

# NAVAL MEDICAL RESEARCH AND DEVELOPMENT

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## NMRC Hosts Visit from U.S. Global Malaria Coordinator, President's Malaria Initiative

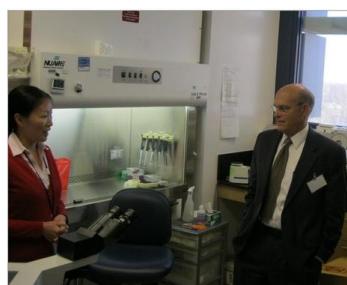
SILVER SPRING, Md. - Rear Adm. (Ret.) Tim Ziemer, the U.S. Global Malaria Coordinator, President's Malaria Initiative, visited the Naval Medical Research Center (NMRC), November 29, for a brief on the current malaria vaccine research efforts and to tour the facility. He was interested in learning more about the malaria program at the laboratory.

Capt. John Sanders, NMRC commanding officer, provided a general overview of the NMRC enterprise with emphasis on the infectious diseases research efforts, specifically in the area of malaria.

"The NMRC malaria research program is at the forefront of malaria

research worldwide," Sanders pointed out and added, "Researchers here have been investigating methods to control and conquer malaria for more than two decades and have made some exciting discoveries in the last few years."

Ziemer visited a laboratory focused on investigating the liver stage of infection as a vaccine target, spoke with a researcher about antigen discovery and another researcher on the humanized mouse model developed at NMRC. He also had the opportunity to visit the insectary and hear about clinical immunology and current malaria (Continued on page 14)



Dr. Xiaoyan "Cathy" Zou, staff scientist from the Henry Jackson Foundation, discusses research on malaria with Rear Adm. (Ret.) Tim Ziemer, the U.S. Global Malaria Coordinator, President, Malaria Initiative.

## NMRC Commanding Officer's Message

As 2012 draws to a close, I want to extend my best wishes to all the members of the NMRC enterprise and their families for a joyous holiday season. One of the joys this holiday season is the opportunity to say thank you for all you do. Your work does not come without sacrifices, and I am grateful and thank you for your service to Navy Medicine research and development. I want to thank you all for your professionalism and dedication and your positive attitude during these turbulent times. Your collective efforts have ensured that we are meeting our mission, contributing to the success of Navy Medicine, and supporting our sailors, Marines, soldiers and airmen who are working everyday to preserve the precious freedoms we enjoy.

Let's remember those who are currently standing the watch so we can enjoy this time with our families and friends, especially Cmdr. Cindy Tamminga of NMRC and Lt. Cmdr. John Melton of NSMRL, who are deployed.

While you enjoy the holidays this season, I ask everybody to keep a proper focus on safety at the workplace, at home, and while traveling. Getting where you are going and returning safely are the best gifts you can give your family, friends and coworkers. For those traveling the highways and byways, plan your trip to include adequate rest before starting, rest stops along the way, and ensure all the safety devices in your vehicle are working properly. Also, be prepared for severe weather and hazardous driving conditions. Stay mindful of the potential hazards and dangers that can bring unwanted tragedy to our lives.

Best wishes for a happy new year filled with health, happiness and spectacular success!

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



## NSMRL Commanding Officer's Message

The Naval Submarine Medical Research Laboratory (NSMRL) is an operational medicine laboratory with focus on the submarine force and human factors within. This past August the Navy Surgeon General entered an agreement with the Commander, Submarine Forces (CSF) that established NSMRL as CSF's primary human technology laboratory, including all physical and mental aspects of submariner health and performance. NSMRL is tasked to conduct medical, psychological and human performance research; provide independent, objective reviews of human systems related projects and technology proposed for CSF use; and develop new and innovative concepts for CSF that use human technology. Working directly with Vice Adm. Connor (CSF), NSMRL is aligned with the submarine force strategic direction. NSMRL also conducts investigations in diving medicine. This year NSMRL saw the addition of an external hatch on the Genesis hyperbaric chamber. This addition allows the chamber to draw a vacuum and be "flown" at pressures representative of those encountered at high altitudes. Unique features of this chamber include the ability to lock-in and lock-out at depth or altitude, allowing for prolonged (months) studies. It also has the ability to study mission profiles that transition from depth to altitude and vice versa (picture a Special Operations Forces mission locking out of submarine and then scaling a mountain) without requiring any configuration changes.

Recently NSMRL acquired NAVSEA's new DP1/2 diving system. The DP1/2 is a surface supplied air system that includes communications capability with the diver. This provides enhanced capabilities for underwater investigations, since the diver can receive directions and report back in real time to the topside personnel orchestrating the experimentation. In return, NSMRL is testing the equipment for general Navy diving use and validating/revising operating instructions for clarity, proper sequencing and procedural accuracy. NSMRL has a history of research in underwater communications, and with the acquisition of this diving system, we harnessed another improved means of communications with our divers.

Hopefully this gave you a peek into the operational research world of NSMRL!

NSMRL Commanding Officer sends, Steven M. Wechsler, CAPT, MC, USN

## NAMRU-3 Partners to Build Medical Capacity in Afghanistan

From NAMRU- 3 Public Affairs

CAIRO - As part of U.S. Naval Medical Research Unit No. 3's (NAMRU- 3) ongoing efforts to build medical capacity with Ministry of Health laboratories in several countries, NAMRU- 3 is partnering with the Defense Threat Reduction Agency (DTRA) Cooperative Biological Engagement Program (CBEPP) in Afghanistan. This collaboration enhances the efficiency and synergy in the U.S. government's biodefense and disease surveillance efforts.

According to NAMRU- 3 Commanding Officer, Capt. Buhari Oyofo, "NAMRU- 3 has developed training materials tailored to the Afghanistan with special consideration of cultural practices."

NAMRU- 3 has been involved in developing Afghanistan's public health capacity since 2006.

NAMRU- 3's initial engagement was focused on the Ministry of Public Health (MoPH) and the Afghan Public Health Institute. NAMRU- 3 assessed the capacity and capability of laboratory, staff and laboratory support facilities. First focusing on the Central Public Health Laboratory (CPHL) in Kabul, the program later included additional facilities in Kabul with plans for other regions of Afghanistan.



NAMRU-3 hosted nine Afghan trainees from the Central Public Health Laboratory in Kabul for a bacteriology training workshop.

Other efforts have been focused on assessing diagnostic capabilities; determining critical needs for supplies or equipment such as refrigerators, autoclaves or serology kits; evaluating existing training and licensing programs; and determining the need and MoPH interest in developing a

training plan was developed for 2012 based on needs and gaps identified by NAMRU- 3 laboratory assessments. NAMRU- 3 researchers developed nine modules on parasitology, bacteriology, bioscience facility management, clinical epidemiology, biomedical equipment repair, laboratory quality management system, serology, molecular biology and virology.

In 2011 NAMRU- 3 provided training for 160 Afghan scientists and technicians on laboratory operations, diagnostic procedures, and ethics in research and management with respect to activity involving U.S. select agents...a comprehensive training plan was developed for 2012 based on needs and gaps identified by NAMRU- 2 laboratory assessments.

NAMRU- 3 established five hospital laboratories as well as virology, bacteriology and serology laboratories within the CPHL. They have provided training for various diagnostic laboratories and through implementation of an acute febrile illness/ diarrhea study.

Information and sample flow to/ from laboratories, including mechanisms and corresponding gaps in sample transport and information flow, were determined. In coordination with DTRA, NAMRU- 3 provided needed supplies and training to fill the gaps.

train-the-trainer program. In 2011 NAMRU- 3 provided training for 160 Afghan scientists and technicians on laboratory operations, diagnostic procedures, and ethics in research and management with respect to activity involving U.S.select agents. With DTRA support, a comprehensive

NAMRU- 3 has also conducted several workshops to train laboratory and administrative staff on proper laboratory procedures, establish inventory for supplies, institute quality control procedures and standard operating procedures, purchase reliable supplies, and develop national laboratory biosafety and laboratory quality control plans.

## NMRC Researcher Supports USNS Mercy Pacific Partnership 2012

SILVER SPRING, Md. - Cmdr. Charmagne Beckett, a Naval Medical Researcher Center (NMRC) physician researcher, volunteered to deploy on the hospital ship USNS Mercy (T- AH 19), now in its seventh year of conducting humanitarian missions. USNS Mercy Pacific Partnership missions began in 2004 as a humanitarian response to the catastrophic tsunami that devastated parts of Southeast Asia. Sponsored by the U.S. Pacific Fleet, it is now the largest annual humanitarian civic action deployment designed to strengthen bilateral relations with other nations, considered crucial to regional security and stability.

From its home port in San Diego, the USNS Mercy set sail in early May 2012 with clinical staff mostly from Naval Medical Center San Diego and many individual augmentees from nearby regional commands. Beckett was a late addition to the mission, fulfilling the role of Internist and Infectious Diseases Officer and was the sole Infectious Diseases subspecialist for the entire mission. She embarked on the ship in Guam, joining nearly 1,300 crew members including civil mariners, U.S. Navy, Army, Air Force and nongovernmental organization (NGO) personnel as well as members of 13 partner nation militaries.



Cmdr. Charmagne Beckett on the flight deck of USNS Mercy (T- AH 19) during the first port call off the coast of Manado, North Sulawesi, Indonesia. Photo taken May 25, 2012.



Pacific Partnership 2012 Internal Medicine Department staff physicians, from left: Dr. Earl Wellington, General IM, Capt (ret); Dr. Lynn Bemiller, Hematology/Oncology; Capt. Toro Endo, General IM; Lt. Cmdr. Jessica Lee, Nephrology; Lt. Cmdr. Valeria Tokarz, Dermatology; Cmdr. Charmagne Beckett, Infectious Diseases; Lt. Cmdr. Wade Shields, Gastroenterology; Cmdr. Brian Bloom, Pulmonary/Critical Care; Lt Cmdr. Gregory Price, Cardiology; and Cmdr. Steven Romero, Cardiology. (Not pictured: Cmdr. Gregory Matwiyoff, Pulmonary/Critical Care.)

Upon invitation, missions were conducted in four host nations: Indonesia, the Philippines, Vietnam and Cambodia. Over the 56 days dedicated to mission activities, more than 49,000 patients were seen and treated ashore, including general adult and pediatric medical care as well as dental and vision screenings at Medical and Dental Civic Action Programs (MEDCAPS). Surgeons of several specialties (e.g., general surgery, orthopedics, plastics, gynecology, ophthalmology, etc.) performed more than 900 surgeries via SURGCAPS, and veterinarians treated and evaluated more than 7,000 livestock and domestic animals at VETCAPS. Other non-medical projects include engineering repairs, construction and community service donations. In addition, Mercy staff participated in more than 60,000 hours during 62 subject-matter expert exchanges (SMEEs) on various topics such as basic first aid, nutrition, public health, disaster response, and food and water safety.

Beckett presented ten SMEE lectures and participated in advising host nation health care personnel on issues of infection control of communicable diseases, disease outbreak response and specific management of diseases such as dengue, malaria, rabies and tuberculosis. She also supported the investigation and management of a shipboard outbreak of gastroenteritis (vomiting and diarrhea) affecting 64 crew members over a three-week period while underway. Her knowledge of Navy research capabilities assisted the Sick Call staff in confirmation of norovirus as the cause of the outbreak via assistance from the Naval Health Research Center molecular diagnostics laboratory. During the mission, she also visited fellow investigators at NAMRU-2 in Pearl Harbor and Phnom Penh, Cambodia.

Beckett returned home to Maryland August 24 and considers her opportunity to contribute to Pacific Partnership 2012 an extreme honor and privilege.

## LAVA Dogs Sign Up with DoD Bone Marrow Program Registry



Petty Officer 1st Class Dennis Gonzales, hospital corpsman, Combat Logistics Battalion 3, swabs a sample from the inside of his cheek during the bone marrow drive. Photo from DVDS.

By Kristen Wong, DVDS

MARINE CORPS BASE HAWAII, Kaneohe Bay - The smell of barbecue wafted in the air just behind Pollock Field as Marines and sailors from 1st Battalion, 3rd Marine Regiment relaxed and enjoyed their Friday afternoon, Oct. 26. But along with games, food and general chit-chat, many service members were rubbing the inside of their cheek with a cotton swab. Marine Corps Base (MCB) Hawaii was participating in a basewide drive to register service members with the C.W. Bill Young Department of Defense Marrow Donor Program.

Because 1st Battalion, 3rd Marines is scheduled to deploy, a drive was held during their family day. Service members were encouraged to fill out an application and provide four samples of cheek cells taken with a cotton swab. According to the program website, the information will be entered into the National Marrow Donor Program registry. If there is a match between someone in the registry and a patient who needs marrow, that person will, with their consent, undergo additional blood and health testing to further confirm a definite match and then determine whether that person is able to donate.

In the past two years, two Marines from MCB Hawaii were confirmed as matches for patients. Lance Cpl. Brantley Smith, a communications technician with 3rd Battalion, 3rd Marine Regiment, and Lance Cpl. Joshua D. Epps, a machine gunner with 3rd Battalion, 3rd Marine Regiment, both underwent surgery and donated their marrow.

"Our mission is to get as much DoD [participants who] can help out (Continued on page 6)

## NMRC-Bridge Between Marrow Drive and National Registry

SILVER SPRING, Md. - In 2012 over 42,000 service members, family members, and DoD employees registered with the C.W. Bill Young DoD Marrow Donor Program, joining more than 730,000 DoD volunteers who are potential marrow donors. Of these, over 5,200 have donated marrow for patients needing transplants to treat one of over 80 potentially fatal diseases.

Following DoD donor drives like the one at Marine Corps Base Hawaii, Kaneohe Bay, donor consent forms and oral swabs with cell samples are sent to the C.W. Bill Young DoD Marrow Donor Program Donor Center and Laboratory, which is part of the Naval Medical Research Center's (NMRC) Bone Marrow Research Directorate. The C.W. Bill Young DoD Marrow Donor Program is operated by the Navy and Georgetown University. Staff members at the laboratory perform genetic testing using the cells from the oral swabs to match potential donors with patients.

Each swab is treated to isolate

pure DNA from the genes on chromosomes from the cheek cells. The precise human leukocyte antigen (HLA) type (sequence of A, T, G or C DNA molecules) of each gene must be matched between potential donor and patient.

Within families, each sibling has a 25 percent chance of being HLA identical to a second sibling. But 70 percent of patients needing transplants do not have a match in their family and rely on finding a match from among 10,000,000 volunteers listed on the National Marrow Donor Program registry. Because of the incredible diversity of HLA types in America, many more donors are needed. There are thousands of HLA types from each of the four HLA genes that are matched for transplantation and millions of potential combinations of the eight types for each person, one set of four HLA genes from each parent.

If the donor who matches a patient is registered in the C.W. Bill Young DoD Program, a program representa-

tive contacts the potential donor and works closely with both the donor and the command.

If the donor is available and agrees to proceed, additional genetic matching is performed to ensure a match. Additional medical evaluations are performed to ensure the donor's good health and a transplant date is selected. The donor's cells are transported to the patient's hospital for transplantation. The patient and donor can choose to meet each other one year after the transplant.

The NMRC Bone Marrow Research Directorate provides military contingency support for causalities with marrow toxic injury due to radiation or chemical warfare agents. Exposure to radiation or chemical agents can cause unrecoverable damage to bone marrow, breaking down the immune system in the process. The directorate performs laboratory research that supports technology innovations to make highly reliable and cost-effective DNA-based typing for marrow transplants.

## Policy and Strategy with an Influenza/Infectious Disease Twist

By NAMRU- 2 Public Affairs



PEARL HARBOR, Hawaii - For the last year, Lt. Cmdr. Dustin Harrison, U.S. Naval Medical Research Unit No. 2 (NAMRU- 2)

Pacific, has been immersing himself in the often strange and unfamiliar world of policy and strategy as a member of U.S. Pacific Command's (USPACOM) Pandemic Influenza and Infectious Disease (PI&ID) Contingency Plan (CONPLAN) 5003- 12 Joint Planning Group (JPG).

Harrison is currently assigned to NAMRU- 2 Pacific as a microbiologist, but at the encouragement of NAMRU2 Pacific's leadership he has been attending a year- long series of working group sessions at USPACOM Headquarters, Camp Smith, Hawaii.

"At first it was very intimidating being in the room with people who do policy for a living. I'm much more comfortable with the operational side of things," said Harrison. "It was very interesting to see the dynamics and work that goes into plans and policy development. It was very educational for a JO [junior officer] like me to be a part of."

The JPG was chaired by USPACOM's Functional Plans Branch Chief Lt. Col. Andrew Hocking, Australian Defense Force, and consisted of members from multiple codes at USPACOM and all over the island of Oahu, including Air Force Pacific, U.S. Army Pacific, Joint TaskForce Homeland Defense, Marine Forces Pacific, Department of State,

the State of Hawaii, the U.S. Centers for Disease Control and Prevention, and Navy and Environmental and Preventive Medicine Unit 6, among others.

The purpose of the working group was to update and formulate the CONPLAN to prepare for, respond to, and mitigate a pandemic outbreak of influenza or other infectious disease of operational significance and, when required, respond to Defense Support of Civilian Authorities and Foreign Humanitarian Assistance requests. Over the past year, the JPG met to conduct a series of Mission Analysis and Course of Action development meetings culminating in a two- day war game aimed at testing the CONPLAN and to identify strengths, weaknesses and areas for improvement before the plan is briefed to the USPACOM Commander.

## LAVA Dogs Sign Up with DoD Bone Marrow Program Registry

(Continued from page 5) families in need," said Chief Petty Officer Arvin Salas, a hospital corpsman with 21st Dental Company. "Every 300 that register, one gets called," Salas said. "The more people we can help the better."

Salas said a bone marrow transplant can raise a patient's chances of living from zero to 80 percent.

"It can happen to anybody," said Petty Officer 1st Class Dennis Gonzales of being chosen to donate. "It's a one in 300 chance. You can always be that one. Who's to say it won't be my kid 10 years from now [who needs marrow]."

Gonzales added that service members are "prime donors," as they are already required to be physically fit to serve in the military.

"Everyone should have a second chance at life," said Pfc. Tommy Arko, a mortarmen with Weapons Company, 1st Battalion, 3rd Marines. Arko was one of many service members filling out applications and giving samples.



Lance Cpl. Kip Boker, radio technician, Headquarters and Service Company, 1st Battalion, 3rd Marine regiment, stands while Cpl. Jacob Echeverri, radio operator, Headquarters and Service Company, 1st Battalion, 3rd Marines, collects a swab sample. Photo from DVDS.

## NAMRU-3 Supports Medical Research Capacity Building in Liberia

From NAMRU- 3 Public Affairs

CAIRO - U.S. Naval Medical Research Unit No. 3 (NAMRU- 3) is playing an important role in medical research capacity building in Liberia, which is recovering from a brutal 14- year civil war that devastated the country's infrastructure.

Since 2010, Navy biomedical researchers have been collaborating with the Liberian Institute of Biomedical Research (LIBR) on two research projects funded by the Armed Forces Health Surveillance Center/Global Emerging Infections System (AFHSC- GEIS). These projects focus on disease vector surveillance, detection of vector- borne viral pathogens such as malaria, and vector control. The projects are enabling the country to independently expand vector- borne disease surveillance and detection capabilities in Liberia to benefit the Liberian Armed Forces as well as the entire population of Liberia.

"Our projects in Liberia directly support our warfighters," said Capt. Buhari Oyofo, NAMRU- 3 commanding officer. "We also need to leave the knowledge and tools behind so they can continue to support themselves once we're done."

The NAMRU- 3 team visited Monrovia, Liberia in November to meet with key collaborators, including Dr. Walter Gwenigale, the Minister of Health and Social Welfare; Dr. Fatahama Bolay, the Director of LIBR; and U.S. Marine Col. Vernon Graham, the officer in charge of Operation Onward Liberty (OOL).

The Minister of Health and Social Welfare gave high praise for NAMRU- 3's capacity building engagements in Liberia. He expressed specific thanks for the collaboration at LIBR, where he also serves as the chairman of the Board of Governors, and he expressed the hope that the current col



From left: Lt. Cmdr. Jennifer Curry, Capt. Chris Martinez, Capt. Buhari Oyofo, Col. Vernon Graham, and Lt. Joseph Diclaro. The NAMRU- 3 commanding officer, Capt. Oyofo, and his team pose with Col. Graham, officer in charge, and Capt. Martinez, SMO, of the U.S. Operation Onward Liberty forces in Liberia. Staff photo.



From left: Lt. Cmdr. Jennifer Curry, Capt. Buhari Oyofo, Dr. Walter T. Gwenigale, Lt. Joseph Diclaro, and Dr. Fatahama Bolay. Capt. Oyofo, the NAMRU- 3 commanding officer, meets with Dr. Gwenigale, the Liberian Minister of Health, to discuss collaboration through the Liberian Institute of Biomedical Research. Staff photo.

laboration with NAMRU- 3 will open doors for future projects for the benefit of Liberia and attract other potential collaborators to LIBR.

In a separate meeting, the Director of LIBR said, "The collaboration with NAMRU- 3 is helping to restore many of the capabilities that LIBR had before the war."

During a meeting with Graham, he expressed particular interest in the project combining insecticide spraying for all base housing with surveillance and geospatial mapping to determine the distribution of malaria- transmitting mosquitoes. No malaria infections have been diagnosed in U.S. troops since the onset of the spraying, which is carried out by NAMRU- 3 in collaboration with the Navy Entomology Center of Excellence (NECE). This illustrates the risk reduction made possible with a force health protection policy employing both environmental vector controls and anti- malarial prophylaxis.

With the assistance of OOL, NAMRU- 3 has pursued military- to- military engagements with the Armed Forces of Liberia (AFL) through vector control training efforts in collaboration with LIBR.

On a tour of Camp Edward Binyah, Oyofo met with Pfc. Nadoris Nador and Pfc. Henry Morris, two AFL Preventive Medicine Technicians. They told Oyofo how they had benefited from the training offered through NAMRU- 3 AFHSC- GEIS projects.

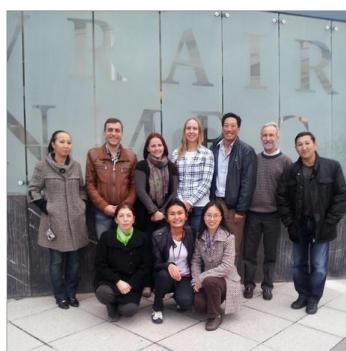
Nador expressed her appreciation for the training in vector surveillance, vector biology/identification and vector control, saying, "The knowledge and the equipment provided by NAMRU- 3 has very much improved our ability to protect our soldiers and their families from disease."

## Kazakh Scientists Visit NMRC, Train on MLST Molecular Assays

SILVER SPRING, Md. - Four scientists from Kazakhstan visited the Rickettsial Diseases Research Program laboratories at the Naval Medical Research Center (NMRC) in Silver Spring, Md., October 29- November 9 for training on molecular assays, specifically multi- locus sequencing typing (MLST), from Dr. Allen Richards and his staff. The training was part of a collaboration with the Cooperative Biological Engagement Program (CBEP) of the Defense Threat Reduction Agency (DTRA).

As part of their mission to assess the risk of rickettsial diseases to military and civilian personnel worldwide, the Rickettsial Diseases Research Program trains individuals involved in regions that are endemic to rickettsial diseases.

The trainees came from four different institutes in the Republic of Kazakhstan. Alexey Andrychushenko came from the Uralsk Anti- Plague Station (UAPS), Uralsk; Talgat Nurmakhanov from the Kazakh Scientific Center for Quarantine and Zoonotic Disease (KSCQZD), Almaty; and Gulnar Omasehva from the Scientific Practical Center for Sanitary Epidemiological Expertise and Monitoring (SEEM), Ministry of Health Committee on State Sanitary and Epidemiological Supervision, Almaty. Lyazzat Musralina, a Kazakh scientist from AECOM, Almaty, accompanied the trainees from Kazakhstan.



Top row, from left: Gulnar Omasehva, Alexey Andrychushenko, Sarah Pisarcik, Heidi St. John, Dr. Kenneth Yeh, Dr. Allen Richards, and Talgat Nurmakhanov. Bottom row, from left: Dr. Ekaterine Adeishvili, Lyazzat Musralina, and Dr. Ju Jiang.

( PCR) and sequencing five different rickettsial genes (both conserved and variable genes), sequencing data

Taylor provided training in the use of one of the genus- specific tick assays she developed to identify ticks common in Kazakhstan. They learned methods necessary to perform quantitative real- time PCR, perform standard and nested PCR to produce amplicons from target genes for use in sequencing, perform sequencing, analyze sequencing data, perform BLAST search and comparisons, and develop conclusions. Once back in their own laboratories, the Kazakh scientists will perform assays on local Kazakh tick samples to identify rickettsial and tick species and assess more fully the risk of rickettsial diseases throughout Kazakhstan.

As part of their mission to assess the risk of rickettsial diseases to military and civilian personnel worldwide, the Rickettsial Diseases Research Program trains individuals involved in regions that are endemic to rickettsial diseases.

Dr. Ju Jiang provided the Kazakh scientists with MLST training that included polymerase chain reaction analysis, and the use of software and web tools. In addition to the Rickettsia- specific assays, Melissa

## Accreditation of Patient Condition Occurrence Verification Tool

By Ralph Nix and Vern Wing, NHRC

SAN DIEGO - The Expeditionary Medicine Modeling, Simulation, and Analysis group at the Naval Health Research Center (NHRC) completed development of the Patient Condition Occurrence Frequency (PCOF) tool. In October, the tool was presented to the Force Health Protection and Readiness, Strategic Analysis Working Group Office of the Assistant Secretary of Defense, Health Affairs as part of the verification, validation, and accreditation (VV&A) plan for service acceptance. The working group forwarded their recommendation for accreditation to the Force Health Protection Integration Council. Once accredited, NHRC's PCOF tool will be approved as the joint patient occurrence generating application.

The PCOF tool generates tables that show the occurrence probabilities of disease and injury types typically sustained in a contingency by a population at risk. PCOF tables exist within casualty categories of wounded in action, nonbattle injuries, disease and outpatient visits for a given combat or noncombat scenario throughout the range of military operations (ROMO). ROMO is defined for this effort to include humanitarian assistance, disaster relief, defense support of civil authorities and various combat operations. The military medical planning community, until now, lacked a functional and accurate means of estimating PCOFs, which are necessary to develop the patient streams used in health care simulations.

Using an accredited PCOF tool, planners can employ baselined, mission- centric PCOF data and tailor it to more precisely fit the anticipated mission. This will help inform decision makers on the types of patient conditions to expect during a contingency. The PCOF tool will enable planners to move beyond anecdotal, rule- of- thumb planning estimates into a repeatable, organized and robust estimating method with the potential to dramatically enhance medical mission planning.



Lt. j.g. Michael Rucker treats the infected feet of a 7-year old Djibouti girl at the Caritas Djibouti complex in Djibouti. Photo by Chief Mass communication Specialist Robert P. Gallagher.



U.S. Marines and Sailors in transition to Afghanistan to begin a 7-month deployment in support of Operational Enduring Freedom. Photo by LanceCpl. Sean M. Searfus.

Combat data sets from Operation Enduring Freedom and Operation Iraqi Freedom were derived with data from the Theater Medical Data Store and the Patient Administration Systems and Biostatistical Activity. To populate humanitarian assistance PCOF tables, patient encounter data from Operations Continuing Promise and Pacific Partnership, spanning the years 2008- 2011, were used. Disaster relief PCOFs for earthquakes, tsunamis, hurricanes and floods were developed from literature reviews and subject matter expert input.

The PCOF tool examined through this formal VVAE effort provides an effective, accurate and repeatable method of generating PCOF estimates using standardized and documented means of adjusting baseline distributions.

## NMRC Researcher Part of Joint Combat Casualty Research Team

By Cmdr. Cindy Tamminga, NMRC researcher deployed to JC2RT

AFGHANISTAN - The Joint Combat Casualty Research Team (JC2RT) is a U.S. Central Command (USCENTCOM) directed, forward deployed unit of military research scientists and clinicians tasked with overseeing, coordinating, facilitating and conducting combat-relevant research in a deployed environment.

The first team was deployed during combat operations in Iraq as the Deployed Combat Casualty Research Team (DC2RT) in mid- 2005. Since then, thirteen teams have deployed, with each team tour spanning six months. Over time, the composition of the team expanded to involve all three services, and in 2010, as the operations tempo decreased in Iraq, the team transitioned to Afghanistan. Members of the JC2RT are embedded with medical assets throughout Afghanistan.

The conduct of research in a combat environment must meet the same human subjects protection regulatory requirements as research conducted within the continental United States. The first Department of Defense Assurance of Compliance and Human Research Protection Plan involving a combatant command was approved and established in 2005. In 2010, this was expanded and updated to include research conducted in Iraq, Afghanistan and Kuwait. All in-theater research protocols undergo an ap



Back row, from left: Cmdr. Cindy Tamminga, Naval Medical Research Center; Lt. Kristina Carter, Naval Environmental and Preventive Medicine Unit 5; Lt. Cmdr. Octavian Adam, Naval Medical Center Portsmouth; Maj. Brandon Tourillott, Uniformed Services University of the Health Sciences; Lt. Col. Susan Dukes, U.S. Air Force School of Aerospace Medicine. Front row, from left: Lt. Col. Bradford Whitcomb, Tripler Army Medical Center; Maj. Devin Bryant, Walter Reed Army Institute of Research; Sgt. Shanelle McNair, U.S. Army Institute of Surgical Research; Lt. Col. Teresa Brininger, Schofield Barracks Health Clinic.

posed research must be highly relevant to military medicine, protect all human research subjects, not hinder ongoing combat operations or health services support, be feasible to conduct in theater, and be unique to the combat environment.

nineteen projects are in the development phase. With the anticipated drawdown in troops, the research window of opportunity is rapidly closing. For this reason, JC2RT Team 13 has prioritized enrollment and conduct of currently approved protocols as well as the judicious and expedient processing of new protocols.

History has shown that medical advances are accelerated during war...It is these medical advances that hold the greatest potential for decreasing the morbidity and mortality associated with combat injuries.

proval process that includes scientific review conducted by researchers at the Institute of Surgical Research and ethical review conducted by the U.S. Army Medical Research and Material Command Institutional Review Board. Each protocol must also meet criteria specific for the deployed combat environment. In particular, the pro

Research priorities and processes are dictated by USCENTCOM. Current research efforts can be divided into four focus areas: pre- hospital and en route care; hemorrhage and acute care; traumatic brain injury; and prevention, resilience and recovery. At this time, twenty research protocols are currently enrolling volunteers and

History has shown that medical advances are accelerated during war. These healthcare advances can only occur with the systematic recording, collection, validation and analysis of data. This is the mission of military medical research. It is these medical advances that hold the greatest potential for decreasing the morbidity and mortality associated with combat injuries. For this reason, combat-relevant research may be the most impactful medical mission currently being conduct in theater.

## Presidential Memorandum - Accelerating Technology Transfer

By Todd Ponzio, NMRC Technology Transfer Office

SILVER SPRING, Md. - The "Presidential Memorandum - Accelerating Technology Transfer and Commercialization of Federal Research in Support of High- Growth Businesses" was released toward the end of last year. This memorandum's objectives directed Federal agencies to "[1] establish goals and measure performance, [2] streamline administrative processes, and [3] facilitate local and regional partnerships in order to accelerate technology transfer and support private sector commercialization."

Technology transfer and commercialization' is a phrase used by the business side of research and development that manages the wide range of discoveries, inventions and other intellectual property within the Naval Medical Research Center (NMRC) enterprise. The goal is bringing these discoveries to market for the benefit of the warfighter.

The NMRC enterprise excels in facilitating local and regional partnerships due to the inventiveness and creativity of our research scientists and physicians. Most valuable biomedical developments begin in a laboratory, but the value to the warfighter requires moving that discovery through all the business steps, ultimately to manufacturing and distribution. This requires the establishment of appropriate technology transfer agreements. NMRC's technology transfer collaborations leverage research capabilities found in the public and private sectors to stretch research dollars and accomplish the mission of supporting the health and readiness of the military's men and women in uniform.

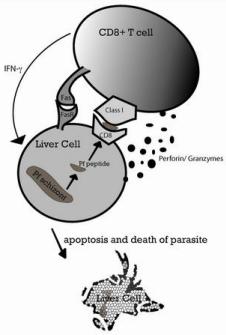
For example, instead of a company having to reinvent something that is already available in a Navy laboratory, or vice versa, a partnership can capitalize on each collaborator's expertise toward achieving a shared goal. Every time an invention from one of our laboratories is commercialized into an accessible product, the U.S. taxpayer sees a tangible return on their investment and the Department of Defense has a product that will enhance the readiness of military personnel.

Cooperative Research and Development Agreements (CRADAs) are key business vehicles among Navy biomedical scientists. This past quarter, the NMRC enterprise executed just over twenty CRADAs and reviewed an additional fourteen CRADAs for the Naval hospitals in Portsmouth and San Diego.

One notable collaboration is being spearheaded by Cmdr. Jonathan Forsberg (NMRC, Operational and Undersea Medicine Directorate), who is working with a company to explore a novel mode of anchoring prosthetics. This project could produce important results for amputees. Another collaboration being led by Lt. Roxanne Burrus (U.S. Naval Medical Research Unit No. 6, Lima, Peru) involves Duke University and focuses on evaluating the effects of changing demography and land use on malaria transmission. This is an important issue in light of the

prevalence of malaria in developing countries and is important to the health of deployed warfighters. An additional malaria- focused collaboration is being headed by Lt. R. Vince Gerbasi (NMRC, Infectious Diseases Directorate), who is using mass spectrometry to identify novel antigens to be used as potential vaccine candidates. Lastly, Dr. Bjorn Song (Naval Medical Research Unit- San Antonio) is leading a collaboration focused on exploring the use of a synthetic oxygen- carrying fluid to reduce tissue damage occurring in response to hemorrhagic shock.

All of these collaborations have significant relevance to the military, but there is also considerable potential for these new sources of information and technologies to benefit the general population. Through the appropriate leveraging of resources through CRADAs and the commercialization of Navy Medicine inventions through patent licensing agreements, the NMRC enterprise excels at technology transfer. This is a key part of what the Presidential Memorandum was all about.



A graphic illustration depicting Lt. R. Vince Gerbasi's effort to use mass spectrometry to identify novel antigens to be used as potential malaria vaccine candidates.

## NMRC Hosts a Dining Out at U.S. Naval Academy October 17

SILVER SPRING, Md. - The Naval Medical Research Center (NMRC) reinstated its Annual Mess Night, also referred to as a Dining Out, for officers and guests at the U.S. Naval Academy, Annapolis, October 17.

The President of the Mess, NMRC Commanding Officer Capt. John Sanders, led the guest of honor, Rear Adm. Bruce A. Doll, head of Bureau of Medicine and Surgery research and development, and the other Dining Out participants into the dining hall while the Navy Hymn played. When everyone was assembled, Sanders began the evening by saying, "Ladies and gentlemen, mess night for the Naval Medical Research Center is now open. Welcome and thank you for joining us this evening, please remain standing for the playing of our National Anthem."

The rest of the evening followed strict Naval protocol, an established tradition that reaches back to the Vikings and the British Navy, but with some special references to the remarkable history of Naval Medical research. The protocol included an invocation, a call to parade the beef for the President of the Mess to sample and approve, followed by the announcement that the beef was fit for human consumption and an invitation for everyone to enjoy their dinner. Capt. Stephen Savarino served as the Vice President of the Mess and took the opportunity to require "poems and odes" to the research accomplishments of our Naval forbears from the junior officers (who demonstrated both a grasp of our history and a flair for poetry).

The traditional mixing of the grog, a Naval beverage with a glorious history of its own, followed the second course and began the formal toasting. The first toast was to the Commander-in-Chief of the United States followed by an array of toasts recognizing the U.S. Navy, U.S. Marine Corps and all other sister services capped by a salute to all sweethearts and spouses.

The President of the Mess introduced Doll, who spoke about the history of Navy Medicine research and development and encouraged the junior officers, who will be the next generation of leaders in re-

(Continued on page 15)



NMRC 2012 Dining Out Event.



From left: Rear Adm. Bruce Doll, guest speaker; NMRC Commanding Officer and President of the Mess Capt. John Sanders and Dr. Leighann Sanders; NMRC Executive Officer Capt. Elizabeth Montcalm-Smith and Dr. Chris Smith.

## NMRC's Villasante Returns "Home" to Speak at Notre Dame

University of Notre Dame Public Affairs

NOTRE DAME, Ind. - Capt. Eileen Franke Villasante, Ph.D., who currently serves as Head of the Malaria Department at the Naval Medical Research Center (NMRC) in Silver Spring, Md., gave the Eck Institute for Global Health Colloquium lecture at the University of Notre Dame October 24 in the very same auditorium where she sat as a student.

The once Notre Dame student had not been back to campus in "too many years to count," according to Villasante. She studied in the laboratory of parasitologist Paul Weinstein, Ph.D., earning her Doctor of Philosophy degree in biology from the University of Notre Dame in 1982. A native of Long Island, New York, Villasante earned her Bachelor of Science degree from the State University of New York at Albany in 1978.

Upon receiving her Ph.D. from the University of Notre Dame, she began a quest to see the world while doing research. She never imagined one day she would conduct laboratory and field - based research on malaria, leishmaniasis and filariasis in places like Indonesia, Peru, and Egypt. This international career was in parallel to her distinguished rise in the ranks of the Navy, holding a variety of leadership positions over the years.

Villasante went to the National Research Council as a postdoctoral fellow in the Leishmaniasis Laboratory as part of the Division of Experimental Therapeutics at the Walter Reed Army Institute of Research. She discovered the U.S. Navy, where they advertised, "It's not just a job, it's an Adventure." She was at Walter Reed for two years prior to being commissioned as an officer in the United States Navy in 1984. Not knowing that adventure would be the career of a lifetime, she signed up and has traveled to the deepest pockets of the world researching infectious diseases.

Over her career, Villasante has held several leadership positions in the Navy including Scientific Director at the Navy's medical research laboratory in Egypt, Special Assistant to the Navy Surgeon General for Research Protections, Executive Officer of NMRC, and, currently, Head of the Malaria Department at NMRC.



From left: Ellen Flannery, doctoral student and Eck Institute for Global Health Fellow, Molly Duman Sheels, Ph.D. Lab; Emmanuel Adu-Gyamfi, doctoral student and Eck Institute for Global Health Fellow, Robert Stahelin, Ph.D. Lab; Eileen Franke Villasante, Ph.D., CAPT, MSC, USN, special guest speaker; and Katherine Taylor, Ph.D., Director of Operations, Eck Institute for Global Health. Photo provided by Notre Dame Institute for Global Health.

The Navy Malaria Department concentrates on developing a vaccine for the malaria parasite. She is often asked why would the Navy or any of the armed forces be interested in infectious disease? Her answer is easy: protection for the troops. For example, in 2011 there were 124 cases of malaria, mostly in Afghanistan. Infectious diseases have a direct impact on our military and their ability to carry out their mission.

Currently, 51 microbiologists are serving the Navy in active duty around the world, including five research laboratories (Cairo; Lima, Peru;

Phnom Penh, Cambodia; Silver Spring, Md.; and San Diego). The overseas labs also have areas of concentration specific to the infectious disease found in that area and function in coordination with the local Ministries of Health, academies, and sometimes, active non-governmental organizations.

Villasante has been an integral part of the success of the Navy's Medical Service Corps and long history of success in infectious disease research. Their new slogan is a testament to her life's mission: "America's Navy: A Global Force for Good." Therefore, delivering a lecture on Navy careers to young scientists in the same auditorium where she attended lectures as a student was more than a coming home, it was a completion of her educational circle.

Life is cyclical.

## NMRC Hosts Visit from the U.S. Global Malaria Coordinator

(Continued from page 1) vaccine clinical trials. The visit ended with a short overview on malaria research in the Navy labs outside the continental United States.

Ziemer said he was very impressed with the work being done at the lab, adding that he did not realize there was so much going on. He hopes to come back and visit again soon.

"It was a great opportunity to have Rear Adm. Ziemer here to see the progress we have made in malaria vaccine development," said Capt. Eileen Villasante, head of the Malaria Department. "Through his visit we were able to raise the awareness of the Navy's malaria vaccine development efforts and hope that someday in the very near future a malaria vaccine can be added to the President's Malaria Initiative armamentarium to combat this deadly disease."

Ziemer, who was appointed in 2006 to lead the President's Malaria Initiative, heads a group with a strategy to achieve Africa-wide impact by halving the burden of malaria in 70 percent of at-risk populations in sub-Saharan Africa,



Cmdr. Daniel Szumlas (left) speaks with Rear Adm. (ret.) Timothy Ziemer (center) about NMRC's malaria research efforts.

approximately 450 million people. The President's Malaria Initiative is a collaborative U.S. effort led by the U.S. Agency for International Development in conjunction with the Department of Health and Human Services, the Department of State, the White House and others.

## NMRC Researcher Speaks at Johns Hopkins Alumni Week

SILVER SPRING, Md. - Dr. Andrea Keane- Myers of the Naval Medical Research Center's Biological Defense Research Directorate provided an hourlong presentation November 6 during Alumni Week at John Hopkins University's Bloomberg School of Public Health.

Keane- Myers' presentation "From spirochetes to

select agents: thoughts on an ongoing science career," was well received by all who attended - graduate students, post-doctoral fellows, faculty and the associate dean. After the presentation, she spent another hour answering questions. Keane- Myers received her Ph.D. in Molecular Microbiology from the school in 1995.

## NAMRU-3 Staff Teach Cub Scouts about Flag Etiquette

CAIRO - NAMRU- 3 takes pride in service to the American expatriate community, as evidenced by a flag folding ceremony held with the assistance of local Boy Scout Troop 201, Den 12. HMC Laregen Valdez and HMC Jaime Inda



8-10, complete requirements for the Wolf badge Achievement Trail. After reciting the pledge of allegiance, the boys learned proper care and respect for the U.S. flag. HMC Inda said, "We asked the scouts questions about why we would fold the flag in a special way. They also wanted to know what it would mean if we dropped the flag." With parents (including two NAMRU- 3 staff members) looking on, the scouts practiced flag folding.

## NMRC Officers Discuss Navy Careers at Elizabeth Seton High School



November 17, Cmdr. Charmagne Beckett and Lt. Cmdr. Janine Danko represented the Navy at a career fair held at the all-girl Elizabeth Seton High School in Bladensburg, Md. Danko and Beckett were able to interact and share their experiences as Naval officers with the young women.

Photos: Cmdr. Charmagne Beckett (left photo) and Lt. Cmdr. Janine Danko (right photo) talking with Elizabeth Seton High School students about a career in the Navy.

## NMRC Hosts a Dining Out at U.S. Naval Academy

(Continued from page 12) search, to look to the senior officers as mentors and examples of how exceptional research is done in the military.

A somber moment during the Dining Out occurred when Hospital Corpsman 1st Class Brian Knetsch of NMRC's Biological Defense Research Directorate requested permission of the President of the Mess to present and explain the Prisoner of War/ Missing in Action table in honor of their memory. This heartfelt tribute to all fallen or lost comrades, past and present, was an awakening moment to all service members and guests in attendance.

Later, informal toasts were offered around the tables.

The evening ended with the President of the Mess offering a final toast to the United States Navy while Anchors Aweigh played.

Special thanks to Lt. Ryan Sheppard (NMRC Mess Caterer) and the entire NMRC Dining Committee for making this time-honored occasion a special one to be remembered always!

## NMRC Officers Teach Science at Rolling Terrace Elementary School

SILVER SPRING, Md. - Naval officers from the Naval Medical Research Center (NMRC) volunteered at Rolling Terrace Elementary school in Takoma, Md. They had the opportunity to teach science to students and act as mentors.

This November, Lt. Cmdr. William Barnett and Lt. Danett Bishop focused on "phases of matter." During their lectures, the officers asked students to generate hypotheses as to how matter changes phases.

Using dry ice and some basic laboratory equipment, students were able to observe the general effect of temperature on matter, understand the transition of liquid to gas (vaporization) and understand the direct transition of solid to gas (sublimation).

"We were able to leverage resources that are absent in the local public school system to deliver an inquiry-based presentation of phys



Photo: Lt. Danett Bishop explains phases of matter and atomic theory to a group of third graders at Rolling Terrace Elementary School. "ics concepts," said Bishop. The students found the demonstration engaging and thanked the visiting officers with colorfully drawn thank-you cards.

## 2012 Combined Federal Campaign Concludes December 15



SILVER SPRING, Md. - The Naval Medical Research Center (NMRC) Combined Federal Campaign (CFC)

lead, Lt. Christina Farris, is pushing for another successful year. NMRC officially kicked off their support of the CFC in the fall. With the campaign already underway, Farris says she is looking forward to the same outstanding level of participation seen in years past.

Seven other team members are assisting Farris in moving forward the mission of the CFC - to promote and support philanthropy through a program that is employee focused, cost- efficient and effective in providing all federal employees the opportunity to improve the quality of life for all. Contributions support eligible non-profit organizations that provide health and human services benefits throughout the world.

The 2012 CFC will run through December 15. CFC is the world's largest and most successful annual workplace charity campaign, with more than 200 CFC campaigns throughout the country and internationally to help to raise millions of dollars each year. Here at NMRC, all military and civilian personnel have been encouraged to participate.

### Happy Holidays from the NMRC Ombudsman!

Good, if you are reading this, it means you made it through Thanksgiving with the family AND black Friday. Here in the Washington, D.C. area, the weather has turned noticeably colder. The colder weather, combined with the crowded shopping malls, is a clear sign that the holiday season is upon us. As promised, because we are in the midst of the holiday season, this month I'm presenting additional holiday budgeting tips. Not to be a Scrooge, but many people blow their holiday budgets because they get carried away by the excitement of the season. It's important to remember that you can still have a joyous holiday season without busting your budget. Here are some more ways to save money during the holidays.

Set expectations with friends and family. If you're worried about your finances, talk about it with friends and family. They might be just as relieved as you are to set limits on spending or, in some cases, to skip gift- giving entirely.

Look for ways to cut back on the number of gifts you buy. If you have a large family or group of friends, ask if they'd like to draw names out of a hat and give one gift per person. Or give family gifts, such as a movies- by- mail membership or a pass to a local museum rather than individual gifts.

Look for bargains and remember to use your Exchange! In addition to the usual tax savings and price- matching benefit, you'll find special holiday discounts. If you live in the D.C. area and haven't done so already, check out the nice new NEX in Bethesda!

Investigate your travel options. How will you get there? Do you drive instead of fly? Where will you stay, with a friend or relative instead of in a hotel room? Make do without a rental car? Plan in advance. If you didn't manage to book your airline tickets well in advance, looking for last- minute deals and being flexible about your travel dates can also save money. Maybe even consider flying immediately after the holidays rather than before.

Use your credit card wisely. Finally, think before you use your credit card to pay for holiday expenses. Don't use it unless you know you can pay it off right away. Don't start your New Year with huge credit card bills!

Beyond holiday budgeting, I would like to take brief moment to bring to your attention a couple of other items. First, the nomination period for Operation Homefront's Military Child of the Year Award is open until December 15. The award recognizes outstanding military children who demonstrate resiliency, leadership and achievement. One winner from each branch of service will receive \$5,000, a laptop and a trip to D.C. for an awards gala. To submit an application, visit [www.militarychildoftheyear.org](http://www.militarychildoftheyear.org).

Also, Wings Over America Scholarship Foundation (WOASF) is now accepting pre- qualification forms for its scholarships. WOASF annually offers more than forty undergraduate scholarships ranging from \$2,000 to \$10,000 to dependent children and spouses of U.S. Navy personnel having served in Naval Aviation commands (Carriers, Wings, Squadrons): officer and enlisted, active duty, retired, honorably discharged or deceased. For more information on eligibility and the application process, please visit [www.wingsoveramerica.us](http://www.wingsoveramerica.us).

In closing, I'd like to wish everyone a wonderful holiday season and a Happy New Year. I look forward to working with you in 2013! As always, if you are in search of other resources or assistance, please don't hesitate to contact me. My email address is NMRC.Ombudsman@gmail.com

Have a Fine Navy Day! Alexandra Mora NMRC Ombudsman