Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Defense Advanced Research Projects Agency	Date: February 2016
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602115E / *BIOMEDICAL TECHNOLOGY*

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	164.589	114.262	115.213	-	115.213	109.817	120.852	116.651	116.651	-	-
BT-01: *BIOMEDICAL TECHNOLOGY*	-	164.589	114.262	115.213	-	115.213	109.817	120.852	116.651	116.651	-	-

A. Mission Description and Budget Item Justification

This Program Element focuses on applied research for medical related technology, information, processes, materials, systems, and devices. Successful battlefield medical technologies and neural interface technologies developed within this Program Element address a broad range of DoD challenges. Example battlefield medical technologies include continued understanding of infection biomarkers to lead to the development of detection devices that can be self-administered and provide a faster ability to diagnose and prevent widespread infection in-theater. Complementary battlefield technologies will be implemented in a predictive platform for forecasting disease outbreak and the capability to manufacture field-relevant pharmaceuticals in theater. New neural interface technologies will reliably extract information from the nervous system to enable control of the best robotic prosthetic-limb technology. Advanced evidence-based techniques will be developed to supplement warfighter healthcare and the diagnosis of post-traumatic stress disorder (PTSD) and mild traumatic brain injury (mTBI). FY 2015 Biomedical Technology program funding includes 117.0 million of base funding and 47.5 million congressionally added funding including $45.0 million of Ebola emergency funding.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	159.790	114.262	109.069	-	109.069
Current President's Budget	164.589	114.262	115.213	-	115.213
Total Adjustments	4.799	0.000	6.144	-	6.144
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	8.295	0.000			
• SBIR/STTR Transfer	-3.496	0.000			
• TotalOtherAdjustments	-	-	6.144	-	6.144

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: BT-01: *BIOMEDICAL TECHNOLOGY*		
Congressional Add: *Ebola Response and Preparedness Congressional Add (Emergency Funds)*	45.000	-
Congressional Add: *Biomedical Congressional Add*	2.548	-

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Congressional Add Subtotals for Project: BT-01	47.548	-
Congressional Add Totals for all Projects	47.548	-

Change Summary Explanation

FY 2015: Increase reflects reprogrammings offset by the SBIR/STTR transfer.
FY 2016: N/A
FY 2017: Increase reflects new focus areas in monitoring health and disease and human performance optimization.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Autonomous Diagnostics to Enable Prevention and Therapeutics (ADEPT)	27.000	22.700	13.441

Description: The overarching goal of the Autonomous Diagnostics to Enable Prevention and Therapeutics (ADEPT) program is to increase our ability to rapidly respond to a disease or threat and improve individual readiness and total force health protection by providing centralized laboratory capabilities at non-tertiary care settings. ADEPT will focus on the development of Ribonucleic Acid (RNA)-based vaccines, potentially eliminating the time and labor required for traditional manufacture of a vaccine while at the same time improving efficacy. Additionally, ADEPT will develop methods to transiently deliver nucleic acids for vaccines and therapeutics, and kinetically control the timing and levels of gene expression so that these drugs will be safe and effective for use in healthy subjects. ADEPT will also focus on advanced development of key elements for simple-to-operate diagnostic devices. A companion basic research effort is budgeted in PE 0601117E, Project MED-01.

FY 2015 Accomplishments:

- Demonstrated the ability to control the time duration of therapeutic response to viral, bacterial, and/or antibiotic-resistant bacterial pathogens suitable for clinical use and rapid public health responses.
- Investigated targeted delivery of nucleic acid constructs to specific cell types.
- Demonstrated feasibility for controlling pharmacokinetics and immunity modulation components to enable a more potent and broader immune response to viral, bacterial, and/or antibiotic resistant bacterial pathogens.
- Developed designs for RNA-based vaccines to enable transition to human clinical trials.
- Developed designs for initial diagnostic device prototypes based on highest performing components.
- Produced first-generation, integrated diagnostic prototypes designed for relevance to physician office, remote clinic, and low-resourced settings.
- Measured quantitative performance of first-generation, integrated diagnostic device prototypes and determine modifications required for performance improvements.

FY 2016 Plans:

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Optimize formulation of transient nucleic acid formats for storage stability at room temperature for at least six months. - Demonstrate continuous production of nucleic acid formats for transient immunity to viral, bacterial, and/or antibiotic-resistant bacterial pathogens for population-scale use. - Incorporate device optimizations identified as a result of first-generation, integrated diagnostic device testing. - Produce integrated diagnostic device prototypes designed for relevance to physician office, remote clinic, and low-resourced settings. - Measure quantitative performance of integrated diagnostic device prototypes. ***FY 2017 Plans:*** - Initiate regulatory approval submission package for transient nucleic-acid based formats against infectious disease with safety and efficacy data. - Demonstrate production of gene encoded antibodies in human safety trials. - Conduct a dose escalation study of nucleic acid-encoded antibody against antibiotic resistant bacteria.			
Title: Restoration of Brain Function Following Trauma	9.700	15.800	19.400
Description: The Restoration of Brain Function Following Trauma program will exploit recent advances in the understanding and modeling of brain activity and organization to develop approaches to treat traumatic brain injury (TBI). Critical to success will be the ability to detect and quantify functional and/or structural changes that occur in the human brain during the formation of distinct new memories, and to correlate those changes with subsequent recall of those memories during performance of behavioral tasks. This program will also develop neural interface hardware for monitoring and modulating neural activity responsible for successful memory formation in a human clinical population. The ultimate goal is identification of efficacious therapeutics approaches that can bypass and/or recover the neural functions underlying memory, which are often disrupted as a consequence of TBI. ***FY 2015 Accomplishments:*** - Identified commonalities of neural codes underlying memory formation. - Identified distinctions between neural codes underlying different classes of memories. - Identified expert memory codes for the formation of memory associations between pairs of elements (e.g., objects, locations, actions). - Initiated development of a portable computational device with integrated computational model of human memory formation. - Demonstrated task-specific improvement/restoration of memory performance in a memory task via hippocampal stimulation. ***FY 2016 Plans:*** - Refine computational model of memory toward distinguishing underlying neural activity related to forgotten memories in three categories and spatial and non-spatial associations. - Identify optimal stimulation parameters for improving performance on spatial memory tasks.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Utilize defined biomarkers of memory encoding and retrieval to adaptively modulate patterned electrical stimulation to dynamically drive neural networks into states optimized for memory encoding and retrieval processes. - Determine the long-term signatures underlying stimulation-induced memory restoration tasks. - Design, develop and validate both external and implantable hardware and software systems for an integrated memory restoration system. ***FY 2017 Plans:*** - Demonstrate improvement of human performance on spatial and semantic memory tasks through the use of real-time, closed-loop, biomarker-driven stimulation. - Utilize clinical data and computational model developments to refine hardware and software components. - Fabricate and test integrated device for memory restoration in clinical patients. - Develop computational model of integrated neural, physiological, and environmental effects on neural replay and subsequent memory recall in the context of task performance relevant to military training and/or operations. - Develop and use a real-time intervention and an interface system to assess, enable, and improve skill performance in human participants.			
Title: Neuro-Adaptive Technology	21.500	30.589	26.388
Description: The Neuro-Adaptive Technology program will explore and develop advanced technologies for real-time detection and monitoring of neural activity. One shortcoming of today's brain functional mapping technologies is the inability to obtain real-time correlation data that links neural function to human activity and behavior. Understanding the structure-function relationship as well as the underlying mechanisms that link brain and behavior is a critical step in providing real-time, closed-loop therapies for military personnel suffering from a variety of brain disorders. Efforts under this program will specifically examine the networks of neurons involved in post-traumatic stress disorder (PTSD), traumatic brain injury (TBI), depression, and anxiety as well as determine how to best ameliorate these disorders. The objective for this program is to develop new hardware and modeling tools to better discriminate the relationship between human behavioral expression and neural function and to provide relief through novel devices. These tools will allow for an improved understanding of how the brain regulates behavior and will enable new, disorder-specific, dynamic neuro-therapies for treating neuropsychiatric and neurological disorders in military personnel. Technologies of interest under this thrust include devices for real-time detection of brain activity during operational tasks, time synchronized acquisition of brain activity and behavior, and statistical models that correlate neural activity with human behavioral expression. ***FY 2015 Accomplishments:*** - Developed tests that activate key brain subnetworks for each functional domain. - Developed computer algorithms/programs to automatically merge elements of multimodal brain activity across time/space.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Created statistical computational models of brain activity and corresponding behavior to support the neurophysiology of new therapeutic systems. - Trained decoders on a subset of domains and cross-validated on novel scan, record, and stimulate data. - Developed hardware interface stability, biocompatibility, and motion correction for recording neural activity. - Demonstrated three-dimensional, single-cell-resolution acquisition of real-time brain activity in large volumes of neural tissue. - Submitted initial, novel devices for regulatory approval. ***FY 2016 Plans:*** - Develop and apply data co-registration and fusion methods for neural activity, wiring, and behavior. - Generate and annotate first intact neural tissue volumes to elucidate microstructure and connections in three dimensions. - Design algorithms for automatic cell identification and optical-signal estimation. - Elucidate neural circuit dynamics using structurally-informed network models. - Refine optical techniques for imaging large volumes of neural tissue. - Expand data curation architecture, databases, and analytical tools to distribute generated data to the neuroscience community. - Develop methods for automatically detecting and removing noise or contamination from datasets. - Deliver a hierarchical computational model of key brain networks that captures features relevant for psychiatric illness and its treatment. - Develop and refine neural state acquisition, classification, and control algorithms to support closed-loop control in an implantable neural device. - Characterize neural network plasticity during behavioral training. ***FY 2017 Plans:*** - Complete high-resolution large-brain imaging using novel optical tools. - Demonstrate optimized optical protocols for human tissue. - Integrate neural state classification, stimulation parameters, and targeted brain networks into a comprehensive computational model to support disorder-specific closed-loop implantable neural devices. - Demonstrate real-time application of integrated disorder-specific stimulation parameters and targeted brain networks. - Utilize clinical data and computational model determinants to refine hardware and software components of an implantable neural device. - Begin fabrication of updated devices for multi-site brain stimulation. - Initiate submission process for regulatory approval of updated parameters of the novel neural device.			
Title: Prosthetic Hand Proprioception & Touch Interfaces (HAPTIX)	10.550	18.300	18.500
Description: Wounded warriors with amputated limbs get limited benefit from recent advances in prosthetic-limb technology because the user interface for controlling the limb is low-performance and unreliable. Through investments in the DARPA			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Reliable Neural-Interface Technology (RE-NET) program, novel interface systems have been developed that overcome these issues and are designed to last for the lifetime of the patient. The goal of the Prosthetic Hand Proprioception & Touch Interfaces (HAPTIX) program is to create the first bi-directional (motor & sensory) peripheral nerve implant for controlling and sensing advanced prosthetic limb systems. With a strong focus on transition, the HAPTIX program will create and transition clinically relevant technology in support of wounded warriors suffering from single or multiple limb loss. ***FY 2015 Accomplishments:*** - Developed and demonstrated advanced algorithms to control prosthetic limbs using signals extracted from commercially available or newly developed electrodes. - Developed and demonstrated micro-stimulation interface technologies that provide reliable signals into the peripheral and/or central nervous system for closed-loop prosthetic control. - Performed safety and efficacy testing of novel implantable interface technology which capture motor control signals and provide electrical sensory stimulation through the peripheral nervous system. - Demonstrated bench-top functionality of next-generation peripheral interface technology. - Developed draft version of outcome metrics for quantifying effects of implantable and external system components on motor function, sensory function, pain, psychological health, and quality of life. - Developed unified virtual prosthesis environment to simulate limb motion and forces of interaction during object manipulation. ***FY 2016 Plans:*** - Integrate interface and electronic systems technology for use in human amputees to control and receive intuitive sensory feedback from a prosthetic device. - Demonstrate closed-loop control of a virtual prosthesis. - Perform safety and efficacy testing of HAPTIX system components to capture motor control signals and provide electrical sensory stimulation through the peripheral nervous system. - Demonstrate in vivo functionality of next-generation HAPTIX peripheral interface technology. - Finalize HAPTIX system prosthetic limb technology, complete sensorization, and begin manufacturing of devices. - Implement draft version of outcome metrics for quantifying effects of HAPTIX technology and begin validation studies. ***FY 2017 Plans:*** - Initiate functional validation of input/output signal transfer and wireless communication of power and data. - Conduct safety studies of HAPTIX system to support submission of investigational device exemption (IDE) application to the U.S. Food and Drug Administration (FDA). - Demonstrate novel nerve stimulation and recording technologies.			
Title: Tactical Biomedical Technologies	12.654	7.150	6.909

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Description: The Tactical Biomedical Technologies thrust will develop new approaches to deliver life-saving medical care on the battlefield. Uncontrolled blood loss is the leading cause of preventable death for soldiers on the battlefield. While immediate control of hemorrhage is the most effective strategy for treating combat casualties and saving lives, currently no method, other than surgical intervention, can effectively treat intracavity bleeding. A focus in this thrust was the co-development of a materials-based agent(s) and delivery mechanism capable of hemostasis and wound control for non-compressible hemorrhage in the abdominal space, regardless of wound geometry or location within that space. This thrust also investigated non-invasive techniques and equipment to use laser energy to treat intracranial hemorrhage through the skull and tissues in a pre-surgical environment. Finally, in order to address logistical delays associated with delivering necessary therapeutics to the battlefield, this thrust will also develop a pharmacy on demand that will provide a rapid response capability to enable far-forward medical providers the ability to manufacture and produce small molecule drugs and biologics.

FY 2015 Accomplishments:
- Developed novel continuous flow crystallizer, miniaturized reactors, and chemically compatible pumps for integration into a bench scale end-to-end manufacturing platform for the following Active Pharmaceutical Ingredients (APIs): Diphenhydramine, Diazepam, Lidocaine, Fluoxetine, Ibuprofen, Atropine, Doxycycline, Salbutamol, Ciprofloxacin, Azithromycin, Rufinamide, Etomidate, Nicardipine, and Neostigmine.
- Demonstrated continuous flow synthesis, crystallization, and formulation for Salbutamol, Ciprofloxacin, Azithromycin, Rufinamide, Etomidate, Nicardipine, and Neostigmine in an integrated manufacturing platform.
- Engaged the Food and Drug Administration (FDA) for input on Process Analytical Technologies (PAT) and Current Good Manufacturing Process (cGMP) for Salbutamol, Ciprofloxacin, Azithromycin, Rufinamide, Etomidate, Nicardipine, and Neostigmine.
- Developed novel cell-free protein synthesis techniques using miniaturized bioreactors and/or microfluidics technologies.
- Demonstrated end-to-end manufacturing of two protein therapeutics in a miniaturized platform, including the integration of protein expression and purification processes.
- Engaged the FDA for input on PAT and cGMP for protein therapeutics.
- Tested prototype device during in vivo pre-clinical studies for treatment of intracranial hemorrhage using laser energy through skull and tissues, and engage with the FDA on design and execution of these studies to meet FDA requirements.

FY 2016 Plans:
- Develop continuous synthesis of Ciprofloxacin (from basic starting materials) and Lisinopril in miniaturized integrated manufacturing platform.
- Demonstrate end-to-end manufacturing and solid formulation of Ciprofloxacin in miniaturized integrated manufacturing platform.
- Design and develop cell-based and cell-free protein expression of four additional biologics out of Insulin, Factor VIIa, Interferon, Hepatitis B Surface Antigen, Tissue Plasminogen Activator, Granulocyte Colony-Stimulating Factor, and Rituxmab.

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Optimize miniaturized biologics manufacturing platform components, including bioreactor, purification, and analytical modules, and begin systems integration of components for both cell-based and cell-free protein expression platforms. ***FY 2017 Plans:*** - Develop continuous synthesis of Linezolid in miniaturized integrated manufacturing platform. - Demonstrate end-to-end manufacturing and solid formulation of Lisinopril and Linezolid in miniaturized integrated manufacturing platform. - Demonstrate end-to-end manufacturing of four additional biologics in miniaturized and integrated platform.			
Title: Performance Optimization in Complex Environments ***Description:*** The Performance Optimization in Complex Environments program focuses on leveraging advances in and integration of sensors, computation, and analytics to enable optimum human performance in complex environments. Device technology has advanced to the point where human beings can be instrumented with and connected to a broad range of unobtrusive, always-on physiological, cognitive, and contextual sensors and information systems. At the same time, body-area networks, wearable displays, haptics, and other novel forms of human-computer interfaces have advanced enough that convenient real-time multifactor analysis for neurofeedback and biofeedback are within reach. The Performance Optimization in Complex Environments program will first focus on developing prototyping and manufacturing techniques necessary to integrate these two advancing areas to enable optimal performance in a wide variety of activities from learning and training to specialized tasking, and to mitigate the effects of physical injury, age, and mental impairment. Research will also focus on understanding various forms of sensing and actuation to improve outcomes and how biofeedback over time can alter human capability. Technologies developed through this program will provide a foundation of novel value propositions to the warfighter in terms of restoration of lost capability, situational awareness, resilience, cognitive and physical effectiveness, and force multiplication. ***FY 2016 Plans:*** - Initiate research on biological interfaces for enabling input-output of information. - Explore and identify scalable technologies for reading and writing biological signals. ***FY 2017 Plans:*** - Refine component technologies to increase scale of information input-output. - Identify component technologies to be integrated into a device for reading and writing biological signals. - Investigate novel approaches to reduce the size, weight, and power requirements for the integrated device.	-	9.650	16.475
Title: Enhanced Monitoring of Health and Disease ***Description:*** The overarching goal of the Enhanced Monitoring of Health and Disease program is to leverage advanced data collection methods and capabilities to predict changes in health and spread of infectious disease from the individual to the	-	-	14.100

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
population scale. While new technology platforms have enhanced our ability to respond to illness and disease, there is a need for predictive and pre-emptive technologies that enable us to correctly prepare a response prior to its obvious need. Research in this thrust will investigate new methods for the collection and detection of multiplexed biological markers as well as the analysis, correlation, and ultimate integration of vast personalized data into the clinical care information technology infrastructure. Additionally, this thrust will develop new approaches to integrate multi-source data streams to create effective predictive models of disease outbreak and spread. Technologies developed in this program will enable clinically actionable information, even when an individual has no awareness of symptoms, and extend infectious disease forecasting into a real-time, accurate capability for decision support. ***FY 2017 Plans:*** - Assess novel methods for multiplexed in vivo monitoring and wireless transmission of data related to disease biomarkers. - Collect biological samples to assess asymptomatic, symptomatic, and co-infection rates among a research cohort. - Identify key parameters of robust epidemiological models for predicting disease transmission. - Evaluate the predictive capability of dynamic, ensemble-based epidemiological models for disease forecasting.			
Title: Dialysis-Like Therapeutics (DLT) ***Description:*** Sepsis, a bacterial infection of the blood stream, is a significant cause of injury and death among combat-injured soldiers. The goal of this program is to develop a portable device capable of controlling relevant components in the blood volume on clinically relevant time scales. Reaching this goal is expected to require significant advances in sensing in complex biologic fluids, complex fluid manipulation, separation of components from these fluids, and mathematical descriptions capable of providing predictive control over the closed loop process. The envisioned device would save the lives of thousands of military patients each year by effectively treating sepsis and associated complications. Additionally, the device may be effective as a medical countermeasure against various chemical and biological (chem-bio) threat agents, such as viruses, bacteria, fungi, and toxins. Applied research under this program further develops and applies existing component technologies and then integrates these to create a complete blood purification system for use in the treatment of sepsis. Included in this effort will be development, integration and demonstration of non-fouling, continuous sensors for complex biological fluids; implementation of high-flow microfluidic structures that do not require the use of anticoagulation; application of intrinsic separation technologies that do not require pathogen specific molecular labels or binding chemistries; and refinement of predictive modeling and control (mathematical formalism) with sufficient fidelity to enable agile adaptive closed-loop therapy. ***FY 2015 Accomplishments:***	19.492	5.073	-

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Manufactured a breadboard device that integrates label-free separation technologies, high-flow fluidic architectures, and non-thrombogenic coatings for testing. - Evaluated the efficacy of the label-free separation technologies in a small-animal model. - Refined the breadboard device design based on animal testing results to inform development of a standalone benchtop integrated prototype device. - Established a clinically relevant model of sepsis in a large animal model in order to validate efficacy of separation technologies at removing pathogens and other sepsis mediators. - Performed biocompatibility studies of each component filter in the device to ensure safety in the integrated system. ***FY 2016 Plans:*** - Complete fabrication of the first generation of integrated DLT device prototypes. - Complete safety studies of the integrated DLT device in a large-animal model. - Initiate safety studies focused on pathogen removal in large-animal model.			
Title: Warrior Web ***Description:*** Musculoskeletal injury and fatigue to the warfighter caused by dynamic events on the battlefield not only impact immediate mission readiness, but also can have a deleterious effect on the warfighter throughout his/her life. The Warrior Web program will mitigate that impact by developing an adaptive, quasi-active, joint support sub-system that can be integrated into current soldier systems. Because this sub-system will be compliant and transparent to the user, it will reduce the injuries sustained by warfighters while allowing them to maintain performance. Success in this program will require the integration of component technologies in areas such as regenerative kinetic energy harvesting to offset power/energy demands; human performance, system, and component modeling; novel materials and dynamic stiffness; actuation; controls and human interface; and power distribution/energy storage. The final system is planned to weigh no more than 9kg and require no more than 100W of external power. Allowing the warfighter to perform missions with reduced risk of injuries will have immediate effects on mission readiness, soldier survivability, mission performance, and the long-term health of our veterans. ***FY 2015 Accomplishments:*** - Conducted preliminary review of Warrior Web designs and refined approaches as necessary. - Finalized open source biomechanical models to be leveraged for the Warrior Web system evaluation. - Matured design of Warrior Web system and continued parallel technology development. - Conducted preliminary evaluation of prototype Warrior Web systems via Soldier tests in laboratory environment. ***FY 2016 Plans:*** - Revise full suit design and implementation based on laboratory evaluations. - Continue to evaluate prototype Warrior Web systems via Soldier tests in laboratory and field environments.	7.245	5.000	-

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
- Continue to pursue research and development of technologies to augment human performance and support rehabilitation.			
Title: Pathogen Defeat	8.900	-	-
Description: Pathogens are well known for the high rate of mutation that enables them to escape drug therapies and primary or secondary immune responses. The Pathogen Defeat thrust area provided capabilities to predict emerging threats and the evolution of resistance of pathogens to medical countermeasures. Pathogen Defeat focused not only on known pathogens but also newly emerging pathogens and future evolution of mutations in these pathogens, allowing pre-emptive preparation of vaccine and therapy countermeasures. ***FY 2015 Accomplishments:*** - Tested predictive capabilities of trajectories to clinical viral isolates in evolution platform. - Elucidated mechanisms to explain viral escape to different pressures. - Rapidly evolved virus strains in avian cells to select vaccine candidates with antigenic similarities. - Performed objective assessment of hand-held devices for detecting biothreats and clinically-relevant pathogens.			
Accomplishments/Planned Programs Subtotals	117.041	114.262	115.213

	FY 2015	FY 2016
Congressional Add: Ebola Response and Preparedness Congressional Add (Emergency Funds)	45.000	-
FY 2015 Accomplishments: This program focused on the development of Ebola antibodies, vaccines, and diagnostics to enable a more rapid response to this outbreak and increase preparedness for response to future epidemics. This research utilized earlier investments by DARPA that explored technologies to discover, optimize, and deliver antibodies as a means to provide fast-acting protection against infectious diseases. A key component of this program was not only identifying effective antibodies to treat and prevent disease, but also defining and developing the antibody gene blueprint for transfer and production of vaccines. The Ebola Response and Preparedness Congressional Add is non-OCO emergency funding. - Conducted dose escalation study for encoded Ebola vaccine in human safety trial. - Demonstrated rapid discovery of potent antibodies from human Ebola survivors. - Evaluated protective efficacy of encoded Ebola antibodies in small and large animal models. - Tested protective efficacy of encoded Ebola vaccine in small and large animal models. - Validated cell-free production of nucleic acid-encoded antibody and vaccine formulations.		
Congressional Add: Biomedical Congressional Add	2.548	-

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	FY 2015	FY 2016
FY 2015 Accomplishments: This effort furthered the development of restorative products and technologies as alternatives to amputation.		
Congressional Adds Subtotals	47.548	-

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Specific programmatic performance metrics are listed above in the program accomplishments and plans section.