TropMed 2017

Baltimore, MD | November 5-9

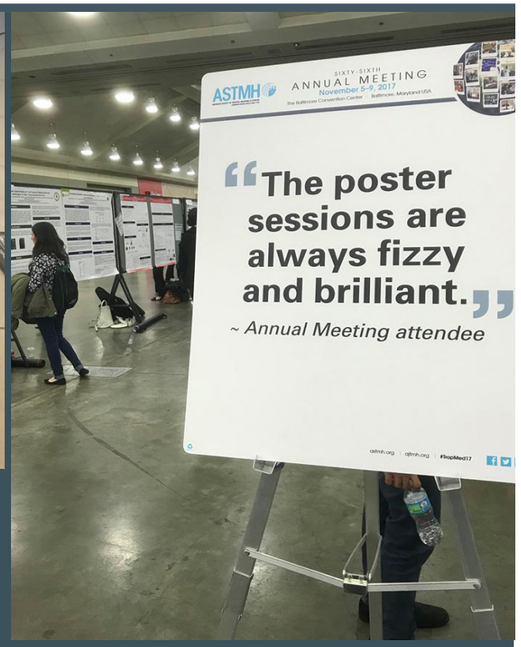
NAVAL MEDICAL R&D NEWS

November 2017

Volume IX **Issue 11**

Top Defense Health Agency R&D Official Visits NHRC

TropMed17 | Baltimore, MD (cover)



Capt. William Deniston, executive officer, Naval Medical Research Center (far left), Capt. Adam Armstrong, commanding officer, Naval Medical Research Center (left center), Capt. Patrick Blair, commanding officer, Naval Medical Research Center - Asia, and Dr. James Andrews, Director of Field Laboratory Operations, Naval Medical Research Center at the American Society of Tropical Medicine and Hygiene Annual Meeting in Baltimore, Maryland, November 7.

The American Society of Tropical Medicine and Hygiene (ASTMH) Annual Meeting draws tropical medicine and global health professionals representing academia, government, non-profits, philanthropy, NGOs, industry, military and private practice. The meeting is designed for researchers, professors, government and public health officials, military personnel, travel clinic physicians, practicing physicians in tropical medicine, students and all health care providers working in the fields of tropical medicine, hygiene and global health. The Annual Meeting is a five-day educational conference that includes four pre-meeting courses and draws approximately 4,400 attendees.

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Top DHA R&D Official Visits NHRC (feature)

From Naval Health Research Center Public Affairs

SAN DIEGO – The Defense Health Agency's (DHA) acting director for Research and Development, Sean Biggerstaff, recieved an in-depth look at the work being done at the Naval Health Research Center (NHRC) to support warfighter health and readiness, Oct. 25.

During his visit to NHRC, Biggerstaff met with command leadership and scientists to learn more about the specific studies and projects being conducted in each of NHRC's core research areas—Operational Readiness and Health, Military Population Health, and Operational Infectious Diseases.

"NHRC has a unique set of research capabilities and a diverse group of scientists, enabling us to provide bench to battlefield solutions to the health and readiness challenges our warfighters face," said Capt. Marshall Monteville, commanding officer, NHRC.

Biggerstaff is responsible for prioritizing and integrating DHA medical research, development, and acquisition programs across the Military Health System; fostering strategic partnerships, and transitioning medical discoveries to deployable products to enhance the readiness of the military community.

"NHRC's motto is 'readiness through research,'" said Monteville. "We use science to improve the health, resilience, and survivability of U.S. warfighters, all of which align with DHA's priorities for research and development."

Research expertise at NHRC includes:

- Human performance optimization and rehabilitation
- Behavioral health interventions
- Medical planning
- Longitudinal epidemiological research
- Medical informatics and data analytics
- Infectious diseases surveillance and outbreak response

"Having all of these capabilities in one location increases the depth and breadth of research possibilities that can deliver the bench to battlefield solutions our warfighters need to maintain their operational readiness," said Monteville.

In addition to NHRC's expertise, the center is the Department of Defense's only medical research center on the West Coast and is located just a short distance from a major military medical center, a naval hospital, several Marine Corps bases,

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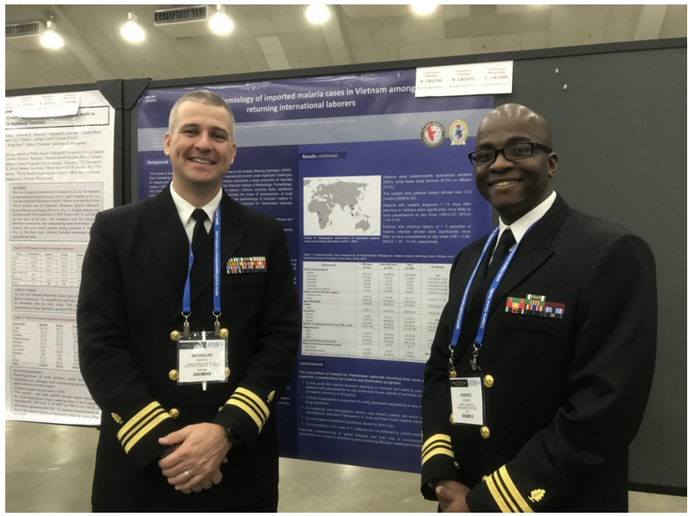
Identifying the Movement of Malaria Parasites one Region to Another

From Naval Medical Research Center Public Affairs



BALTIMORE – Researchers from the U.S. Naval Medical Research Center - Asia (NMRC-A) shared findings on the epidemiology of imported malaria cases in Vietnam among returning nationals, at the American Society of Tropical Medicine and Hygiene Annual Meeting, November 7.

"The burden of malaria in Vietnam has been significantly reduced in recent years, but the challenges to malaria elimination remain, including drug-resistance and the importation of malaria from outside of Vietnam," said Lt. Cmdr. Nicholas Martin, NMRC-A.

According to Martin, drug-resistant malaria, currently confined to Southeast Asia, poses a threat to global health and can be a driver of instability in the region. This research project aims to characterize malaria in Vietnamese patients returning from Africa and determine if they are infected by malaria resistant to current frontline treatments.

"Resistance to anti-malarial drugs threatens to shrink the arsenal of treatments available to the Department of Defense (DoD)," said Martin. "Malaria, invisible to rapid diagnostic tests, presents a direct threat to the Warfighter and to the many tools used by the DoD to detect malaria."

Martin, along with others at NMRC-A, conducted a review study of records gathered at Vietnamese hospitals and identified malaria cases in laborers recently returned to Vietnam from overseas work. During the study's timeframe, a total of 247 malaria patients returned from abroad.

According to the study results, the majority of individuals who returned were males with a median age of around 34 years-old who had stayed abroad for an average of over a year. Seventy-eight percent of the 247 individuals presented with Plasmodium Falciparum malaria – 83 percent of these individuals had recently returned from Angola.

"The importation of malaria by Vietnamese nationals returning from work warrants research to understand the epidemiology of these cases and their impact on elimination efforts," said Martin. "Improved understanding of global linkages and their role in re-introducing or sustaining ongoing transmission is crucial for developing and sustaining effective malaria elimination strategies."

The ASTMH Annual Meeting draws tropical medicine and global health professionals representing academia, government, non-profits, philanthropy, NGOs, industry, military and private practice...(cont.)

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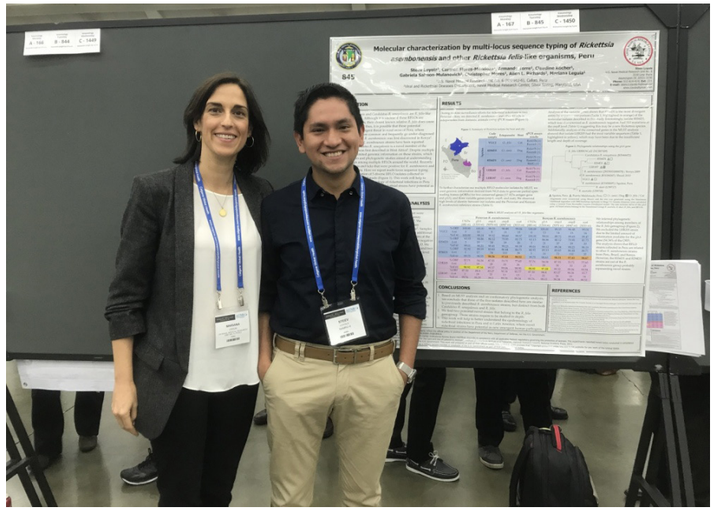
The Phylogeography and Phylodynamics of of Dengue Virus-2

From Naval Medical Research Center Public Affairs



BALTIMORE – Researchers from the U.S. Naval Medical Research Center No. 6 (NAMRU-6) in Lima, Peru, shared findings on the patterns of dispersal of a recent epidemic strain of dengue virus, specifically the American-Asian genotype of dengue virus type 2 (DENV-2), at the American Society of Tropical Medicine and Hygiene (ASTMH) Annual Meeting, November 7.

This study marks the development of a state-of- the-art next generation sequencing laboratory in Peru which can be used to enhance the surveillance and response to future dengue epidemics and other emerging viruses of public health importance.

NAMRU-6 researchers were able to reconstruct the geographic routes of dengue virus spread within Peru and between Peru and neighboring countries by performing nucleic acid sequencing of around 500 dengue virus strains isolated from human infections occurring throughout Peru and nearby countries.

"Through advanced evolutionary analysis and computational modeling we identified that DENV-2 was likely introduced through three distinct routes, one from the north of Peru and two from the east of Peru," said Dr. Mariana Leguia, principal investigator.

Leguia and a team of researchers also discovered within Peru, the spread of this epidemic strain was most common between neighboring provinces. According to Leguia, NAMRU-6's research indicated this epidemic strain seems to persist between years in Iquitos, a remote urban city in the Amazon basin that may act as a hub of viral traffic from one location to others in the Amazon region.

"Dengue virus causes a substantial amount of morbidity in local populations in Peru and other tropical areas," said Leguia. "It truly is a major threat to travelers and the deployed warfighter, which is why we are working so hard to understand the phylogeography and phylodynamics of dengue."

The ASTMH Annual Meeting draws tropical medicine and global health professionals representing academia, government, non-profits, philanthropy, NGOs, industry, military and private practice. The meeting is designed for researchers, professors, government and public health officials, military personnel, travel clinic physicians, practicing physicians in tropical medicine, students and all health care providers working in the fields of tropical medicine, hygiene and global health. The Annual Meeting is a five-day educational conference that includes four pre-meeting courses and draws approximately 4,400 attendees....(cont.)

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Identifying a Novel highly Protective Plasmodium Malaria Antigen

From Naval Medical Research Center Public Affairs

BALTIMORE – Researchers from the Naval Medical Research Center (NMRC) presented findings on the identification of a novel highly protective malaria antigen, *Plasmodium yoelii* E140 at the American Society of Tropical Medicine and Hygiene Annual Meeting (ASTMH), November 8. An antigen induces an immune response in the body and the production of antibodies.

The development of a safe, effective malaria vaccine depends on inducing an immune response capable of preventing infection, disease, and transmission. While current studies show the leading malaria vaccine candidates can protect humans from malaria, they may not achieve the long-term efficacy and cross-strain protection necessary to protect warfighters deployed to endemic areas. When an infected mosquito bites a person the infective stages of the malaria parasite, called sporozoites, are injected into the person's bloodstream, initiating the first part of the complex life-cycle in the human host.

"E140 is found in multiple stages of the life-cycle of the malaria parasite, including sporozoites, liver stages, and blood stages," said Dr. Eileen Villasante, Head, Malaria Department.

Researchers discovered that E140 induced up to 100 percent sterile protection, persisting for at least three months. They are now developing a vaccine containing the E140 antigen that will hopefully protect warfighters from malaria.

Malaria has had a significant impact on U.S. military operations throughout history. It was responsible for a greater loss of manpower than enemy fire in all conflicts occurring in tropical regions during the 20th century.

Malaria continues to present a major challenge to force health protection during operations in any environment where malaria is endemic. This includes countries spanning the tropical and subtropical regions of the world, including most of sub-Saharan Africa and larger regions of South Asia, Southeast Asia, Oceania, central Asia, the Middle East, Central and South America and the Caribbean.

"In 2015, nearly half of the countries in the world had ongoing malaria transmission. Malaria can severely impact missions and is a major challenge to warfighter health and readiness. This antigen has the potential to provide long-term protection," said Villasante....(cont.)

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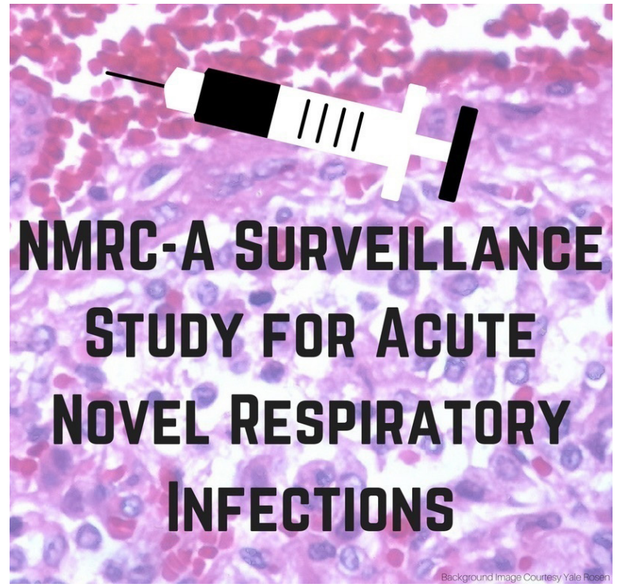
NMRC-A Surveillance Study for Acute Novel Respiratory Infections

From Naval Medical Research Center Public Affairs



BALTIMORE – Researchers from the U.S. Naval Medical Research Center - Asia (NMRC-A) presented findings on a study identifying novel respiratory viruses causing morbidity in people or domestic animals with the potential to spread to people. The findings were presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, November 8.

"We ultimately seek to detect and characterize viruses before they fully cross over to humans with the potential of causing an epidemic," said Cmdr. Tyler Warkentien, principal investigator.

Warkentien, along with others at NMRC-A, developed a multi-phase surveillance program at four hospitals in Vietnam focusing on severe acute respiratory infections (SARI) caused by viruses prone to causing epidemics.

"The aim of the first phase is to develop a sustainable sentinel surveillance system that strengthens the ability to detect emerging infections," said Warkentien.

NMRC-A researchers in collaboration with Duke National University Singapore (Duke – NUS), trained local staff in the molecular techniques using algorithms developed for evidence in nasopharyngeal samples of human adenovirus, influenza viruses, enteroviruses and coronavirus infections.

According to Warkentien, "when an algorithm indicates a patient may be suffering from a recognized human virus, a specimen will be shared for further culture and sequence-based study. Additionally, samples of the specimens that screen negative for known pathogens will also be screened for veterinary viruses."

Specimens collected will be isolated, sequenced and studied by collaborators in Singapore in an effort to detect emerging strains of viruses prone to transmission from a zoonotic origin.

In addition to collaboration with Duke – NUS, this project is being carried out in collaboration with the Vietnam National Institute of Health and Epidemiology, and the Vietnam Military Institute of Preventative Medicine.

"This effort will hopefully lead to an improved capability of Vietnam's military and civilian health laboratories to detect both common and novel respiratory viruses. The design of this project could potentially allow for broader coordination with military, government and academia partners in the region to prevent, detect and respond to an emerging respiratory virus epidemic," said Warkentien.

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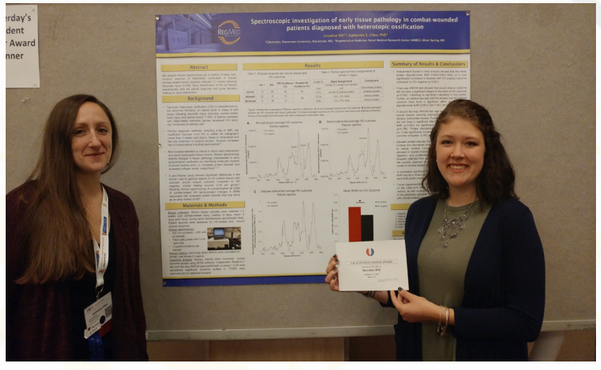
NMRC NREIP Intern awarded award and travel grant at SciX 2017

From Naval Medical Research Center Public Affairs



SILVER SPRING, Md. – Former Naval Medical Research Center (NMRC), Naval Research Enterprise Internship Program (NREIP) intern, Krystine Hill, was awarded a Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) student poster award and received a Society of Applied Spectroscopy (SAS) undergraduate student travel grant for work presented at SciX 2017 (the Great Scientific Exchange), the FACSS annual meeting, October 10.

Hill, a senior chemistry major at Stevenson University, presented findings from her internship research conducted at NMRC under her mentor Dr. Katherine Cilwa in the Operational Undersea Medicine Directorate, Department of Regenerative Medicine.

Her research project, Spectroscopic Investigation of Early Tissue Pathology in Combat-Wounded Patients Diagnosed with Heterotopic Ossification, focused on the use of Raman spectroscopy as a method of early, non-invasive detection of heterotopic ossification in human combat-related wound biopsies collected shortly after traumatic injury. Heterotopic ossification is the abnormal formation of bone in soft tissue often in response to traumatic injury.

"Early identification of heterotopic ossification via Raman spectroscopy may aid clinical diagnosis and guide decision making for early intervention," said Cilwa....(cont.)

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NHRC Talks Readiness, Resilience with 21st Century Sailor Director

From Naval Health Research Center Public Affairs

SAN DIEGO (NNS) -- Rear Adm. Karl Thomas, director, 21st Century Sailor Office, met with researchers at the Naval Health Research Center (NHRC), September 20, to learn more about how science can help Sailors overcome adversity and thrive.

"The research we conduct at NHRC aligns nicely with the goals of the 21st Century Sailor Office, which is to maximize total force fitness by promoting resiliency," said Capt. Marshall Monteville, NHRC's commanding officer. "At NHRC, our research aims to promote the physical and mental readiness, health and resiliency of warfighters."

From the work being done by NHRC's Health and Behavioral Sciences Department to develop programs that promote healthy behaviors, to the sleep studies being conducted by scientists in the Warfighter Performance Department, optimizing readiness and warfighter health is NHRC's mission, said Monteville....(cont.)

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NSMRL Research Psychologist Attends Attends the Army MSC Junior Officer Week

From Naval Submarine Medical Research Laboratory Public Affairs

Washington, DC – Lt. Christopher Rodeheffer, Research Psychologist, Naval Submarine Medical Research Laboratory (NSMRL), Groton, Connecticut, was selected as one of two Navy Medical Service Corps (MSC) representatives to attend the Army MSC Junior Officer Week (JOW) in Washington, D.C. September 22-27.

This program provides personal recognition to outstanding junior MSC officers who have made significant contributions to the U.S. Army Medical Department (AMEDD) mission and have performed in an exceptionally outstanding manner. Rodeheffer was one of eleven attendees from the Army, Navy, Air Force and other public health services.

"Having the opportunity to be a part of this was a fantastic professional development experience," said Rodeheffer. "It was such an honor to be selected and I am grateful to the command for supporting my attendance. I learned a lot about how our sister services operate, which will serve me well as I transition to a joint command."

Since 1982, the Chief, Army Medical Service Corps has invited a select group of deserving junior officers to participate in JOW activities. The purpose of JOW activities is to recognize outstanding junior officers and to provide the opportunity to meet and discuss issues with senior leaders of the Army Medical Service Corps, the Army Medical Department, and across the Department of Defense. Additionally, briefings by several key organizations are provided, including the Office of the Army Surgeon General, Army Human Resources Command, and Military Health System Joint partners.

Attendees spent two days discussing the future of the Army MSC with strategic leaders and toured historic monuments in the D.C. Capital region, including the White House, the Capitol building, the Pentagon, and other monuments located on the National Mall. In addition to sightseeing, Rodeheffer was one of four officers who had the honor of laying a wreath at the Tomb of The Unknown Soldier at Arlington National Cemetery.

NSMRL provides research solutions to the most medically challenging platform in the Navy – the U.S. submarine. NSMRL serves the submarine fleet by taking the lead in undersea human factors, sensory sciences, and operational medicine, delivering timely evidenced-based healthcare solutions.

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Naval Attachés Learn About NHRC's Relentless Pursuit of Readiness

From Naval Health Research Center Public Affairs

SAN DIEGO – Staff from the Naval Health Research Center (NHRC) hosted 14 visiting foreign military officers and their five U.S. escorts, Oct. 23.

The tour was sponsored by the U.S. Navy Foreign Liaison Office, part of the Chief of Naval Operations office at the Pentagon. The goal of the program is to expose foreign officers to the U.S. Navy's diversity, facilities, capabilities, personnel, and culture.

"Our office is the touchpoint for all foreign naval attachés to the U.S.," said Capt. James Biggs, director of the Navy Foreign Liaison Office and one of the escorts. "Tours like this help build more positive relationships with these countries. We want them to understand how a country and military of our size does business. This helps them better understand areas for improvement and shows them areas where we can work together in the future."

During the tour, the naval attachés visited NHRC's infectious diseases and warfighter performance laboratories where researchers provided an overview of how science improves the health and readiness of U.S. warfighters....(cont.)

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NHRC Celebrates 242nd Marine Corps Birthday

From Naval Health Research Center Public Affairs

SAN DIEGO - The Naval Health Research Center (NHRC) celebrated the U.S. Marine Corps' 242nd birthday with the traditional cake-cutting ceremony and reading of the Commandant of the Marine Corps' birthday message, Nov. 8.

"As a Navy Medicine command, many of our staff have served with the Marine Corps and have the utmost respect for their history, heritage, and service," said Capt. Matthew Hebert, NHRC's executive officer and guest speaker at the event. "Even though we don't have active duty Marines at NHRC, many of our research and support staff are veterans who either served as Marines or Fleet Marine Force hospital corpsmen. There's a strong sense of connection with our Marine brothers and sisters, and it's only fitting to recognize their birthday."...(cont.)

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R&D Chronicles: The Story of Dr. Rivers and the Origin of NAMRU-2, Part III of III

By André B. Sobocinski, Historian, BUMED

"I want to emphasize here that the Navy took quite a gamble in organizing such a unit. First, no one in the Navy had ever had any previous experience in organizing and running a medical research unit close to the fighting lines; second, no one had the slightest idea whether doctors and scientists could actually do scientific research under military conditions; and third, even if they could do such research, no one knew whether the results they would achieve warranted the existence of such a unit in a military force."

~Rear Adm. Thomas Milton Rivers, Medical Corps, USNR on the formation of NAMRU-2 (From an oral history with Saul Beniston, published posthumously in 1967)

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From January 1945—when Thomas Rivers first arrived on Guam—to the end of the war, U.S. Naval Medical Research Unit No. 2 (NAMRU-2) would be anything but underutilized.

Throughout the year, NAMRU-2 field teams deployed to Bougainville, Fiji, Guadalcanal, Kwajalein, Leyte, New Caledonia, Peleliu, Samar, Iwo Jima, and Okinawa, and after the war ventured into mainland Japan and China.

In the Philippines, teams targeted the schistosomiasis threat, surveying native snail species, and experimented with new efforts (i.e., application of copper salts) to control disease-carrying snail populations.

On April 1, 1945, a NAMRU-2 field medical team lead by Cmdr. Richard Shope sailed with the invasion forces to Okinawa. The team established mobile laboratories behind fighting lines, searched for schistosomiasis and scrub typhus vectors, and helped minimize malaria and dengue threats. In July, members of the team travelled to the other Ryukyu Islands to investigate a Japanese B encephalitis outbreak localized among natives.

Beginning May 11, 1945, NAMRU-2 personnel would take part in interrogations of six Japanese Army medical officers captured on Guam. Aside from obtaining vital medical intelligence to support Allied efforts, NAMRU-2 discovered that amebiasis (amebic dysentery) and tuberculosis had been the greatest disease threats to the Japanese warfighter.

At times, NAMRU-2 was even called upon for missions impacting the morale of deployed servicemen. On Ulithi, the unit was asked to investigate why the beer on the island was "undrinkable." Lt. Cmdr. Kendall Emerson, of the unit's chemistry department, discovered it rested with the "imperfections in the lining of the cans caused by exposure to heat." ... (cont.)

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NMRC Researcher Ties for First at the Armed Forces Open Chess Championship

From Naval Medical Research Center Public Affairs

SILVER SPRING, Md. – A Naval Medical Research Center (NMRC) scientist tied for first at the Armed Forces Open (AFO) chess championship held at West Point Military Academy, New York, October 7-9 with a score of 4.5/5. Lt. Chaselynn Watters, Microbiologist, Wound Infections Department (WID), was one of 44 active duty, reservists, and retired military representatives from across the Navy, Marines, Army, and Air Force.

After five rounds and three days of play, Watters tied with a retired Air Force Master Sergeant before coming up one tie-break point short of winning. No rookie to chess, Watters is a United States Chess Federation rated National chess master, and has competed in military chess championships around the world, including the North Atlantic Treaty Organization Chess Championship in Hungary earlier this year.

"The AFO is a delightful experience," said Watters. "You get to meet wizened veterans from all services, including those who served in Vietnam and the Korean War, to active duty line and staff corps officers, and enlisted personnel traveling as far as Qatar and Germany to participate."

While he spends his off time figuring out how to win a complicated chess game against a seasoned opponent, Watters primary focus is developing biomedical research solutions for the warfighter.

Watters began conducting military research in 2013 as an Oak Ridge Institute for Science and Education postdoctoral research fellow at the Naval Medical Research Unit - San Antonio. He later joined the Navy in 2015, and now continues to bring his insight, experience and research skills to NMRC.

"My primary research projects focus on trying to harness the therapeutic potential of commensal bacteria and viruses to eradicate antibiotic resistant bacteria that are problematic for wound infections," explained Watters.

The primary mission of WID is to develop and evaluate novel and alternative treatment and prevention strategies for multidrug-resistant wound infections, which have increasingly afflicted U.S. military members injured in combat.

"From the bright-eyed midshipman to the cadets from the U.S. Naval Academy and West Point respectively, it was really great meeting old and new faces alike, and I played some decent chess, which is always a plus," said Watters...(cont.)

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NAMRU-SA Celebrates the Navy's 242nd Birthday at the Texas Regional Navy Ball

From Naval Medical Research Unit - San Antonio Public Affairs

SAN ANTONIO – Naval Medical Research Unit - San Antonio (NAMRU-SA) joined Navy commands across Southern Texas to celebrate the 242nd birthday of the United States Navy in downtown San Antonio, Texas, Oct 20.

This 2017 Navy birthday theme, "Seapower to Protect and Promote," honors the brave men and women who conduct combat, training, humanitarian, rescue and other missions worldwide, protecting our interests, promoting our security and helping to shape our nation's history.

"It is an honor to celebrate our Navy's growth and its legacy of proud history and impact across the globe," said Capt. Thomas Herzig, commanding officer, NAMRU-SA. "The ceremony reminds us of where we came from and honors the passing on of that proud heritage."

More than a dozen sea service commands in the San Antonio area gather annually to celebrate the Navy birthday. This year, Navy Medicine Education, Training and Logistics Command (NMETLC) coordinated and hosted the annual event, which has grown exponentially in recent years....(cont.)

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Navy Medicine R&D Enterprise Command

Capt. Adam Armstrong
Commanding Officer
Medical Corps, USN

Capt. William Deniston
Executive Officer
Medical Service Corps, USN

NMR&D News is a publication of the Naval Medical Research Center, 503 Robert Grant Avenue, Silver Spring, Maryland, 20910. NMR&D E-News is published by the NMRC Public Affairs Office 301-319-9378.

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