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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Health Program **Date:** March 2014

Appropriation/Budget Activity
0130: *Defense Health Program I BA 2: RDT&E*

R-1 Program Element (Number/Name)
PE 0601101HP *I In-House Laboratory Independent Research (ILIR)*

COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
Total Program Element	2.827	0.885	3.002	2.836	-	2.836	3.099	3.153	3.379	2.927	Continuing	Continuing
240A: <i>Infectious Disease (USUHS)</i>	0.396	0.124	0.419	0.397	-	0.397	0.433	0.440	0.471	0.408	Continuing	Continuing
240B: <i>Military Operational Medicine (USUHS)</i>	1.213	0.380	1.288	1.217	-	1.217	1.330	1.354	1.451	1.258	Continuing	Continuing
240C: <i>Combat Casualty Care (USUHS)</i>	1.218	0.381	1.295	1.222	-	1.222	1.336	1.359	1.457	1.261	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

For the Uniformed Services University of the Health Sciences (USUHS), this program element supports basic medical research at the Uniformed Services University of the Health Sciences (USUHS). It facilitates the recruitment and retention of faculty; supports unique research training for military medical students and resident fellows; and allows the University's faculty researchers to collect pilot data towards military relevant medical research projects in order to secure research funds from extramural sources (estimated \$127 million annually). Approximately 130 intramural research projects are active each year, including 37 faculty start-ups. Projects are funded on a peer-reviewed, competitive basis. Results from these studies contribute to the fund of knowledge intended to enable technical approaches and investment strategies within Defense Science and Technology (S&T) programs.

The ILIR program at USUHS is designed to answer fundamental questions of importance to the military medical mission of the Department of Defense in the areas of Infectious Disease, Military Operational Medicine, Combat Casualty Care, and Chemical, Biological, and Radiologic Defense. The portfolio of research projects will vary annually because this research is investigator-initiated. Examples of typical research efforts are detailed in R-2a.

Infectious Disease: Immunology and molecular biology of bacterial, viral and parasitic disease threats to military operations. These threats include *Bartonella bacilliformis*, *Clostridium difficile*, *E. coli* and their Shiga toxins, Henipaviruses (Hendra & Nipah), Hepatitis A, *Helicobacter pylori*, HIV, HTLV-1, Leishmaniasis, Malaria, *Neisseriae gonorrhea*, *Shigella* spp., *Streptococcus*, *Staphylococcus*, and Typhoid fever.

Military Operational Medicine: Sustainment of individual performance; mapping and managing deployment and operational stressors; cognitive enhancement; and military and medical training readiness.

Combat Casualty Care: Ischemia and reperfusion injury, traumatic brain and peripheral nerve injury, neural control of pain, endotoxic shock, cryotherapy, malignant hyperthermia, inflammation, and wound healing.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Health Program					Date: March 2014
Appropriation/Budget Activity 0130: <i>Defense Health Program I BA 2: RDT&E</i>			R-1 Program Element (Number/Name) PE 0601101HP <i>I In-House Laboratory Independent Research (ILIR)</i>		
B. Program Change Summary (\$ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	3.030	3.088	3.151	-	3.151
Current President's Budget	0.885	3.002	2.836	-	2.836
Total Adjustments	-2.145	-0.086	-0.315	-	-0.315
• Congressional General Reductions	-0.004	-			
• Congressional Directed Reductions	-2.116	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.025	-0.086			
• Reductions related to Departmental Efficiencies - Project Code 240A	-	-	-0.044	-	-0.044
• Reductions related to Departmental Efficiencies - Project Code 240B	-	-	-0.135	-	-0.135
• Reductions related to Departmental Efficiencies - Project Code 240C	-	-	-0.136	-	-0.136
<u>Change Summary Explanation</u>					
FY 2013: Realignment from Defense Health Program, Research, Development, Test and Evaluation (DHP RDT&E), Program Element (PE) 0601101-In-House Laboratory Independent Research (-\$0.025 million) to DHP RDT&E, PE 0605502-Small Business Innovation Research (SBIR) Program (+\$0.025 million).					
FY 2013: General Congressional Reductions to DHP RDT&E, PE 0601101-In-House Laboratory Independent Research (-\$0.004 million).					
FY 2013: Congressional Directed Reductions (Sequestration) to DHP RDT&E, PE 0601101-In-House Laboratory Independent Research (-\$2.116 million).					
FY 2014: Realignment from Defense Health Program, Research, Development, Test and Evaluation (DHP RDT&E), Program Element (PE) 0601101-In-House Laboratory Independent Research (-\$0.086 million) to DHP RDT&E, PE 0605502-Small Business Innovation Research (SBIR) Program (+\$0.086 million).					
FY 2015: Reduces non-combat injury research funding in order to focus and continue the pace of progress in critical and high priority research areas in the DHP RDT&E, PE 0601101-In-House Laboratory Independent Research (-\$0.315 million).					

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Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Health Program										Date: March 2014		
Appropriation/Budget Activity 0130 / 2					R-1 Program Element (Number/Name) PE 0601101HP / <i>In-House Laboratory Independent Research (ILIR)</i>				Project (Number/Name) 240A / <i>Infectious Disease (USUHS)</i>			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
240A: <i>Infectious Disease (USUHS)</i>	0.396	0.124	0.419	0.397	-	0.397	0.433	0.440	0.471	0.408	Continuing	Continuing
# The FY 2015 OCO Request will be submitted at a later date.												
A. Mission Description and Budget Item Justification												
Infectious Diseases: Immunology and molecular biology of bacterial, viral and parasitic disease threats to military operations. These threats include Bartonella bacilliformis, Clostridium difficile, E. coli and their Shiga toxins, Henipaviruses (Hendra & Nipah), Hepatitis A, Helicobacter pylori, HIV, HTLV-1, Leishmaniasis, Malaria, Neisseriae gonorrhea, Shigella spp., Streptococcus, Staphylococcus, and Typhoid fever.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2013	FY 2014	FY 2015	
Title: Infectious Disease									0.124	0.419	0.397	
Description: Infectious Diseases: Immunology and molecular biology of bacterial, viral and parasitic disease threats to military operations. These threats include Bartonella bacilliformis, Clostridium difficile, E. coli and their Shiga toxins, Henipaviruses (Hendra & Nipah), Hepatitis A, Helicobacter pylori, HIV, HTLV-1, Leishmaniasis, Malaria, Neisseriae gonorrhea, Shigella spp., Streptococcus, Staphylococcus, and Typhoid fever.												
FY 2013 Accomplishments: Representative projects include the following: Determination of the factors responsible for maintaining and driving the immune response against helminth (parasitic worm) infections eventually leading to effective vaccines against these infections; investigation of skin and soft tissue infections (SSTI) in the military population, generally caused by community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA), towards the development of novel prevention and treatment strategies; investigation of the Henipaviruses and their bat hosts towards the development of novel intervention and vaccine strategies; development of a cutaneous leishmaniasis vaccine to prevent parasitic infection; elucidation of the natural transmission of Bartonella bacilliformis by the sand fly towards disease prevention and control; surveillance and treatment of Rickettsia parkeri and their associated tick vectors; analysis of genetic factors resulting in colonization of the host intestinal tract by Escherichia coli O157:H7, the most common infectious cause of bloody diarrhea & hemorrhagic colitis; and the health behaviors and deployment factors that are associated with acquisition of sexually transmitted diseases (STDs).												
These projects will support the essential military mission by advancing our understanding of both the transmission and the internal mechanisms of a spectrum of pernicious and/or common diseases that may be faced by warfighters both at home and abroad.												

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014
<p>In turn, that understanding opens avenues to better control, diagnosis, and treatment of both natural and manmade biological threats.</p> <p>FY 2014 Plans: We will continue to investigate infectious diseases that impact soldiers from the standpoint of lost “man-days” to death. We recognize that infectious disease can severely hamper combat readiness and effectiveness, and therefore we will continue to concentrate our efforts on diagnosis and treatment of those naturally occurring infectious diseases that can affect the war fighter by further development of vaccines, drugs, and diagnostic tools.</p> <p>FY 2015 Plans: Efforts will continue within the Infectious Disease research area in FY 2015. Specific investigator-initiated projects compete for funding each year, usually with two to three-year project periods. Therefore, no detailed description of the research is possible at this time.</p>			
Accomplishments/Planned Programs Subtotals		0.124	0.419
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			

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Appropriation/Budget Activity 0130 / 2					R-1 Program Element (Number/Name) PE 0601101HP / In-House Laboratory Independent Research (ILIR)				Project (Number/Name) 240B / Military Operational Medicine (USUHS)			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
240B: Military Operational Medicine (USUHS)	1.213	0.380	1.288	1.217	-	1.217	1.330	1.354	1.451	1.258	Continuing	Continuing
# The FY 2015 OCO Request will be submitted at a later date.												
A. Mission Description and Budget Item Justification												
Military Operational Medicine: Sustainment of individual performance; mapping and managing deployment and operational stressors; cognitive enhancement; and military and medical training readiness.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2013	FY 2014	FY 2015
Title: Military Operational Medicine										0.380	1.288	1.217
Description: Military Operational Medicine: Sustainment of individual performance; mapping and managing deployment and operational stressors; cognitive enhancement; and military and medical training readiness.												
FY 2013 Accomplishments: Representative projects will include the following: Refinement of a single item post traumatic stress disorder (PTSD) screening tool for use in the DOD Primary Care system; understanding and attenuating deleterious effects of tobacco, alcohol, stress and their interactions upon military personnel; forecasting levels of full or threshold PTSD, depression, health and alcohol problems within the military population; understanding the determinants of health promoting behaviors towards preventing obesity in both active duty military and their family members; implementation of a neuromuscular routine that minimizes musculoskeletal injury in military academy cadets; evaluation of suicidal behaviors within recent suicide deaths of active duty service members to aid in identification and prevention efforts; determination of the psychosocial and biomedical risks and protective factors for heart failure and ischemia within the military and veteran population; and the determination of non-invasive neurological biomarkers for heat intolerance using in vivo Magnetic Resonance Imaging (MRI) and Spectroscopy (MRS).												
These studies support the essential military mission by enhancing and protecting the health, performance and fitness of soldiers throughout the deployment cycle. These studies strive to increase our understanding of and ability to manipulate the physiological mechanisms of stress and immunity, human sleep and seasonal cycles, and neurological changes necessary for short- and long-term memory. Their discoveries should enable warfighters to stay awake longer with fewer detriments to performance; lead to better strategies for enhancing and preserving memory and reasoning capabilities under battle conditions; help understand and ultimately prevent and treat neuropsychiatric illnesses such as depression and PTSD; and assist deployed troops and their families better prepare for and contend with common, significant stressors related to the deployment cycle												
FY 2014 Plans:												

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014
<p>Our efforts will concentrate on biomedical solutions that protect and enhance the health, performance, and fitness of our soldiers. Our focus will continue to be to understand stress as it is related to performance and health. We will also study performance in environmental extremes. Our goal is to lay the ground work that will establish platforms that build biomedical products and solutions that mitigate risk to soldiers and protect them from "head to toe" both on the battlefield and at home.</p> <p>FY 2015 Plans: Efforts will continue within the Military Operational Medicine research area in FY 2015. Specific investigator-initiated projects compete for funding each year, usually with two to three-year project periods. Therefore, no detailed description of the research is possible at this time.</p>			
Accomplishments/Planned Programs Subtotals		0.380	1.288
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			

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Appropriation/Budget Activity 0130 / 2					R-1 Program Element (Number/Name) PE 0601101HP / In-House Laboratory Independent Research (ILIR)				Project (Number/Name) 240C / Combat Casualty Care (USUHS)			
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
240C: Combat Casualty Care (USUHS)	1.218	0.381	1.295	1.222	-	1.222	1.336	1.359	1.457	1.261	Continuing	Continuing
# The FY 2015 OCO Request will be submitted at a later date.												
A. Mission Description and Budget Item Justification												
Combat Casualty Care: Ischemia and reperfusion injury, traumatic brain and peripheral nerve injury, neural control of pain, endotoxic shock, cryotherapy, malignant hyperthermia, inflammation, and wound healing.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2013	FY 2014	FY 2015	
Title: Combat Casualty Care									0.381	1.295	1.222	
Description: Combat Casualty Care: Ischemia and reperfusion injury, traumatic brain and peripheral nerve injury, neural control of pain, endotoxic shock, cryotherapy, malignant hyperthermia, inflammation, and wound healing.												
FY 2013 Accomplishments: Representative projects will include: Investigation of synaptic plasticity in temporal lobe epilepsy and possible development of novel therapies; determination whether BMP-2 is a effective therapy to promotes recapitulation of the meninges surrounding the spinal cord; understanding the contribution of inflammation to post-injury loss of function after traumatic brain and spinal cord injury; identifying how the formation of nerve cell circuits in the brain are affected by psychological stress and traumatic brain injury; analysis of the underlying mechanisms responsible for the development of tolerance following the chronic use of opiates for severe pain; development of psychological interventions to be used with military health care providers who experience post-traumatic stress symptoms to prevent burn-out; and development of accurate millisecond-level assessment tools and computer based analyses to assist in the evaluation and assessment of traumatic brain injury.												
These studies support the essential military mission by further exploring the mechanism of pain control for an established treatment; providing the groundwork for effective treatments to limit nerve damage and encourage regeneration; and identifying a possible cause for life-threatening complications due to the combination of exertion and injury common under heavy battlefield conditions.												
FY 2014 Plans: Our efforts will concentrate on diagnosis and treatment for our wounded warriors to reduce mortality and morbidity resulting from injuries on the battlefield. We will study physical and biological determinants of brain injury and post-traumatic stress disorder. In												

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014
<p>addition, we will also focus on rehabilitation for amputees and pain management. Our goal is to understand how to best care for soldiers who have suffered any type of physical or mental traumatic injury in the field.</p> <p><i>FY 2015 Plans:</i> Efforts will continue within the Combat Casualty Care research area in FY 2015. Specific investigator-initiated projects compete for funding each year, usually with two to three-year project periods. Therefore, no detailed description of the research is possible at this time.</p>			
Accomplishments/Planned Programs Subtotals		0.381	1.295
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			