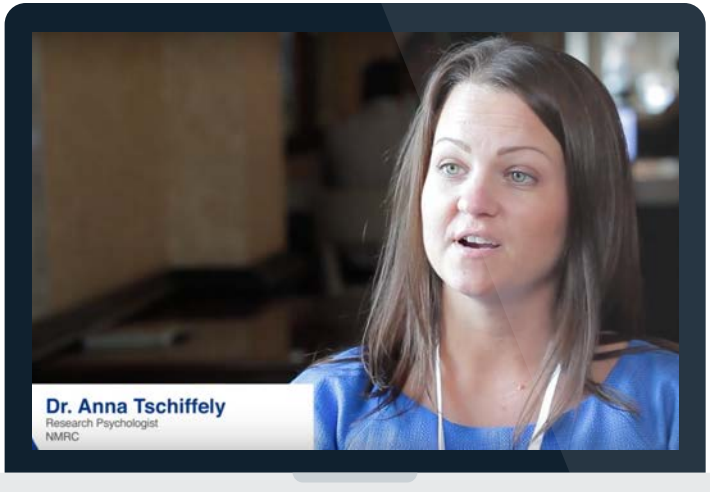

Navy Medicine R&D Enterprise Command

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