Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	231.001	96.797	105.929	-	105.929	105.289	104.033	88.305	82.024	Continuing	Continuing
869: *Warfighter Health Prot & Perf Stnds*	33.933	34.718	38.740	-	38.740	39.710	38.206	32.371	25.123	Continuing	Continuing
870: *DOD MED DEF AG INF DIS*	17.091	13.914	16.869	-	16.869	16.603	16.797	16.898	17.186	Continuing	Continuing
873: *HIV EXPLORATORY RSCH*	8.914	9.243	9.392	-	9.392	9.582	9.638	9.584	9.747	Continuing	Continuing
874: *CBT CASUALTY CARE TECH*	17.363	16.782	17.044	-	17.044	17.417	17.293	17.171	17.486	Continuing	Continuing
878: *HLTH HAZ MIL MATERIEL*	-	0.078	-	-	-	-	-	-	-	Continuing	Continuing
879: *MED FACT ENH SOLD EFF*	-	0.106	-	-	-	-	-	-	-	Continuing	Continuing
968: *SYNCH BASED HI ENERGY RADIATION BEAM CANCER DETECT*	5.969	-	-	-	-	-	-	-	-	Continuing	Continuing
FH2: *FORCE HEALTH PROTECTION - APPLIED RESEARCH*	7.995	10.779	9.136	-	9.136	7.127	7.212	7.376	7.493	Continuing	Continuing
PA4: *WOUND HEALING PROJECT (CA)*	1.989	-	-	-	-	-	-	-	-	Continuing	Continuing
UA8: *PROTEIN HYDROGEL (CA)*	0.796	-	-	-	-	-	-	-	-	Continuing	Continuing
VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*	125.821	-	-	-	-	-	-	-	-	Continuing	Continuing
VB4: *SYSTEM BIOLOGY AND NETWORK SCIENCE TECHNOLOGY*	1.130	1.177	4.748	-	4.748	4.850	4.887	4.905	4.989	Continuing	Continuing
VJ4: *SUICIDE PREVENTION/ MITIGATION*	10.000	10.000	10.000	-	10.000	10.000	10.000	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) supports application of knowledge gained through basic research to develop drugs, vaccines, medical devices, diagnostics, medical practices/procedures, and other preventive measures essential to the protection and sustainment of Warfighter health. Research is conducted in five principal areas:

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Combat Casualty Care; Military Operational Medicine; Military Relevant Infectious Diseases, including Human Immunodeficiency Virus (HIV); Clinical and Rehabilitative Medicine; and Systems Biology/Network Sciences.

Project (869) supports and matures knowledge and technologies, such as screening tools and preventive measures, for Post-Traumatic Stress Disorder and mild Traumatic Brain Injuries, physiological monitors to protect Soldiers from injuries due to exposure to hazardous environments and materials, and medically valid testing devices and predictive models used for the development of Soldier protective equipment. This project is being coordinated with the Defense Health Program.

Project (870) supports designing and developing medical diagnosis, protection and treatment against naturally occurring diseases and wound infections of military importance, as identified by worldwide medical surveillance and military threat analysis. This project is being coordinated with the Defense Health Program.

Project (873) supports research on the human immunodeficiency virus (HIV), which causes Acquired Immunodeficiency Syndrome (AIDS). Work in this area includes developing improved identification methods to determine genetic diversity of the virus, preclinical work in laboratory animals including non-human primates to identify candidates for future vaccine development, and evaluating and preparing overseas sites for future vaccine trials. This project is being coordinated with the Defense Health Program.

Project (874) supports identification and evaluation of drugs, biologics (products derived from living organisms), medical devices, and diagnostics for resuscitation, life support and post-evacuation restorative and rehabilitative care, as well as trauma care systems for use by field medics and surgeons. Research focus is on identifying more effective critical care technologies and protocols to treat severe bleeding, traumatic brain injury and other blast related injuries, and treatments for ocular injury and visual system dysfunction, as well as laboratory and animal studies of regenerating skin, muscle, nerves, and bone tissue for the care and treatment of battle-injured casualties. This project is being coordinated with the Defense Health Program.

Project (968) supports Congressional Interest Item funding for Cancer Detection applied research.

Project (FH2) funds research to support applied research directed toward the sustainment of a healthy force of Warfighters from accession through retirement.

Project (PA4) supports Congressional Interest Item funding for Nanofabricated Bioartificial Kidney applied research.

Project (UA8) supports Congressional Interest Item funding for BioFoam protein hydrogel for battlefield trauma.

Project (VB3) supports Congressional Interest Item funding for Medical Technology applied research.

Project (VB4) supports applied research in systems biology to provide a highly effective mechanism to integrate iterative biological tests, computer simulations, and animal studies. Such developmental efforts using systems biology could ultimately reduce the time and effort invested in medical product development. This project is being coordinated with the Defense Health Program.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army	DATE: February 2011
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Project (VJ4) supports project funds research over a planned five-year period to examine the mental and behavioral health of Soldiers to counter suicidal behavior. This work will focus on advancing the understanding of the multiple determinants of suicidal behavior, psychopathology (study of the causes and nature of abnormal behavior), psychological resilience, and role functioning. Work on this project is being performed by the National Institute of Mental Health through extramural cooperative research grants in collaboration with the Department of the Army. This project is being coordinated with the Defense Health Program.

All medical applied research is conducted in compliance with US Food and Drug Administration (FDA) or Environmental Protection Agency (EPA) regulations. The FDA requires thorough testing in animals (referred to as preclinical testing) to assure safety and, where possible, effectiveness (i.e., efficacy) prior to approving controlled clinical trials where these early (previously unproven in humans) drugs, vaccines, and medical devices are tested in humans. These clinical trials are conducted in three phases (Phase 1, 2, and 3) to prove safety and effectiveness of the drug/vaccine/device for the targeted disease/condition. Each successive clinical trial includes more voluntary study subjects. This PE focuses on identifying candidate solutions on rese

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	221.944	96.797	99.310	-	99.310
Current President's Budget	231.001	96.797	105.929	-	105.929
Total Adjustments	9.057	-	6.619	-	6.619
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	11.534	-			
• SBIR/STTR Transfer	-2.477	-			
• Adjustments to Budget Years	-	-	6.619	-	6.619

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COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
869: *Warfighter Health Prot & Perf Stnds*	33.933	34.718	38.740	-	38.740	39.710	38.206	32.371	25.123	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds research to prevent and protect Soldiers from training and operational injuries, the development of mechanisms for detection of physiological and psychological health problems, the evaluation of hazards to head, neck, spine, eyes, and ears, the standards for rapid return-to-duty, and the determination of new methods to sustain and enhance performance across the operational spectrum. This research provides medical information important to the design and operational use of military systems, and this work forms the basis for behavioral, training, pharmacological (drug actions), and nutritional interventions.

The four main areas of study are:

(1) Physiological Health
(2) Environmental Health and Protection
(3) Injury Prevention and Reduction
(4) Psychological Health and Resilience

Promising efforts identified in this project are further matured under PE 0603002A, project MM3.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD; US Army Research Institute of Environmental Medicine (USARIEM), Natick, MA; US Institute of Surgical Research (USAISR), Fort Sam Houston, TX; and the US Army Aeromedical Research Laboratory (USAARL), Fort Rucker, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Environmental Health and Protection - Physiological Awareness Tools and Warrior Sustainment in Extreme Environments	1.961	2.379	3.567
Description: This effort evaluates remote monitoring of Soldier physiological status and mitigating/eliminating the effects of heat, cold, altitude and other environmental stressors on Soldier performance.			
FY 2010 Accomplishments:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Employed hydration sensor technologies to conduct early device evaluations; determined the effectiveness of a 7- to 8-hour nighttime exposure to a normal-altitude, low-oxygen environment for high-altitude pre-acclimatization; evaluated current heat strain decision aid capabilities for potential future enhancement. ***FY 2011 Plans:*** Develop low-oxygen training guidelines based on analysis of low-oxygen exposure studies; perform biomedical modeling to define individual differences affecting heat regulation; develop methods and models to predict core temperature using identified thermal parameters. ***FY 2012 Plans:*** Will develop altitude acclimatization and work performance models for altitudes between 7,000 and 14,000 feet.			
Title: Physiological Health - Nutritional Sustainment and Fatigue Interventions ***Description:*** This effort evaluates methods for managing and controlling the effects of nutrition and fatigue on Soldier operational performance. ***FY 2010 Accomplishments:*** Demonstrated effectiveness of nutritional supplements for sustaining cognition during military operational stress; determined impact of nutritional supplements on enhancing post-exercise recovery; determined effectiveness of zinc supplements for reducing the incidence of diarrhea; developed models to study the relationship between hormonal regulation and eating behavior; evaluated individualized alertness and performance prediction model software for the Sleep Management System. ***FY 2011 Plans:*** Develop nutritional countermeasures (supplements taken to counter or offset injury or trauma) for diminished bone health in response to operational stress; define impact of micronutrient status on performance and immune function during military training; demonstrate protective effects of probiotics (dietary supplements) for sustaining digestive and immune function during operational stress; demonstrate effectiveness of nutritional supplements for promoting fat loss in overweight Warriors; conduct study to determine changes in sleep brain activity on Soldiers in theater; conduct a study to determine extent to which sleep duration impacts resilience/sensitivity to combat experiences. ***FY 2012 Plans:*** Will investigate whether there is any association between disturbances in nutritional health and the prevalence of Warfighter psychological disorders; will determine the impact of weight status on risk of musculoskeletal injury; will define the muscle	2.118	2.787	2.281

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
metabolic responses to energy deficit for development of treatment interventions; will determine impact of nutritional status on blast recovery; will demonstrate effectiveness of a non-prescription medication for promoting fat loss in overweight Warriors.			
Title: Injury Prevention and Reduction - Neurosensory Injury Prevention ***Description:*** This effort analyzes and models the effects of mechanical and operational stressors on Soldier performance, to include acoustic and impact trauma, vision, vibration and jolt to model the effects of these stressors on the brain, spine, eyes and hearing. ***FY 2010 Accomplishments:*** Characterized blunt-impact protection capabilities of current and future helmet designs to develop biomedically-valid criteria for US Army Test and Evaluation Command (ATEC) to develop realistic visual headforms and to model eye injury vulnerabilities for candidate protection solutions; developed auditory test fixtures/headforms for model hearing protection solutions; conducted assessment of candidate drugs to prevent hearing loss. ***FY 2011 Plans:*** Determine head injury thresholds in boxers and paratroopers for risk assessment and development of biomedically-valid criteria for use in materiel development; complete eye injury dose-response modeling for vulnerability assessments using the instrumented headform system; extend laser injury diagnostics to animal models; using improved headforms, will assess ear protection strategies with simulated battle sounds and conduct assessments of vulnerability models for jobs that define job-specific strategies and interventions; conduct comparative analysis of foam and preformed eartips for use with the Communications Earplug. ***FY 2012 Plans:*** Will determine thresholds of operationally relevant blunt head injury; complete additional eye injury dose-response modeling for the instrumented headform system; assess effectiveness of existing hearing protection in continuous high-noise training environments using otoacoustic emissions (sound generated within the inner ear, which can be used as a measure of inner ear health); will develop biomedically-based injury mechanism criteria to define auditory risk potential; will examine both biophysical and animal models of blast to characterize the nature and extent of effects on the eye.	10.237	8.926	7.176
Title: Injury Prevention and Reduction - Musculoskeletal Injury Prevention ***Description:*** This effort evaluates and assesses the effects of repetitive motion during military operations and training on the human body. ***FY 2010 Accomplishments:***	4.561	4.775	5.212

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Characterized performance deficits from Warfighter injury and identified promising interventions for rapid return-to-duty following musculoskeletal injury; provided high-resolution musculoskeletal injury data for use in the training and overuse injury prediction model; evaluated physical impact forces on the lower leg associated with prolonged running and fatigue; evaluated musculoskeletal adaptations in response to military-relevant training and injuries to assess mechanisms of skeletal muscle repair, regeneration, and adaptation. ***FY 2011 Plans:*** Develop recovery assessment tests that are used to develop return-to-duty recommendations after musculoskeletal injury; refine and validate the training, overuse, and injury prediction model to incorporate stress fracture data. ***FY 2012 Plans:*** Will develop and validate a model that will identify relationships among multi-sensory and musculoskeletal injuries; will develop and implement an injury risk methodology for remediation and prevention in an effort to mitigate lost duty-time due to musculoskeletal injury; will develop strategies to evaluate predictions and generalizations of musculoskeletal injuries.			
Title: Injury Prevention and Reduction - Injury Return to Duty Standards: ***Description:*** This effort evaluates standards and methods for the rapid return-to-duty of Soldiers following injury. ***FY 2010 Accomplishments:*** Characterized specific performance deficits from Warfighter brain, eye, and hearing injury as well as developed promising interventions for rapid return-to-duty; developed return-to-duty standards for mission-critical occupations following brain, eye, and hearing injury; determined appropriate clinical and physical health assessment tools to enable early return-to-duty. ***FY 2011 Plans:*** Develop measures of effectiveness for interventions with baseline criteria for Warriors with brain, eye, and hearing injury; develop preliminary techniques and technologies to accelerate and assist Wounded Warriors in rapid return to military duty. ***FY 2012 Plans:*** Will develop strategies to validate if hearing following blast or blunt trauma is a predictor of mild Traumatic Brain Injury (mTBI); will evaluate the human vestibular system (system which contributes to our sense of balance and spatial orientation) as a predictor of mTBI from blast and blunt trauma.	2.619	2.798	2.598
Title: Psychological Health - Psychological Resilience ***Description:*** This effort develops and validates interventions to prevent and reduce combat-related behavioral health problems, including symptoms of Post-Traumatic Stress Disorder (PTSD), depression, anger problems, anxiety, substance abuse, post-	5.023	5.219	15.197

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
concussive symptoms, and other health risk behaviors. This effort also assesses and develops interventions to enhance and sustain resilience throughout the service member?s career. ***FY 2010 Accomplishments:*** Revised Battlemind and integrated it into the Army's resilience training program sponsored by Comprehensive Soldier Fitness (G-3/5/7); developed initial recommendations for methods writing to increase efficacy of Post-Deployment Health Reassessment Battlemind Training; conducted two-group randomized trials at Basic Combat Training demonstrating the impact of performance psychology training on Soldier mental skills and performance. ***FY 2011 Plans:*** Finalize assessments of components of Advanced Battlemind; determine lessons-learned from post-deployment health assessments and healthcare utilization to determine outcomes of psychological disorders. ***FY 2012 Plans:*** Establish key targeted skills that leaders employ to effectively build resilience and handle behavioral health issues in their units. Develop training content for these leader skills. Conduct studies to assess efficacy of new advanced resilience training modules post-deployment and deliver validated training. Validate enhanced resilience training techniques and assess optimal training delivery strategies. Assess post-deployment reintegration strategies. Develop and assess efficacy of spouse resilience training to enhance mental health and reintegration. Provide evidence-based guidance for adequate resourcing of mental health services for military families.			
Title: Psychological Health & Resilience - Suicide Prevention and Treatment of PTSD ***Description:*** This effort supports investigation of methods to treat PTSD in a military population and identifies causative and preventive factors in military suicides. ***FY 2010 Accomplishments:*** Initiated a new research effort that evaluated PTSD risk factors, including co-occurring mTBI and mental health problems, as well as other factors (such as combat action and the stressors associated with single/ multiple deployments) to improve diagnostic capabilities; conducted a laboratory study to compare sensitivity of existing neurocognitive tests to PTSD; collected and evaluated all data on the suicide intervention programs. ***FY 2011 Plans:*** Conduct a laboratory study to determine effects of PTSD on objectively measured sleep and neurocognitive performance; conduct studies to assess effectiveness of suicide interventions on suicide behavior. ***FY 2012 Plans:***	5.183	5.193	1.013

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will conduct assessments to identify long-term effects of deployment (multiple and prolonged deployments, dwell time, and combat intensity) related to mental health symptoms (PTSD, etc) and other illnesses (respiratory, hearing, functional, and cognitive); will assess effectiveness of increasing suicide awareness training with decreasing suicide-related behaviors and intentions.			
Title: Psychological Health & Resilience - Concussion/Mild Traumatic Brain Injury (mTBI) Interventions ***Description:*** This effort develops and evaluates methods to detect and treat concussion as well as identify and evaluate the effects of cognitive deficits in Soldiers during operations. ***FY 2010 Accomplishments:*** Compared initial sensitivity and practicality of neuropsychological performance tests/batteries for diagnosis of concussion in Soldiers and civilians; conducted a study to determine susceptibility to concussion based upon baseline psychological and neurological functioning; determined short-term effects of concussion on sleep patterns and neurocognitive performance. ***FY 2011 Plans:*** Assess the utility of neuropsychological measures for tracking/monitoring recovery rate from concussion; conduct a study to determine predictive value of a neuropsychological test for subsequent pos-concussive symptoms; conduct a study to determine changes in sleep parameters coincident with concussion and correlate this data with changes in neuropsychological performance. ***FY 2012 Plans:*** Will determine if concussion/mTBI-related neurocognitive performance deficits predict other objective neurophysiological indicators of functional capability; will assess impact of neurocognitive measures for tracking/monitoring recovery rate and for providing guidance for the determination of return-to-duty status.	2.231	2.641	1.696
Accomplishments/Planned Programs Subtotals	33.933	34.718	38.740

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

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COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
870: *DOD MED DEF AG INF DIS*	17.091	13.914	16.869	-	16.869	16.603	16.797	16.898	17.186	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds applied research for medical countermeasures to naturally occurring infectious diseases that pose a significant threat to the operational effectiveness of forces deployed outside the United States. Effective preventive countermeasures (protective/therapeutic drugs and vaccines, insect repellents and traps) protect the force from disease and sustain operations by avoiding the need for evacuations from the theater of operations. Diseases of military importance are malaria, bacterial diarrhea, and viral diseases (e.g., dengue fever and hantavirus). In addition to countermeasures, this project funds development of improved diagnostic tools to facilitate early identification of infectious disease threats in an operational environment, informing Commanders of the need to institute preventive actions and improved medical care. Major goals are to integrate genomics (DNA-based) and proteomics (protein-based) as well as other new biotechnologies into the development of new concepts for new vaccine, drug, and diagnostics candidates.

Research conducted in this project focuses on the following five areas:

(1) Drugs to Prevent/Treat Parasitic (symbiotic relationship between two organisms) Diseases
(2) Vaccines for Preventing Malaria
(3) Bacterial Threats
(4) Diagnostics and Disease Transmission Control
(5) Viral threats

For the development of drugs and biological products, studies in the laboratory and in animal models provide a proof-of-concept for these candidate products including safety, toxicity, and effectiveness, and are necessary to provide evidence to the US Food and Drug Administration (FDA) to justify approval for a product to enter into future human subject testing. Additional non-clinical studies are often needed in Applied Research even after candidate products enter into human testing during Advanced Technology Development, usually at the direction of the FDA, to assess potential safety issues. Drug and vaccine development bears high technical risk. Of those candidates identified as promising in initial screens, the vast majority are eliminated after additional safety, toxicity, and/or effectiveness testing. Similarly, vaccine candidates have a high failure rate, as animal testing may not be a good predictor of human response, and therefore candidate technologies/products are often eliminated after going into human trials. Because of this high failure rate, a continuing effort to identify other potential candidates to sustain a working pipeline of countermeasures is critical for replacing those products that fail in testing.

Work is managed by the US Army Medical Research and Materiel Command in coordination with the Naval Medical Research Center. The Army is responsible for programming and funding all DoD naturally occurring infectious disease research requirements, thereby precluding duplication of effort within the Military Departments.

Promising medical countermeasures identified in this project are further matured under PE 0603002A, project 810.

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The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD, and its overseas laboratories; the US Army Medical Research Institute of Infectious Diseases (USAMRIID), Fort Detrick, MD; and the Naval Medical Research Center (NMRC), Silver Spring, MD, and its overseas laboratories.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Drugs to Prevent/Treat Parasitic Diseases (harmful effects on host by an infecting organism) ***Description:*** This effort conducts assessments and improves candidate drugs coming from the DoD discovery program and from other collaborations for prevention and treatment of malaria to counter the continuing spread of drug resistance to current drugs. Conducts assessments in animal models of currently available drugs for use against cutaneous leishmaniasis (a skin-based disease transmitted by sand flies). This program selects the most effective and safe candidates for continued development and possible clinical testing. ***FY 2010 Accomplishments:*** Optimized chemical compounds that have potential to be effective drugs against malaria and/or leishmaniasis, including new candidates. Completed optimization of one lead malaria drug to test in animals, and prepared for possible initial testing in humans. ***FY 2011 Plans:*** Synthesize promising compounds in larger quantities to support preclinical studies. Drugs against malaria and/or leishmaniasis are further screened in animal tests for toxicity and effectiveness. Complete testing and prepare for FDA application for clinical testing in humans. ***FY 2012 Plans:*** Will undertake preclinical effectiveness and toxicity evaluations of selected antiparasitic compounds, both in vitro (outside the body) and in vivo (within a living organism) in rat/nonhuman primates and down-select for advancement to clinical studies in human.	4.570	3.385	3.925
Title: Vaccines for Prevention of Malaria ***Description:*** This effort conducts studies to investigate new candidate vaccines for preventing malaria, and selects the best candidate(s) for continued development. A highly effective vaccine would reduce or eliminate the use of anti-malarial drugs and would minimize the progression and impact of drug resistance to current/future drugs. ***FY 2010 Accomplishments:***	4.323	2.798	4.661

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Manufactured and tested DNA-based Plasmodium falciparum (the severe form of malaria) vaccine candidates in animal models to support a new vaccine application with the FDA; filed the FDA application to test these candidates in humans; evaluated the safety and effectiveness in animals of DNA-based Plasmodium falciparum vaccine candidates. ***FY 2011 Plans:*** Down-select among the vaccine candidates based on results from safety and effectiveness studies in animals; prepare for vaccine testing in locations where the disease occurs naturally. ***FY 2012 Plans:*** Will select candidate antigens (substance that when introduced into the body stimulates the production of an antibody) for further evaluation in preclinical testing and advance those candidates demonstrating effectiveness in primate testing toward further development.			
Title: Diagnostics and Disease Transmission Control: ***Description:*** This effort designs and prototypes new medical diagnostic and surveillance tools for the field, focusing on bedside and field-deployable diagnostic systems. Develops interventions that protect Warfighters from biting insects, such as sand flies (responsible for transmitting leishmaniasis) and mosquitoes (responsible for transmitting a variety of diseases including dengue fever, Japanese encephalitis, and malaria). ***FY 2010 Accomplishments:*** Developed passive insect repellent systems that do not require application of chemicals to skin or clothing; evaluated new tests for detecting infectious organisms within insects that transmit diseases; validated field-deployable point-of-care diagnostic devices to prepare for FDA review; developed a repository of standardized critical reagents for producing consistent reproducible results in both laboratory and field-based diagnostic devices. ***FY 2011 Plans:*** Develop super-attractant traps that remove biting insects from localized areas; conduct proof-of-concept testing of passive insect repellent systems; optimize hospital-based diagnostic devices for selected infectious disease agents to be transitioned to the Joint Biological Agent Identification System (JBAIDS) platform; increase repositories of clinical samples and reagents needed to develop and validate multiple new disease-specific diagnostic devices. ***FY 2012 Plans:***	2.100	2.070	1.709

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will develop and optimize a multi-drug resistant organism diagnostic tool in collaboration with a commercial partner; will transition the dengue virus diagnostic test for the JBAIDS platform to advanced development following preclinical trials; will determine the next group of pathogens for which to develop rapid diagnostic tools with commercial partnership.			
Title: Viral Threats Research ***Description:*** This effort designs and laboratory tests new vaccine candidates against dengue and other hemorrhagic fever viruses (severe viral infection that causes internal bleeding) such as hantaviruses (cause of Korean hemorrhagic fever) and other lethal viruses (i.e., Lassa fever and Crimean-Congo hemorrhagic fever), as well as assesses other non-vaccine technologies to protect against such lethal viral diseases. ***FY 2010 Accomplishments:*** Developed reagents, assays, and animal models to test medical countermeasures for hantaviruses; developed molecular vaccines and antibody-based countermeasures for flaviviruses (dengue fever, a severe debilitating disease caused by a virus and transmitted by a mosquito); explored the feasibility of combining inactivated, molecular, and attenuated vaccines into a single vaccine that is effective against four dengue fever strains. ***FY 2011 Plans:*** Develop proof-of-concept molecular vaccines for viruses of military importance and support vaccine candidate development by providing necessary laboratory and animal tests; provide laboratory support for dengue fever vaccine testing in humans. ***FY 2012 Plans:*** Will continue to develop proof-of-concept molecular vaccines for viruses of military importance; will conduct effectiveness studies to develop and/or maintain vaccine test site infrastructure; will refine and validate assays in animal studies for future testing of dengue fever vaccine trials; will establish partnerships with industry for pre-clinical and clinical evaluation of medical countermeasures.	2.484	2.861	2.989
Title: Bacterial Threats ***Description:*** This effort conducts studies to develop antibacterial countermeasures, including vaccine candidates, to prevent diarrhea (a common disease in deployed troops caused by E. coli, Campylobacter and Shigella), meningitis (a threat to trainee and deployed troops and military families), wound infection, and scrub typhus (a debilitating mite-borne disease that is developing resistance to currently available antibiotics). ***FY 2010 Accomplishments:*** Completed evaluation of E. coli subunit vaccine in monkeys; evaluated alternative Shigella constituents as potential vaccine candidates in animals; manufactured lead candidate Campylobacter vaccine for evaluation in humans; transitioned a	3.614	2.800	3.585

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 870: *DOD MED DEF AG INF DIS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
multicomponent Group B meningococcal vaccine to the next phase of development; evaluated scrub typhus for drug resistance, identified new proteins as candidate vaccine components, and evaluated vaccine delivery methods in animals; evaluated new therapeutic approaches to accelerate wound healing, such as vacuum-assisted closure of wounds using binding agents to kill bacteria. ***FY 2011 Plans:*** Prepare an alternative E. coli vaccine for testing in humans; evaluate alternative Shigella constituents as potential vaccine candidates in animals; test lead candidate Campylobacter vaccine in animals; continue to evaluate scrub typhus for drug resistance, identify new proteins as candidate vaccine components, and evaluate vaccine delivery methods in animals. ***FY 2012 Plans:*** Will determine level of protection of alternative E. coli vaccine in animal challenge studies (animal vaccinated and challenged with bacteria causing diarrhea); will perform animal and toxicology studies on alternative (Invaplex-AR) Shigella vaccine; will conduct human clinical trials on 12 to 24 healthy volunteers to determine safety of best lead candidate Campylobacter vaccine; will perform animal wound infection studies on several candidate products to prevent wound infection and biofilm (thin resistant layer of microorganisms that helps bacteria survive in wounds) formation.			
Accomplishments/Planned Programs Subtotals	17.091	13.914	16.869

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 873: *HIV EXPLORATORY RSCH*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
873: *HIV EXPLORATORY RSCH*	8.914	9.243	9.392	-	9.392	9.582	9.638	9.584	9.747	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds research on the human immunodeficiency virus (HIV), which causes Acquired Immunodeficiency Syndrome (AIDS). Work in this area includes developing improved identification methods to determine genetic diversity of the virus, and evaluating and preparing overseas sites for future vaccine trials. Additional activities include developing candidate vaccines for preventing HIV and undertaking preclinical studies (studies required before testing in humans) to assess vaccine for potential to protect and/or manage the disease in infected individuals.

This program is jointly managed through an Interagency Agreement between the US Army Medical Research and Materiel Command and the National Institute of Allergy and Infectious Diseases of the National Institutes of Health. This project contains no duplication of effort within the Military Departments or other government organizations.

Work is related to and fully coordinated with work funded in PE 0603105A, project H29.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Walter Reed Army Institute of Research (WRAIR) and the Naval Medical Research Center (NMRC), Silver Spring, MD, and their overseas laboratories. The Henry M. Jackson Foundation (HMJF), located in Rockville, MD provides support for FDA testing and other research under a cooperative agreement.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: HIV Research Program	8.914	9.243	9.392
Description: This effort supports projects assessing new HIV vaccine candidates, worldwide vaccine test site development, HIV disease outbreaks, and genetic attributes of HIV threat.			
FY 2010 Accomplishments: Continued to identify and characterize different HIV subtypes present in East Africa and Asia involved with the global epidemic of HIV-infected populations to include in vaccine development strategy; developed new human study test sites in Uganda to expand testing facilities, including production of new vaccine candidates against selected HIV subtypes found in East Africa; controlled production quality of new vaccine candidates to be used in humans.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 873: *HIV EXPLORATORY RSCH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Test the new East African subtype-based candidate vaccine in animals; identify and characterize new HIV infections; develop new field sites in Tanzania and Nigeria for future testing of vaccine candidates in humans; identify manufacturing processes with multiple combinations of vaccine candidates. ***FY 2012 Plans:*** Will characterize and develop new populations at high risk of being infected with HIV for clinical evaluation of potential vaccine candidates at overseas sites; will study the impact of human genetics on HIV vaccine development, disease acquisition, and disease progression; will manufacture vaccines for various HIV subtypes present worldwide and complete testing in animals; will evaluate and implement methods of disease prevention through clinical research.			
Accomplishments/Planned Programs Subtotals	8.914	9.243	9.392

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 874: *CBT CASUALTY CARE TECH*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
874: *CBT CASUALTY CARE TECH*	17.363	16.782	17.044	-	17.044	17.417	17.293	17.171	17.486	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds the development and assessment of concepts, techniques, and materiel that improve survivability and ensure better medical treatment outcomes for Warfighters wounded in combat and other military operations. Combat casualty care research addresses: control of severe bleeding, revival and stabilization, prognostics and diagnostics for life support systems (predictive indicators and decision aids), treatment of burns, and Traumatic Brain Injury (TBI). Clinical and rehabilitative medicine research addresses: tissue repair including transplant technologies, orthopedic, eye injuries and face trauma.

Research involves extensive collaboration with multiple academic institutions to develop treatments for combat wounds through the Armed Forces Institute of Regenerative Medicine. This project contains no duplication of effort within the Military Departments or other government organizations.

Research conducted in this project focuses on the following five areas:

(1) Damage Control Resuscitation
(2) Combat Trauma Therapies
(3) Combat Critical Care Engineering
(4) Clinical and Rehabilitative Medicine
(5) Traumatic Brain Injury

All drugs, biological products, and medical devices, are developed in accordance with US Food and Drug Administration regulations, which governs testing in animals to assess safety, toxicity, and effectiveness prior to conducting human subject clinical trials.

Promising efforts identified in this project are further matured under PE 0603002A, project 840.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work on this project is performed by the US Army Institute of Surgical Research (USAISR), the US Army Dental Trauma Research Detachment, Fort Sam Houston, TX; the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD; and the Armed Forces Institute of Regenerative Medicine (AFIRM), Fort Detrick, MD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Damage Control Resuscitation	5.697	7.405	5.170

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 874: *CBT CASUALTY CARE TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort supports knowledge products, materials, and systems for control of internal bleeding, minimizing the effects of traumatic blood loss, preserving blood, blood products, and resuscitation following trauma. ***FY 2010 Accomplishments:*** Continued animal studies of freeze-dried plasma; developed and evaluated performance of candidate blood substitutes and expanders (e.g., frozen and freeze-dried platelets); tested treatment interventions to stop internal bleeding in an animal model; characterized the body's blood clotting mechanism associated with head injury bleeding and other trauma to identify ways to better control clotting and determine the effects on resuscitation; continued evaluation in animal models of various combinations of plasma, clotting factors, and Complement Inhibitors (CI's) (a series of disease-fighting proteins and their reactions in the body) as therapies to stop severe bleeding and treat trauma. ***FY 2011 Plans:*** Complete identification and characterization of frozen and freeze-dried blood substitutes and expanders; complete testing of interventions to stop internal bleeding and transition most promising candidates to safety and effectiveness testing in human subjects; continue to identify and assess potential ways to control blood clotting; begin investigation of treatment interventions to mitigate effects of head injury on resuscitation; begin to evaluate products to treat intracavitary (non-compressible) or junctional (compressible) hemorrhage; complete animal study of blood components and CI's. ***FY 2012 Plans:*** Will initiate studies of blood vessels, platelets (cell fragments that play a role in blood clotting), and coagulation (blood clotting) factor contributions to the body?s ability to properly clot blood following trauma, as well as determine whether blood products cause inflammation.			
Title: Combat Trauma Therapies ***Description:*** This effort supports efforts to enhance the ability to diagnose and stabilize casualties with survivable wounds to the brain, face and head, and extremities to include accelerating wound healing and repair of damaged tissue. ***FY 2010 Accomplishments:*** Began several injury studies of Penetrating Ballistic-type Brain Injury (PBBI) in large animals; conducted animal study of oral surgical dressing; evaluated promising repair methods in laboratory and animal models. ***FY 2011 Plans:*** Continue poly-trauma studies (multiple injuries) of PBBI in large animals; complete oral surgical dressing study; continue to develop therapeutic strategies (drugs, stem cells and brain cooling) to manage TBI. ***FY 2012 Plans:***	4.031	3.168	1.634

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 874: *CBT CASUALTY CARE TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will develop local antibiotic delivery that can be used with Negative Pressure Wound Therapy; conduct studies of pre- vs. post-deployment dental classification; conduct research in skin, muscle, and bone repair. Work related to neuroprotection research will move to the TBI program. Regenerative efforts in craniomaxillofacial trauma (soft tissue and skeletal injuries to the face, head and neck) will move to the Clinical and Rehabilitative Medicine Research Program.			
Title: Combat Critical Care Engineering ***Description:*** This effort supports development of diagnostic and therapeutic medical devices as well as associated algorithms, software, and data-processing systems for resuscitation, stabilization, life support, and surgical support that can be applied across the pre-hospital, operational field setting and initial definitive care facilities. ***FY 2010 Accomplishments:*** Conducted large animal studies evaluating change in electrical signals in the brain as a way to measure the degree of shock from blood loss. ***FY 2011 Plans:*** Evaluate algorithms being developed to control devices delivering oxygen under conditions of varying rates and levels of respiration, as well as for ability to track resuscitation in real-time; continue testing devices for use in intensive care units. ***FY 2012 Plans:*** Will develop advanced monitoring technology to rapidly and accurately detect early-onset of blood loss, continuously estimate blood loss volume, and predict patient's risk for cardiovascular collapse.	1.228	1.409	0.751
Title: Clinical and Rehabilitative Medicine ***Description:*** This effort supports laboratory and animal studies of regenerating skin, muscle, nerve and bone tissue for the care and treatment of battle-injured casualties, as well as studies regarding ocular and visual system traumatic injury. ***FY 2010 Accomplishments:*** Conducted studies of compounds to reduce cellular damage during compartment syndrome (nerve or tendon constriction in an enclosed space) in laboratory and animal models; tested a tissue-engineered functional human facial expression muscle; evaluated a biodegradable tissue-lined stent; tested reconstruction of a facial defect in the skull by using synthetic bone scaffold material; tested a dressing that mimics fetal skin structure to prevent wound scarring. ***FY 2011 Plans:*** Conduct studies using relevant animals to evaluate the most promising treatments for repairing traumatic eye injuries; continue regenerative medicine studies addressing ways to construct a nerve conduit scaffold to provide a guide for nerve regeneration;	6.407	4.800	7.706

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 874: *CBT CASUALTY CARE TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
evaluate engineered cartilage; study methods to reduce post-burn injury progression by use of inflammation inhibitors and agents to prevent cell death; explore the use of stem cells to repair soft and hard tissue defects. ***FY 2012 Plans:*** Will evaluate novel drug delivery, diagnostic and/or tissue repair strategies for eye injury; and evaluate candidate strategies for maxillofacial (head, neck, face and jaw) reconstruction, including wound-healing control and tissue engineering/regeneration techniques to restore facial features. Continue development and standardization of animal models for an artificial means for guiding nerve regeneration; continue studies of chronic bone defect and burn repair; continue studies of soft tissue repair strategies; continue development and testing of experimental stem cell therapies and scaffolds (tissue-engineered grafts) in animal models.			
Title: Traumatic Brain Injury ***Description:*** This effort supports development of drugs and therapeutic strategies to manage brain injury resulting from battlefield trauma, to include mature drug technologies, novel stem cell strategies, and selective brain cooling. ***FY 2012 Plans:*** Will realign neuroprotection research from the Combat Trauma Therapies task area to the TBI task area. Will continue studies of a single and combination drug therapies of silent seizures, animal studies of stem cell therapy for repair of brain tissue, and optimizing cooling temperature and duration of cooling to improve functional recovery.	-	-	1.783
Accomplishments/Planned Programs Subtotals	17.363	16.782	17.044

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 878: *HLTH HAZ MIL MATERIEL*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
878: *HLTH HAZ MIL MATERIEL*	-	0.078	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports the Medical and Survivability technology areas with a focus on providing Soldier protection from health hazards associated with materiel and operational environments. Emphasis is placed on identifying health hazards inherent to the engineering design and operational use of equipment, systems, and materiel used in Army combat operations and training. Areas of emphasis include battlefield lasers, ballistic and mechanical injury (e.g., models of protection by soft body armor), and health hazards of operations in extreme environments and toxic environments. Hazards addressed include blast overpressure generated by weapons systems, toxic chemical hazards associated with deployment into environments contaminated with industrial and agricultural chemicals (effort complements ongoing Defense Threat Reduction Agency initiatives for chemical/biological threat agent detection), directed energy sources (laser), and environmental stressors (heat, cold, and high altitude). Specific research tasks include characterizing the extent of exposure to potential hazards; delineating exposure thresholds for illness, injury, and performance degradation; establishing biomedical databases to support protection criteria; and developing and validating models for hazard assessment, injury prediction, and health and performance protection.

In FY10, project 878 was consolidated into Project 869.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Mater Plan.

Work in this project is performed by the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD; the US Army Research Institute of Environmental Medicine (USARIEM), Natick, MA; the US Army Center for Environmental Health Research, Fort Detrick, MD; and the US Army Aeromedical Research Laboratory, Fort Rucker, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Systems Biology	-	0.078	-
Description: Systems Biology and Network Science			
FY 2011 Plans: Beginning in FY10, this effort moved to project 869.			
Accomplishments/Planned Programs Subtotals	-	0.078	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 878: *HLTH HAZ MIL MATERIEL*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 879: *MED FACT ENH SOLD EFF*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
879: *MED FACT ENH SOLD EFF*	-	0.106	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports applied research with a focus on sustaining and enhancing Soldier health and performance during military operations in the full spectrum of military environments. Emphasis is placed on the identification of baseline physiological performance and assessment of degradations produced by operational stressors. The resulting databases and collection of rules and algorithms for performance degradation in multi-stressor environments form the basis for the development of behavioral, training, pharmacological, and nutritional interventions that include psychological debriefing to prevent degradation in Soldier health and sustain Soldier performance. Key stressors include psychological stress from isolation, new operational roles, frequent deployments, inadequate restorative sleep, prolonged physical effort, and inadequate hydration in extreme environments. This project also assesses the adverse effect of shifting biological rhythms during deployments across multiple time zones (extreme jet lag), night operations, and thermal as well as altitude stress.

In FY10, project 879 was consolidated into project 869.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD; the US Army Research Institute of Environmental Medicine, Natick, MD; and the US Army Aeromedical Research Laboratory, Fort Rucker, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: High Altitude Research	-	0.106	-
Description: High Altitude Research ***FY 2011 Plans:*** Beginning in FY10, this effort was consolidated into project 869.			
Accomplishments/Planned Programs Subtotals	-	0.106	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 879: *MED FACT ENH SOLD EFF*

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT 968: *SYNCH BASED HI ENERGY RADIATION BEAM CANCER DETECT*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
968: *SYNCH BASED HI ENERGY RADIATION BEAM CANCER DETECT*	5.969	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Cancer Detection applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Synchrotron-Based Scanning Research with the Neuroscience and Proton Institute	5.969	-	-
Description: This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Conducted research into Synchrotron-Based Scanning with the Neuroscience and Proton Institute.			
Accomplishments/Planned Programs Subtotals	5.969	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT FH2: *FORCE HEALTH PROTECTION - APPLIED RESEARCH*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
FH2: *FORCE HEALTH PROTECTION - APPLIED RESEARCH*	7.995	10.779	9.136	-	9.136	7.127	7.212	7.376	7.493	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds research to support applied research directed toward the sustainment of a healthy force of Warfighters from accession through retirement. This research focuses on enhanced protection of Soldiers against health threats in military operations and training. Stressors that adversely affect individual Soldier health readiness are identified and studied to develop interventions that will protect Soldiers and improve their health and performance in stressful environments. This is follow-on research that extends and applies findings from over a decade of research on Gulf War Illnesses and other chronic multi-symptom illnesses that have suspected nerve and behavioral alterations due to environmental contaminants and deployment stressors. Key databases include the Millennium Cohort Study and the Total Army Injury and Health Outcomes Database. These databases allow us to evaluate interactions of psychological stress and other deployment and occupational stressors that affect Warfighter health behaviors.

Force Health Protection applied research is conducted in close coordination with the Department of Veterans Affairs. This project contains no duplication with any effort within the Military Departments and includes direct participation by other Services working on Army projects.

Research conducted in this project focuses on the following three areas:

(1) Physiological Response and Blast and Blunt Trauma Models of Thoracic (chest) and Pulmonary (lung) Injuries
(2) Millennium Cohort Research
(3) Biomarkers of Exposure and Environmental Biomonitoring.

Promising efforts identified in this project are further matured under PE 0603002A, project FH4.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the US Army Center for Environmental Health Research, Fort Detrick, MD; the Naval Health Research Center (NHRC), San Diego, CA; and the US Army Research Institute of Environmental Medicine (USARIEM), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Millennium Cohort Research	3.289	4.212	4.401

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT FH2: *FORCE HEALTH PROTECTION - APPLIED RESEARCH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort supports a long-term study of Soldiers that includes psychological, physical, and spiritual impacts of military service throughout their lifetime. ***FY 2010 Accomplishments:*** Performed analyses of newly reported Post-Traumatic Stress Disorder (PTSD), depression, and anxiety symptoms among Millennium Cohort participants in conjunction with increased mental and physical health problems; linked Millennium Cohort data with DoD and Veteran Administration health risk databases; conducted long-term studies to investigate the use of tobacco and alcohol among Service members in order to provide policy recommendations that enhance the long-term health of deploying forces. ***FY 2011 Plans:*** Conduct analyses to determine resilience factors for PTSD symptoms over time; conduct analysis to determine factors that influence resistance to depression symptoms over time and enhance mental resilience in deploying forces; conduct death analysis with specific interest in modifying factors for post-combat suicide. ***FY 2012 Plans:*** Will develop policy recommendations and potential intervention strategies for reduction of PTSD, depression, and anxiety symptoms and factors with a goal to reduce overall mental health symptoms.			
Title: Biomarkers of Exposure and Environmental Biomonitoring ***Description:*** This effort supports development and evaluation of methods to detect environmental contamination and toxic exposure during military operations. ***FY 2010 Accomplishments:*** Reviewed available sensor technology and conducted down-selection of sensors best suited to meet user performance requirements; evaluated biomarkers of exposure to selected Militarily Relevant Chemicals (MRCs) and evaluated relevant toxicity pathways to develop a method to detect toxic exposure in Soldiers. ***FY 2011 Plans:*** Evaluate biomarkers of exposure to additional MRCs; evaluate and accelerate discovery methods for new biomarkers; optimize individual toxicity sensor performance and minimize system components to comply with logistical deployment requirements for use in the final increment of the Environmental Sentinel Biomonitor.	2.546	2.936	-
Title: Physiological Response and Blast and Blunt Trauma Models of Thoracic (Chest) and Pulmonary (Lung) Injury	2.160	3.631	4.735

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT FH2: *FORCE HEALTH PROTECTION - APPLIED RESEARCH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort supports modeling and assessment of the combined effects of blast, impact, and ballistic trauma on the chest and lung system. ***FY 2010 Accomplishments:*** Conducted modeling of lung function disruption due to blunt-force trauma to the chest; combined thoracic (chest) blunt trauma model with performance decrement models and compared with large animal exercise data for the development of advanced survivability assessment and health hazard analysis tools. ***FY 2011 Plans:*** Refine combined thoracic (chest) blunt trauma/physiology models against combined thoracic blunt trauma and inhalation large animal exposure tests; combine thoracic blast trauma model with performance decrement models to develop an integrated tool for survivability assessment and health hazard analysis. ***FY 2012 Plans:*** Will develop software that evaluates the combined physiological effects of toxic gas exposure; will assess software that estimates lung, heart, and rib injury from blunt trauma due to debris impact (secondary blast injury); will assess increased functionality and support end-users for health hazard assessment, survivability assessment, and personal protection evaluation and improvement.			
Accomplishments/Planned Programs Subtotals	7.995	10.779	9.136

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT PA4: *WOUND HEALING PROJECT (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
PA4: *WOUND HEALING PROJECT (CA)*	1.989	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Wound Healing applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Rapid Wound Healing Technology Development	1.989	-	-
Description: This is a Congressional Interest Item.			
FY 2010 Accomplishments: Researched rapid wound healing technology.			
Accomplishments/Planned Programs Subtotals	1.989	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT UA8: *PROTEIN HYDROGEL (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
UA8: *PROTEIN HYDROGEL (CA)*	0.796	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Protein Hydrogel applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: BioFoam Protein Hydrogel for Battlefield Trauma	0.796	-	-
Description: This is a Congressional Interest Item.			
FY 2010 Accomplishments: Researched biofoam protein hydrogel for battlefield trauma.			
Accomplishments/Planned Programs Subtotals	0.796	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*	125.821	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Medical Technology applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Cancer Prevention Through Remote Biological Sensing ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Cancer Prevention Through Remote Biological Sensing	1.592	-	-
Title: Center for Injury Biomechanics ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Center for Injury Biomechanics	3.978	-	-
Title: Impact of Intensive Lifestyle Modification on Chronic Medical Conditions ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Impact of Intensive Lifestyle Modification on Chronic Medical Conditions	1.492	-	-
Title: Neuroscience Research Consortium to Study Spinal Cord Injury ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Neuroscience Research Consortium to Study Spinal Cord Injury	1.194	-	-
Title: Cold Spring Harbor Laboratory Women's Cancer Genomics Center ***Description:*** This is a Congressional Interest Item.	2.387	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Cold Spring Harbor Laboratory Women's Cancer Genomics Center			
Title: New Vaccines to Fight Respiratory Infection ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** New Vaccines to Fight Respiratory Infection	4.775	-	-
Title: Complementary and Alternative Medicine Research (MIL-CAM) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Complementary and Alternative Medicine Research (MIL-CAM)	5.173	-	-
Title: Lehman Injury Research Center-Ryder Trauma Center ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Lehman Injury Research Center-Ryder Trauma Center	3.183	-	-
Title: Advanced Functional Nanomaterials for Biological Processes ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Advanced Functional Nanomaterials for Biological Processes	2.387	-	-
Title: Battlefield Research Accelerating Virtual Environments for Mil Indiv Neuro Disorders (BRAVEMIND) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Battlefield Research Accelerating Virtual Environments for Mil Indiv Neuro Disorders (BRAVEMIND)	0.995	-	-
Title: Control of Vector-Borne Diseases ***Description:*** This is a Congressional Interest Item.	2.387	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Control of Vector-Borne Diseases			
Title: Extended Duration Silver Wound Dressing-Clinical Trials ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Extended Duration Silver Wound Dressing-Clinical Trials	0.796	-	-
Title: Nano-Imaging Agents for Early Disease Detection ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Nano-Imaging Agents for Early Disease Detection	0.796	-	-
Title: Self-Powered Prosthetic Limb Technology ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Self-Powered Prosthetic Limb Technology	1.592	-	-
Title: Development of Drugs for Malaria and Leishmaniasis in US Military and Civilian Personnel ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Development of Drugs for Malaria and Leishmaniasis in US Military and Civilian Personnel	3.104	-	-
Title: Expansion and Development, Upper and Lower Bionic Limbs ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Expansion and Development, Upper and Lower Bionic Limbs	1.990	-	-
Title: Optical Neural Techniques for Combat/Post-Trauma Healthcare ***Description:*** Optical Neural Techniques for Combat/Post-Trauma Healthcare	3.482	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: This is a Congressional Interest Item.			
Title: National Eye Eval & Research Network (NEER)-Clinical Trials of Orphan Retinal Degenerative Diseases ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** National Eye Eval & Research Network (NEER)-Clinical Trials of Orphan Retinal Degenerative Diseases	2.387	-	-
Title: New York Medical College Bioterrorism Research ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** New York Medical College Bioterrorism Research	0.131	-	-
Title: Center for Engineered Biomedical Devices ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Center for Engineered Biomedical Devices	0.286	-	-
Title: Lightweight, Battery Driven and Battlefield Deployment Ready NG Feeding Tube Cleaner ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Lightweight, Battery Driven and Battlefield Deployment Ready NG Feeding Tube Cleaner	0.496	-	-
Title: Eye Trauma and Visual Restoration ***Description:*** Eye Trauma and Visual Restoration ***FY 2010 Accomplishments:*** This is a Congressional Interest Item.	0.795	-	-
Title: Carbide-Derived Carbon for Treatment of Combat Related Sepsis ***Description:*** This is a Congressional Interest Item.	0.796	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Carbide-Derived Carbon for Treatment of Combat Related Sepsis			
Title: Clinical Trial to Investigate Efficacy of Human Skin Substitute ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Clinical Trial to Investigate Efficacy of Human Skin Substitute	0.796	-	-
Title: Cleveland Clinic Rehabilitation Research ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Cleveland Clinic Rehabilitation Research	0.796	-	-
Title: Military Family Empowerment Initiative ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Military Family Empowerment Initiative	0.796	-	-
Title: Myositis Association-Exposure to Environmental Toxins ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Myositis Association-Exposure to Environmental Toxins	0.995	-	-
Title: Nanofiber Based Synthetic Bone Repair Devices for Limb Salvage ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Nanofiber Based Synthetic Bone Repair Devices for Limb Salvage	0.995	-	-
Title: Regenerative Medicine for Battlefield Injuries ***Description:*** This is a Congressional Interest Item.	0.995	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Regenerative Medicine for Battlefield Injuries			
Title: Center for Bone Repair and Military Readiness ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Center for Bone Repair and Military Readiness	1.194	-	-
Title: Flu Vaccine Technology Program ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Flu Vaccine Technology Program	1.194	-	-
Title: Non-Leaching Antimicrobial Surface for Orthopedic Devices ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Non-Leaching Antimicrobial Surface for Orthopedic Devices	1.194	-	-
Title: Technology Solutions for Brain Cancer Detection and Treatment ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Technology Solutions for Brain Cancer Detection and Treatment	1.194	-	-
Title: Westchester County Medical Center Health Imaging Upgrades ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Westchester County Medical Center Health Imaging Upgrades	1.194	-	-
Title: Stabilized Hemoglobin Wound Healing Development ***Description:*** This is a Congressional Interest Item.	1.194	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Stabilized Hemoglobin Wound Healing Development			
Title: Alginate Oligomers to Treat Infectious Microbial Biofilms ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Alginate Oligomers to Treat Infectious Microbial Biofilms	1.592	-	-
Title: Diabetes Care in the Military ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Diabetes Care in the Military	1.592	-	-
Title: Evaluation of Integrative Approaches to Resilience ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Evaluation of Integrative Approaches to Resilience	1.592	-	-
Title: Neuro-Performance Research ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Neuro-Performance Research	1.592	-	-
Title: Portable Low-Volume Therapy for Severe Blood Loss ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Portable Low-Volume Therapy for Severe Blood Loss	1.592	-	-
Title: Regenerative Medicine Research ***Description:*** This is a Congressional Interest Item.	1.592	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Regenerative Medicine Research			
Title: Research to Develop Strategies to Improve Prognosis of Soldiers Suffering Abdominal Trauma ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Research to Develop Strategies to Improve Prognosis of Soldiers Suffering Abdominal Trauma	1.592	-	-
Title: Research to Treat Cancerous Brain Tumors using Neural Stem Cells ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Research to Treat Cancerous Brain Tumors using Neural Stem Cells	1.592	-	-
Title: Lightweight Medical Devices ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Lightweight Medical Devices	1.592	-	-
Title: Epigenetic Disease Research ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Epigenetic Disease Research	1.592	-	-
Title: Neuroprosthetics and BioMEMS Development Project ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Neuroprosthetics and BioMEMS Development Project	1.592	-	-
Title: Minimizing Shock in Battlefield Injuries ***Description:*** This is a Congressional Interest Item.	1.892	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Minimizing Shock in Battlefield Injuries			
Title: Jackson Health System Military Trauma Training Enhancement Initiative ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Jackson Health System Military Trauma Training Enhancement Initiative	1.989	-	-
Title: Operating Room of the Future ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Operating Room of the Future	1.990	-	-
Title: School of Nursing Advancement ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** School of Nursing Advancement	1.990	-	-
Title: Identification of New Drug Targets in Multi-Drug Resistant Bacterial Infections ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Identification of New Drug Targets in Multi-Drug Resistant Bacterial Infections	1.990	-	-
Title: Long-term Pain and Infection Management for Combat Casualty Care ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Long-term Pain and Infection Management for Combat Casualty Care	2.308	-	-
Title: Florida Trauma Rehabilitation Institute for Returning Military Personnel ***Description:*** This is a Congressional Interest Item.	2.386	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Florida Trauma Rehabilitation Institute for Returning Military Personnel			
Title: Framework for Electronic Health Record-Linked Predictive Models ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Framework for Electronic Health Record-Linked Predictive Models	2.386	-	-
Title: SupportNet for Frontline Providers ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** SupportNet for Frontline Providers	2.387	-	-
Title: Center for Respiratory Biodefense ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Center for Respiratory Biodefense	2.387	-	-
Title: Advanced Bioengineering for Enhancement of Solider Survivability ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Advanced Bioengineering for Enhancement of Solider Survivability	2.487	-	-
Title: Online Health Services Optimization ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Online Health Services Optimization	3.104	-	-
Title: Imp Soldier Recovery from Catastrophic Bone Injury ***Description:*** This is a Congressional Interest Item.	3.183	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Improved Soldier Recovery from Catastrophic Bone Injury			
Title: Center for Advanced Emergency Response ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Center for Advanced Emergency Response	3.979	-	-
Title: Plant-Based Vaccine Research ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Research vaccines produced from plants.	1.990	-	-
Title: Northern Illinois Proton Treatment and Research Center ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Funded research on cancer treatment using proton therapy.	2.784	-	-
Title: Center for Ophthalmic Innovation ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Funded the Center for Ophthalmic Innovation.	2.387	-	-
Title: Vision Integrating Strategies in Opthamology and Neurochemistry (VISION) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Researched causes and effects of visual damage resulting from both ocular injuries and eye exposure to the elements during combat operations.	3.183	-	-
Title: Plug-In Architecture for DoD Medical Imaging	1.194	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB3: *MEDICAL TECHNOLOGY INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Continued the development of a plug-in architecture that will make medical imaging hardware and software compatible.			
Title: Military Family Coping Patterns ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Researched the effects of Post Traumatic Stree Disorder on military families.	0.398	-	-
Title: Carbon Nanotube Production ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Researched carbon-based nanoparticles in order to develop a dramatically improved nanocenter for use in patients.	1.592	-	-
Title: Hadron Particle Therapy ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Research cancer treatment using hadron particle therapy.	1.592	-	-
Accomplishments/Planned Programs Subtotals	125.821	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB4: *SYSTEM BIOLOGY AND NETWORK SCIENCE TECHNOLOGY*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
VB4: *SYSTEM BIOLOGY AND NETWORK SCIENCE TECHNOLOGY*	1.130	1.177	4.748	-	4.748	4.850	4.887	4.905	4.989	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports applied research in systems biology to provide a highly effective mechanism to integrate iterative biological tests, computer simulations, and animal studies. Such developmental efforts using systems biology could ultimately reduce the time and effort invested in medical product development.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the US Army Medical Research and Materiel Command, Fort Detrick, MD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Systems Biology	1.130	1.177	4.748
Description: This project supports multidisciplinary applied research in systems biology designed to integrate animal studies, computational simulations, and biologics (products derived from living organisms). ***FY 2010 Accomplishments:*** Established animal models and protocols for multidisciplinary investigations of heat stroke-caused multi-organ failure. ***FY 2011 Plans:*** Refine experimental model systems, identify markers for prediction of multi-organ failure resulting from heat injury, and develop supporting computational models of regulatory systems of heat injury. ***FY 2012 Plans:*** Refine experimental systems for assessment and enhancement of computational models for identifying pharmacological interventions for heat stroke-caused multi-organ failure.			
Accomplishments/Planned Programs Subtotals	1.130	1.177	4.748

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VB4: *SYSTEM BIOLOGY AND NETWORK SCIENCE TECHNOLOGY*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VJ4: *SUICIDE PREVENTION/MITIGATION*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
VJ4: *SUICIDE PREVENTION/ MITIGATION*	10.000	10.000	10.000	-	10.000	10.000	10.000	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project funds research over a planned five (5) year period to examine the mental and behavioral health of Soldiers to counter suicidal behavior. This work will focus on advancing understanding of the multiple determinants of suicidal behavior, psychopathology (study of the causes and nature of abnormal behavior), psychological resilience, and role functioning. A significant thrust area will focus on the development of better methods for preventing and mitigating suicidal behavior as well as to improve the overall mental health and behavioral function of Army personnel during and after their military service.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work on this project is performed by The National Institute of Mental Health (NIMH) through extramural cooperative research grants in collaboration with the Department of the Army.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Suicide Prevention/Mitigation	10.000	10.000	10.000
Description: This effort conducts research to better understand the apparent increase in suicide deaths and nonfatal attempts among Active Duty Soldiers. Improved prevention/intervention methods to be identified for individuals at risk for suicide based on data-driven recommendations. The efforts would be utilized to decrease suicide rates in both military populations as well as in the general public.			
FY 2010 Accomplishments: Completed initial analyses of blood and biomarker data collected from historical records of Army recruits; initiated a biomarker pilot study to investigate depression in soldiers; initiated research efforts designed to enhance screening, prevention, and intervention strategies for suicide prevention.			
FY 2011 Plans: Continue to conduct research to better understand the apparent increase in suicide deaths and nonfatal attempts among active duty Soldiers; continue epidemiological (population-based) studies to identify determinants of suicidal behaviors and potential modifiable risk factors; continue to develop better methods for preventing suicidal behaviors based on data driven recommendations to mitigate or prevent suicidal behaviors.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602787A: *MEDICAL TECHNOLOGY*	PROJECT VJ4: *SUICIDE PREVENTION/MITIGATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will continue epidemiological (population-based) studies to further identify determinants of suicidal behavior as well as potential modifiable risk factors; will collect data for suicide-death case control study; will conduct research efforts to assist in improved identification of individuals at greatest risk for suicide as well as to validate screening measures and enhance prevention/ intervention methods.			
Accomplishments/Planned Programs Subtotals	10.000	10.000	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.