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NAMRU-6 Counters the Threat Against Bacteria and Resistant Organisms

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By Lt. Cmdr. Drake Tilley, head, Department of Bacteriology, U.S. Naval Medical Research Unit 6 -Peru

***Editor's note: This is blog number two of six from NAMRU-6 on their vast research efforts.*

Gladys Nuñez, microbiologist for NAMRU-6, performing an Immunoblot Assay looking for the prese ETEC challenge strain as a cause of diarrhea during a pre-clinical trial using novel adhesion-based ETEC vaccines. (Courtesy photo)

Infectious bacteria have been causing problems for military campaigns since time immemorial. At the forefront has always been diarrhea, and with every deployment or armed conflict, diarrhea has taken its toll on unit readiness and the ability to operate at ones best. To counter this burden, the overseas medical research labs have been investigating and developing strategies to mitigate the detrimental effects of bacterial diarrhea over the last 30

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years. Due to this effort, surveillance networks have been set up to help determine the most common causes of diarrhea within our troops and which bacteria are responsible for the most severe illness worldwide.

At NAMRU-6, we focused on diarrhea occurring within travelers to Peru, deployed troops as part of operations New Horizons and Beyond the Horizons, and within the local populations to get a pulse on which bacteria are causing diarrhea within South America and to determine if these bacteria are developing resistant to the antibiotics commonly used to treat these cases. This has become vital information in the development of countermeasures to keep our people healthy and to focus Department of Defense vaccine development efforts.

As part of our mission, we have been integrally involved in the pre-clinical trials of novel vaccines against some of the most common bacterial cause of travelers' diarrhea. Vaccines against Campylobacter, enterotoxigenic Escherichia coli (ETEC), and Shigella are currently under development with the assistance of the Military Infectious Disease Research Program (MIDRP) and have the potential to provide needed protection against the morbidity associated with these common causes of diarrhea while deployed.

Methicillin resistant Staphylococcus aureus isolated from a surgical wound in Iquitos, Peru within th
as shown on blood agar (Left) and by Kirby-Bauer antibiotic testing by disk diffusion method (R

Another potential morbidity for deployed service members are wound infections. Wounds and hospital acquired infections have become more difficult to treat in recent years due to multi-drug resistant bacteria which are harder to kill with standard antibiotics. As shown with recent conflicts in South-West Asia, these bacteria have complicated hospital courses for our wounded service members and have proven to be a global health threat. Given this threat, NAMRU-6 is spearheading surveillance in South America for the presence of resistant organisms with the potential to cause severe hospital or wound infections. In concert with multiple military and civilian hospitals within the city of Lima, Peru and within the Amazon town of Iquitos, isolates known to cause hospital acquired infection and those associated with wound infections are collected and analyzed for the emergence of resistance and for virulence factors which make them more deadly. Through our efforts, we are beginning to fully grasp the scope of the problem and to develop strategies to counter this global health threat.

Although the Bacteriology Department at NAMRU-6 is only one department in one overseas lab, it is part of a bigger system whose strength is in its connectivity to the region and its ability to form channels of communication between institution and researchers with a common goal. Through this teamwork, progress toward mitigating and or eliminating infectious disease threats will remain progressive.

Graduating class of the first 5 week laboratory training course held at NAMRU-6, Universidad Nacional Mayor de San Marcos San Marco, and Universidad Peruana Cayetano Heredia as part of the PROMELA program this last October 2012. With the support of the CDC and DHAPP, this laboratory improvement program is now helping over 14 regional laboratories within 8 counties throughout Latin America to include 11 partner military laboratories.

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To read blog number one in the series from NAMRU-6 click here.

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