



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Mechanisms of Injury

Temporal Progression of Visual Injury from Blast Exposure

Dr. Brittany Coats from the University of Utah's Department of Mechanical Engineering is conducting research funded by a DHP grant through USAMRMC's CRM Research Program (CRM RP) and a DHA grant through USAMRMC's CRM RP to investigate the temporal progression of eye injury from blast exposure and identify early predictors of visual dysfunction. Two studies comprise Coats' current work on the progression of visual system injury: (1) a retrospective and prospective analysis of Service Members exposed to a blast, and (2) an experimental study using a rat model to evaluate retinal and corneal damage as well as vitreous protein expression. Results from the second study using the rat model indicate that there is an immediate decrease in vision following a low-level blast exposure that remains steady until eight weeks post injury. The blast pressure alone resulted in corneal damage that was not observed until three weeks after exposure. The work from this project has resulted in collaboration with Dr. Barbara Wirostko, Chief Scientific Officer of Jade Therapeutics, Inc., who is also funded by USAMRMC to develop biodegradable biofilms that can be placed in the eye for drug delivery that will prevent or treat corneal damage resulting from blast exposure. The successful completion of these studies will expand our understanding of the time-dependent response of the visual system to blast, enhance current diagnostic capabilities, and lead to the development of time-dependent treatment strategies to mitigate the loss of vision in military personnel.