



NAVAL MEDICAL RESEARCH UNIT SAN ANTONIO

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NAMRU-SA's mission is to conduct medical, craniofacial, and biomedical research, which focuses on ways to enhance the health, safety, performance, and operational readiness of Navy and Marine Corps personnel and addresses their emergent medical and oral/facial problems in routine and combat operations.

Research Directorates and Departments

Combat Casualty Care and Operational Medicine

Expeditionary and Trauma Medicine Department

The Expeditionary and Trauma Medicine Department conducts RDT&E focused on the protection, resuscitation, and stabilization of combat casualties at frontline points of care in the combat theater. The Trauma Medicine Group focuses on primary and pre-clinical RDT&E for the development and optimization of drug products and advanced therapies for the treatment of hemorrhagic shock. The Expeditionary Medicine Group works to identify and effectively mitigate stressors and improve survivability through the evaluation of products and agents that deliver capabilities to meet rapidly evolving expeditionary warfare requirements.

Immunodiagnostic and Bioassay Department

The Immunodiagnostic and Bioassay Development Department conducts RDT&E on therapeutic and diagnostic assays and devices intended to improve warfighter standards of care. Research efforts focus on the detection of microbial agents, as well as biomarkers associated with wound healing, wound regeneration, and hemorrhagic shock. Additional efforts focus on developing field-deployable biosensors for identifying infectious agents and biomolecules.

Veterinary Science Department and Vivarium

The Veterinary Science Department and Vivarium are located in the Tri-Services Research Laboratory (TSRL) with a 15 member team that provides a variety of services to support diverse research requirements. Laboratory veterinarian support is available to all investigators and it is all available under one roof. The TSRL facility includes 40 research laboratories, three state-of-the-art surgical suites, and seven procedure rooms. The veterinary science team works with researchers on protocols that include small to large laboratory models and provides basic veterinary medicine to critical care procedures.

Craniofacial Health and Restorative Medicine

Epidemiology and Biostatistics Department

The Epidemiology and Biostatistics Department studies the distribution of oral, dental, and craniofacial diseases and injuries occurring in Sailors and Marines. Research is directed toward the improvement of diagnosis, treatment, and prevention of oral/dental diseases and injuries that affect the health and readiness of Sailors and Marines while deployed or in garrison.

Maxillofacial Injury and Disease Department

The Maxillofacial Injury and Disease Department conducts research on the microbiology, immunology, etiology, diagnosis, and treatment of medical and dental diseases, especially infections and biofilms that are resistant to currently used antibiotics. Novel laser-acoustic methods and nanoparticle technologies are being studied to increase the armamentarium available to clinicians for the treatment of resistant infections.

Biomaterials and Environmental Surveillance Department

The Biomaterials and Environmental Surveillance Department conducts research, development, testing and evaluation of biomaterials used in medicine and dentistry. As the lead agent for mercury abatement in Navy Dental Treatment Facilities, the department is responsible for the development and testing of systems and technologies that minimize the environmental impact and occupational hazards of Navy Dentistry.



Combat Casualty Care and Operational Medicine

Expeditionary and Trauma Medicine

- Control of Severe Intra-Abdominal Hemorrhage with Infusible Platelet-Derived Hemostatic Agents
- Immunomodulation of Hemorrhagic Shock by Lymphocyte Sequestration as a Part of Initial Resuscitation in a Model of Non-Compressible, Severe Uncontrolled Hemorrhage and Acute Shock
- Optimized Animal Model Testing of Hemorrhage Control and Life Support Strategies
- Test and Evaluation of:
 - Field Tourniquets
 - Compression Bandages
 - Pelvic Binders
 - Small Medical Tool Sterilization Systems
 - Junctional Hemorrhage Control Devices
 - Patient Active Warming Systems (PAWS)
 - Rapid Blood Typing Kits
 - Resuscitation Fluids
 - Third Generation Hemostatic Dressings

Immunodiagnosics and Bioassay Development

- Evaluation of the Immune Response associated with Maxillofacial Bone Regeneration and Wound Healing
- Rapid Detection of Multi-Drug Resistant Microorganism by Surface Enhanced Raman Spectroscopy
- Evaluation of Innate Immune Biomarkers in Saliva for Diagnostic Potential

Veterinary Science Department and Vivarium

- Provides state-of-the art surgical and laboratory support for research investigations.
- 40 Multi-species Rooms – Laboratories: Behavior, Clinical, Pathology, Radiology, Tissue, Five Surgical Suites including Laparoscopic Equipment and Digital X-ray Machine

Unique Research Capabilities

- Advanced Hemorrhage Control and Resuscitation Models
- Multipurpose Test and Evaluation Devices
 - SynDaver™ Synthetic Humans (Male & Female)
 - HapMed Mannequin Instrumented Leg & Arm
- Prototype Ozone Sterilizer Device
- Immunodiagnosics and Bioassays Development
- Handheld Surface Enhanced Raman Spectroscopy Biosensor
- Directed Energy Research Facilities

Craniofacial Health and Restorative Medicine

Epidemiology and Biostatistics

- Surveillance of Craniofacial Injuries, Dental Disease Non-Battle Injuries, and Oral/Facial Diseases in Military Personnel

Biomaterials and Environmental Surveillance

- Antibacterial Effects of Dental Resin Composite Containing Visible Light Activated Doped Titanium Dioxide Nanoparticles
- Analyses of 3 inch DD2011 Chairside Amalgam Separators for Heavy Metal, Organometallic, and Organic Waste Capacity and Toxicity Assessments of Dental Wastewater Effluent
- Evaluation of a Novel Bioactive Chitosan-Fibrinogen Wound Healing Dressing
- Evaluation of Resin Modified Glass Ionomers

Maxillofacial Injury and Disease

- Evaluation of the Antimicrobial Effectiveness of Direct Incorporation of Antibiotics into Polymethyl Methacrylate during Implant Fabrication
- Laser Induced Optoacoustic Treatment of Bacterial Biofilm Infections
- Efficacy of Swept Source/Polarization Sensitive-Optical Coherence Tomography to Identify Enamel Crack Propagation and Predict Tooth Fracture
- Antimicrobial Implant Coating for Preventing Infections
- Development of a Nano-Material Based Systems to Deliver Time-Released Local Anesthetics and Antibiotics for the Treatment of Maxillofacial Injuries and Burns
- Development of Genetically Engineered Bacteriophage with Enhanced Biofilm-Degrading Capability for the Treatment of Periodontal Infections

Unique Research Capabilities

- Atomic Absorbance Spectrophotometer
- High Performance Liquid Chromatography Triple Quadrupole Mass Spectrometer
- Swept Source/Polarization Sensitive-Optical Coherence Tomography
- Electrospinning Apparatus
- Automated In-Line System with HPLC fittings
- PermeGear, Inc. ILC07 Automated System
- Nanoparticle Size Analyzer
- Anaerobic Chamber