



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Injury Models

Blast-Related Heterotopic Ossification: Animal Model of Combat Relevant Blast and Extremity Injury

Researchers from the Regenerative Medicine Department at NMRC and the Department of Surgery at USUHS have developed a combat-relevant rat model of heterotopic ossification (HO) that incorporates critical elements associated with combat-related blast injury: fracture/crush injury followed by traumatic amputation/repair that involves multi-system trauma, TBI, and the systemic inflammation seen in combat casualties. The development of an animal model of HO is critical to understanding how blast exposure contributes to this unique condition and to developing strategies to reduce the occurrence in the military population confronted with the increased use of IEDs on the battlefield. In addition to developing the blast HO animal model system, this research team has also demonstrated the possible contribution of wound infection, specifically of microbial bioburden (*Acinetobacter baumannii* and methicillin-resistant *Staphylococcus aureus*) to the development of HO. The completion of this work effort and subsequent studies will enable the design and implementation of a future therapeutic clinical trial in which patients and specific tissue sites that are at high risk for HO are identified within 1 week after injury, and subjects will then be treated using targeted local therapies involving local injection or topical application of agents that can effectively prevent or inhibit HO with low associated risk.