JOURNAL OF NEUROTRAUMA 33:511–512 (March 15, 2016)

DOI: 10.1089/neu.2016.29007.ter

Introduction

Synergy in Science and Resources

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The Department of Defense (DoD) Combat Casualty Care Research Program (CCCRP) is a requirements-driven platform that applies investment to a spectrum of topics in military-relevant trauma and injury.[1,2] Unlike many medical research programs or institutes, the CCCRP plans and programs research topics that are aligned to established gaps in care with an emphasis toward delivery of knowledge and materiel (devices and therapeutics), solutions, and accelerated translation. As a major focus area of the program, traumatic brain injury receives considerable attention and investment directed across the spectrum of medical research—discovery, basic, pre-clinical translational, and human subjects. Each of these domains is steered with the intent to improve the diagnosis and treatment of mild, moderate, and severe brain injury. Operation Brain Trauma Therapy (OBTT) and the articles in this special issue of the *Journal of Neurotrauma* represent the output from one line of effort stemming from the military's trauma research program. With OBTT, the effort was unique and aimed at integrating the expertise of civilian scientists in order to improve the understanding of medications and circulating biomarkers in the early and acute phases of moderate and severe brain injury.

To appreciate the achievements of OBTT and the capability it provides the military and civilian trauma communities, it is important to understand the founding strategy of the consortium and context surrounding the findings reported in this publication. Foremost, OBTT is one of several efforts spearheaded by the DoD trauma research program in the pre-clinical translational focus area of brain injury. OBTT was not designed to be the only means by which to achieve knowledge pertaining to therapeutic strategies in pre-clinical models. Exuberance of superb investigators notwithstanding, OBTT was not necessarily intended to provide encompassing and immediately transformative results. Instead, the military's strategy with OBTT rests in its unique opportunity to coordinate expertise from three nationally recognized laboratories, including the Army's Walter Reed Army Institute of Research. In establishing the consortium to endeavor with three validated models of traumatic brain injury (TBI)—parasagittal fluid percussion injury (FPI), controlled cortical impact (CCI), and penetrating ballistic-like brain injury (PBBI)—the CCCRP attempted to achieve unity of effort and efficiency of resources. Stated another way, linking the military's own laboratory with the University of Miami and the Miami Project to Cure Paralysis and the Safar Center for Resuscitation Research at the University of Pittsburgh School of Medicine provided an opportunity for synergy in science.

Additional context for this publication can be found in the main objectives of the consortium, which were focused and pragmatic. In a resource limited environment, OBBT chose to make the most of established, ''up and running,'' rodent models to: (1) select potential therapies among existing pharmacologics; (2) implement an evidence-based, clinically relevant, and concise pharmacological approach; (3) assess the medications in three distinct models of moderate and severe TBI, and (4) evaluate for effects in either one or more of the models across the consortium. Although the medications evaluated in the OBTT network – nicotinamide, simvastatin, erythropoietin (EPO), cyclosporine-A (CsA), and levetiracetam – did not ''perform'' to anticipated standards, the objectives of the consortium were summarily met and important information was gained; both as it pertains to the drugs and emerging biomarkers and to the integration of the scientific effort.

The network and scientific results reported in this publication constitute a pre-clinical, research capability achieved through a unique military–civilian partnership. Now established, this capability has the potential to evaluate different dosing strategies of these same or other pharmacologics or to characterize other brain resuscitation and preservation strategies. This type of capability can also be extended to include different pre-clinical models including ones of mild brain injury or those incorporating polytrauma and hemorrhagic shock (rodent or porcine). Importantly, and as a common iterative step, the capability achieved in OBTT stands to inform and hone subsequent research performed in more translatable models including those in the nonhuman primate.

With this context, the investigative teams of the OBTT network are to be commended for their dedication and expert accomplishment. The articles in this issue exemplify a tremendous amount of intricate work aimed at advancing the diagnosis and management of TBI. The effort as a whole is an apt tribute to civilians and military members who have sustained this type of injury and the overall effort to improve survival and outcomes. However, the work is not complete and the reader of this journal is encouraged to ''dig into'' the issue and consider with us its strengths, weaknesses, meaning, and implication for future study. The organizers

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of this initiative also provide the OBTT strategy and effort as a case study of planned and integrated pre-clinical research and thank the *Journal of Neurotrauma* for featuring this issue. By continuing to maximize military–civilian partnerships in the area of trauma and injury research, the CCCRP hopes to be efficient with resources and effective with science to narrow high priority gaps in patient care.

Acknowledgment

The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army, Department of the Air Force, or the Department of Defense.

References

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