Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Advanced Research Projects Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602383E / *BIOLOGICAL WARFARE DEFENSE*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	20.453	13.014	38.640	-	38.640	44.346	39.346	34.346	34.346	-	-
BW-01: *BIOLOGICAL WARFARE DEFENSE*	-	20.453	13.014	38.640	-	38.640	44.346	39.346	34.346	34.346	-	-

A. Mission Description and Budget Item Justification

The Biological Warfare Defense project is budgeted in the Applied Research Budget Activity because its focus is on the underlying technologies associated with the detection, prevention, treatment and remediation of biological, chemical, and radionuclide threats.

Efforts to counter existing and emerging biological, chemical and radiological threats included: countermeasures to stop the pathophysiologic processes that occur as a consequence of an attack; host immune response enhancers, medical diagnostics for the most virulent pathogens and their molecular mechanisms; collection of environmental trace constituents to support chemical mapping, tactical and strategic biological, chemical, and radiological sensors; and integrated defense systems. This project also includes development of a unique set of platform technologies and medical countermeasures synthesis that will dramatically decrease the timeline from military threat detection to countermeasure availability.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	21.250	13.014	13.469	-	13.469
Current President's Budget	20.453	13.014	38.640	-	38.640
Total Adjustments	-0.797	0.000	25.171	-	25.171
• 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	0.000	0.000			
• SBIR/STTR Transfer	-0.797	0.000			
• TotalOtherAdjustments	-	-	25.171	-	25.171

Change Summary Explanation

FY 2017: Decrease reflects the SBIR/STTR transfer.

FY 2018: N/A

FY 2019: Increase reflects Defense Against Mass Terror Threats program enhancement to include city-sized simulation detection of multiple classes of Weapons of Mass Destruction threats.

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Defense Against Mass Terror Threats	13.371	13.014	38.640
Description: The objective of the Defense Against Mass Terror Threats program is to identify and develop technologies that have the potential to significantly improve U.S. ability to reduce the risk of mass casualties in the wake of Weapon of Mass Terror (WMT) attack. Challenges in reducing U.S. vulnerability to these attacks include developing new sensors and systems that afford early warning and opportunities to interdict these threats before they can be employed in urban areas and other population centers. A major goal of this program is to develop new sensors and sensing networks that can economically and reliably provide these wide-area monitoring capabilities for WMT threat signatures. ***FY 2018 Plans:*** - Refine system features and functionality of continuous, wide-area, radiation sensor network based on pilot data collections and user feedback. - Demonstrate, operationalize, and transition full-scale radiation WMT threat monitoring capability with operational partner. - Assess feasibility of generalizing continuous, wide-area, radiation sensing network to monitor beyond radiological and nuclear WMT threats. - Demonstrate integration of chemical WMT sensors into a continuous, wide-area sensing network. - Formalize a cross-discipline multi-path research strategy to realize a holistic detection capability for WMT proliferant activities, actor behaviors, and WMT signatures. ***FY 2019 Plans:*** - Begin process to make an open source, continuous, wide-area sensing platform. - Initiate advanced network algorithms for new sensing modalities and data fusion. - Begin to develop general interfaces to supply advanced WMT monitoring capabilities to existing, operational, and situational awareness systems. - Demonstrate feasibility of continuous sensing network scalability to city-sized areas through simulation for multiple classes of WMT threats, including chemical and biological. - Commence development of advanced adversary prediction models to improve overall system interdiction capabilities. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 increase is due to investment in identifying and developing technologies beyond nuclear that have the potential to significantly improve U.S. ability to reduce the risk of mass casualties in the wake of Weapon of Mass Terror (WMT) attack.			
Title: Medical Countermeasures	7.082	-	-
Description: The Medical Countermeasures program addressed the safety and efficacy considerations in the risk/benefit package necessary to successfully counter naturally emerging or engineered biological warfare threats and new emerging chemical and radiological threats. These technologies focused on reduction of time, risk, and costs associated with new therapeutic			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
development. This program developed in vitro tissue constructs (IVTC) that will emulate human response to therapeutic compounds, thereby significantly reducing the cost and time for evaluating safety and efficacy of therapeutics.			
Accomplishments/Planned Programs Subtotals	20.453	13.014	38.640

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.