



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Injury Models

Triglyceride-Based, Ω -3 Long Chain Fatty Acid Emulsion for the Treatment of Blast-Induced TBI

The large incidence of blast-induced mTBI in combat casualties has prompted recognition of the need to establish the means to increase TBI resilience to hasten safe return to duty and minimize long-term and delayed TBI-related debilitations in returning Veterans. Using laboratory rats, investigators at WRAIR are establishing whether an ω -3 PUFA-deficient diet (mimicking a contemporary Western diet) promotes blast-induced TBI vulnerability and whether a concentrated ω -3 PUFA emulsion given intravenously immediately following blast-induced TBI serves as an effective countermeasure to blast-induced TBI. These investigators have established that consumption of a high-fat diet deficient in ω -3 PUFAs promotes an increased ω -6/ ω -3 PUFA ratio resulting in a pro-inflammatory state following blast-induced TBI. The ω -6/ ω -3 status is significantly reduced by a continuous intravenous infusion of the ω -3 enriched emulsion over five days following blast-induced TBI and is accompanied by significantly improved clinical outcome as measured by neurobehavioral testing. These researchers conclude that the intravenous infusion of a ω -3 enriched emulsion is an efficacious treatment for the management of blast-induced TBI in this rodent model and may represent a safe and effective therapy for blast-induced TBI in military Service Members.