

A LOOK INSIDE: NAVY MEDICINE'S PERUVIAN RESEARCH LAB, U.S. NAVAL MEDICAL RESEARCH UNIT NO. 6 [PHOTOS]

U.S. Naval Medical Research Unit No. 6 (NAMRU-6) is the U.S. Navy's first stand-alone research facility in South America, and is one of six overseas research laboratories operated by the U.S. Department of Defense (DoD).

NAMRU-6 was initially established in Lima, Peru in 1983, as the Naval Medical Research Institute Detachment (NAMRID) to investigate infectious diseases. Today, NAMRU-6 research activates focus on applied research to evaluate and test new vaccines, prevention strategies, treatment modalities, diagnostics, and novel insect control measures. Additional efforts have concentrated on disease detection, epidemiologic descriptions, and assistance to regional partners in developing surveillance systems, with a strong focus on viral pathogens, especially influenza, dengue, chikungunya, and Zika virus. NAMRU-6 conducts research through the coordination of six different departments; bacteriology; entomology, parasitology, virology and emerging infections, as well biomedical informatics.



U.S. Naval Medical Research Unit No. 6

“NAMRU-6 has a broad range of research endeavors, from the evaluation of better and faster diagnostic technology, to the continuous monitoring of emerging and re-emerging infectious diseases, and the evaluation of preventive measures such as novel vaccines and vector control methods. The research that is conducted here is instrumental in global health and the readiness of our fighting force.”

Captain Guillermo Pimentel, Commanding Officer, U.S. Naval Medical Research Unit No. 6

Department of Bacteriology

The Bacteriology Department focuses on the development, testing and evaluation of vaccine products against enteric pathogens affecting our deployed troops worldwide. Researchers conduct regional

antimicrobial resistance surveillance relevant to determine best antibiotic treatment regime. Other research efforts include:

- Determining the distribution, resistance patterns and molecular mechanisms of multidrug resistant bacterial pathogens within the U.S. Southern Command area of responsibility.
- Conducting field studies to determine the etiologies and impact of diarrhea on military and traveler populations, and support preclinical and clinical vaccine testing and development
- Support the development and testing of novel therapeutics against resistant bacteria, including bacteriophage product development efforts.



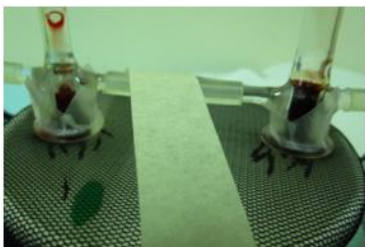
Microbiologist for NAMRU-6, performing an Immunoblot Assay looking for the presence of the Enterotoxigenic Escherichia coli (EPEC) challenge strain as a cause of diarrhea during a pre-clinical trial using novel adhesion-based EPEC vaccines. (Courtesy photo)



Microbiologist for NAMRU-6, performing an Immunoblot Assay looking for the presence of the Enterotoxigenic Escherichia coli (ETEC) challenge strain as a cause of diarrhea during a pre-clinical trial using novel adhesion-based ETEC vaccines. (Courtesy photo)

Department of Entomology

- The Entomology Department conducts field and lab studies to test technologies that protect the warfighter in deployed settings by understanding the biology, taxonomy and population dynamics of vectors. NAMRU-6 is home to the first overseas DoD mosquito insectary and maintains a colony of *Anopheles darlingii* mosquitos, a common malaria vector, allowing the production of millions of sporozoites for research use. Other research efforts include:
- Testing the efficacy of Functional Micro Dispensers, a device small enough to fit in the palm of a hand that uses reactions to release an organic compound through pores to create a temporary barrier to prevent insect bites.
- The development of informational products, including surveillance systems, insecticides and training materials.



Anopheles membrane feeding



Lab technician aid, feeds mosquitos blood



Model residential huts constructed in Iquitos, Peru for testing novel combinations of mosquito attractants and repellents (Courtesy photos)

Department of Parasitology

The Parasitology Department focuses on the development, testing and evaluation of vaccine products against *P. falciparum* and *P. vivax* malaria. Researchers conduct field studies for faster detection and treatment of cutaneous leishmaniasis. Other research efforts include:

- The development, testing and evaluation of vaccine products against the most commonly encountered parasite pathogens worldwide and in South America.
- The use of genomics as a novel method for identifying *P. vivax* relapses that has the potential to improve the ability of tracking *P. vivax* transmission and monitoring the efficacy of anti-relapse medication.
- In collaboration with Naval Medical Research Center in Silver Spring, Maryland. NAMRU-6 has identified 20 potential vaccines that will be tested.

Department of Virology and Emerging Infections

The Virology and Emerging Infections Department conducts research on acute febrile and respiratory illness surveillance throughout USSOUTHCOM and maintains cohort field studies in the Amazons, providing knowledge on the epidemiology and ecology of viral infectious diseases. Research units in the Department of Virology and Emerging Infections include:

- **The Vector-borne and Zoonotic Disease Unit:** Researchers in this unit study diseases that spread from animals to humans, such as the bird flu.
- **The Genomics and Pathogen Discovery Unit:** Researchers study and map an organisms complete set of DNA.



Lt. Kimberly Edgel, left, and Christian Baldeviano examine a positive malaria blood smear at U.S. Naval Medical Research Unit (NAMRU) 6. NAMRU-6 is studying the interplay between malaria and the human immune system to identify new malaria vaccine targets. (U.S. Navy photo/Released)

The Diagnostic Unit: Researchers provide laboratory results for the Virology and Emerging Infections Department.

- **The Respiratory and Enteric Disease Unit:** Researchers in this unit have the capacity to analyze samples using a variety of diagnostic tests.
- Researchers in the Department of Virology and Emerging Infections study emerging pathogens, which is any disease producing agent such as a virus or bacterium, and focus on the discovery of emerging pathogens by using next generation sequencing platforms.
- Researchers regularly conduct influenza studies to assess attitudes toward vaccination and have over 3,000 individuals enrolled.
- NAMRU-6 researchers have been spent 25 years studying infectious diseases and have identified nine viruses and captured all four strains of Dengue fever in the Amazon region of Peru. Researchers plan to expand surveillance sites in more remote regions throughout Peru and South America in preparation for future vaccine studies.
- NAMRU-6 research on influenza is essential in providing input into future flu strain prediction and predicting flu trends in Latin America.

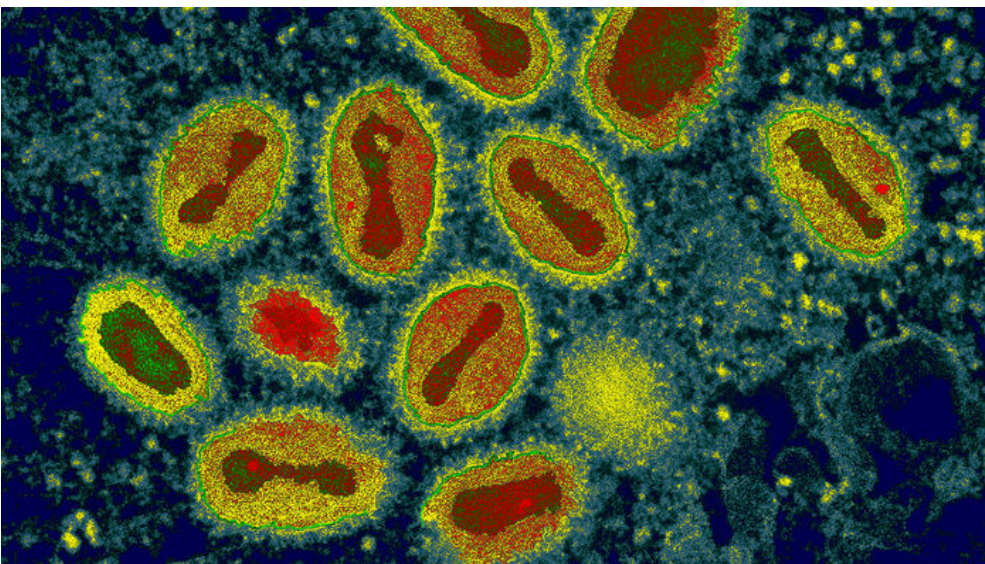


NAMRU-6 conducting surveillance for hosts and vectors of infectious diseases' from areas presenting the greatest risk of human exposure. (Courtesy photos)

Biomedical Informatics Department

- Efforts relate to the development, testing, monitoring, adoption, and evaluation of hardware and software solutions for the prevention of health threats of military relevance

The mission of NAMRU-6 is to conduct biomedical research in the field of infectious diseases and global health that is responsive to U.S. Navy requirements and delivers life saving products including knowledge, technology, and medical material that sustain the effectiveness of uniformed service members, through respectful cooperation with collaborators.



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