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NMRC Researcher Publishes 100th Manuscript



Lt. Cmdr. Tadeusz Kochel of NMRC's Viral and Rickettsial Diseases Department, who recently published his 100th manuscript. Photo by HM2 (FMF) Kyle Oldknow.

SILVER SPRING, Md. – Lt. Cmdr. Tadeusz Kochel, Viral and Rickettsial Diseases Department (VRDD), Naval Medical Research Center ([NMRC](#)), recently celebrated a remarkable career milestone: the publication of his 100th manuscript while in the Navy.

In the 100th article, Kochel and his co-authors evaluated the impact of sample type on the results of standard serologic testing, an area of great interest to influenza researchers working in the laboratory and conducting epidemiologic investigations. The manuscript, entitled *Comparative analysis of hemagglutination inhibition titers generated using temporally matched serum and plasma samples*, was a collaborative project with current and former members of VRDD along with research investigators from the multi-center Acute Respiratory Infection Consortium. The findings in this report suggest that either serum or citrated plasma samples can be used in standard influenza tests, which could lead to time and cost saving for seroepidemiology studies.

A large focus of Kochel's research involves investigating diagnostic,

therapeutic and vaccine products designed to protect and improve the medical care of the warfighter and at-risk populations against dengue virus and influenza infections around the globe. His prodigious research efforts span a wide range of topics from studying the disease patterns of Venezuelan equine encephalitis and dengue fever to participating in large collaborative projects improving current understanding of HIV and influenza transmission. During his 20 years in Navy Medicine research, Kochel has shared his knowledge and passion for research with students, fellow scientists and public health officials in the United States and abroad. He has established himself as one of the Department of Defense's preeminent subject matter experts while enhancing the research capabilities wherever he has been stationed.

When asked about this remarkable accomplishment, Kochel said, "I did have lots of help. This is not Tad Kochel; this is collaboration with investigators throughout the enterprise and with foreign partners."

NMRC Commanding Officer's Message

Readiness, Value, Jointness - Navy Medicine's Strategy for World Class Care - Anytime, Anywhere.

Although we've recently been understandably preoccupied by concerns over sequestration and other budget cuts, we had been highlighting Navy Medical R&D's successes in aligning with the Surgeon General's strategic goals of Readiness, Value, and Jointness, and I'd like to return to that theme and bring to your attention some ongoing discussions related to jointness.

As many of you are aware, there has been direction by the Deputy Secretary of Defense to implement reforms to the governance of the Military Health System to gain efficiencies by operating more jointly through shared services with the Army and Air Force. R&D has a tremendous history of working jointly with the other services on common mission goals such as military operational medicine, combat casualty care, and protection from infectious diseases. A Shared Services Committee, with representatives from all of the services, was established to identify additional opportunities for more effective DoD investments in joint research. The findings from this committee will be completed this summer, and I am optimistic the recommendations will help us continue to improve our operations.

In the meantime, we should continue to embrace the opportunities we already have to work jointly with the other services to protect the health of all of our service men and women. *One Team, One Fight!*

NMRC Commanding Officer sends,
John W. Sanders III
CAPT, MC, USN



NAMRU-Dayton Commanding Officer's Message

As one of the newest commands in Navy Medical R&D and after two and a half years, NAMRU-Dayton is still on a growth trajectory. We are fortunate to be located at Wright Patterson AFB, where both of our science directorates are able to collaborate with their Air Force counterparts. As with most of our sister labs, our growth is predicated on a stable source of funding, so we are waiting to see how the fiscal turmoil we're currently experiencing plays out.

We are proud of our Environmental Health Effects Directorate's capabilities for conducting inhalation toxicology research, *in vitro* testing, and physiologically based pharmacokinetic modeling (PBPK). The former represents one of the last remaining capabilities within DoD to conduct inhalation toxicology research. PBPK is a modeling technique that applies known effects of exposures in animals to generate safe exposure levels for humans. Our *in vitro* work focuses on toxicologic analysis abilities without using an animal species for the testing. Researchers are conducting studies for the Navy and Air Force looking at the effects of jet fuel exposure and attempting to determine the toxicity of a variety of alternative fuels. Our group demonstrated that atmospheric conditions aboard submarines are not harmful to female crew members. We recently completed a study for the Army on the safety of the fire retardant chemical used in Army tactical vehicles. As part of our collocation with the Air Force, we work very closely with their toxicologists to share capabilities and promote jointness to address common problems of our warfighters.

Another source of pride is our Aeromedical Research Directorate, and we are putting our new facility to productive use. New proposals and protocols have been written, and it is very gratifying to see research subjects reporting to the lab on a regular basis. Our newest capability, the Disorientation Research Device, a six axis of motion research platform, is a unique national asset and is now only months away from delivery by the contractor. The aeromedical group is also involved with the Air Force conducting research of joint interest and was instrumental in the analysis that restored the F-22 to flight operations following a period of grounding due to hypoxia-like symptoms.

NAMRU-Dayton Commanding Officer sends,
Doug Forcino
CAPT, MSC, USN

The Attending Physician for the U.S. Congress Tours NMRC

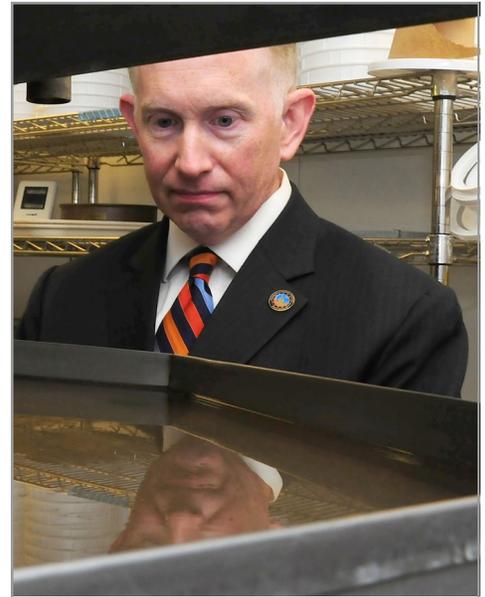
SILVER SPRING, Md. – Rear Adm. Brian P. Monahan, the attending physician for the United States Congress and United States Supreme Court, toured the Naval Medical Research Center (NMRC), March 15.

The morning began with an enterprise overview by Capt. John W. Sanders, NMRC commanding officer, highlighting the eight laboratories and their accomplishments. Sanders pointed out that enterprise investigators have been out in front in several areas of research such as influenza surveillance; traumatic brain injury and post-traumatic stress disorder research; medical modeling and simulation; tissue regeneration; bone marrow transplantation technology; biological weapons detection assays; and vaccines for malaria, dengue and diarrheal diseases.

Before the tour of the laboratory began, Sanders invited the NMRC science directors to informally discuss

their areas of research with Monahan. Infectious diseases researchers are involved with vaccine trials against dengue, *Campylobacter*, *Shigella*, *E. coli* and malaria. Recent accomplishments in bone marrow research include the DNA-based human leukocyte antigen typing for transplantation pioneered by Navy Medicine and resulting in precise definition of critical genes of the immune system, the ability to rapidly match patients or casualties with donors, and improved clinical marrow transplant outcomes. In operational medicine, advances are being made in predictive biomarkers of wound healing that may reduce the number of required surgical procedures. Undersea medicine researchers established a laboratory model of decompression sickness to study oxygen pre-breathe to develop guidance for submarine rescue. Biodefense researchers are involved in the critical

(Continued on page 4)



Rear Adm. Monahan, attending physician for the U.S. Congress and U.S. Supreme Court, tours the insectary during his visit to NMRC. Photo by David Miles.

Commander, Military Sealift Command Tours NMRC



Rear Adm. Mark H. Buzby, Commander, Military Sealift Command, visits the Undersea Medicine Laboratory at the Naval Medical Research Center. Photo by HM2 (FMF) Kyle Oldknow.

SILVER SPRING, Md. – Rear Adm. Mark H. Buzby, Commander, Military Sealift Command, visited the Naval Medical Research Center (NMRC), March 12. Capt. John W. Sanders, NMRC commanding officer, provided an enterprise overview followed by an in-depth presentation on regenerative medicine from Dr. Douglas Tadaki, deputy head, Regenerative Medicine Department of the Operational and Undersea Medicine Directorate.

Tadaki began by providing a summary of regenerative medicine's focus areas of tissue regeneration, extremity injuries, organ and tissue transplantation technology and the assessment and treatment of wounds. Using a plastic model of a patient with heterotopic ossification (HO), he went on to explain that HO is the formation of mature bone in soft tissue, which is associated with central nervous system injury.

"The incidence of HO casualties with orthopedic injuries is 65 percent.

(Continued on page 6)

Naval Medical R&D Lab in Cairo Initiates First Project in Nigeria

From NAMRU-3 Public Affairs

CAIRO - As part of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) mission to seek jointness with research institutions for the detection of emerging/re-emerging pathogens, the laboratory initiated their first project in Nigeria. Funded by the U.S. Department of State Biosecurity Engagement Program, NAMRU-3 will collaborate with the Calabar Institute of Tropical Diseases Research and Prevention (CITDR&P), located at the University of Calabar Teaching Hospital. The city of Calabar is a seaport located near the border with Cameroon and is also the home of a large Nigerian navy base.

Capt. Buhari A. Oyoyo, NAMRU-3 commanding officer, paid a courtesy call to the U.S. Consul General in Lagos, Nigeria, to explain NAMRU-3's role. The goal of this collaboration is to build medical capacity to support public health in developing countries. With malaria endemic throughout Nigeria, this project provides training and equipment for CITDR&P to detect malaria, both in malaria-causing vectors and human blood samples. Over the next year, a team from the NAMRU-3 Vector Biology Research Program (VBRP) and Bacterial and Parasitic Disease Research Program (BPDRP) will train CITDR&P staff to conduct malaria vector surveillance, advanced vector identification, diagnostic techniques with enzyme-linked immunosorbent assay, molecular techniques, malaria detection in human blood by microscopic examination, rapid detec-



Emmanuel Ezedinachi, director of CITDR&P (second from left) and staff escort the NAMRU-3 team (Lt. Diclaro, third from left, and Capt. Oyoyo, center) on tour. CITDR&P staff photo.

tion tests, and detection of malaria resistance genes.

Lt. Joseph Diclaro, head of the VBRP, said, "The main purpose of our first visit to Calabar is to conduct an initial laboratory assessment of CITDR&P's capabilities and facilities."

The NAMRU-3 team met the CITDR&P staff, and Oyoyo expressed his enthusiasm for the collaborative journey that the two teams were undertaking.

Dr. Emmanuel Ezedinachi, director of CITDR&P and director of research at the University of Calabar, said NAMRU-3 would provide a much-needed boost to their laboratory capabilities.

Dr. Hala Bassaly of VBRP added, "This visit is the first step in developing a sustainable plan for laboratory capacity building in Calabar, to ensure that it will benefit the public health system for years to come."

The collaboration with CITDR&P will have a synergistic effect on other public health institutions in the country, including possible research activities with the Nigerian navy to foster joint military-to-military engagements in West Africa.

According to Oyoyo, "Medical diplomacy though jointness enables NAMRU-3 to accomplish its mission and at the same time provide needed humanitarian support."



NAMRU-3 team's initial meeting with Dr. Okon Bassay (standing) and Dr. Emmanuel Ezedinachi, director of CITDR&P. CITDR&P staff photo.

The Attending Physician for the U.S. Congress Tours NMRC

(Continued from [page 3](#))

role of keeping the nation safe from the biowarfare threat.

The tour began with a stop at the Biological Defense Research Directorate's rapid deployable mobile biological weapons detection laboratory, highlighting the DoD Joint Biological Agent Identification System. The tour ended with

an informal briefing and tour of the Operational and Undersea Medicine laboratory that included the diving chambers used to study decompression sickness and hyperbaric oxygen toxicity and the blast tube used to study blast injuries and traumatic brain injury and to develop models and treatments of polytrauma.

NMRC Enterprise Junior Office of the Year – Lt. Carlo J. Traverso

LIMA, Peru – Lt. Carlo J. Traverso is the Director for Administration at the U.S. Naval Medical Research Unit No. 6 (NAMRU-6), Lima, Peru. His level of dedication and productivity were unparalleled in 2012. In addition to his myriad achievements that benefited the command and the NMRC Enterprise, he also volunteers to help at a local orphanage and maintained his professional credentials by renewing his Defense Financial Manager certification. His can-do attitude, brilliant problem solving skills, indefatigable work ethic, and outstanding military bearing show he is an excellent military officer.

NAMRU-6’s mission is to conduct research and surveillance to diminish the threat of infectious disease to the warfighter by developing prevention or therapeutic strategies and to serve the health interest of the people of Peru and South America. NAMRU-6 scientists are involved in infectious diseases research, outbreak response, surveillance, training and



Lt. Carlo J. Traverso, recipient of the NMRC Enterprise Junior Officer of the Year award for 2012. Traverso is the Director for Administration at NAMRU-6, Lima, Peru. Photo provided by NAMRU-6.

collaborations with military and ministries of health from twelve Latin American countries, numerous

nongovernmental organizations, academic institutions and public health organizations.

HM1 Knetsch Selected as NMRC’s Sailor of the Year for 2012

SILVER SPRING, Md. – Hospital Corpsman 1st Class (SW/AW/FMF) Brian Knetsch was selected the 2012 NMRC Enterprise Sailor of the Year. Chosen in November, Knetsch was surprised and honored to receive the award. He was selected by NMRC’s commanding officer, executive officer, and the senior enlisted leader, Chief Jerrold Diederich.

“Knetsch is an outstanding Sailor who exemplifies excellence,” said Diederich. “He possesses the skills and attributes the Navy needs, setting the example for others to follow. He is always ready to take on more challenging assignments. His dedicated hard work paid off with his selection as the NMRC Sailor of the Year.”

Knetsch demonstrates he is a hard worker by putting in long hours. In the past year, he worked to reorganize the mobile labs to make them more up to date with what the lab is doing and to lighten the load.

“I was humbled by the selection, but my hard work is to benefit everyone, not just myself. I do it for our mission, not for the recognition,” Knetsch said.

Some of the projects Knetsch has been working on include NMRC’s Biological Defense Research Department Operations Mobile Lab and the Navy and Air Force Proficiency Testing program for Joint Biological Agent Identification Detection System.



HM1 Brain Knetsch, working in the portable rapid mobile biological weapons detection laboratory. Photo by David Miles.

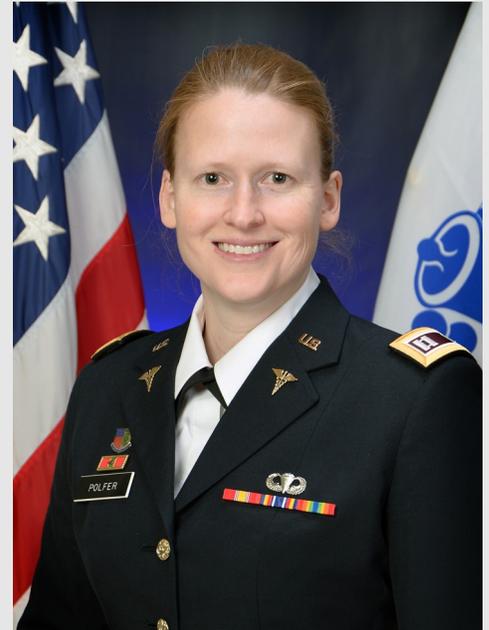
Orthopaedic Surgery Resident Working at NMRC Wins Phillips Award

SILVER SPRING, Md. – Army Capt. Elizabeth Polfer, an orthopaedic surgery resident at the Walter Reed National Military Medicine Center (WRNMMC) in Bethesda and doing an internship in the Regenerative Medicine Department at the Naval Medical Research Center (NMRC), won the Robert A. Phillips Resident Research Award. She will receive her award and present her groundbreaking work, April 19, as part of the Walter Reed National Military Medical Center Research Symposium Day.

Polfer's work involved the development of a novel animal model for heterotopic ossification

(HO). Working under the mentorship of Cmdr. Jonathan Forsberg, head of the NMRC Regenerative Medicine Department and an attending orthopaedic surgeon at WRNMMC, she and the research team developed the most relevant model for the type of HO seen in combat casualties. This model matches both the etiology as well as the timing of development of the ectopic bone and will be a powerful tool used to test new treatments that will potentially impact care provided to wounded warriors.

Photo: Army Capt. Elizabeth Polfer, recipient of the Robert A. Phillips Resident Research Award.



Commander, Military Sealift Command Tours NMRC Laboratories

(Continued from page 3)

One hundred percent of patients with a high transfemoral amputation develop HO," said Tadaki, adding the HO is associated with a higher injury severity score, traumatic brain injury, blast and polytrauma.

Tadaki pointed out that the level of trauma the research team is focusing on is unique to combat casualties. Warfighters are surviving wounds that ten years ago would have been fatal. Researchers need to understand the immune responses to these injuries to better support clinicians treating these patients.

Following the briefings, Sanders led the visitors on a facility tour that included the Biological Defense Research Directorate's rapid deployable mobile biological weapons detection laboratory, highlighting the DoD Joint Biological Agent Identification System. The group went on to the Infectious Diseases Directorate, toured the insectary and received a short overview of the current vaccine development programs. The visit ended with an informal briefing and tour of the Operational and Undersea Medicine



Rear Admiral Buzby examines the blast tube used to study blast and traumatic brain injury to develop models and treatments for polytrauma. Photo by HM2 (FMF) Kyle Oldknow.

laboratory that included the diving chambers used to study decompression sickness and hyperbaric oxygen toxicity and the

blast tube used to study blast injuries and traumatic brain injury and to develop models and treatments of polytrauma.

NAMRU-6 Helps Take the “Bite” out of Insect-borne Diseases

From NAMRU-6 Public Affairs

LIMA, Peru – Deployed U.S. military personnel are often exposed to insect-borne diseases. The Entomology Department at the U.S. Naval Medical Research Unit No. 6 (NAMRU-6) leads research projects in surveillance and control of insect vectors of dengue fever, malaria and leishmaniasis and collaborates with local Peruvian universities and the Ministry of Health to develop better mosquito and sand fly control strategies.

One novel mosquito control strategy is focused on testing new combinations of mosquito attractants and repellents applied inside a series of model residential huts, a design meant to replicate the living environment typically found in the tropical cities of Peru and other South American cities. This research will help determine the effect of

The Department of Entomology supports Peru in building the capacity to conduct vector-borne disease research through collaboration, providing equipment and technology training, and designing future studies.

insect repellents on the movement patterns of mosquitoes and whether it may be possible to achieve successful repellency of mosquitoes from residences or whether the mosquitoes will simply move to another untreated location. Data gained from this project could guide further study of the pre-treatment of tents for deployed personnel and whether this may be a useful strategy during contingencies.

The Entomology Department also performs insecticide-resistance bioassays on the vector of dengue fever, *Aedes aegypti*, and on the malaria vector, *Anopheles darlingi*, by exposing groups of mosquitoes to the primary chemical



NAMRU-6 entomology personnel preparing the insecticide resistance bioassay in the Iquitos laboratory.

groups (e.g., pyrethroids and organophosphates) used in their control to establish a resistance-profile baseline against reference populations of known susceptible mosquito strains. A collaboration between NAMRU-6 and the University of San Marcos in Lima led to the establishment of an insectary to rear mosquitoes for use in bioassays to determine insecticide resistance levels. Although mosquito populations in Peru may only represent a fraction of all populations worldwide, refining the testing process with field-collected insects is critical, and the variety of ecosystems in Peru, such as desert, tropical rainforest, and mountain, enables the testing of numerous strains of varying insecticide-resistance status, a condition that could be encountered anywhere in the world.

The Department of Entomology supports Peru in building the capacity to conduct vector-borne disease research through collaboration on these projects, providing equipment and technology training, and designing future studies to address local public health concerns. A previous dengue fever outbreak in Iquitos provided the opportunity for NAMRU-6 to assist the Ministry of Health by providing specialized mosquito traps to capture the *Aedes aegypti* vector and supporting the surveillance and control efforts of the public health staff to control this disease. In addition, capacity-building training courses on mosquito surveillance have been provided to DISAMAR (Direccion de Salud de la Marina de Guerra del Peru) personnel and have included mosquito collection methods, species identification, basic ecology and habits, and the procedures for insecticide resistance testing.

The entomology program continues to fulfill NAMRU-6's mission to protect deployed U.S. forces throughout the world while solidifying relationships with host nation entities.



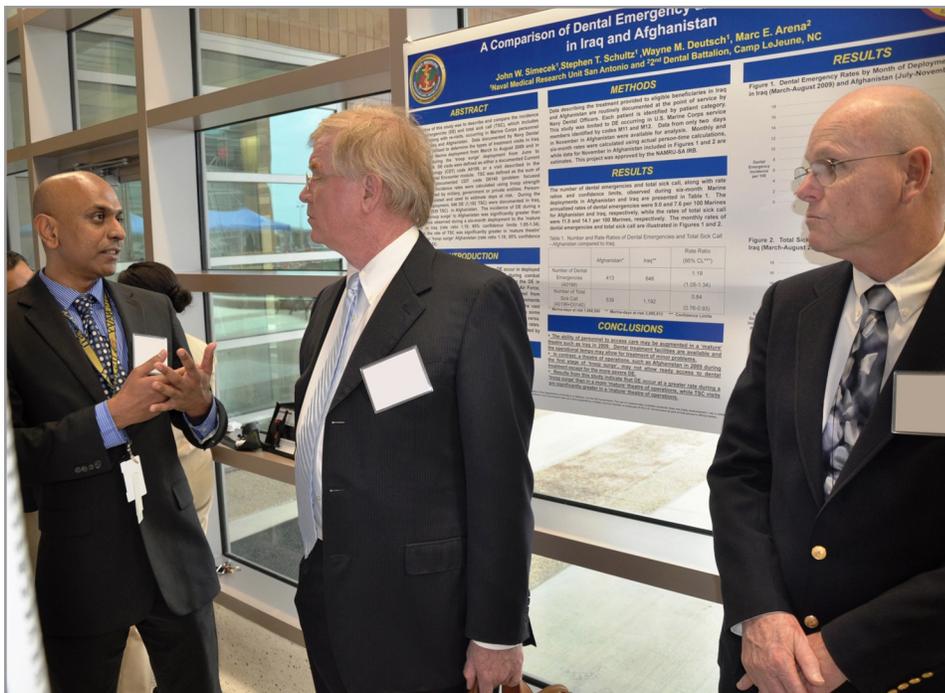
Model residential huts constructed by NAMRU-6 in Iquitos for testing novel combinations of mosquito attractants and repellents. Photos provided by NAMRU-6.

San Antonio Staff Supports Outreach to Biomedical Community

From NAMRU-San Antonio Public Affairs

FORT SAM HOUSTON, Texas – Staff members from the Naval Medical Research Unit San Antonio ([NAMRU-San Antonio](#)) participated in and supported the first “Innovation Day” conducted at the Battlefield Health and Trauma Research Institute (BHT) hosted by the Army Institute of Surgical Research. The “Innovation Day” event provided an opportunity to showcase the research of NAMRU-San Antonio and the other military research units to local government officials and scientists from institutions such as the University of Texas Health Science Center San Antonio, the University of Texas at San Antonio, and the Southwest Research Institute.

The event at the Battlefield Health and Trauma Research Institute included NAMRU-San Antonio and Army personnel along with the Air Force Dental Evaluation and Consultation Service. The half-day event, held March 14, was attended by approximately 50 people and consisted of short, interactive sessions where guests had an opportunity to discuss the work conducted by each of the organizations as well as the joint interactions among the Army, Navy and Air Force units.



NAMRU-San Antonio principal investigator Dr. Mauris DeSilva (left) speaks with Dr. Robert Smith of Keraplast Technologies about the capabilities and operations of the unit during the recent Innovation Day jointly held at the Battlefield Health and Trauma Research Institute. Dr. John Simecek (right), head of the Epidemiology and Biostatistics Department at NAMRU-San Antonio, also had the opportunity to discuss the unit's capabilities with Dr. Smith during the presentation. Photo provided by NAMRU-San Antonio.

Capt. Rita G. Simmons, commanding officer of NAMRU-San Antonio. “We’ve already established contacts with many of these organizations, but bringing them into the facility gave

Guests had the opportunity to view several research posters from the different units during a reception held in the lobby area. NAMRU-San Antonio staff presented posters focusing on the unit’s key areas of research, including combat casualty care, craniofacial biomedical and directed energy biomedical research.

“Innovation Day engaged stakeholders in the San Antonio community to better coordinate our efforts in ways that are mutually beneficial,” said Dr. David Baer, director of research for the Army Institute of Surgical Research. “Many in the local community did not realize the extent, quality and importance of the work going on right here in San Antonio, and the event was a great success.”

NAMRU-San Antonio has been operating at the Battlefield Health and Trauma Research Institute facility at Fort Sam Houston, Texas since 2010.

“Innovation Day gave us a great opportunity to showcase some of our research projects and our capabilities to key people outside of the military biomedical research community. We’ve already established contacts with many of these organizations, but bringing them into the facility gave them a unique opportunity to see several examples of what we do here. We look forward to participating in more events like this in the future.”

“Innovation Day gave us a great opportunity to showcase some of our research projects and our capabilities to key people outside of the military biomedical research community,” said

them a unique opportunity to see several examples of what we do here. We look forward to participating in more events like this in the future,” she added.

NMRC Wound Infections Department Benefits Wounded Warfighters

SILVER SPRING, Md. – In keeping with the ever-changing needs of the U.S. Military, the Naval Medical Research Center's (NMRC) Wound Infections Department (WID) was established in September 2011 in response to the Navy Surgeon General's call for research activities that will provide direct benefit to our wounded warfighters. Wound infections are often difficult and costly to treat both in the hospital and during prolonged care and also have a significant impact on military readiness and the overall health and well-being of the Fleet.

The primary mission of WID is to develop and evaluate novel and alternative treatment and prevention strategies for skin and soft tissue infections (SSTIs) associated with multidrug-resistant organisms. In the short time since WID's inception, researchers have developed a close collaboration with the Walter Reed Army Institute of Research's Bacterial Rickettsial Disease-Wound Infection Department. This collaboration led to the development of a simulated traumatic wound infection mouse model used for the testing and developing of novel antibacterial strategies. Currently researchers are developing therapeutics



Lt. Rebecca Pavlicek of NMRC's Wound Infections Department. Photo by HM2 (FMF) Kyle Oldknow.

such as bacteriophage and photodynamic therapy that may be directly applied to traumatic wounds in order to reduce infection rates and significantly reduce patient morbidity and resource utilization. When extrapolated to the

total combat-injured population, the successful use of these therapeutic approaches for preventing and treating infection may translate to significant cost savings and better medical care.

(Continued on page 13)

Seminar: Staphylococcal Skin and Soft-Tissue Infection Prevention in Soldiers

SILVER SPRING, Md. – Lt. Col. Michael Ellis, M.D., infectious diseases physician and research scientist in the U.S. Army Infectious Diseases Division and Department of Medicine at the Uniformed Services University, Bethesda, Md., presented an "Overview of Staphylococcal Skin and Soft-Tissue Infection Prevention in Soldiers" at the Naval Medical Research Center (NMRC) Infectious Diseases Directorate's monthly seminar, March 15.

Ellis focused on the burden of disease of community-associated Methicillin-resistant *Staphylococcus aureus* (CA-MRSA) among military recruits and the Department of Defense's efforts toward prevention and control. CA-MRSA causes skin and

soft-tissue infection (SSTI) in community settings where crowding, frequent skin trauma and suboptimal hygiene are a concern (e.g., among prisoners, athletes, and military recruits). Military trainees are at higher risk of SSTI; it is the leading cause of infectious disease hospitalization within the first two years of service, adversely affecting mission capability and readiness. CA-MRSA is also prevalent in wound cultures of warfighters.

Research efforts include defining the natural history, prevalence and risk factors of MRSA infection and colonization and clinical impact. A retrospective study of recruits at the Marine Corps Recruit Depot, Parris Island, suggested that improved hygiene practices may reduce the incidence of

SSTI. Intervention studies looking at different agents to prevent or reduce colonization of MRSA and subsequent SSTIs were performed at San Antonio, Texas and Quantico, Va. with limited success. New and ongoing studies at Fort Benning are focused on the epidemiology of SSTI in a high CA-MRSA setting, the etiology of non-purulent cellulitis, and the efficacy of improved hygiene practices and instructional intervention in infection prevention. These studies will also assess humoral and cellular immune responses during active SSTI to determine immune correlates of protection and to develop DoD vaccine candidates. This work is being performed in collaboration with the NMRC Wound Infections Department.

NAMRU-3 Supports Disease Surveillance Capabilities in Mauritania

From NAMRU-3 Public Affairs

CAIRO – The U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) is assisting the Islamic Republic of Mauritania to augment its national influenza reference laboratory and establish a viral hemorrhagic fever (VHF) molecular identification capability. Mauritania is striving to meet the 2005 International Health Regulation implementation benchmarks while managing the public health response to endemic and recurring VHF outbreaks.

With Department of State and Global Emerging Infections Surveillance and Response System funding, staff members from NAMRU-3's Viral and Zoonotic Disease Research Program traveled to Nouakchott to evaluate influenza surveillance activities and work on capacity building efforts at the Institut National de Recherches en Santé Publique (INSRP) and also assist the Ministry of Health (MoH) to develop a VHF surveillance network.

The team conducted an assessment of influenza-like illness and severe acute respiratory illness sentinel sites at the Centre Hospitalier National and Polyclinique de Nouakchott. They also conducted on-site refresher training on proper storage and transport of surveillance samples to maintain cold chain integrity. They trained five staff members on influenza typing and subtyping.

“One of the key goals in establishing a National Influenza Center in Mauritania is to provide the opportunity for representative influenza isolates in the AFRICOM region to be available for consideration during the biannual WHO/CDC influenza vaccine selection meetings,” said Lt. Gabriel Defang, deputy head of NAMRU-3's Viral and Zoonotic Diseases Research Program.

The NAMRU-3 team also assisted the MoH in develop-



Secretary General of the Mauritania Ministry of Health (second from right) thanks Lt. Gabriel Defang (far right) during outbreak. Photo by Mustafa AbdelAziz, NAMRU-3.

ing protocols for conducting human and animal surveillance for viral hemorrhagic fever diseases. As part of the VHF laboratory capacity building initiative, the team conducted a three-day training session on molecular and serological techniques in detecting VHF pathogens. During the hands-on training, INSRP technicians used archived, untested samples from a recent hospital-based cluster of unidentified hemorrhagic disease. Molecular testing indicated that some of the samples were positive for Rift Valley Fever, a hemorrhagic disease associated with high mortality. The positive results confirmed, for the first time, the identity of the pathogen associated with the recent cluster. The successful completion of the training provided confirmatory diagnosis of VHF agents, which is a major milestone in Mauritania's public health capability. This service had previously been provided by the Institut Pasteur in the neighboring country of Senegal.

The Secretary General of the MoH, the Hon. Sidi Ali Boubacar, said he was delighted with the new lab capabilities and thanked NAMRU-3 for its assistance. NAMRU-3 will continue to work with the INSRP and the MoH to strengthen disease monitoring and other public health capacities in Mauritania.

Defang said, “With the presence of international military forces fighting extremists in neighboring Mali, effective disease surveillance in Mauritania will provide critical force health protection medical data for international allied troops in Mali.”



NAMRU-3's Mustafa AbdelAziz conducts training for Institut National de Recherches en Sante Publique lab staff on VHF ELISA techniques. Photo by Lt. Gabriel Defang, NAMRU-3.

Navy and UK Researchers Conduct Travellers’ Diarrhea Study

CAIRO – Researchers from the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) and the Naval Medical Research Center in Silver Spring, Md., are part of a multi-country, multi-service treatment trial to determine the best treatment for what is commonly known as travelers’ diarrhea. TrEAT TD, which stands for Trial Evaluating Ambulatory Treatment of Travelers’ Diarrhea, is a U.S. and United Kingdom endeavor involving sites in Afghanistan, Djibouti and Kenya. The coordinating principal investigator for the study is NMRC’s Cmdr. Mark Riddle. NAMRU-3’s Lt. Cmdr. Sam Levin is the site principal investigator at Camp Lemonnier, Djibouti.

Levin said, “With diarrhea a frequent operational show stopper, it is hoped that this study will generate guidance to treat the deployed warfighter, effectively decreasing the time boots on the ground are out of action and increasing the capabilities of our operational personnel, a force multiplier.”

The NAMRU-3 study site is at



From left: Lt. Col. Patrick Connor, Jamie Fraser, Cmdr. Mark Riddle, Lt Cmdr. Sam Levin, Margaret Koech, and Dr. David Tribble at the entrance to Camp Lemonnier. Photo provided by Camp Lemonnier.

Camp Lemonnier, a U.S. Navy Expeditionary Base located in Djibouti in the Horn of Africa. NAMRU-3 constructed a specially built containerized working unit for this study. This is a unique platform that can serve multiple functions to allow for a wide variety of clinical research and force health protection activities. In no other

coalition diarrhea treatment guidance for deployed personnel. This would mean that if a sailor or Marine with diarrhea goes into a battalion aid station, expeditionary medical facility, or sees the company corpsman anywhere in the world, the treatment will be a simple, uniform, single dose, directly observed therapy.



Lt. Cmdr. Levin preparing to run a stool sample in the Container Working Unit (CWU) lab at Camp Lemonnier.

“With diarrhea a frequent operational show stopper, it is hoped that this study will generate guidance to treat the deployed warfighter, effectively decreasing the time boots on the ground are out of action and increasing the capabilities of our operational personnel, a force multiplier.”

place in the U.S. military is there a dedicated, stand-alone, collocated advanced medical research lab and clinic in an operational setting.

This study is the largest evaluation of a single dose treatment for ambulatory diarrhea ever undertaken. The ultimate goal is to establish DoD and

To begin enrollment, an Infectious Disease Clinical Research Program team from the Uniformed Services University of the Health Sciences finalized the site set-up and opened the site at the camp. Riddle and Levin were ready to enroll subjects the next day.

Forsberg Inducted into American Academy of Orthopaedic Surgeons

CHICAGO - Cmdr. Jonathan A. Forsberg was inducted as a fellow of the American Academy of Orthopaedic Surgeons (AAOS), March 22, during ceremonies at the Academy's 2013 Annual Meeting in Chicago, Ill. The AAOS has more than 37,000 members worldwide.

Forsberg is the head of the Regenerative Medicine Department at the Naval Medical Research Center (NMRC) in Silver Spring, Md., and is the orthopaedic oncology consultant to the National Cancer Institute.

He is also an associate professor of surgery at the F. Edward Hebert School of Medicine, Uniformed Services University.

Forsberg is the author of more than 80 scientific papers and abstracts and has a special interest in combat casualty care and orthopaedic oncology.

His research efforts are geared to-

ward improving the care of combat casualties; the characterization, prevention and treatment of combat-related heterotopic ossification; and applying personalized medicine to extremity surgery using advanced mathematical approaches.

An orthopaedic surgeon is a physician with extensive training in the diagnosis and non-surgical as well as surgical treatment of the musculoskeletal system, including bones, joints, ligaments, tendons, muscles and nerves.

The Academy is the largest medical association for musculoskeletal specialists. Its fellows have completed medical school and at least five years of specialty study in orthopaedics in an accredited residency program, passed a comprehensive oral and written exam, and been certified by the American Board of Orthopaedic Surgery.

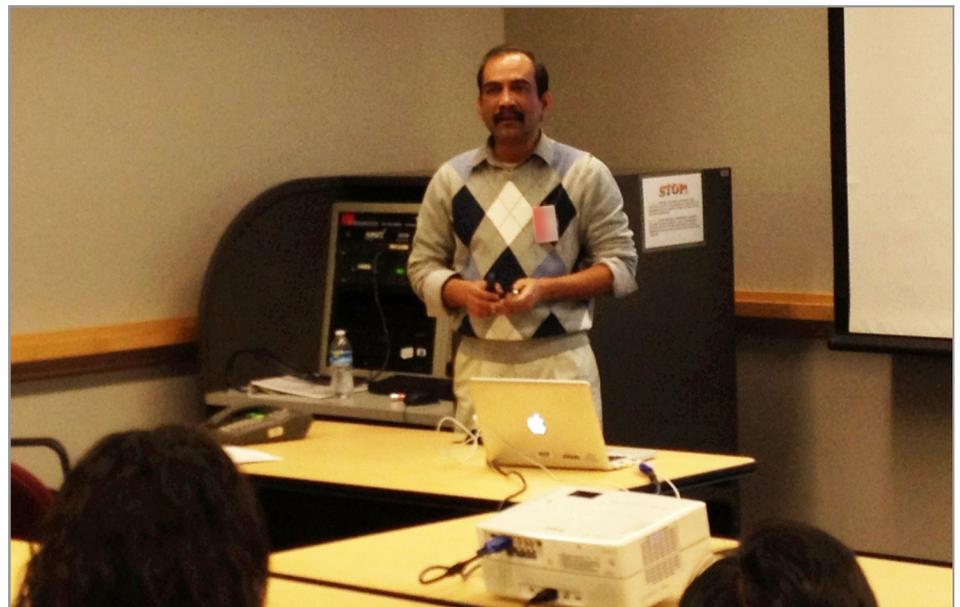


Cmdr. Jonathan A. Forsberg, new fellow of the American Academy of Orthopaedic Surgeons. Photo by Makeda Knott.

NMRC Seminar: Evaluation of Vaccines against Enteric Diseases

SILVER SPRING, Md. – Professor Rezwan Wahid of the Center for Vaccine Development, University of Maryland, presented a seminar on evaluating enteric vaccines at the Naval Medical Research Center (NMRC), March 19. The enteric diseases caused by enterotoxigenic *E. coli* (ETEC), *Shigella*, and *Campylobacter* are still notable causes of morbidity for the warfighter and of mortality and morbidity in many developing countries, especially affecting children.

A vaccine's efficacy depends on its ability to elicit protective immune memory to either eliminate the pathogen or ameliorate illness through a robust recall response. One of the important challenges for vaccine researchers is to define immune correlates of protection that can be used to evaluate new vaccines. The development of new immunological assays is critical in the understanding of B memory (BM) generation and persistence. Recent development of a novel BM assay is enabling researchers to evaluate the induction and persistence of humoral immunity following exposure to vaccines or natural infection.

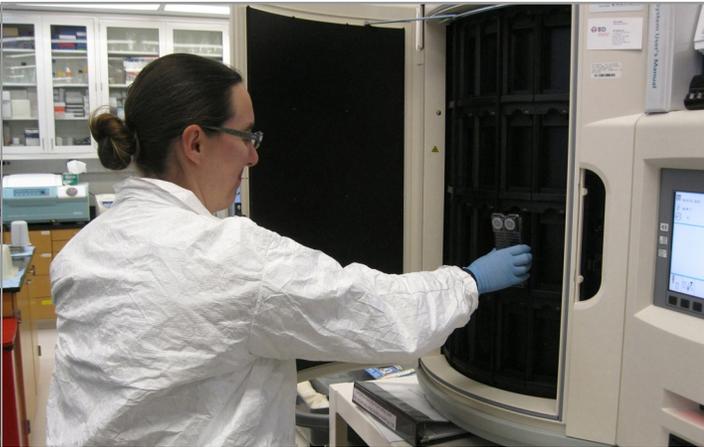


Professor Rezwan Wahid of the Center for Vaccine Development, University of Maryland, presents a seminar on evaluating enteric vaccines at NMRC. Photo by HM2 (FMF) Kyle Oldknow.

In a recent manuscript, Wahid and colleagues described how a higher magnitude of BM was negatively associated with disease intensity in clinical trials with wild type *Shigella* challenge performed in the 1990s.

NMRC researchers are currently establishing this methodology to use with recent phase 1 clinical trials, where new ETEC vaccine candidates are being evaluated for safety and immunogenicity.

NMRC Wound Infections Department Benefits Wounded Warfighters



Lt. Dannett Bishop of NMRC's Wound Infections Dept.
Photo by HM2 (FMF) Kyle Oldknow.

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Another important objective of WID is to conduct immunologic studies to identify and characterize correlate(s) of protection for SSTIs. In collaboration with investigators at the Uniformed Services University of the Health Sciences, WID researchers are studying human immunologic re-

sponse to SSTIs caused by organisms such as *Staphylococcus aureus*, including methicillin-resistant *Staphylococcus aureus* (MRSA). Research results may become critical for developing protective vaccines in the future.

Although the main focus of WID is treatment and vaccine development, the department is working in close collaboration with clinical investigators at the Walter Reed National Military Medical Center to quickly identify pathogens infecting the wounds of the warfighter. Towards that aim, researchers are developing a core facility and have acquired a Becton-Dickenson Phoenix. This machine is a powerful tool for the rapid diagnosis of bacterial infections and enables physicians to deliver timely and appropriate treatment. Early implementation of appropriate treatment leads to earlier resolution of symptoms, prevention of complications, and reduction of patient morbidity.

"I am very proud of the hard-working WID staff," said Capt. Eric Hall, department head. "In just under two years, Cmdr. Nimfa Teneza-Mora, Lt. Danett Bishop, and Lt. Rebecca Pavlicek have effectively expanded NMRC's capabilities, covering the spectrum from animal modeling to vaccine development."

The WID continues to build collaborative efforts to address battlefield wound management.

Greetings from the NMRC Ombudsman!

April is the Month of the Military Child! With more than a decade of war behind us, we've heard many a story about the sacrifices of our nation's soldiers and sailors, and sometimes their spouses. However, the challenges and sacrifices military children make are often overlooked. Approximately two million military children have experienced a parental deployment since 2001 and there are currently 1.2 million military children of active duty members worldwide. Unlike our active duty members and even their spouses, our military children never had a say in whether or not they wanted a military lifestyle and its associated challenges. Military children often have to contend with disruption, whether it's enduring the stresses placed on them from having a deployed parent or having to adjust to a classroom as "the new student" yet again. In fact, the average military family moves three times more often than their civilian counterparts, moving six to nine times during the K-12 school years. The unique challenges that military children face can take their toll. One third of school-age military children show psychosocial behaviors associated with increased stress.

Recognizing the special challenges faced by military families and military children in particular, numerous resources have arisen to lessen the sacrifices that we ask of our children. For instance, the Military OneSource website (<http://www.militaryonesource.mil/cyt>) has an entire section dedicated to military children, with a wealth of resources for parents and children of all age groups. In addition to informational resources for parents, the site contains links to resources targeted directly to children. Specifically, there is a link to the site "Military Youth on the Move," which is tailored to, among other topics, children adjusting to the mobility that comes with military life. There is also a link to "Military Kids Connect" (<https://www.militarykidsconnect.org/>), an online forum for military children ranging in age from 6 to 17. Another valuable resource, also accessed through the OneSource website, is the Military Child Education Coalition (<http://www.militarychild.org/>), which is focused on ensuring quality educational opportunities for all military children affected by mobility, family separation and transition.

Balancing the demands of a military life with those of building a stable home life can be a challenge. At the center of these conflicting demands is our responsibility to raise healthy, well-adjusted children in our military community. It is our responsibility to recognize the unique challenges that military children often face and to act to help ensure their success.

As always, if you are in search of resources or if you need further assistance in finding resources for your child, please don't hesitate to contact me. I can be reached by phone at (301) 233-9789 or by email at NMRC.Ombudsman@gmail.com.

Have a Fine Navy Day!
Alexandra Mora, NMRC Ombudsman