



# NAVY MEDICINE

WORLD-CLASS CARE...ANYTIME, ANYWHERE

## Naval Medical Research Center

The NMRC laboratory focuses on solutions to operational medical problems such as battlefield neurotrauma and wound infections, decompression sickness, naturally occurring infectious diseases, and biological threat agents; and is home to the DoD bone marrow registry.

The NMRC laboratory is co-located in the Daniel K. Inouye Building with the Walter Reed Army Institute of Research at the U.S. Army Forest Glen Annex, Silver Spring, Maryland. NMRC also operates a Biological Defense Research Directorate at the U.S. Army Ft. Detrick Garrison in Frederick, Maryland.



### MISSION

To conduct health and medical research, development, testing, evaluation, and surveillance to enhance deployment readiness of DoD personnel worldwide. NMRC is a premier research organization with the vision of World-class, operationally relevant health and medical research solutions.

### VISION

Provide world-class, operationally relevant health and medical research solutions—anytime, anywhere.



**Join The Conversation:**



### Commanding Officer:

CAPT Adam W. Armstrong  
Medical Corps  
United States Navy



### Executive Officer:

CAPT William M. Deniston  
Medical Service Corps  
United States Navy





# Naval Medical Research Center

## Research Directorates

### **Infectious Disease:**

The geographical distribution of a disease; the rapid emergence of drug resistance; the lack of a vaccine, treatment, or other control measures; the mode of transmission; and the medical impact on operations determine the military importance of infectious diseases. Research focuses on minimizing the impact of infectious diseases by preventing infection or clinical diseases. Researchers focus on malaria, enteric diseases, viral and rickettsial diseases and combat related wound infections. For most infectious diseases, the best approach is a vaccine. Researchers can develop a vaccine from the conceptual stage through “test tube” evaluation, laboratory model testing, human volunteer safety and immunogenicity trials to final large-scale volunteer field trials to prove efficacy as required for FDA licensure. Field testing is made easier by collaborating with Navy Medicine’s overseas laboratories where the target infectious diseases are highly endemic.

### **Operational and Undersea Medicine:**

Current studies focus on undersea medicine, neurotrauma and regenerative medicine. In undersea medicine researchers study interventions to improve performance and reduce injury in deployed naval forces engaged in undersea occupations. They are developing cutting edge technologies to identify, prevent and treat decompression sickness as well as pulmonary and central nervous system toxicity associated with exposure to hyperbaric and hypobaric oxygen. They are also assessing the physiologic effects of extreme environments on performance capabilities and work to find effective tools for mitigation. In the area of neurotrauma, researchers conduct studies on a variety of topics pertinent to the protection, resuscitation, and en route care of combat casualties with traumatic injuries to the nervous system either alone or in combination with other traumas such as hemorrhage. The primary focus is on injuries occurring in austere circumstances with anticipated delayed access to definitive care. The regenerative medicine team maintains active research efforts in translational and precision medicine. They conduct both pre-clinical and clinical studies in wound healing, tissue regeneration, and sepsis following complex trauma. By identifying key protein and gene expression patterns involved in wound healing and inflammation, they work to develop advanced diagnostics and treatment protocols to enhance overall outcomes for combat casualties.

### **Biological Defense Research:**

Since World War I U.S. military medical researchers have focused on how to defend against the threat of biological and chemical warfare. Today, NMRC is a leader in the detection and confirmatory analysis of infectious disease agents of public health importance especially select agents. Researchers are focusing on international field microbiology, genomics and bioinformatics, immunodiagnostics, molecular diagnostics, and clinical research. For example researchers perform high-throughput genomic sequencing, develop faster and more accurate bioinformatics tools to facilitate genomic research in laboratory or field conditions, and have a particular focus on phage genomics and phage-based medical countermeasures. In 1991, NMRC developed the first portable laboratory capable of conducting molecular detection. This unique laboratory allows military personnel in the field to quickly conduct confirmatory assays to determine whether biological agents are present. It was deployed in Desert Storm/Desert Shield, and similar capabilities were deployed in Operation Iraqi Freedom. It was a major asset during the anthrax attack in 2001 and the Ebola crisis in Africa. The portable lab weighs approximately 1,000 pounds, requires three people to operate, and holds supplies sufficient to process samples with PCR and ELISA testing. It also includes protective gear for the personnel, a generator, a freezer, field lighting, and field uninterruptible power supply.

### **C.W. Bill Young Bone Marrow Marrow Donor Recruitment and Research Program:**

For over 40 years, NMRC has played a key role in expanding the knowledge of the hematopoietic and immune systems and genetic matching for treatment and prevention of disease. The program’s mission is to develop treatment methods for marrow damaged by radiation and chemical weapons. Casualties with marrow toxic injury can recover normal function because a small number of remaining cells can restore function with medical support. More severely damaged marrow can be replaced by transplantation of hematopoietic cells from a normal, genetically matched donor. In 1990 DoD initiated the C.W. Bill Young Marrow Donor Recruitment and Registry program at NMRC to connect with the national bone marrow program. The ability to find matched donors requires huge numbers of volunteers. This national system has been built to develop in parallel the capability to respond to a national emergency from radiation, nuclear or chemical event. As of 2017, 19 million volunteers are listed in the national program, that includes 850,000 DoD volunteers. Over 84,000 transplants have been coordinated with over 7,000 donations from DoD volunteers, and more than 300 donations annually.