

## **A LOOK INSIDE: NAVY MEDICINE'S TEXAS RESEARCH LAB, NAVAL MEDICAL RESEARCH UNIT SAN ANTONIO [PHOTOS]**

In May 2009, the Navy consolidated several laboratory detachments into Naval Medical Research Unit San Antonio (NAMRU-SA), located on the San Antonio Military Medical Center campus, Joint Base San Antonio, Fort Sam Houston, Texas. Today, NAMRU-SA supports Navy Medicine's commitment to improving the survival and medical readiness of the warfighter with operationally related research and development for the treatment of traumatic injuries, as well as ensuring world-wide dental readiness.

The mission of NAMRU-SA is to conduct gap driven combat casualty care, craniofacial, and directed energy research to improve survival, operational readiness, and safety of Department of Defense (DoD) personnel engaged in routine and expeditionary operations. NAMRU-SA conducts investigations through two research directorates, the Combat Casualty Care and Operational Medicine (CCC&OM) and the Craniofacial Health and Restorative Medicine (CH&RM).

*"The research conducted at NAMRU-SA is diverse in its approach as well as in the methods used to achieve our objectives. Our goal is to deliver products that support the survivability of our wounded warriors, to enhance the performance of DoD personnel through improved operational readiness, and to optimize safety. The products we deliver fulfill identified gaps in our knowledge in the areas of combat casualty*

*care, craniofacial health, and directed energy. Importantly, many of our products can easily be transitioned for use by operational forces.”*

Capt. Thomas Herzig, Commanding Officer, Naval Medical Research Unit San Antonio

## **Combat Casualty Care and Operational Medicine Research Directorate**

CCC&OM utilizes an advanced laboratory model unique to NAMRU-SA that positions hemorrhage mitigation studies at the forefront of expeditionary trauma medicine research. CCC&OM researchers investigate therapies to control bleeding, stabilize casualties and improve survival. CCC&OM is comprised of four departments:

### **Expeditionary and Trauma Medicine**

- Focused on the protection, revival, and stabilization of combat casualties at frontline points of care in combat theater
- The Trauma Medicine group conducts pre-clinical research to develop drug products and advanced therapies for the treatment of shock
- The Expeditionary Medicine group works to identify and mitigate stressors and improve survivability through the evaluation of products and agents

### **Cellular and Immune Based Adjuncts for Casualty Care Department**

- Conducts research on stem cell and immune based therapeutics intended to improve warfighter outcomes and survival
- The Stem Cell Therapeutics group focuses on the comparison and assessment of stem cells, the assessment of trauma, and treatment of severe tissue defects
- The Immune Based Therapeutics group focuses on treatments to prevent and reduce tissue and organ damage from trauma and hemorrhagic shock



*Commander Jacob Glaser, US Navy trauma surgeon (left) heads Naval Medical Research Unit-San Antonio (NAMRU-SA)'s Expeditionary and Trauma Medicine Department. Glaser and his team evaluate interventions to safely and efficiently stem and control hemorrhage and provide subsequent resuscitation. (Photo courtesy of NAMRU-SA Public Affairs)*

### **Biomedical Systems Engineering and Evaluation Department**

- Applies engineering principles and design concepts to develop and evaluate medical devices, treatments, and diagnostic tools used in military medicine
- The Biomedical Systems team conducts studies utilizing advanced trauma mannequin systems
- Engineering conducts; design and prototype development, computational modeling, custom machining/fabrication, and software development/ automation

### **Directed Energy Bio Effects Department**

- Develops diagnostic and treatment tools to aid first responders/physicians in identification and treatment of distinct injury patterns caused by directed energy sources
- Uses data to establish guidelines to ensure the appropriate care and treatment for directed energy injuries is implemented



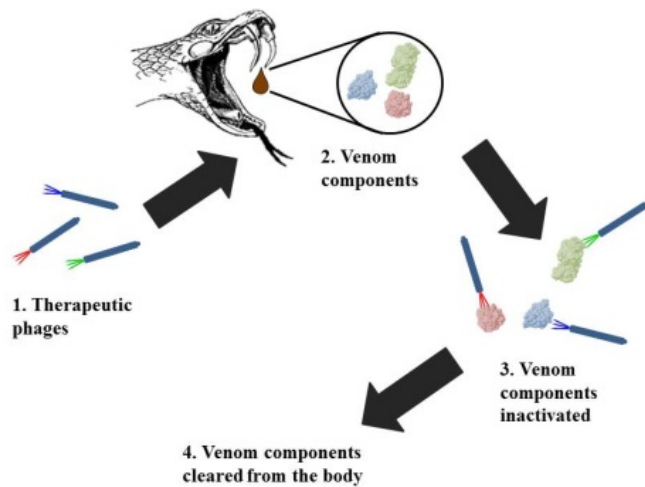
*Naval Medical Research Unit-San Antonio (NAMRU-SA)'s Dr. Nancy Millenbaugh and Dr. Dickson Kirui investigate how pulsed laser irradiation may maximize bacterial biofilm destruction. (Photo courtesy of NAMRU-SA Public Affairs)*

## **Craniofacial Health and Restorative Medicine Research Directorate**

Conducts integrated research in the areas of biomaterials, bio-statistical analysis, environmental surveillance, epidemiology, infection control, and face and jaw injury. CH&RM is comprised of three departments:

### **Maxillofacial Injury and Disease Department**

- Conducts research on dental diseases, leading to the development of technologies to increase the collection of therapeutic resources available to clinicians for the treatment of antibiotic resistant infections
- Researchers use laser-acoustic, nanoparticle and bacteriophage to fight multi-drug resistant pathogens
- Developing universal antivenom for treatment of snake bites and a first responder snake bite treatment



*Naval Medical Research Unit-San Antonio (NAMRU-SA) is investigating the therapeutic use of bacteriophages to treat snake bites. The goal is to develop a more stable, simple to transport, and quick to administer universal alternative to current antivenoms. (Graphic courtesy of NAMRU-SA Public Affairs)*

### **Biomaterials and Epidemiology Department**

- Conducts research, development, testing, and evaluation of biomaterials used in medicine and dentistry and studies the distribution of oral, dental, and craniofacial diseases affecting Sailors and Marines
- Analyze trends and identify risk factors to improve diagnosis, treatment, and prevention of the head and oral

### **Environmental Surveillance Department**

- Lead agent for mercury abatement in Navy Dental Treatment Facilities Responsible for the development and testing of systems and technologies that minimize the environmental impact and occupational hazards of Navy dentistry
- Tests and evaluates the effective lifetime of commercially available chairside mercury separators



*Naval Medical Research Unit-San Antonio (NAMRU-SA) is committed to inspire the next generation of scientists at career fairs in the greater San Antonio community. Lieutenant Commander Jeffrey Hoyle heads the Department of Maxillofacial Injury and Disease at NAMRU-SA. Hoyle and his team investigate the use of nanoparticles for environmental biomedical applications. (Photo by Susann Whitecotten.)*