



**OFFICE OF THE UNDER SECRETARY OF DEFENSE**

**4000 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-4000**

**PERSONNEL AND  
READINESS**

The Honorable Mitch McConnell  
Chairman  
Subcommittee on Defense  
Committee on Appropriations  
United States Senate  
Washington, DC 20510

**OCT - 6 2025**

Dear Mr. Chairman:

The Department's response to the Joint Explanatory Statement, page 110-111, accompanying H.R. 2617, the Consolidated Appropriations Act, 2023 (Public Law 117-328), "Joint Warfighter Medical Research Program," is enclosed.

This report summarizes the projects selected for Fiscal Year (FY) 2023 Joint Warfighter Medical Research Program (JWMRP) funding and covers the total congressional appropriations for the JWMRP during this period (\$25 million). The FY 2023 JWMRP funded 18 projects, aligned under the Science and Technology or Advanced Development project domains, which collectively address medical research areas aligned with Defense Health Program core programs. This diverse set of JWMRP projects enhances and accelerates high-priority Department of Defense and Military Department medical requirements, with potential to provide significant benefits to military medicine.

Thank you for your continued strong support for the health and well-being of our Service members. I am sending similar letters to the other congressional defense committees.

Sincerely,

Sean O'Keefe  
Deputy Under Secretary of Defense for  
Personnel and Readiness

Enclosure:  
As stated

The Honorable Christopher Coons  
Ranking Member



PERSONNEL AND  
READINESS

OFFICE OF THE UNDER SECRETARY OF DEFENSE

4000 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-4000

The Honorable Ken Calvert  
Chairman  
Subcommittee on Defense  
Committee on Appropriations  
U.S. House of Representatives  
Washington, DC 20515

OCT - 6 2025

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Deputy Under Secretary of Defense for  
Personnel and Readiness

Enclosure:  
As stated

cc:  
The Honorable Betty McCollum  
Ranking Member





PERSONNEL AND  
READINESS

OFFICE OF THE UNDER SECRETARY OF DEFENSE

4000 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-4000

The Honorable Roger F. Wicker  
Chairman  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

OCT - 6 2025

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Sincerely,

  
Sean O'Keefe  
Deputy Under Secretary of Defense for  
Personnel and Readiness

Enclosure:  
As stated

cc:  
The Honorable Jack Reed  
Ranking Member





OFFICE OF THE UNDER SECRETARY OF DEFENSE

4000 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-4000

PERSONNEL AND  
READINESS

The Honorable Mike D. Rogers  
Chairman  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

OCT - 6 2025

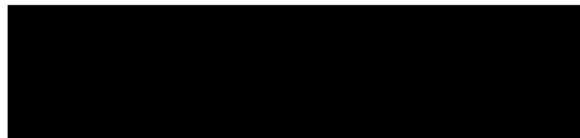
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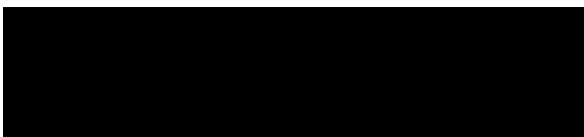
Sincerely,



Sean O'Keefe  
Deputy Under Secretary of Defense for  
Personnel and Readiness

Enclosure:  
As stated

cc:  
The Honorable Adam Smith  
Ranking Member



# **Report to the Congressional Defense Committees**



## **Joint Warfighter Medical Research Program**

**September 2025**

The estimated cost of this report for the Department of Defense (DoD) is approximately \$4,000.00 for Fiscal Years 2024–2025. This includes \$1,500.00 in expenses and \$2,500.00 in DoD labor.  
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## BACKGROUND AND PURPOSE

This report is in response to the Joint Explanatory Statement, pages 110-111, accompanying H.R. 2617, the Consolidated Appropriations Act, 2023 (Public Law 117–328), which requests that the Assistant Secretary of Defense for Health Affairs (ASD(HA)) submit a report to the congressional defense committees on the Joint Warfighter Medical Research Program (JWMRP). This report lists the projects that receive funding, including the funding amount awarded to each project, a thorough description of each project’s research, and the benefit this research will provide to the Department of Defense (DoD).

As requested by the ASD(HA), the Defense Health Agency manages the Defense Health Program (DHP) Research, Development, Test, and Evaluation (RDT&E) appropriation. The U.S. Army Medical Research and Development Command (USAMRDC) Congressionally Directed Medical Research Programs (CDMRP) provides execution management for the DHP RDT&E JWMRP Congressional Special Interest funds.

## FISCAL YEAR 2023 JWMRP RESEARCH

Congress appropriated \$25 million for the JWMRP in Fiscal Year (FY) 2023, stipulating these funds “shall be used to augment and accelerate high priority DoD and Service medical requirements and to continue core and congressionally-directed prior year initiatives that are close to achieving their objectives and yielding a benefit to military medicine. The funds shall not be used for new projects or basic research.” The Department continues to ensure projects funded under JWMRP are ongoing and not new starts.

Table 1 provides the total number of FY 2023 JWMRP funded projects and investment amounts (totaling \$22,950,911) per the two project domains: Science and Technology and Advanced Development. The Department allocated the remaining \$2,049,089 of the FY 2023 appropriation to Small Business Innovative Research (SBIR)/Small Business Technology Transfer Program (STTR) withholds (\$834,000), USAMRDC withholds (\$483,000), and CDMRP management costs (\$732,089).

**Table 1. FY 2023 JWMRP Funding Summary**

| PROJECT DOMAINS*             | PROJECTS FUNDED | JWMRP INVESTMENT    |
|------------------------------|-----------------|---------------------|
| Science and Technology       | 12              | \$12,055,911        |
| Advanced Development         | 6               | \$10,895,000        |
| Less: SBIR/STTR              | N/A             | (\$834,000)         |
| Less: USAMRDC Withholds      | N/A             | (\$483,000)         |
| Less: CDMRP Management Costs | N/A             | (\$732,089)         |
| <b>Totals</b>                | <b>18</b>       | <b>\$25,000,000</b> |

\*Science and Technology focuses on the development and maturation of technologies to enable transformational capabilities and accelerate the transition into Advanced Development. Advanced Development centers on advanced component and prototype development for technologies with demonstrated proof of concept and an established transition pathway.

Table 2 summarizes the projects funded by the FY 2023 JWMRP, including the research award recipients, project descriptions with explanations of their potential benefits to the DoD, and funding amounts. The prime recipient organization received the JWMRP funding amount listed, unless otherwise noted.

**Table 2. FY 2023 JWMRP Project Summaries**

| NO.                                                            | PROJECT TITLE                                                                                                 | RECIPIENT                                          | PROJECT DESCRIPTION AND DoD BENEFIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | JWMRP FUNDING AMOUNT                                                  |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <i>Science and Technology Domain: Musculoskeletal Injuries</i> |                                                                                                               |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                       |
| 1.                                                             | Quantification of Cervical and Lumbar Spine Kinematics and Muscle Physiology in Swift Boat Combatant Commands | Naval Health Research Center (NHRC), San Diego, CA | <p>Project Description: <i>Science and Technology</i>/Combatant craft crewmen operate high-performance watercraft on missions aimed at unconventional warfare, special reconnaissance, direct action, and counter terrorism. Exposure to extreme and varied gravitational forces during these missions affects musculoskeletal structure, increasing risk of injury and reduced physicality. This ongoing extension effort aims to apply novel magnetic resonance imaging (MRI) techniques to understand the effect of high-speed maritime transits on both cervical spine (CS) and lumbar spine (LS) structure and supporting musculature. Information gathered could lead to physical training strategies to increase muscular strength and endurance in critical muscle groups that support the spine under the dynamic impact imposed by this operational environment. Relative to operational readiness and injury rates, these data may shed light onto measurable changes in the CS/LS, which may predict injury.</p> <p>DoD Benefit: In the long term, these data may provide information to prevent future injury, either through changes in training practices, gear design, and/or implementation of exercises to strengthen the musculature of the spine.</p> | <p>\$83,000*</p> <p>(Sent to the NHRC in support of this effort).</p> |

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|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 2.                                                     | The Effects of Vibration on Indicators of Post-Traumatic Knee Osteoarthritis (PTOA) Risk Following Anterior Cruciate Ligament Injury | University of North Carolina at Chapel Hill, Chapel Hill, NC | <p>Project Description: <i>Science and Technology</i>/PTOA a leading cause of medical separation from military service, degrades quality of life, increases the risks of several comorbidities (e.g., obesity, depression, cardiovascular disease), and is a primary contributor to years of life lost due to disability. Improving rehabilitation of knee injuries is paramount for maintaining the combat readiness of our Armed Forces and preserving the health and well-being of Service members, veterans, and the American public. In collaboration with Womack Army Medical Center (WAMC), this ongoing study aims to evaluate the effects of a local muscle vibration (LMV) device used for anterior cruciate ligament reconstruction rehabilitation in comparison to standard rehabilitation by assessing quadriceps function, gait biomechanics linked to PTOA development, patient self-report outcomes, and MRI indicators of knee joint health via a Phase 2 treatment, single-blind, randomized controlled clinical trial. These studies are necessary to establish the efficacy of the LMV prototype and accelerate its development as a commercially available device.</p> <p>DoD Benefit: In addition to being cost-effective, the portable nature of the prototype LMV device could have substantial implications for improving rehabilitation of knee injuries in military personnel and U.S. citizens, particularly those with limited access to rehabilitation facilities.</p> | <p>\$15,000*</p> <p>(Sent to WAMC in support of this effort).</p> |
| <b><i>Science and Technology Domain: Pathogens</i></b> |                                                                                                                                      |                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                   |
| 3.                                                     | Phase 1 Clinical Trial for Therapeutic Intervention                                                                                  | J. David Gladstone Institutes, San Francisco, CA             | <p>Project Description: <i>Science and Technology</i>/Despite the success of antiretroviral therapy for human immunodeficiency virus (HIV)-1, 1.7 million people acquired HIV in 2019. The Department of Veterans Affairs (VA) is the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | \$605,735                                                         |

|    |                                                                                                                     |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |
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|    | Particles (TIPs)                                                                                                    |                                                           | <p>largest single provider of HIV-1 care in the United States with approximately 31,000 HIV-infected veterans (1 in 250 veterans living with HIV as of 2019). The cost of providing lifelong continuous antiviral therapy is projected to increase to an estimated \$31 billion per year before 2030. A need exists for new therapeutic approaches that do not rely on continuous administration, particularly for resource-limited settings and at-risk populations facing treatment adherence challenges. This project will accelerate the development of a first-in-class biologic therapeutic candidate for HIV-1, TIPs, by testing their safety (i.e., tolerability and immunogenicity) in a Phase 1a clinical trial. If successful, these studies will lead to a follow-on Phase Ib/IIa clinical intervention trial to test TIPs efficacy in sustainably lowering HIV-1 viral loads among HIV-positive healthy individuals.</p> <p>DoD Benefit: As a single-administration therapeutic for HIV-1, TIPs would substantially improve the quality of life for HIV-infected veterans and their caregivers and reduce the burden of treatments administered by the VA and Military Health System.</p> |           |
| 4. | Investigational New Drug (IND)-Enabling Studies of Novel A. baumannii Therapeutics in Combat-Relevant Animal Models | Walter Reed Army Institute of Research, Silver Spring, MD | <p>Project Description: <i>Science and Technology/Acinetobacter baumannii</i> is an opportunistic pathogen that targets immunocompromised individuals and is responsible for thousands of deaths and enormous financial burden in civilian and military healthcare systems. This pathogen was always among the most frequently isolated species from combat wounds in recent conflicts. <i>A. baumannii</i>'s intrinsic resistance to antibiotics combined with genomic flexibility to increase its fitness makes it extremely difficult to treat. Walter Reed Army Institute of Research identified Outer Membrane Protein OmpW as a druggable conserved key transport</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | \$659,030 |

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|    |                                                                                                                  |                                  | <p>protein among clinical isolates of <i>A. baumannii</i> and other Gram-negative bacteria and developed small molecule candidates against OmpW that demonstrated efficacy in vitro and a mouse wound infection model. This project will involve in vivo safety and efficacy studies of lead therapeutic candidates in combat-relevant animal models involving blast and polytrauma. Clearly identifiable “go-no-go” checkpoints will identify the top lead compound and support pre-IND meetings with the U.S. Food and Drug Administration (FDA).</p> <p>DoD Benefit: The development and availability of novel antibacterials for the treatment of <i>A. baumannii</i> will maximize Warfighter health and combat effectiveness.</p>                                                                                                                                                                                                                                                                                                                                          |                                                                       |
| 5. | Preclinical Development of a Balanced, Tetravalent, Live-Attenuated Vaccine Against the 4 Dengue Virus Serotypes | Codagenix, Inc., Farmingdale, NY | <p>Project Description: <i>Science and Technology</i>/The mosquito-borne dengue virus (DENV) is a major international health concern and ranked as the top viral threat to U.S. military personnel and the third most significant infectious disease threat overall by a military prioritization panel in 2019. The only current prevention strategy for dengue fever is the avoidance of mosquito bites. In collaboration with the Naval Medical Research Center (NMRC), this project is a critical step in the development of CodaVax-DENV, a tetravalent live attenuated vaccine to prevent dengue fever. Research aims primarily focus on administering CodaVax-DENV to non-human primates and monitoring animals for reduced viremia in response to DENV challenge and development of a neutralizing antibody response that persists for at least 24 weeks. The remaining pre-clinical work of this project, along with required manufacturing tasks, will facilitate preparation and submission of an IND package to the FDA to enable first-in-human clinical trials.</p> | <p>\$19,000*</p> <p>(Sent to the NMRC in support of this effort).</p> |

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|    |                                                                                                                                                                         |                                   | DoD Benefit: Successful development of CodaVax-DENV would address a critical unmet need in protecting active duty and retired Service members against DENV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |
| 6. | Clinical Validation of a Portable, Ruggedized Antimicrobial Wound Dressing (FSWD) in Management of Large Surface Area Burns for Prolonged Field Care and Long-Term Care | KeriCure, Inc., Wesley Chapel, FL | <p>Project Description: <i>Science and Technology</i>/The ability to provide advanced wound care for large area burns in theater is a critical capability gap. KeriCure's FSWD is positioned to fill this gap with extensive preclinical data supporting antimicrobial efficacy against multidrug-resistant bacteria and fungi. This lightweight, ruggedized pump spray barrier is intended for combat wound management, including large surface area burn wounds, in Roles 1–4 of care; austere and prolonged field care; and hospital and fixed care environments. In collaboration with the U.S. Army Institute of Surgical Research (USAISR), the current project involves: (1) manufacturing and stability testing of FSWD to support a clinical trial; (2) a randomized clinical trial to establish the ease of FSWD use in the management of multiple large burn wounds, as well as the ability of the dressing to promote wound healing/closure, mitigate infection development, and reduce pain associated with dressing changes, compared to the standard of care silver wound dressing; and (3) develop product clinical guidelines and training requirements.</p> <p>DoD Benefit: Though the proposed clinical studies apply to acute wounds that impact military and civilian populations, the clinical trial of this wound dressing will specifically address large surface area burn wounds often associated with combat injuries. The USAISR, the only DoD burn center in the United States, will serve as one of the two study sites for this trial. FSWD has the potential to advance Warfighter operational performance and medical readiness.</p> | <p>\$89,682*</p> <p>(Sent to the USAISR in support of this effort).</p> |

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| 7. | Developing IN-007 as a Widely Deployable Inhaled Treatment Against Pathogens Utilizing Human ACE2 for Viral Attachment and Entry | Inhalon Biopharma, Inc., Morrisville, NC | <p>Project Description: <i>Science and Technology</i>/The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus that causes coronavirus disease-2019 uses ACE2, a human protein in the airways, to enter and infect cells. Studies show that blocking the virus's ability to bind ACE2 halts the cycle of infection and viral replication. This project supports the continued development of Inhalon's inhaled antibody-based drug, IN-007, as a preventative or therapeutic against any ACE2-binding pathogen of pandemic potential, with Warfighter-focused objectives. Inhaled delivery offers several key advantages over intravenous infusion or intramuscular injection for preventing or treating respiratory infectious diseases, including lowering the dose of monoclonal antibodies required to achieve the same dose in the airway mucus, providing immediate therapeutic concentrations in the airways without waiting for biodistribution from the serum, and allowing convenient dosing at home or in the field. Study objectives include: (1) drug product formulation optimized for extreme ambient temperature storage; (2) improved nebulizer design; (3) feasibility assessment of soft mist inhalation; and (4) optimization of drug product manufacturing.</p> <p>DoD Benefit: It is possible that future SARS-CoV-2 variants or other ACE2-binding pathogens may pose a greater threat to military populations. This work provides feasibility for a Warfighter self-administered, heat-stable, inhaled therapeutic capable of neutralizing any current or future ACE2-binding emerging infectious viral threat. IN-007 would enable therapy, prophylaxis, and reduction in transmissibility by infected Warfighters.</p> | \$2,234,650     |
| 8. | Development of a Military-Grade Bovine                                                                                           | NMRC, Silver Spring, MD                  | <p>Project Description: <i>Science and Technology</i>/Diarrheal disease is the leading infectious disease threat against deployed</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | \$1,294,000 and |

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|  | Colostrum Supplement That Prevents Traveler's Diarrhea | <p>military personnel, caused by bacterial infections including Campylobacter, Enterotoxigenic Escherichia coli (ETEC) and Shigella. No prophylactics are available that protect against all these pathogens; however, a commercially available immunoprophylactic hyperimmune bovine colostrum (HBC) product known as Travelan<sup>®</sup> effectively prevented diarrheal illness due to ETEC. The NMRC partnered with Immuron, Ltd. to improve the current Travelan<sup>®</sup> formulation by expanding its reactivity against additional bacterial pathogens endemic to regions of military interest. Other collaborators include the Walter Reed Army Institute of Research and the Armed Forces Research Institute of Medical Sciences (AFRIMS). Researchers aim to: (1) file a pre-IND with the FDA and obtain regulatory approval of proposed animal studies; (2) produce military-grade drug product; (3) conduct toxicological and efficacy analysis of the drug product; and (4) develop the Chemistry Manufacturing and Controls section for a future IND filing with the FDA.</p> <p>DoD Benefit: Progress in vaccine development remains, at best, a mid- to long-term solution to the problem of infectious diarrhea among the deployed military due in part to the slow pathway to licensure. Antimicrobial therapy has minimized the duration of diarrhea illness but does not prevent illness and can contribute to antimicrobial resistance. A passive prophylactic with a demonstrated safety profile can significantly improve diarrhea prevention in forward operating areas where diarrhea is endemic to prevent diminished military operational readiness and capabilities.</p> | <p>\$465,161</p> <p>(Sent to the AFRIMS in support of this effort).</p> |
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***Science and Technology Domain: Exposures***

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| 9. | Evidence-Based Injury Criteria for Blast Exposure in Humans | Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., Bethesda, MD | <p>Project Description: <i>Science and Technology</i>/Traumatic brain injury (TBI) is a major cause of morbidity among Service members deployed to warzones, with 82 percent of cases characterized as mild (mTBI). Blast exposure from explosive devices is known to cause mTBI, yet the biomechanics in the human head that are responsible for injury are unknown, and there are no blast-injury criteria that delineate the pressure exposures that result in a brain injury. This project, performed by the Biotechnology High Performance Computing Software Applications Institute (BHSAI) of the Telemedicine and Advanced Technology Research Center under contract with the Henry M. Jackson Foundation for the Advancement of Military Medicine, will reconstruct an actual missile attack on a U.S. base, reproducing the blast-pressure exposure experienced by Warfighters, and link it to documented mTBI diagnoses. Using BHSAI's validated biomechanical model of the human head, in collaboration with the U.S. Army Engineer Research and Development Center, the study will accurately characterize the pressure wave loading on the human head due to blast exposure inside a bunker and computationally quantify the biomechanical brain responses to blast exposure. These results will be mapped to de-identified medical records provided by the USAMRDC Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC) program, to establish evidence-based injury criteria for mTBI and link blast-pressure exposure and the likelihood of brain injury.</p> <p>DoD Benefit: Injury criteria established in this project will inform and accelerate the development of quantitative screening tools for blast-pressure exposure. In conjunction</p> | <p>\$12,302*</p> <p>(Sent to the USAMRDC BHSAI in support of this effort).</p> <p>and</p> <p>\$62,988*</p> <p>(Sent to the USAMRDC JTAPIC program in support of this effort)</p> |
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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|     |                                                                                                                                                        |                               | with wearable sensors, these tools will identify Warfighters at risk for mTBI at the point of exposure. Results will also inform the design of related personal protective equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |
| 10. | Optimized, Field-Stable Glycopolymers-Mimicking Polysaccharides to Prevent Morbidity and Mortality in Exposure to Ionizing Radiation or Nuclear Injury | Synedgen, Inc., Claremont, CA | <p>Project Description: <i>Science and Technology</i>/A mass casualty radiation event, such as the detonation of an improvised nuclear device, could cause severe hemorrhage, multi-organ failure, and infection leading to sepsis and/or death in civilian and military populations. There is a critical need to develop medical countermeasures for radiation exposure including treating gastrointestinal (GI) acute radiation syndrome (ARS). Synedgen, Inc. developed a drug product, MIIST305, for an ulcerative colitis (UC) indication that showed efficacy in treating ARS when administered after ionizing radiation exposure. This study will assess whether MIIST305 will be effective in reducing mortality in two different animal models of lethal ionizing radiation when administered prior to radiation exposure. The objectives are to demonstrate the effective dose administration and translate dosing from a murine to porcine model, enabling a dose scaling assessment and a drug response curve.</p> <p>DoD Benefit: From nuclear disasters to radioactive isotopes of cesium and cobalt from radiation sources on the battlefield, to intentional nuclear detonation by adversaries, the risk to military personnel, first responders, and civilians of nuclear radiation exposure is greater now than it was during the Cold War. MIIST305, with its relative ease of administration and minimal side effects, will facilitate force protection, Warfighter retention and readiness, and maintain force health. MIIST305's broad applicability to multiple civilian GI indications including UC and radiation oncology-induced gastrointestinal</p> | \$2,299,951 |

|                                                                   |                                                                             |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |
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|                                                                   |                                                                             |                                                                    | mucositis, make it an ideal candidate for the Strategic National Stockpile.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |
| <b><i>Science and Technology Domain: Combat Casualty Care</i></b> |                                                                             |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |
| 11.                                                               | Development of Dried Blood for Prolonged Field Care in Austere Environments | University of Louisville Research Foundation, Inc., Louisville, KY | <p><b>Project Description:</b> <i>Science and Technology</i>/Blood storage limitations pose a significant barrier to transfusion in austere environments often encountered in far-forward military operations. Therefore, a technology that enables blood storage at ambient temperatures without the need for refrigeration or frozen storage is essential. A potential solution is a novel approach of processing red blood cells (RBCs) for long-term preservation in a dried state at ambient temperatures, enabling rapid reconstitution of the dried cells by adding water. The objective of this project is to develop validated protocols for purification of rehydrated RBCs that meet clinical requirements and are safe and effective when transfused into small and large animal models of hemorrhagic shock. Researchers at the University of Louisville aim to: (1) assess the quality of purified rehydrated RBCs using chemical, manufacturing, and controls studies; and (2) evaluate in vivo performance of purified rehydrated RBCs for one week in a rat model of hemorrhagic shock and for 24 hours in a swine model of hemorrhagic shock to assess safety and efficacy with clinical scale transfusions.</p> <p><b>DoD Benefit:</b> Successful development of this approach will revolutionize transfusion medicine and damage control/resuscitation procedures for far-forward military operations in austere environments. In addition, dry preservation of RBCs may increase shelf-life and reduce blood shortages. Furthermore, this approach will enable transfusions in remote medical centers where refrigeration or freezing are not feasible.</p> | \$1,927,512 |

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| 12. | Clinical Evaluation of an AI [Artificial Intelligence] Risk Prediction and Decision Support System for Early Management of Injured Patients | Queen Mary University of London, London, UK | <p><b>Project Description:</b> <i>Science and Technology</i>/Key treatment decisions in trauma care are often time-sensitive and rely heavily on clinicians' judgment of risk. These decisions can be challenging due to inadequate information, high uncertainty, and time constraints. Clinician estimations can cause treatment delays and avoidable errors. Prior research at the Queen Mary University of London led to the development and validation of AI algorithms for risk prediction and a useful Clinical Decision Support (CDS) system, called AI-TRiPS, which has shown promising performance in pre-clinical, in silico, and early-phase non-randomized clinical evaluations. This study will clinically evaluate AI-TRiPS in a real-world trauma care setting during a 54-week period across the London Trauma System. Researchers aim to: (1) assess and compare the behavior and performance of clinicians during the initial trauma resuscitation phase, comparing AI-assisted with standard practice; (2) evaluate AI system impact on clinical processes and outcomes; (3) evaluate AI system impact on patient outcomes; (4) assess AI system safety and develop risk-mitigation strategies; (5) evaluate implementation and adoption of the system; and (6) compile sufficient clinical evidence for full regulatory approval.</p> <p><b>DoD Benefit:</b> This project aims to enhance the quality, accuracy, and timeliness of clinical decisions within deployed trauma systems. The CDS system will allow military clinical decision-makers, across a range of professional seniorities from battalion medical officer to attending surgeon, to access real-time, documentable predictions concerning patient status that are readily understandable, evidence-based, and amenable to prospective and retrospective interrogation.</p> | \$2,287,900 |
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**Advanced Development Domain: Combat Casualty Care**

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| 13. | Joint Arctic Medical Infrastructure Testing | U.S. Army Combat Capabilities Development Command (DEVCOM) – Soldier Center, Natick, MA | <p>Project Description: <i>Advanced Development</i>/The Arctic is an arena of competition; a line of attack in conflict; a vital area holding many natural resources; and a platform for global power projection. An Arctic Gap Report published by the Center for Army Lessons Learned identified five medical gaps that must be addressed to effectively provide Role 3 medical care in the arctic environment, with other Services identifying similar gaps. This project will address one of those gaps to optimize medical equipment currently used in Joint hospitals operating in environments with temperatures as low as -25 degrees Fahrenheit (°F) for use in settings with temperatures to -65 °F. Various prototype systems, including a new casualty collection point concept for extreme cold weather, low temperature shelters, high wind kits, radiant floor heating, water/wastewater systems, and hypothermia prevention products, were tested in climate chambers and optimized for use in arctic environments. This project will involve actual field testing of these prototype systems at the U.S. Army Cold Regions Test Center located at Fort Greely, AK to meet a threshold of -40 °F and an objective of -60 °F to provide a true test of environmental conditions necessary to validate the technologies.</p> <p>DoD Benefit: This project addresses the 2019 DoD Arctic Strategy Report to Congress that calls for the Joint Services to provide medical care in arctic conditions with temperatures as low as -65 °F. Importantly, this effort will allow the DoD to regain arctic dominance by optimizing medical capabilities for extreme cold conditions that impact medical care in three different Combatant Commands, eight countries, and all time zones.</p> | <p>\$1,300,000</p> <p>(Sent to the U.S. Army Medical Materiel Development Activity (USAMMDA) to add to an existing contract for this effort).</p> |
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| 14.                                                               | Rapid Donor Screening Capability (RDSC) | Biolytical Laboratories, Inc., Richmond, British Columbia | <p>Project Description: <i>Advanced Development</i>/The military practice of collecting and transfusing whole blood and apheresis platelets in austere locations will continue in future operations. Transfusions within 30 minutes of injury have repeatedly shown to save lives. The ability to screen donors for blood type, Rh factor, HIV-1, HIV-2, hepatitis B, and hepatitis C prior to collecting a unit of blood reduces risk of transfusion reactions and transfusion-transmitted infection. The objective of this project is to develop a prototype multiplex assay for blood donor screening that can provide results in 15 minutes or less for blood type, Rh factor, HIV, and hepatitis in an operational environment. The prototype will be optimized for portability, low weight, and minimal power requirements, while impact of various environmental conditions on technical operation will be considered.</p> <p>DoD Benefit: This RDSC will enable rapid decisions to exclude or include a prospective donor of whole blood or blood components during contingency blood collections, and blood type-specific transfusions when Type O blood is unavailable. The RDSC will be used on U.S. Navy casualty receiving ships, at Role 1 Battalion Aid Stations, U.S. Marine Corps Expeditionary Forces, and DoD Special Operations teams, as well as U.S. Army and U.S. Air Force land-based Role 2 and 3 military medical treatment facilities.</p> | <p>\$2,500,000</p> <p>(Sent to the USAMMDA to add to an existing contract for this effort).</p> |
| <b><i>Advanced Development Domain: Traumatic Brain Injury</i></b> |                                         |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                 |
| 15.                                                               | Concussion Dosimeter                    | LifeLens Technologies, Inc., Ivyland, PA                  | <p>Project Description: <i>Advanced Development</i>/The USAMMDA Concussion Dosimeter program is developing body-wearable sensors that detect blast and impact/accelerative incidents. This project will explore the use of general-purpose wearables for detecting vestibular motor</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>\$2,500,000</p> <p>(Sent to the USAMMDA to add to an existing</p>                            |

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|     |                                                   |                                       | <p>and other physiological disruptions to more accurately identify Warfighters who require screening by medical personnel. The primary objective of this project is to test and evaluate candidate physiological sensor technologies to help inform the solutions analysis for the program and how the DoD will implement section 735 of the James M. Inhofe National Defense Authorization Act for FY 2023, which recommends that the DoD initiate a pilot blast overpressure monitoring program to accurately predict blast overpressure for explosives. The Wearables Integration Center will conduct testing and evaluation at the Walter Reed Army Institute of Research.</p> <p>DoD Benefit: The wearable sensors will reduce the risk of TBI by providing early indicators of potentially concussive events, helping units prevent unnecessary exposures, identifying Warfighters in potential need of medical intervention, and mitigating cognitive decline while increasing the chances of successful return to duty. The sensors will also enable data collection for entry into the e-Health record, allowing Warfighters and medical personnel to better track and respond to occupational hazards.</p> | contract for this effort).                                                                    |
| 16. | Traumatic Brain Injury– Assessments and Diagnosis | University of Maryland, Baltimore, MD | <p>Project Description: <i>Advanced Development</i>/The USAMMDA Traumatic Brain Injury Assessments and Diagnosis program is developing a suite of applications on a mobile device to assess and monitor Service members after a suspected mTBI and/or an event linked to cognitive impairment. The objectives of this project are to support: 1) ongoing refinement of user requirements; 2) continued development of the electronic-guided Military Acute Concussion Evaluation 2 tool for integration as a Tactical Assault Kit plug-in to enhance use by the U.S. Special Operations Command</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>\$500,000</p> <p>(Sent to the USAMMDA to add to an existing contract for this effort).</p> |

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|     |                                                    |                                         | <p>and other U.S. military forces; and 3) feasibility studies to adapt suitable portions of the current Automated Neuropsychological Assessment Metrics for mobile device applications. The study is a prospective observational clinical evaluation of these mobile health applications for the assessment of mTBI, using a case control design with 60 mTBI patients and 20 orthopedic trauma control patients.</p> <p>DoD Benefit: This effort will identify operationally relevant technologies to aid field medics in identifying and triaging Warfighters who sustained a mTBI and assess return to duty and evacuation decisions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |
| 17. | Hyperbaric Neurocognitive Assessment System (HNAS) | Vista LifeSciences, Inc., Englewood, CO | <p>Project Description: <i>Advanced Development</i>/There is a lack of validated neurocognitive assessment tools for medical research and operational testing in diving and hyperbaric environments. Military, recreational, and commercial diving requires a high level of cognitive functioning to mitigate the risk for dive-related incidents and enhance working performance. Divers are exposed to many stressors that may impact brain behavior and cognitive function. Vista LifeSciences, Inc. developed a field-deployable, tablet-based neurocognitive assessment tool, the HNAS, which is capable of rapidly quantifying changes in neurocognitive function during underwater operations to assess cognitive readiness of divers exposed to extended periods of time under significant thermal stress while immersed in darkness with limited mobility. The current study aims to update and ruggedize the HNAS protective housing and associated hardware/software components; validate a neurocognitive test battery in a diving environment; and conduct feasibility testing of the advanced</p> | <p>\$2,200,000</p> <p>(Sent to the NMRC Naval Advanced Medical Development to add to an existing contract for this effort).</p> |

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|                                                                     |                                                    |                              | <p>HNAS prototype under operationally relevant conditions.</p> <p>DoD Benefit: This ruggedized, tablet-based assessment tool will enable evaluation of cognitive readiness and performance limiting factors in training and operational dive settings. HNAS has potential for integration with physiological monitoring devices and passive neural imaging capabilities to inform readiness and performance enhancement initiatives across undersea warfighting communities.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |
| <b><i>Advanced Development Domain: Physiological Monitoring</i></b> |                                                    |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |
| 18.                                                                 | Ruggedized Diver Physiological Monitoring Platform | NIRSense, Inc., Richmond, VA | <p>Project Description: <i>Advanced Development</i>/The Naval Advanced Medical Development Integrative Monitoring System program aims to provide a wearable biomedical monitor for divers that securely collects, stores, and/or transmits quality quantitative physiological metrics and location data tailored for complex operational settings. NIRSense, Inc. is developing a cerebral oximeter for aircrew physiological monitoring and adapting their technology to develop a generalized ruggedized tissue oximeter to maximize its operational use and benefit, as well as applicability to civilian healthcare. This adaptation supports various uses such as guiding human performance training, musculoskeletal injury rehabilitation, and medical care in combat environments, and may be adapted for Navy-relevant underwater applications to monitor Warfighter physiological and cognitive performance. This study aims to: 1) include requirements refinement and prototype DoDn-selection, independent government laboratory testing, and matured prototype development, testing, and validation to integrate modular systems and accessories; and 2) obtain relevant required certifications.</p> | <p>\$1,895,000</p> <p>(Sent to the NMRC Naval Advanced Medical Development to add to an existing contract for this effort).</p> |

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|  |  |  | DoD Benefit: The mission-specific health data collected by this physiological monitor will inform decision-making by the wearer, support personnel, and higher echelons during specialized Naval diving training and operations, thus providing overall improvement to performance and readiness. |  |
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\*These projects, initially awarded JWMP funding prior to FY 2023, have intramural prime recipients or sub-awardees with approved out-year funding commitments. Amounts shown reflect current-year obligations. Out-year funding is dependent on JWMP receiving appropriated funding.

## SUMMARY

Congressional appropriations for the FY 2023 JWMP totaled \$25M. The JWMP invested approximately \$23M in research, after CDMRP management costs, USAMRDC withholds, and SBIR/STTR withholds. The FY 2023 JWMP funded 18 projects. These projects, each aligned under the Science and Technology or Advanced Development project domain, collectively address medical research areas aligned with DHP core programs. This diverse set of JWMP projects enhances and accelerates high-priority DoD and Service medical requirements and has the potential to provide significant benefits to military medicine.