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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

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| Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i> | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> |
|---|--|

| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|--|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 0.000 | 221.213 | 267.073 | 230.051 | 0.000 | 230.051 | 252.831 | 232.509 | 240.025 | 240.025 | Continuing | Continuing |
| UN3: <i>Understand (ATD)</i> | - | 69.652 | 83.825 | 76.114 | 0.000 | 76.114 | 87.384 | 73.515 | 71.015 | 71.015 | Continuing | Continuing |
| PT3: <i>Protect (ATD)</i> | - | 29.631 | 29.261 | 46.050 | 0.000 | 46.050 | 46.703 | 46.159 | 54.536 | 54.535 | Continuing | Continuing |
| MT3: <i>Mitigate (ATD)</i> | - | 83.766 | 100.791 | 81.920 | 0.000 | 81.920 | 90.704 | 84.795 | 86.434 | 86.435 | Continuing | Continuing |
| EN3: <i>Enabling Investments (ATD)</i> | - | 38.164 | 43.196 | 16.967 | 0.000 | 16.967 | 19.040 | 19.040 | 19.040 | 19.040 | Continuing | Continuing |
| ET3: <i>Emerging Threats (ATD)</i> | - | 0.000 | 10.000 | 9.000 | 0.000 | 9.000 | 9.000 | 9.000 | 9.000 | 9.000 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

This program element (PE) resources Advanced Technology Development across the Understand, Protect, Mitigate, and Enabling Investments portfolios. Chemical and Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable Countering Weapons of Mass Destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE demonstrate technologies supporting the transition to advanced component development for physical capabilities, which cover chemical and biological (CB) detection, situational awareness and effects modeling, and protection and hazard mitigation. FY25 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

- Understand (UN3): Demonstration of enhanced chemical detection capabilities for aerosols and non-traditional agents, expanded capabilities for biosurveillance in pathogen detection and diagnosis, produce biological diagnostic arrays and reagents and diagnostic device platforms.
- Protect (PT3): Production of pretreatment candidates for bacterial, viral, and toxin threats.
- Mitigate (MT3): Production of therapeutic candidates for bacterial, viral, and toxin threats.
- Enabling Investments (EN3): Demonstrations of CB defense technologies, including biological detection, chemical detection, and decontamination, including non-traditional agents. Continued efforts to enhance the military operational capability, concepts of operation, and WMD elimination.
- Emerging Threats (ET3): identify and develop scientific solutions or to modernize capabilities that allow for a more rapid response to emerging threats.

CBDP Science and Technology (S&T) Applied Research Performers: U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense

UNCLASSIFIED

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| | |
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(USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL), and Department of Energy Laboratories such as Pacific Northwest National Laboratory (PNNL), among others. The intent is to maintain strategic partnerships with the DoD Service communities & the interagency for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

Work conducted under this PE will transition to and will provide risk reduction for Advanced Component Development and Prototypes (PE 0603884BP) and System Development and Demonstration (PE 0604384BP) activities.

| B. Program Change Summary (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 226.225 | 267.073 | 273.070 | - | 273.070 |
| Current President's Budget | 221.213 | 267.073 | 230.051 | - | 230.051 |
| Total Adjustments | -5.012 | 0.000 | -43.019 | - | -43.019 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -5.012 | - | | | |
| • Other Adjustments | - | - | -43.019 | - | -43.019 |

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: MT3: *Mitigate (ATD)*

Congressional Add: *Broad Spectrum Small Molecule Anti-viral Development*

Congressional Add Subtotals for Project: MT3

Congressional Add Totals for all Projects

| | FY 2023 | FY 2024 |
|--|----------------|----------------|
| | 5.000 | - |
| | 5.000 | - |
| | 5.000 | - |

Change Summary Explanation

Funding: FY 2023 (-\$5.012 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2025 (-\$43.019 Million): The decrease in Budget Activity 3/Advanced Technology Development aligns to revised FY2025 CB Incident Preparedness and Response planning priorities (-\$24.500 Million) and an Advanced Technology Development adjustment to support DoD high priority efforts (-\$18.519 Million).

Schedule: N/A

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Technical: N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

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|--|--|---|
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |
|--|--|---|

| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| UN3: <i>Understand (ATD)</i> | - | 69.652 | 83.825 | 76.114 | 0.000 | 76.114 | 87.384 | 73.515 | 71.015 | 71.015 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The Understand Advanced Technology Development (ATD) Project supports freedom of maneuver and informs commanders' decisions by predicting, locating, identifying, analyzing, and warning of chemical and biological (CB) hazards.

Thrust Areas included in this Project are:

- (1) Chemical, Biological, Radiological, and Nuclear (CBRN) Battlespace Sensing, Alerting & Response
- (2) CBRN Decision Aids
- (3) CBRN Situational Awareness
- (4) Battlefield Readiness
- (5) Chemical Diagnostics
- (6) Clinical Evaluation
- (7) Diagnostic Building Blocks
- (8) Emerging Threats
- (9) Operational Diagnostics
- (10) Technical Surprise
- (11) Emerging and Enhanced Biothreat Sensing
- (12) Distributed CB Reconnaissance
- (13) Expeditionary Analytical Toolkit (ExAnT)
- (14) Modernized and Enhanced Chemical Sensing
- (15) Operational Biological Sensing
- (16) Operational Chemical Sensing
- (17) Unconventional Detection Modalities
- (18) Unattended Perimeter Monitoring

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2023 | FY 2024 | FY 2025 |
|---|---------|---------|---------|
| Title: 1) CBRN Battlespace Sensing, Alerting, and Response | 4.301 | 4.500 | 5.549 |
| Description: The CBDP is trying to improve detection capabilities while reducing the burden on the warfighter. Wearable technologies will be a significant part of this effort, acting as the initial "check engine" light for the warfighter without adding any | | | |

UNCLASSIFIED

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>equipment requirements (since the Joint Force will already be equipped with wearables). This thrust area invests in breakthrough technology to improve wearable device-based early warning capabilities by conducting data collection trials to support algorithm development; leveraging artificial intelligence (AI) to identify key indicators, combinations of indicators, and sensing modalities; and exploring alternative methods for non-invasive early warning of chemical and biological (CB) exposure. This will reduce false alarms and strengthen predictions of potential CB exposure—including emerging threats.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue the improvement of algorithms that leverage non-invasive based physiological data to provide early warning of chemical and biological threats and/or exposure. - Continue the advancement of standoff physiological monitoring capabilities. - Expand and further develop a data and Artificial Intelligence (AI) platform to support the access to harmonized physiological status monitoring data and development and validation of models in order to continue to develop predictive algorithms for the rapid response to Emerging Threats. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to isolate and identify indicators of respiratory infection that can be used in determining severity of infection, and predicting return to mission readiness after exposure. - Continue to expand and enhance a cloud-based data and Artificial Intelligence (AI) platform to support the access to harmonized physiological status monitoring data and development and validation of models in order to continue to develop predictive algorithms for the rapid response to Emerging Threats - Continue competitive prototyping to evaluate alternative concepts for providing remote sensing and/or minimally and noninvasive techniques to enhance our ability to quickly identify afflicted personnel and inform courses of action, ideally prior to the onset of symptoms. - Continue to advance standoff physiological monitoring capabilities (e.g., detecting fever from a distance and/or within a given population) to include efforts that increase the standoff distance at which physiological data can be captured and analyzed. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase due to transfer from CBRN Battlespace Sensing, Alerting & Response - Enhanced Biological Defense (ENBD) for advancement of competitive prototyping efforts focused on optimizing wearable-based algorithms for the early warning of CB exposures.</p> | | | | |
| Title: 2) CBRN Decision Aids | | 2.700 | 3.500 | 3.750 |
| Description: In order to unencumber the warfighter at the tactical edge, efforts continue to develop and transition science & technology for Chemical, Biological, Radiological and Nuclear (CBRN) Decision Aids on End User Devices (EUDs) in both | | | | |

UNCLASSIFIED

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>connected and disconnected operations by leveraging automation, reducing the burden experienced by the warfighter, and providing accurate, actionable information.</p> <p>FY 2024 Plans: - Continue developing new decision support plug-ins for integration with TAK, including the Android, web, Windows OS, and virtual and augmented reality versions, to further enhance the TAK infrastructure and cross-community tools and develop a rapid and iterative software capability.</p> <p>FY 2025 Plans: - Continue the development and deployment of new decision support plug-ins for integration with Tactical Assault Kit (TAK), including the Android, web, Windows Operating System (OS), and virtual and augmented reality versions, to further enhance the TAK infrastructure and cross-community tools and develop a rapid and iterative software capability.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase due to development efforts maturing and transitioning from Project UN2 CBRN Decision Aids (\$0.150M).</p> | | | |
| <p>Title: 3) CBRN Situational Awareness</p> <p>Description: Understanding how various chemical and biological (CB) threats—both traditional and emerging—interact with the environment and impact the human body is essential for the Joint Force to operate effectively in a CB-contested environment. Leveraging data from other Science and Technology (S&T) programs, Chemical, Biological, Radiological, and Nuclear (CBRN) Situational Awareness creates forecasting models and hazard assessments to provide warfighters with optimal situational awareness in these environments. This thrust area is also exploiting advances in eXtended Reality (XR), Virtual Reality (VR) and Augmented Reality (AR) to provide warfighters with an immersive environment for realistic training and mission rehearsal opportunities.</p> <p>FY 2024 Plans: - Complete development of a digital environment prototype for science and technology software modernization using a Development, Security, and Operations (DevSecOps) framework. - Continue improvement of performance enhancements for T&D models, particularly for urban environments and for hazard release from drone platforms and alternate types of delivery mechanisms. - Continue the development of comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment. - Continue to enhance CB situational awareness capabilities for integration into Heads up Display (HUD) technologies for tactical use.</p> | 3.581 | 6.690 | 5.819 |

UNCLASSIFIED

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <ul style="list-style-type: none"> - Continue work to ingest and store disparate chemical and biological threat datasets and advanced analytic development to support the CBDP medical enterprise. - Expedite the development of a CB Defense Digital Laboratory capability encompassing a DevSecOps environment for end-to-end AI/ML data analysis, model development and training, and agile software development. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Complete the development of a Chemical and Biological (CB) Defense Digital Laboratory capability encompassing a DevSecOps environment for end-to-end Artificial Intelligence (AI)/Machine Learning (ML) data analysis, model development and training, and agile software development. - Enhance the performance of Transport and Dispersion (T&D) models, particularly for urban environments and for hazard release from drone platforms and alternate types of delivery mechanisms. - Continue work to ingest and store disparate chemical and biological threat datasets and advanced analytic development to support the Chemical and Biological Defense Program (CBDP) medical enterprise. - Enhance comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment. - Continue to enhance CB situational awareness capabilities for integration into Heads up Display (HUD) technologies for tactical use. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to transfer of the Project UN2 CBRN Situational Awareness thrust area efforts (\$0.871M) focused on development of modeling capabilities utilizing Artificial Intelligence and Machine Learning and begin next generation hazard modeling capability development.</p> | | | | |
| <p>Title: 4) CBRN Battlespace Sensing, Alerting & Response - Enhanced Biological Defense (ENBD)</p> <p>Description: The CBDP seeks to enhance the warfighters' ability to seek medical treatment, as well as take other measures to minimize the impact to Joint Force operations, by identifying exposure to biothreats at the earliest time possible, including before symptoms appear. Efforts in this area include focusing on data collection and analysis of chemical and biological (CB) exposure data; competitive prototyping of wearable-based early warning algorithms to optimize performance; expansion of efforts to develop analytic resources for early warning/decision support; and the advancement of an integrated cloud-based data environment to store a dynamic knowledge base of biothreat characteristics.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to isolate and identify indicators of respiratory infection that can be used in determining severity of infection, and predicting return to mission readiness after exposure. | | 2.400 | 2.500 | 1.000 |

UNCLASSIFIED

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| <p>- Continue competitive prototyping to evaluate alternative concepts for providing remote sensing and/or minimally and non-invasive techniques to enhance our ability to quickly identify afflicted personnel and inform courses of action, ideally prior to the onset of symptoms.</p> <p>- Continue the development and expansion of an advanced, integrated cloud based data environment to store a dynamic knowledge base of biothreat characteristics; capability would support automated data ingestion, collection, curation, search, and advanced analytics of data.</p> <p>FY 2025 Plans:</p> <p>- Continue to evaluate competitive prototyping initiatives for alternative approaches to remote sensing and/or minimally and non-invasive techniques to enhance our ability to quickly identify afflicted personnel, inform courses of action prior to the onset of symptoms, and mitigate impacts for chemical and biological (CB) agent exposure.</p> <p>- Continue the development and expansion of an advanced, integrated cloud-based data environment to store a dynamic knowledge base of biothreat characteristics; this capability will support automated data ingestion, collection, curation, search, and advanced analytics of data for rapid response to CB threats.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding (-\$1.049M) moved to the CBRN Battlespace Sensing, Alerting and Response thrust area for better project alignment. \$0.451M not transferred due to realized cost savings.</p> | | | |
| <p>Title: 5) CBRN Decision Aids - Enhanced Biological Defense (ENBD)</p> <p>Description: Focus on improved solutions for comprehensive biothreat characterization in support of Chemical and Biological Defense Program (CBDP) biodefense modernization goals, to include leveraging a cloud based data environment of biothreat characteristics, data sources, repositories created and curated under the Chemical, Biological, Radiological and Nuclear (CBRN) Battlespace Sensing, Alerting, and Response thrust area, and translating it into actionable information for transmission to and use on end-user devices (EUDs).</p> <p>FY 2024 Plans: -Explore and initiate efforts that will utilize data streams from a cloud based data environment to provide actionable information about biological threats and exposures on EUDs.</p> <p>FY 2025 Plans: -Continue efforts that utilize data streams from the enhanced cloud-based data environment in order to provide actionable information about biological threats and exposures on End User Devices (EUDs).</p> | - | 1.000 | 1.000 |
| <p>Title: 6) CBRN Situational Awareness - Enhanced Biological Defense (ENBD)</p> | 3.000 | 2.500 | - |

UNCLASSIFIED

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| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| <p>Description: Focus on exploring solutions for comprehensive biothreat characterization in support of Chemical and Biological Defense Program (CBDP) biodefense modernization goals, including the development of data analytics using machine learning (ML) and artificial intelligence (AI) and efforts to provide a suite of analytic tools for biological threat agent modeling, forecasting, and prediction to determine optimal defense postures.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue the development of analytic tools for biological threat agent surveillance, modeling, forecasting, and prediction. - Continue efforts to develop data analytics using ML/AI to predict individual warfighter susceptibility to acute CB agent exposure based on advanced omics, epigenetics, host immune responses, and wearables data sources. - Continue to explore mathematical models for innate immune recognition based on clinical data and prediction of signature patterns associated with bacterial vs. viral pathogens. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to funds moved to Project UN2 CBRN Situational Awareness to better align requirements with budget activity.</p> | | | |
| <p>Title: 7) Battlefield Readiness</p> <p>Description: Develop platforms to prepare the warfighter with rapid and easy to use diagnostics tests to make sure they are healthy and ready for movement. Platforms developed with affinity-based identification of either pathogen or host response to the pathogen may leverage immunodiagnostics to identify specific targets using antibodies, or explore other innovative approaches. This will enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure. Investments in this area will provide capabilities to the warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue investigating minimally invasive testing methods and reduce diagnostic windows, even to pre-symptomatic identification. - Continue the development of a Point of Contamination (POC) diagnostic platform, capable of pre-symptomatically diagnosing infection within minutes and transition technology to Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense's (JPEO-CBRND) Advanced Differential Diagnostics (ADD) program. Pre-symptomatic evaluation will enable forces to determine personnel who are ideal candidates for troop movements or basic training. - Continue the development of a non-invasive diagnostic platform that can predict severity of disease which will enable logistical and resource optimization as well as quicker return of duty for a majority of patients. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | 8.732 | 5.085 | - |

UNCLASSIFIED

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|---|--|---|----------------|----------------|
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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| Program/project funding transferred to another thrust area. Funding moved to the Operational Diagnostics thrust area for better project alignment. | | | | |
| <p>Title: 8) Chemical Diagnostics</p> <p>Description: Provide innovative and integrated capabilities to the warfighter that are able to diagnose threats across the chemical spectrum. Enhance force protection by investing in diagnostics for exposure to traditional and nontraditional Chemical Warfare Agents (CWA), including pharmaceutical based agents.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue efforts that expand the capability of wearable devices from an alert to an FDA-approved diagnostic platform that can detect a chemical threat and allow a physician to diagnose and determine a treatment strategy for exposure to traditional/nontraditional chemical agents. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Program/project funding transferred to another thrust area. Funding moved to the Operational Diagnostics thrust area for better project alignment.</p> | | 2.414 | 1.695 | - |
| <p>Title: 9) Operational Diagnostics</p> <p>Description: Develop diagnostic platforms that equip the warfighter with tools ensuring force protection against chemical and biological (CB) threats. Enhance force protection by investing in field forward, point of care medical diagnostics to identify multiple pathogens simultaneously.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue the development of a point of care (POC) diagnostic platform, capable of pre-symptomatically diagnosing infection within minutes and transition technology to the Advanced Differential Diagnostics (ADD) program. - Continue the development of a minimally invasive diagnostic platform that can predict severity of disease which will enable logistical and resource optimization as well as a more prompt return to duty for a majority of patients. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Program/project funding transferred from another thrust area. Decrease due to revised priorities from the Battlefield Readiness, Chemical Diagnostics, and Battlefield Readiness - Biological Defense Improvement Program thrust area transfers to focus on wearable technologies to FDA diagnostics.</p> | | - | - | 10.117 |
| <p>Title: 10) Clinical Evaluation</p> <p>Description: Optimize the diagnostic development pathway by incorporating independent testing and evaluation for more informed prototype transition prior to advanced development. Investments in this area allow evaluation of diagnostic platforms</p> | | 2.314 | 0.848 | 1.836 |

UNCLASSIFIED

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|--|--|---|----------------|----------------|
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| <p>through real world, austere environment testing. This area maintains access to research sites where populations are exposed to diseases of interest that would affect the warfighter in battlefield settings, thus providing valuable test data which will aid further prototype development.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to maintain the capability to access clinical samples for infectious diseases of interest, and collaborate with sites around the world where diseases of concern are circulating. - Continue independent third-party testing - to establish clinical and performance parameters to evaluate diagnostic platforms through real world, austere environment testing and evaluation prior to transition. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to maintain capability to access clinical samples for a variety of biological threats of interest and expand collaboration with sites around the world where diseases of concern are circulating performing clinical evaluations of various prototype platforms to validate transition readiness. - Expand independent third-party evaluation of lab-based clinical and performance parameters to test diagnostic platforms in real world, austere environments prior to transition. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Increase due to maturing prototypes culminating in expanded requirements independent third-party evaluation to de-risk potential transitions to advanced developers.</p> | | | | |
| <p>Title: 11) Diagnostic Building Blocks</p> <p>Description: Develop novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats in days instead of weeks.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue field validation studies for diagnostics prototypes using synthetic binders and evaluate performance against current gold standard diagnostic methods and integrate enzymes to create inexpensive, on-demand, diagnostics with reduced logistical burdens. - Continue efforts to collect the baseline data required for future development of a whole breath diagnostic platform the use of breath as a non-invasive sampling mechanism offers warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure. | | 6.813 | 5.934 | 8.507 |

UNCLASSIFIED

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|--|--|---|----------------|----------------|
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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Initiate efforts to identify and establish testing methods utilizing low to minimally invasive clinical matrices. Matrices like breath, sweat or interstitial fluid could significantly expand field-forward testing abilities and minimize requirements for trained personnel to collect and administer testing.</p> <p>FY 2025 Plans:</p> <p>- Initiate characterization and development of the organ-on-a-chip (OOC) technology and develop high thru put systems for biomarker discovery. Identifying new biomarkers will lead to tests that require less reagents, and are potentially more sensitive and specific than those currently fielded.</p> <p>- Continue developing prototypes that will supplant current test methodologies. New prototypes will be more sensitive, rely less on supply chain disruption, and can be developed and fielded faster than current technology allows.</p> <p>- Continue implementation of breath-based biomarkers for bacterial and viral respiratory infections into a portable prototype device to provide the warfighter with a minimally invasive tool for rapid diagnostics against biological threats.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Program/project funding transferred from another thrust area. Increase due to revised priorities from the Diagnostic Building Blocks - Biological Defense Improvement Program thrust area transfer for development of emerging technologies.</p> | | | | |
| <p>Title: 12) Emerging Threats</p> <p>Description: Push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.</p> <p>FY 2024 Plans:</p> <p>- Initiate efforts to identify novel platforms that are capable of identifying broad classes of toxins in complex matrices. These platforms will ideally enable the diagnosis of exposure to toxins as well as other biological threats, resulting in a broad-spectrum capability in the hands of the warfighter.</p> <p>- Begin preliminary research efforts to diagnose biological threats.</p> <p>FY 2025 Plans:</p> <p>- Continue development of novel platforms for field forward toxin identification devices into light, deployable, and easy to use technologies for rapid diagnosis and characterization of toxin exposure.</p> <p>- Initiate development of a portable assay capable of performing multiple detection assays against a panel of marine toxins and pharmaceutical- based agents to be compatible with advanced development Program of Record (POR) for Next Generation</p> | | 4.796 | 3.391 | 4.754 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>Diagnostics System (NGDS) Increment 2 system to rapidly and comprehensively characterize traditional and emerging threat agents in field-forward settings.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Decrease due to revised priorities from the Emerging Threats - Biological Defense Improvement Program thrust area transfer.</p> | | | | |
| <p>Title: 13) Emerging and Enhanced Biothreat Sensing - Waste Water Surveillance</p> <p>Description: Emerging Biological Threat Surveillance is designed to address capabilities identified in the National Biodefense Strategy and DoD Biodefense Posture Review. The goal of this thrust is to analyze wastewater for emerging biological threats and help foster early warning. Early warning will allow for more timely and useful consequence management operations (Vaccine development, diagnostic testing).</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Expand early warning through wastewater surveillance capabilities to enable detect to warn capability and identification of unknown biological threats in Total Force populations. - Initiate technology to deliver capabilities to detect any pathogen, including engineered bioweapons. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Initiate augmentation of biological detection by leveraging characterization to hasten development of detection solutions to inform of potential biological hazards in wastewater environments. - Continue to develop quicker workflows to monitor and characterize novel or emerging threats. - Continue to develop workflow with automated processes that can sample, analyze, and report. - Continue Demos, initiate sprint tests and refinement of detection workflows. - Showcase the detection workflow and demonstrate rapid detection and reporting. Optimize, repeat, and field when successful. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase due to additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p> | | - | 5.700 | 6.200 |
| <p>Title: 14) Battlefield Readiness - Biological Defense Improvement Program</p> <p>Description: Provide non-invasive disease screening capabilities to rapidly respond to emerging biological threats and greatly enhance the warfighters' ability to seek medical treatment at the earliest indication of exposure.</p> <p>FY 2024 Plans:</p> | | - | 4.235 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| Expand development of Wearable technologies to evaluate customizable hardware and algorithms that detect warfighters autonomic- response to biological warfare agents, both natural and unnatural. FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Operational Diagnostics thrust area for better project alignment. | | | | |
| Title: 15) Diagnostic Building Blocks - Biological Defense Improvement Program Description: Provide agile assay development capabilities aided by Artificial Intelligence (AI) to advance the speed and accuracy of diagnostic assay design, addressing a key functional capability needed for emerging biological threat response. FY 2024 Plans: - Continue the development of agile biological assays to reduce the design assay and increase assay quality to better respond to emerging biological threats. FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Diagnostic Building Blocks thrust area for better project alignment. | | 1.000 | 1.347 | - |
| Title: 16) Emerging and Enhanced Biothreat Sensing - Biological Defense Improvement Program Description: Provide end users with a rapid assay capability (< 6 weeks from discovery of emerging/enhanced threat to delivery of the initial assay) that will be disruptive to current detection and diagnostic timelines. Eliminate the need to rely on single-source reagents to rapidly respond to emerging biological threat. FY 2024 Plans: - Continue assay development to provide rapid, agile, and scalable biodetection technology to quickly address emerging biological threats and allow the warfighter to use a highly-specific assay that is built to minimize logistics burden and is user-friendly. FY 2024 to FY 2025 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed. | | 2.200 | 1.865 | - |
| Title: 17) Emerging Threats - Biological Defense Improvement Program Description: Expand on agnostic disease screening and sensing capabilities for emerging biological threats. FY 2024 Plans: | | 0.460 | 3.170 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Continue prototype development investments in agnostic sensing/screening capabilities for multiple sample types and environments that are end user-friendly and can be deployed in the field.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Emerging Threats thrust area for better project alignment.</p> | | | | |
| <p>Title: 18) Technical Surprise - Biological Defense Improvement Program</p> <p>Description: Technical Surprise assesses technological advancements for potential implications to the threat space, including agent use and release. Technical Surprise includes horizon scanning to identify potential areas of concern as well as conducts technical assessments of emerging technological advancements (e.g. biotechnology, artificial intelligence, machine learning, quantum computing). This program develops capabilities to evaluate and assess technical enhancements that may alter the nature or magnitude of a threat agent. The technical surprise program evaluates technologies and convergence of technologies that improve the ease of threat use and make threats more likely to survive being released. The program identifies the limitations and barriers associated with synthetic biology and assesses the implications. Finally, these efforts identify and assess former technology hurdles that have been lowered or overcome and assesses the implications to the magnitude of the potential threat.</p> <p>FY 2024 Plans: - Complete the Threat Area Panel (TAP) efforts at US Army Medical Research Institute of Infectious Disease (USAMRIID). Complete and augment horizon scanning capabilities, including identification of knowledge gaps for emerging/future agents enhancing or altering the biological threat space, and use these to inform more focused studies within Threat Agent Science.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p> | | 2.452 | 0.500 | - |
| <p>Title: 19) Distributed Chemical Reconnaissance</p> <p>Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/collection systems that are rugged, rapid and accurate.</p> <p>FY 2024 Plans: - Continue development toward a deployable microsensor development pipeline and enhance sensor integration efforts. - Initiate efforts to modernize capabilities to reduce false alarms and increase sensitivity and specificity.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | | 3.157 | 3.176 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| Program/project funding transferred to another thrust area. Funding moved to the Operational Chemical Sensing thrust area for better project alignment. | | | | |
| <p>Title: 20) Operational Chemical Sensing</p> <p>Description: The Operational Chemical Sensing thrust area will mature and miniaturize chemical threat sensing and sampling technologies for distributed and networked detection systems beyond the warfighter’s line of sight to support early warning of chemical threats for fixed site, reconnaissance, and maneuver operations. Furthermore, the thrust area will provide capabilities for the full spectrum of missions and threats with rugged, low-cost point sensors and automated technologies.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue development toward a deployable microsensor development pipeline for improved size, weight, and power CBRN sensor prototypes. - Initiate integration of mature chemical threat sensing and sampling system prototypes onto unmanned and manned platforms and perform test assessments. - Continue efforts to modernize detection prototypes to reduce false alarms and increase sensitivity and specificity. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Program/project funding transferred from another thrust area. Decrease due to the Distributed Chemical Reconnaissance thrust area transfer to focus on deployable microsensor development pipeline maturation.</p> | | - | - | 2.956 |
| <p>Title: 21) Expeditionary Analytical Toolkit (ExAnT)</p> <p>Description: Provide general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Transition stand-off detector prototypes that identify and alert to chemical hazards to PCAD Program of Record. - Continue development toward detection prototypes to address PBA and other emerging threats. - Continue the development of sensor technologies against non-traditional threats of concern to develop class-based detection and reduce reliance on known threat libraries. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Program/project funding transferred to another thrust area. Funding moved to the Modernized and Enhanced Chemical Sensing thrust area for better project alignment.</p> | | 13.972 | 17.269 | - |
| <p>Title: 22) Modernized and Enhanced Chemical Sensing</p> | | - | - | 13.457 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| <p>Description: The Modernized and Enhanced Chemical Sensing thrust area will develop a suite of modernized detection technologies for traditional chemical threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards. Furthermore, this thrust area will miniaturize high-fidelity identification instruments for field use, keeping the warfighter ahead of traditional and emerging chemical threats in complex environments.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Transition hand-held, non-contact (1-2 meters standoff) detector prototypes that identify and alert to trace chemical hazards on surfaces to the Proximal Chemical Agent Detector (PCAD) Program of Record. - Transition detection prototype with fast identification of pharmaceutical based agents (PBA) and the ability to classify other emerging threats, targeting Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense (JPEO-CBRND) - Joint Product Manager for Chemical, Biological, Radiological, and Nuclear (CBRN) Special Operation Forces (JPM CBRN SOF) as transition partner. - Continue the development of sensor technologies against non-traditional threats of concern to develop class-based detection and reduce reliance on known threat libraries. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Decrease due to the Expeditionary Analytical Toolkit (ExAnT) thrust area transfer to focus on developing modernized detection technologies for traditional chemical threats in complex environments.</p> | | | |
| <p>Title: 23) Unconventional Detection Modalities - Chemical Detection</p> <p>Description: Develops disruptive technologies to identify unknown or emerging chemical threats as well as sensors that can operate in complex threat environments with high accuracy. Efforts in this area pursue a “fail fast” approach, with promising technologies transferred to other thrust areas/budget lines for further development.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue pursuing advances in photonic integrated circuits by reducing size, weight and power of traditional photonic sensors but keeping the selectivity and sensitivity of a traditional sensor. - Incorporating early warning and threat mapping using ML/AI tools to aggregate and analyze sensor data in real-time. - Continuing library-less detection to surmount current sustainment limitations of library-based or analyte-specific chemical sensor to be updated to detect emerging threats. - Continue development in machine learning (ML) and artificial intelligence (AI) to make sensor detection faster with reduced false alarm rates. <p>FY 2025 Plans:</p> | 1.485 | 2.443 | 2.328 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <ul style="list-style-type: none"> - Continue to develop library-less chemical detection capabilities to surmount sustainment limitations of library-based or analyte specific chemical sensor to detect emerging threats - Continue development of commercial telecommunication radiofrequency bands for networked and integrated chemical sensing - Continue the development of chip-sized, manufacture-ready optical detectors based on recent advances in photonic technologies - Transition the development of machine learning (ML)/artificial intelligence (AI) to improve sensor detection response with reduced false alarm rates to the Nuclear Biological Chemical Reconnaissance Vehicle – Sensor Suite Upgrade (NBCRV –SSU) Program of Record. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to maturing technologies transitioning to other thrust areas (Modernized and Enhanced Chemical Sensing and Operational Chemical Sensing).</p> | | | | |
| <p>Title: 24) Distributed Biological Reconnaissance</p> <p>Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of biological and chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/ collection systems that are rugged, rapid and accurate. Early indications from capabilities under Chemical and Biological (CB) Reconnaissance will allow for enhanced warning of threats.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to develop innovative sensor solutions and make technological improvements to include early warning of aerosolized biological threats. -Continue to explore fundamental science and novel technologies to increase sensing performance through enhanced speed and specificity; low size, weight, and power (SWaP); low-burden; and reduced consumables and life-cycle costs of fielded biological sensors. - Continue developing enhanced sensing capabilities and sampling systems, to include unmanned vehicles and mobile platforms. - Initiate the use of computational tools, like machine learning, into detector/identifier technologies to further reduce false reporting due to environmental factors. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Operational Biological Sensing thrust area for better project alignment.</p> | | 0.948 | 1.741 | - |
| <p>Title: 25) Unattended Perimeter Monitoring - Biological Detection</p> | | 0.687 | 1.283 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>Description: Establish a layered defense capability by developing and implementing automated and integrated technologies enabling unattended monitoring for chemical and biological threats. These technologies will provide early warning of vapor, aerosol, solid, and liquid hazards and unencumber the warfighter by reducing logistics and operator burden. Providing a reliable detect-to-warn capability at fixed or expeditionary sites will enhance the overall protective posture of ground and maneuver forces as robust technologies can be miniaturized for portability and operational sustainment.</p> <p>FY 2024 Plans: - Continue efforts to modernize capabilities to reduce false alarms and increase sensitivity and specificity.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Operational Biological Sensing thrust area for better project alignment.</p> | | | |
| <p>Title: 26) Operational Biological Sensing</p> <p>Description: The Operational Biological Sensing Thrust Area aims to inform and alert the warfighter of biological hazards they may encounter in an operational setting. This thrust area continues to develop fieldable technologies capable of collecting and detecting air-borne biological threats in the battlespace.</p> <p>FY 2025 Plans: - Continue to develop prototype of novel and innovative detectors to identify airborne biological threats. - Continue to integrate computational tools (e.g. machine learning) into detector/identifier technologies to further reduce false reporting. - Validate HEPA filtration purification systems aboard US Navy hospital ship Sample Collection for Detection. - Continue to develop automated, hands-free biosample collection systems to optimize collection efficiencies and reduce end-user interaction and potential exposure. - Initiate rapid sample collection for either perimeter defense or unmanned platform operation. - Continue development and transition enhanced sensing capabilities, particle classifiers, and sampling systems for unmanned vehicles and mobile platforms.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Decrease due to efficiencies gained by consolidating the Distributed Biological Reconnaissance and Unattended Perimeter Monitoring - Biological Detection thrust areas for biological threat sensing efforts.</p> | - | - | 2.880 |
| <p>Title: 27) Emerging and Enhanced Biothreat Sensing</p> | 1.369 | 3.453 | 4.943 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>Description: Establish robust capability to assess emerging and enhanced biological threats to rapidly develop biosensors for detecting emerging or enhanced biological threats. Quickly develop adaptable, analyte-agnostic laboratory and field-forward detection capabilities to provide a spectrum of improved detection assets for novel threats. This thrust area leverages multi-omics data science or the combining multiple measurements to inform rational and rapid design and development of biodetection solutions. Synthetic biological concepts will be thoroughly evaluated and exploited for the development of biosensing solutions and refinement of laboratory methods.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue development of detection and identification capabilities that discern if pathogens are genetically manipulated and/or identify pathogens of unknown origin. - Continue development of detection algorithms, laboratory workflows, and implementation of bioinformatics analysis tools to identify threats in unknown samples - Continue development of assays on demand biological threat detection assays that provide the Warfighter with the ability to rapidly respond to emerging biological threats and provide only the assay needed for threat identification and therefore reducing cost and reagents needed by most current assay kits. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to augmenting machine learning (ML)/artificial intelligence (AI) application to data processing algorithms and workflows for strategic assessment of agnostic threat signatures toward enhanced detection capabilities of emerging biothreats. - Develop portable technologies that can process, sequence and analyze samples in the field to detect emerging pathogens and engineered microorganisms. - Complete Assays on Demand (AoD) applied research component of far-forward pathogen agnostic sensing. - Continue AoD development and transition rapidly fieldable, high-performance biothreat identification assay. - Continue AoD development of point-of-need assay capability in the field. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another funding line. Increase due to Assays on Demand (AoD) technology maturation and transition from Project UN2 Emerging and Enhanced Biothreat Sensing thrust area.</p> | | | |
| <p>Title: 28) Unconventional Detection Modalities - Biological Detection</p> <p>Description: Develops disruptive technologies to identify unknown or emerging biological threats as well as sensors that can operate in complex threat environments with high accuracy. Efforts in this area pursue a “fail fast” approach, with promising technologies transferred to other thrust areas/budget lines for further development</p> <p>FY 2025 Plans:</p> | 0.871 | - | 1.018 |

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) UN3 / <i>Understand (ATD)</i> |
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|--|----------------|----------------|----------------|
| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
| <ul style="list-style-type: none"> - Continue development of low size, weight, and power collection system integrated onto robotic bees. - Continue maturation of electrochemical sensors for biological detection. <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Increase due to maturing technologies transitioning from Project UN2.</p> | | | |
| Accomplishments/Planned Programs Subtotals | 69.652 | 83.825 | 76.114 |

| | | | | | | | | | | | |
|--|----------------|----------------|-------------------------|------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
| Line Item | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| • UN4: <i>Understand (ACD&P)</i> | 52.163 | 61.638 | 53.120 | - | 53.120 | 47.808 | 49.646 | 49.608 | 62.105 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> |
|--|--|--|

| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| PT3: <i>Protect (ATD)</i> | - | 29.631 | 29.261 | 46.050 | 0.000 | 46.050 | 46.703 | 46.159 | 54.536 | 54.535 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The Protect Advanced Technology Development (ATD) Project enhances mission performance while providing effective protection against current and emerging chemical and biological (CB) threats, enables Joint Force lethality by protecting Warfighters against adverse effects of CB hazards, and fields protection capabilities against engineered biological agents, opioids and other Pharmaceutical Based Agents (PBAs), and Fourth Generation Agents (FGAs).

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Prophylaxis
- (2) Air Purification Enhancements
- (3) All-Hazards & Respiratory Protection
- (4) Enhanced Survivability Coatings
- (5) Multifunctional Materials for Protection (MMfP)
- (6) Protective Garments
- (7) Nerve Agent Prophylaxis/Pretreatments

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2023 | FY 2024 | FY 2025 |
|---|---------|---------|---------|
| Title: 1) Biological Warfare Defense Prophylaxis | 22.731 | 15.082 | 24.043 |
| Description: The ultimate protection of the warfighter is achieved by pretreating the warfighter to withstand any biological threat, which will decrease reliance on early warning and personal protective equipment, and facilitate the warfighter to operate at peak performance. This area supports transitions of lead PT2 platforms and capabilities (including broad-spectrum and rapid response) and develops them further before transition to advanced development. | | | |
| FY 2024 Plans: Bacterial: - Initiate Phase 1 vaccine clinical trial in collaboration with Australia for the Burkholderia OMV vaccine. - Continue building relationships in Madagascar to collect plague survivor samples for identification of vaccine antigen targets from emerging plague strains | | | |
| Viral: | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <ul style="list-style-type: none"> - Initiate Phase 1 clinical trial for the VEE deoxyribonucleic acid (DNA) Vaccine. - Continue preclinical development of Hydrovax pan-Alphavirus vaccine - Continue preclinical development of mucosal SARS CoV2 vaccine, expanding to multivalent coronavirus vaccine - Complete Current Good Manufacturing Practices (cGMP) manufacture of Recombinant Vesicular Stomatitis Virus rVSV Marburg virus vaccine and IND enabling studies to support pivotal animal studies and upcoming Phase 1 clinical trial. - Continue correlates of protection studies for viral vaccines. - Continue evaluation and mitigation studies of Filovirus aerosol pathology. - Continue development of rVSV Marburg vaccine in animal models to support investigational new drug (IND) submission. - Continued development of alphavirus animal models to support animal rule licensure of alphavirus vaccines - Continue assay qualification and validation for Marburg virus, and alphavirus vaccines <p>Broad Spectrum:</p> <ul style="list-style-type: none"> - Continue layered defense studies for pathogen threats to test vaccines, antibody therapies and antibiotics in combination to broaden protection. - Continue development of the multivalent Nanolipoprotein vaccine against multiple bacterial agents. - Continue preclinical development of universal cellular nanosponge MCM to protect against multiple respiratory viruses. - Continue non-clinical safety and efficacy studies with the broad spectrum NLP vaccine for advancement to clinical Phase 1. - Initiate development of oral multivalent mRNA vaccine <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Complete Phase 1 clinical trials for two vaccine candidates and transition to advanced development. - Complete preclinical studies and manufacturing process development for two additional vaccines using other platforms for transition to advanced development. - Continue preclinical development of multiple broad spectrum and multivalent vaccine platforms and toxin mAbs for transition to advanced development. - Data from preclinical studies will enhance understanding of how to use these platforms in rapid response scenarios. - Continue establishment of animal models for FDA approval. - Initiate and improve manufacturing process development and scale up for toxin antibodies and multiple prophylactic platform technologies. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increased investments in broad-spectrum and multivalent prophylactic platform technologies. Impacts late development and transition of advanced capabilities and well characterized animal models</p> | | | | |
| Title: 2) Multifunctional Materials for Protection | | 1.432 | 1.404 | 0.256 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| <p>Description: Multifunctional Materials for Protection (MMfP) iteratively develops and tests new materials and prototypes for protective garment, filter, and coatings technologies that will absorb, neutralize, and repel chemical and biological warfare agents. This will reduce costs by extending service life. New materials can also reduce the heat burden of individual protection (i.e., boots, suits, masks, and gloves) and make it more natural to operate in. . This will allow Warfighters to operate in individual protection gear for extended periods of time, reducing the necessity of early warning MMfP replaces PFAS-based textile finishes and surface coatings. MMfP matures and scales technologies that transition to all physical protection thrust areas.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Generate prototype next generation reactive and regenerative protective garment prototypes with longer service life and lower thermal burden for whole system testing. - Integrate responsive technologies to develop prototype protective suits that adapt to the environment by switching between low burden and high protection mode on demand in response to the presence of CB agents, offering proactive contamination protection. - Integrate reactive materials into filters for enhanced threat spectrum protection, extending service life and regenerative capacity. - Scale materials manufacturing processes for cost-efficiency. - Characterize materials using operationally-relevant test methods and conditions. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Optimize scaled materials manufacturing processes for cost and process efficiency and characterize materials using operationally relevant test methods. - Fabricate and test biologically inspired and two-dimensional materials for protection as they mature from applied research to advanced applied research. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Decrease due to efficiencies gained by moving efforts to the Air Purification Enhancements (\$.500M) and Protective Garments (\$.500M) thrust areas to support development of next generation individual protection filter and self-detoxifying garment prototypes.</p> | | | |
| <p>Title: 3) Protective Garments</p> <p>Description: Protective Garments provides reduced burden, low encumbrance protective garments integrated into full systems with operationally relevant, whole system test methods, and reduces cost, logistical resupply demand, and increases sustainability of solutions.</p> <p>FY 2024 Plans:</p> | - | 0.117 | 0.617 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Manufacture scaled responsive/reactive prototype garments that adapt or react to the threat and environment while reducing thermal burden and integrate with current combat garments.</p> <p>- Test scaled responsive/reactive prototype garments using whole system test methods.</p> <p>FY 2025 Plans:</p> <p>- Perform user assessments of prototype protective garments for self-detoxifying and regenerative capacity to inform iterative design improvements.</p> <p>- Continue swatch material and whole system testing of prototype protective garments for self-detoxifying and regenerative capacity to inform chemical threat protection, neutralization, and increased service life.</p> <p>- Develop, optimize, and demonstrate scaled manufacturing methods for prototype protective garments for self-detoxifying and regenerative capacity to inform cost projections.</p> <p>- Incorporate elasticity into laminated regenerative fabrics.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Funding moved from the Multifunctional Materials for Protection thrust area to support development of self-detoxifying garment prototypes.</p> | | | | |
| <p>Title: 4) Air Purification Enhancements</p> <p>Description: Air purification filters go on individual protective gear (masks) and collective protection (i.e., military systems such as tanks, ships, and buildings). Current filters are expensive and do not alert operators when they are no longer effective at blocking CB threats. Air Purification Enhancements develops filters that last longer and reduce lifecycle costs, as well as satellite filters to monitor their effectiveness throughout their lifecycle. The thrust's filters will transition enhanced protection technologies against both traditional and advanced threats to the advanced developer.</p> <p>FY 2024 Plans:</p> <p>- Transition improved, compact vehicle ColPro system filters to the Modernization ColPro program of record to broaden the spectrum of threat protection and reduce production and replacement costs.</p> <p>- Transition the Residual Life Indicator System to the Modernization ColPro program of record to accurately predict remaining filter life, reducing cost and logistics for facility and shipboard ColPro systems.</p> <p>FY 2025 Plans:</p> <p>- Redesign and down select improved M98 filter designs with extended filter life.</p> <p>- Improve filter integration/interoperability into Service equipment and platforms that offer protection against diverse threat agents.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | | 0.126 | 0.117 | 0.617 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| Program/project funding transferred from another thrust area. Funding moved from the Multifunctional Materials for Protection thrust area to support development of next generation individual protection filter. | | | | |
| <p>Title: 5) All-Hazards & Respiratory Protection</p> <p>Description: All-Hazards and Respiratory Protection tests, scales, and transitions prototypes for reduced burden, low encumbrance respiratory and ocular (eye) protection. This will make it easier for the Warfighter to perform mission essential tasks while operating in individual protective gear. Because current CB protective masks don't integrate with the Services' existing, non-CB defense helmets and displays, All-Hazards Respiratory Protection works to develop CB defense masks that integrate with existing combat systems.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Transition a microcooling-garment system that extended the time for mission operations to the Tactical Advanced Threat Protective Ensemble (TATPE) effort under the UIPE FoS GP program of record. - Complete design challenge for next generation respiratory protection concepts. - Perform early user assessment of next generation prototype respiratory protection concepts in the form of a low-burden, unencumbering respirator that integrates with existing systems (e.g., helmets and displays) and may include off-the-face and low profile filter designs. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Transition Full Spectrum Respiratory Protection System (as part of the Tactical All Hazards Ensemble) to the UIPE FoS and to the Tactical All Hazards Threat Protective Ensemble programs of record. - Transition next generation low burden respirator to ASPIRE program of record. - Transition wearable respiratory protection assessment system for operationally relevant mask fit testing. - Transition anti-fogging test standard and improved optical correction for masks. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Microcooling garment system transitions in FY24 to UIPE Fos GP program for advanced development.</p> | | 1.241 | 1.912 | 1.637 |
| <p>Title: 6) Enhanced Survivability Coatings</p> <p>Description: Enhanced Survivability Coatings improves ability to restore asset to use in normal, unprotected operations and speeds ability to reduce MOPP.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Transition candidate temporary overcoats that are commercially-available, improve success of decontamination, have low impact on signature, and reduce logistics to the TTC (Tactical Temporary Coatings) program of record. | | 0.501 | 0.629 | 0.380 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <ul style="list-style-type: none"> - Continue to evaluate and demonstrate industry polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination in support of the TTC program of record. - Conduct operational user assessments to validate temporary overcoats that improve decontamination for equipment elastomers. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue evaluating polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination in support of the TTC program of record. - Conduct equipment coatings broad materials surveys and improve two-dimensional surface treatments to repel agents of interest from current military equipment coatings. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to revised priorities to no longer pursue temporary equipment overcoats.</p> | | | | |
| <p>Title: 7) Air Purification Enhancements - Enhanced Biological Defense (ENBD)</p> <p>Description: Air Purification Enhancements (Enhanced Biodefense) provides low cost, continuous-operation collective protection engineering standards and guidelines for temporary, rapid enhancement of unprotected DOD facilities during pandemic or biological warfare agent release.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Generate validated experimental data that quantifies the range of biological infection risk reduction based on indoor air quality measurements. - Use appropriate, validated experimental methodologies to characterize and compare the impact of collective protection biological infection risk and cost, and plan operationally-relevant testing. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Use operationally relevant test beds to evaluate technologies that enhance DoD facility collective protection to reduce risk of biological infection from internal or external sources. | | 2.000 | 2.000 | 2.000 |
| <p>Title: 8) All-Hazards & Respiratory Protection - Enhanced Biological Defense (ENBD)</p> <p>Description: All-Hazards and Respiratory Protection (Enhanced Biodefense) reduces Warfighter physical burden imposed by existing respiratory and ocular protection capabilities, reduces cost, and extends equipment service life.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Identify potential antimicrobial textiles and innovative designs for respirators by partnering with industry, Department of Defense laboratories, and academic performers. - Evaluate textiles for bactericidal and bacteriostatic effects using standardized test methods. | | 1.285 | 1.500 | 1.000 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>- Scale manufacturing of candidate antimicrobial textiles for respirator prototypes.</p> <p>FY 2025 Plans:</p> <p>- Perform early user assessment of respiratory and ocular protection specifically for protection against biological agents.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Decrease due to transfer of funding to Protective Garments - ENBD thrust area to support advancement of successful antimicrobial swatch materials to prototype protective garment design, manufacture, scaling, and whole system testing.</p> | | | |
| <p>Title: 9) Protective Garments - Enhanced Biological Defense (ENBD)</p> <p>Description: Protective Garments (Enhanced Biodefense) reduces Warfighter physical burden imposed by existing personal protection capabilities, reduces cost, and extends garment service life.</p> <p>FY 2024 Plans:</p> <p>- Partner with industry, Department of Defense laboratories, and academic partners to identify potential antimicrobial textiles for evaluation.</p> <p>- Down select and evaluate textiles for bactericidal and bacteriostatic effects using standardized test methods.</p> <p>- Scale manufacturing of candidate antimicrobial textiles for prototype garments.</p> <p>FY 2025 Plans:</p> <p>- Perform early user assessment and swatch testing for percutaneous protection specifically for protection against biological agents.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Increase due to transfer of funding from All-Hazards & Respiratory Protection - ENBD to support advancement of successful antimicrobial swatch materials to prototype protective garment design, manufacture, scaling, and whole system testing.</p> | 0.315 | 0.500 | 1.000 |
| <p>Title: 10) Nerve Agent Prophylaxis/Pretreatments</p> <p>Description: Exposure to nerve agents is at worst catastrophic and at best disabling for an extended period – and in most cases the onset of symptoms is very fast. Nerve agents work by blocking the signal flow across nerve junctions, ultimately resulting in a loss of ability to control both voluntary and involuntary muscles and death by asphyxiation. Maintaining full mission readiness in a CB contested environment would require advance administration of a medical antidote well before exposure and would not require additional treatment after exposure (prophylaxis). Until now, no such antidote has existed. The nerve agent (NA) prophylaxis portfolio is developing protective medicines that are effective against a broader range of nerve agents – including fourth generation agents – than had ever before been thought possible. Successful development of these medicines will greatly enhance the ability of the Warfighter to stay in the fight and move forward.</p> | - | 6.000 | 14.500 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) PT3 / <i>Protect (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| <p>FY 2024 Plans: - Continue to advance candidate bioconjugated organophosphorus hydrolase (OPH) mutants as catalytic nerve agent prophylaxes through current Good Manufacturing Practice (cGMP) production and on-Good Laboratory Practice (GLP)/GLP efficacy, toxicity and PK studies.</p> <p>FY 2025 Plans: - Continue to perform studies on how well the protective drugs work (efficacy), how they move into, through and out of the body (pharmacokinetics), and if there are any significant harmful effects (toxicity). These continuing studies are performed at standards suitable for submission to the FDA. Additionally, Phase I clinical studies will be initiated for one protective drug.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Current planning calls for FY25 initiation of a Phase I clinical trial, which necessitates a large increase in cost/funding.</p> | | | |
| Accomplishments/Planned Programs Subtotals | 29.631 | 29.261 | 46.050 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025 Base</u> | <u>FY 2025 OCO</u> | <u>FY 2025 Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
| • PT4: <i>Protect (ACD&P)</i> | 170.788 | 179.158 | 172.190 | - | 172.190 | 154.024 | 131.577 | 137.660 | 120.758 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

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| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> |
|--|--|---|

| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| MT3: <i>Mitigate (ATD)</i> | - | 83.766 | 100.791 | 81.920 | 0.000 | 81.920 | 90.704 | 84.795 | 86.434 | 86.435 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The Mitigate Advanced Technology Development (ATD) Project provides the Joint Force the ability to preserve combat power by mitigating exposure to chemical and biological (CB) hazards and restoring combat readiness of critical personnel and platforms.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Therapeutics
- (2) Discovery of Medical Countermeasures Against New and Emerging Threats (DOMANE)
- (3) Chemically Reactive Ocular, Wound and Dermal Therapeutics (CROWD)
- (4) Emerging and Pharmaceutical-based Agent Threats (EMPATH)
- (5) Reactivators of Acetylcholinesterase as Therapeutics (ReACT)
- (6) Enhanced Survivability Coatings
- (7) Equipment Decontamination
- (8) Multifunctional Materials for Protection (MMfP)
- (9) Personnel Decontamination
- (10) Wide Area Decontamination
- (11) Critical Area Decontamination

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2023 | FY 2024 | FY 2025 |
|---|---------|---------|---------|
| <p>Title: 1) Biological Warfare Defense Therapeutics</p> <p>Description: Funds biomedical research focused on the nonclinical and early clinical development of therapeutic countermeasures against known and emerging viral, bacterial, and toxin biological warfare (BW) threats for which U.S. Food & Drug Administration (FDA) approved therapeutics are limited or lacking.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue nonclinical and regulatory activities to transition broad spectrum antibacterial candidate to Biomedical Advanced Research and Development Authority (BARDA). - Initiate clinical and/or nonclinical studies for broad-spectrum antiviral therapeutic candidates. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | - | 3.984 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| Decrease due to funding consolidation for Biological Warfare Defense Therapeutics. | | | |
| <p>Title: 2) Biological Warfare Defense Therapeutics</p> <p>Description: Therapeutics represent an important component of integrated layered defense. Therapeutics will mitigate the impact of biological threats to the warfighter by enabling rapid recovery and expediting return to the fight. This effort funds biomedical research focused on the early discovery and evaluation of therapeutic countermeasures against known and emerging biological warfare (BW) threats for which Food & Drug Administration (FDA)-approved therapeutics are limited or lacking. Effort supports transition of lead candidates from MT2 for further development before transitioning to advanced development.</p> <p>FY 2024 Plans:</p> <p>Bacterial:</p> <ul style="list-style-type: none"> - Continue efforts to identify and advance bacterial therapeutic candidates, including non-traditional candidates. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation or transition to other therapeutic efforts or an advanced developer. Two broad-spectrum therapeutic candidates will advance to the Department of Health and Human Services, Biomedical Advanced Research and Development Authority for continued development. - Continue to partner with interagency, international and industry partners to fund nonclinical BW therapeutic efficacy studies for therapeutic candidates already in advanced development for public and force health indications. - Continue to execute proof of concept efficacy studies for antibiotic therapy in combination with prophylaxis or complimentary treatments (layered medical defense). Advance layered combinations toward proof of concept in safety/efficacy models. <p>Viral:</p> <ul style="list-style-type: none"> - Continue efforts to identify and advance viral therapeutic candidates against new and existing BW viral threats, including host targeted and direct acting, broad-spectrum anti-virals and monoclonal antibodies. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation or transition to other therapeutic efforts or an advanced developer. One broad-spectrum therapeutic candidate will advance to the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense Antiviral Oral Therapeutic Program for continued development. - Continue proof of concept viral therapeutic efficacy studies for combinations of therapeutics including, small molecule, monoclonal antibody and host-directed therapeutics. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Efforts focused on transitioning to advanced development partners - Continue to execute proof of concept efficacy studies for therapy in combination with prophylaxis or complimentary treatments (layered medical defense). | 29.065 | 29.703 | 17.694 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Advance small molecules, monoclonal antibodies and host-directed therapeutics and layered combinations toward establishing proof of concept in large animal models and transition to advanced development</p> <p>- One broad-spectrum therapeutic candidate will transition to the Antiviral Oral Therapeutic Program for continued development.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to revised priorities to focus on emerging threats.</p> | | | | |
| <p>Title: 3) Biological Warfare Defense Therapeutics - Enhanced Biological Defense (ENBD)</p> <p>Description: This effort focuses on repurposing FDA approved therapeutics against different biological threats to enable rapid response. These activities support the development of repurposing tools and processes for more efficient future responses against new and emerging threats.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to repurpose broad-spectrum drugs against viral, bacterial and toxin threats. - Continue to create and sustain curated, searchable databases of molecules with toxicity, drug development and efficacy data for use in a response to emerging biological threats. - Continue to develop host-targeted technologies that can be used to stop progression of disease caused by viral threats. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to repurpose 5-10 broad-spectrum capabilities against biological threats. - Continue to create and sustain curated, searchable databases of molecules with toxicity, drug development and efficacy data to decrease timeline in MCM fielding in future responses to emerging biological threats. - Continue to develop host-targeted technologies that can be used to reduce symptoms caused by biological threats and minimize impact to the warfighter. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to revised priorities to focus on emerging threats.</p> | | 22.945 | 23.000 | 21.000 |
| <p>Title: 4) Discovery of Medical countermeasures Against New and Emerging threats (DOMANE)</p> <p>Description: This effort focuses on predicting disease origin of pathogens and toxins while using artificial intelligence (AI) and machine learning (ML) to identify targets for both host and pathogen while conducting high throughput screens using new structural models with AI to predict and recommend potential therapeutics. It supports DOMANE thrusts like Disease Origin and Toxicity forecasting using Multi-Organoid Systems (PATMOS) prototype, which develops an advanced-artificial intelligence (AI) assisted multi-organoid system capable of forecasting disease origin of viral threats and toxicity of biotoxin threats.</p> | | 2.834 | 7.469 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue prototype development of PATMOS platform for high resolution forecasting of pathogenesis that occurs during interaction of new and emerging biological threats and providing initial safety data on recommended medical countermeasures. - Continue development of prototype development of ambient ionization mass spectroscopy high-throughput screens (AIM-HITS) system to rapidly characterize MCMs by collecting and analyzing large amounts of structural data and use AI/ML to recommend new MCMs. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the DOMANE-ENBD thrust area for better project alignment.</p> | | | | |
| <p>Title: 5) Discovery of Medical countermeasures Against New and Emerging threats (DOMANE) - Enhanced Biological Defense (ENBD)</p> <p>Description: Provides innovative and rapid medical countermeasures (MCMs) development capabilities (Artificial Intelligence, machine learning, data science, and platform technologies) that reduce developmental risks, cost, and schedule associated with MCM fielding. Building upon previous investments in DOMANE (e.g. BA2 funded efforts), this program focuses on predictive and generative AI/ML capabilities to rapidly identify safe and effective MCMs against a broad range of new and emerging threats.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue prototype development of PATMOS platform for high resolution forecasting of pathogenesis using organoid platforms that occurs during interaction of new and emerging biological threats. - Initiate 2nd PATMOS prototype to provide additional pathogenesis forecasting capability along with recommending MCMs for treatment. -Continued prototype development of ambient ionization mass spectroscopy high-throughput screens (AIM-HITS) system to rapidly characterize MCMs and continued development of cryo-electron microscopy (cyro-em) prototype with high throughput system to characterize MCMs at the atomic level combined with AI/ML to recommend MCMs for new and emerging threats. - Continue prototype development for MEDFIND platform to identify repurposed and new drugs using AI and ML using high throughput screens and micro-electron diffraction to deliver crystal structures on the atomic scale to enable accurate target and host characterization leading to designing new MCMs. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue development of organoid platform to predict and assess MCM safety - Continue to use organoid platform to characterize disease progression | | 12.000 | 12.000 | 14.219 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| - Continue to identify potential drug candidates utilizing various AI/ML-supported platforms | | | | |
| <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Decrease due to revised priorities from the DOMANE thrust area transfer to focus on enhanced biodefense and pandemic preparedness.</p> | | | | |
| <p>Title: 6) Chemically Reactive Ocular, Wound and Dermal Therapeutics (CROWD)</p> <p>Description: While there exist multiple processes and reagents for cleaning physical surfaces that have been contaminated with chemical agents, there are limited options for human skin, and nothing that could be used for open wounds. This represents a source of continuing exposure for the warfighter and a hazard to medical personnel treating them. CROWD focuses on developing a ready-to-use product to remove Chemical Warfare Agent (CWA) contamination on skin, eyes and ultimately wounds. Removing or neutralizing CWA decreases the total exposure to the warfighter and allows optimal effectiveness of other medicines.</p> <p>FY 2024 Plans: - Perform advanced preclinical studies to validate safety and efficacy in support of clinical trials.</p> <p>FY 2025 Plans: - Perform preclinical studies to validate safety and efficacy in support of clinical trials and optimize processes for meeting the set of quality regulations established by the FDA. - Initiate preclinical studies for wounds in large animals.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Decrease due to economic cost adjustments supporting CROWD efforts.</p> | | - | 2.500 | 2.407 |
| <p>Title: 7) Emerging and Pharmaceutical-based Agent Threats (EMPATH)</p> <p>Description: As technology advances, the number of “easily available” threat chemicals increases. Some of these new chemicals pose threats to the warfighter and are therefore termed Emerging Chemical Threats (ECTs). In addition to ECTs, a subset of chemical threats includes legitimate medicines that are repurposed by those with malign intent as chemical threat agents, referred to collectively as Pharmaceutical Based Agents (PBAs). These compounds have genuine medical utility but can be abused (by level of exposure and/or delivery method) as general incapacitants (notably, large doses can easily become lethal). The warfighter requires effective MCMs that prevent or reverse the adverse effects of ECTs and PBAs, while still allowing for the use of U.S. Food & Drug Administration (FDA) approved drugs (e.g., morphine, fentanyl) by Joint Force Medical Staff for their labeled indications of pain management and sedation. EmPATH is evaluating approved medicines as well as developing new ones for use in the field to counteract these effects. The portfolio is working to develop MCMs that are effective against a wide range of ECT/PBA-induced symptoms which may be common across several different types of threat agents. Groups of symptoms caused</p> | | 0.387 | 4.361 | 4.496 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>by a family of threat agents that act similarly are called toxidromes; and medical countermeasures that address the symptoms of several different types of threat agents simultaneously are called cross-toxidromic medicines.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue cGMP production and non-GLP/GLP safety and/or efficacy assessment of a novel, multi-dose vial formulation. - IND filing and initiation of a human bioavailability/bioequivalence study to support a New Drug Application (NDA) filing for a novel, multi-dose vial formulation. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continues to further develop medicine candidates that treat key symptoms regardless of the specific agent that is causing them. This moves us away from “one risk, one remedy” solutions. This approach is called a “cross-toxidromic” approach and will be critical in addressing the rapidly expanding universe of chemical threat agents. <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>Increase due to economic cost adjustments supporting emerging and Pharmaceutical-based Agents.</p> | | | |
| <p>Title: 8) Reactivators of AChE as Therapeutics (ReACT)</p> <p>Description: Exposure to nerve agents is at worst catastrophic and at best disabling for an extended period – and in most cases the onset of symptoms is very fast. Nerve agents work by blocking the signal flow across nerve junctions, ultimately resulting in a loss of ability to control both voluntary and involuntary muscles and death by asphyxiation. Currently, there is only one FDA- approved post-exposure drug treatment that restores the activity of the human molecule deactivated by nerve agent, and it is essentially unchanged since the 1950s. The ReACT portfolio is developing a number of different candidate medicines that are effective against a broader range of nerve agents – including fourth generation agents - than had ever before been thought possible. Successful development of these medicines will greatly enhance the ability of the Warfighter to survive and potentially stay in the fight and move forward.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to advance pre-clinical development of lead therapeutic candidates. - Complete IND-enabling studies on the current lead reactivator candidates. - Continue development efforts in preparation for IND/phase 1 clinical trials, including cGMP manufacturing. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to perform preclinical studies for lead drug candidate and optimize processes for meeting the set of quality regulations established by the FDA. | 4.768 | 8.205 | 9.837 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| - Initiate investigative new drug (IND) package submission and Phase I clinical trials for one drug candidate. FY 2024 to FY 2025 Increase/Decrease Statement: Current planning calls for FY25 initiation of a Phase I clinical trial, which necessitates a large increase in cost/funding. | | | | |
| Title: 9) Enhanced Survivability Coatings Description: Enhanced Survivability Coatings assesses existing technologies and develops new coatings to increase chemical agent resistance for equipment and individual protection gear. This will make it quicker and easier to decontaminate and restore assets for use in normal, unprotected operations. It will also allow the Joint Force to reduce individual protective gear more quickly. FY 2024 Plans: - Transition candidate temporary overcoats that are commercially-available, improve success of decontamination, have low impact on signature, and reduce logistics to the Tactical Temporary Coatings (TTC) program of record. - Continue to evaluate and demonstrate industry polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination. FY 2025 Plans: - Transition test method for temporary overcoat evaluation to the Tactical Temporary Coatings (TTC) program of record. FY 2024 to FY 2025 Increase/Decrease Statement: Increase due to economic cost adjustments. | | 0.230 | 0.074 | 0.090 |
| Title: 10) Equipment Decontamination Description: Equipment Decontamination provides reduced troop-to-task, logistics decontaminants, and decontamination methods with operationally-relevant test methods. FY 2024 Plans: - Demonstrate autonomous equipment decontamination platform to reduce troop-to-task and logistics requirements for operational decontamination. - Transition methodology for decontaminating chemically-contaminated sensitive equipment using hot, humid air. - Transition methodology for decontaminating bacterial spore-contaminated aircraft using hot, humid air. FY 2025 Plans: - Demonstrate autonomous equipment decontamination subsystems to reduce troop-to-task and logistics requirements for operational decontamination. | | 0.890 | 0.454 | 1.521 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Conduct field demonstration of technologies and methods for chemical and biological tactical and thorough decontamination of aircraft (e.g., helicopter) interiors and exteriors.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase in FY25 to support user assessments of autonomous decontamination system.</p> | | | | |
| <p>Title: 11) Multifunctional Materials for Protection</p> <p>Description: Multifunctional Materials for Protection (MMfP) develops new materials for decontaminants and coatings technologies that will absorb, neutralize, and repel chemical and biological warfare agents. This will make decontamination easier, reducing costs and the logistical burden on the Joint Force, supporting the Joint Force’s operational concepts in priority theaters. MMfP also develops new materials to replace PFAS-based finishes and surface coatings. MMfP matures technologies that transition to all hazard mitigation thrust areas.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Integrate reactive materials into decontamination systems for enhanced threat spectrum mitigation. - Continue ambient pressure characterization of reactive chemical decontamination mechanisms. - Scale materials manufacturing processes for cost-efficiency and characterize materials using operationally-relevant conditions. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Optimize scaled materials manufacturing processes for cost and process efficiency and transition to Protective Garments thrust. - Characterize materials using operationally relevant test methods. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase due to revised priorities supporting the characterization of materials using operationally relevant test methods.</p> | | 0.162 | 0.117 | 0.148 |
| <p>Title: 12) Personnel Decontamination</p> <p>Description: Decontamination is critical to being able to fight through and recover quickly after CB threat usage. Personnel Decontamination provides new personnel decontamination kits with reduced costs and logistics (storage and shelf-life limitations) compared to the currently fielded product and provides new processes and methods for decontamination of unbroken skin.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Prepare a medical device package for FDA consideration for a new personnel decontamination form factor that reduces sustainment risk of Reactive Skin Decontamination Lotion cold storage and shelf-life concerns for the next generation Medical Decontamination Personnel Skin program of record. <p>FY 2025 Plans:</p> | | 0.485 | 2.339 | 3.572 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Continue Personnel Decontamination kit testing and demonstrations to support transition of technology to the Medical Decontamination Personnel Skin program of record.</p> <p>- Continue to seek FDA approval for a medical device 510K package for a powder/dry decontamination that reduces sustainment risk of RSDL cold storage and shelf-life concerns for general purpose warfighter personnel decontamination.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase in FY25 for scaled manufacturing of prototype personnel decontamination kit and safety and efficacy testing to support medical device 510K package submission to FDA.</p> | | | | |
| <p>Title: 13) Wide Area Decontamination</p> <p>Description: Wide Area Decontamination develops autonomous systems and formulations for decontamination of mission-critical terrain.</p> <p>FY 2024 Plans: -Optimize chemical wide area decontamination methods and processes for using commercially-available packaged chemicals for decontaminating critical infrastructure area surfaces for effectiveness, availability, and sprayability/scalability. -Demonstrate chemical wide area decontamination methods, processes, and feasibility for using commercially-available packaged chemicals using operationally-relevant environments and simulants in support of autonomous decontamination.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred to another thrust area. Funding moved to the Critical Area Decontamination thrust area for better project alignment.</p> | | - | 0.585 | - |
| <p>Title: 14) Critical Area Decontamination</p> <p>Description: Critical Area Decontamination mitigates hazards and contamination spread in mission-critical areas, such as airports and seaports, that are operationally essential for COCOM commanders to generate combat power within the theater of operations and enable normal, unprotected operations. This will enhance the Joint Force's ability to fight through and recover rapidly from adversary CB attacks on these mission-critical areas.</p> <p>FY 2025 Plans: - Demonstrate chemical and biological critical area decontamination formulations methods. - Validate processes for using commercially available packaged chemicals and operationally relevant environments and simulants. - Demonstrate formulation efficacy in operationally relevant field testing.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | | - | - | 0.936 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| Program/project funding transferred from another thrust area. Increase due to the Wide Area Decontamination thrust area transfer to demonstrate formulation efficacy in operationally relevant field testing. | | | | |
| <p>Title: 15) Equipment Decontamination - Enhanced Biological Defense (ENBD)</p> <p>Description: Equipment Decontamination (Enhanced Biodefense) provides guidelines, standards, and methods for disinfection of DOD facility and large-platform interiors; provides biological contamination mapping capability for surfaces.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete and transition methods for field testing of surface decontamination methods for viruses using a safe, non-infectious surrogate to the Joint Biological Aircraft Decontamination Systems program of record. - Continue development of biological disinfection guidelines, procedures, and CONOPs, for DoD facility and large-platform interiors, including directed energy decontamination approaches. - Optimize and verify laboratory methods for biological agent disclosure sprays for sensitive, specific biological contamination mapping on surfaces to guide and reduce logistics of decontamination. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Demonstrate biological disinfection guidelines, procedures, and Concepts of Operations (CONOPs) for Department of Defense (DoD) facility and large-platform interiors, including development of directed energy disinfection methods including plasma and ultraviolet germicidal irradiation. - Continue to develop biological agent disclosure sprays for sensitive, specific biological contamination mapping on surfaces to guide and reduce logistics of decontamination. - Continue research, development, and demonstration of one or more functional prototype technologies in a phased approach for a biological agent disclosure sprays and down select designs for further development. | | 4.000 | 5.000 | 5.000 |
| <p>Title: 16) Wide Area Decontamination - Enhanced Biological Defense (ENBD)</p> <p>Description: Wide Area Decontamination develops autonomous systems and formulations for biological decontamination of mission-critical terrain.</p> <p>FY 2024 Plans:</p> <p>Develop concept platform and required subsystems for autonomous wide area biological decontamination, methods, processes, and feasibility and identify and optimize biological decontaminant formulations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> | | - | 1.000 | - |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| Program/project funding transferred to another thrust area. Funding moved to the Critical Area Decontamination - Enhanced Biodefense thrust area for better project alignment. | | | |
| Title: 17) Critical Area Decontamination - Enhanced Biological Defense (ENBD) Description: Critical Area Decontamination mitigates hazards and contamination spread in mission-critical areas, such as airports and seaports, that are operationally essential for COCOM commanders to generate combat power within the theater of operations and enable normal, unprotected operations. This will enhance the Joint Force's ability to fight through and recover rapidly from adversary CB attacks on these mission-critical areas. FY 2025 Plans: - Demonstrate chemical and biological critical area decontamination formulations methods. - Validate processes for using commercially available packaged chemicals and operationally-relevant environments and simulants. - Demonstrate formulation efficacy in operationally relevant field testing. FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Funding moved from the Wide Area Decontamination - Enhanced Biodefense thrust area for better project alignment. | 1.000 | - | 1.000 |
| Accomplishments/Planned Programs Subtotals | 78.766 | 100.791 | 81.920 |

| | FY 2023 | FY 2024 |
|--|----------------|----------------|
| Congressional Add: Broad Spectrum Small Molecule Anti-viral Development FY 2023 Accomplishments: Viral: - Enhanced the viral therapeutic development pipeline by initiating two new efforts to identify and advance broad-spectrum viral therapeutic candidates against new and existing biological warfare (BW) viral threats. - Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation under Advanced Component Development and Prototypes (PE 0603884BP) or transition to an advanced developer. | 5.000 | - |
| Congressional Adds Subtotals | 5.000 | - |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> <u>Base</u> | <u>FY 2025</u> <u>OCO</u> | <u>FY 2025</u> <u>Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
| • MT4: <i>Mitigate (ACD&P)</i> | 16.935 | 28.785 | 43.364 | - | 43.364 | 44.601 | 36.558 | 5.309 | 11.643 | Continuing | Continuing |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) MT3 / <i>Mitigate (ATD)</i> |

C. Other Program Funding Summary (\$ in Millions)

| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> <u>Base</u> | <u>FY 2025</u> <u>OCO</u> | <u>FY 2025</u> <u>Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
|------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|

Remarks

D. Acquisition Strategy

N/A

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|---|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|-------------------------|-------------------------|-------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | | | | | | | | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | | | | | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | | | | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| EN3: <i>Enabling Investments (ATD)</i> | - | 38.164 | 43.196 | 16.967 | 0.000 | 16.967 | 19.040 | 19.040 | 19.040 | 19.040 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The Enabling Investments Advanced Technology Development (ATD) Project focuses on early and continued involvement of the warfighter in the technology development process and has implemented a user community engagement process to align science and technology (S&T) activities with operational needs and ensure functional design. This process begins with the identification of an innovative technology concept, continues through the assessment of the prototype, and ends at the operational and utility demonstrations to enhance transition to an advanced developer. Enabling efforts in this area support dedicated infrastructure capabilities, demonstrations, and overarching development support functions as portfolio enablers responding to emerging threats. Project EN3 aligns revised CB incident preparedness and response priorities. In FY 2025, efforts supporting existing CB incident preparedness and response priorities transition to Project EN2 to continue resourcing for this portfolio.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Prophylaxis
- (2) Advanced Technology Demonstration (ATD)
- (3) Technology Concepts
- (4) User Assessment
- (5) Battlefield Readiness
- (6) Diagnostic Building Blocks
- (7) Emerging Threats
- (8) Medical Countermeasures Initiative

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| Title: 1) Biological Warfare Defense Prophylaxis - Enabling Science | - | - | 7.500 |
| Description: This effort will focus on the development of alternate animal models and validation of microphysiological models that mimic the human system. Investment includes efforts to advance multiple models for prototype pathogens and chemical agents and validation of models to replace, reduce, or refine animal use in MCM development in alignment with Congressional requirements (the FDA Modernization Act 2.0). This capability will decrease the time and resources necessary to mount an effective medical response against biological and chemical threats. | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Advance developed alternate animal models for exemplar biological and chemical agents for model validation - Initiate validation of developed human and animal microphysiological model systems for direct comparison of animal models, Organ tissue equivalents, Immune system mimics, and human to bridge the data between animal models and humans <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project funding transferred from another thrust area. Funding moved from the Medical Countermeasures Initiative thrust areas to support investments in alternatives to animal models supporting rapid response for new and emerging threats.</p> | | | |
| <p>Title: 2) Advanced Technology Demonstration</p> <p>Description: Advanced Technology Demonstrations (ATDs) are Joint Task Force (JTF) scenario-based experiments that demonstrate and evaluate groupings of integrated technologies or prototype systems, prioritized on warfighter operational needs in the context of the future fight, mitigate transition risk by assessing technologies for DOTMLPF-P considerations and demonstrating operational utility.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue Tenacious Dragon Campaign ATD. - Demonstrate developmental technologies and gather warfighter feedback on capabilities that enable the effective employment and layering of CBRN awareness, understanding, protection and mitigation capabilities across medical and non-medical portfolios to provide rapid and effective reduction of the operational impact of CBRN hazards. - Demonstrate novel technologies from Defense Threat Reduction Agency (DTRA) Technology Divisions to accelerate and optimize their development, maturation, and transition coordinated with other technologies, enhancing capability development and DOTMLPF-P updates early in the Research & Development (R&D) cycle. - Coordinate an active pathway for developmental technologies from Technology Concepts and User Assessment (e.g. CBOA) thrust areas to ATDs, where appropriate, to demonstrate feedback-based progress in increasingly complex environments and facilitate technology transitions. - Continue the expansion of the service participation to include participation from the Services. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue the execution of Tenacious Dragon Campaign with an Integrated Layered Defense (ILD) construct and provide written knowledge products that analyze the integrated technology sets in the context of the operational baseline and DOTMLPF-P considerations, to inform the Services what is in early S&T R&D, to solicit Warfighter feedback on potential future capabilities, and identify opportunities to accelerate development, transition, and fielding, where possible. | 4.818 | 5.943 | 5.943 |
| <p>Title: 3) Technology Concepts</p> | 0.300 | 1.496 | 1.673 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|----------------|----------------|----------------|
| <p>Description: Efforts in this area focus on exploring potential operational use of emerging technology concepts in order to explore potential applications for the Warfighter. These projects work directly with the Warfighter to help answer the question “If we build it, how might it be used?”</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Explore select technology concepts from an operational perspective across all capability areas. Tech Concepts explore the utility and application of technological approaches. These include autonomous operations; enhanced biothreat detection; CB threat diagnosis; improvements to sensitivity, specificity, and the limit of detection for CB sensors; features of biosensors to inform therapeutic or medical countermeasure decisions and treatment; next generation respiratory or physical protection; collective protection guidelines and techniques; and coating concepts for porous surfaces. - Continue to conduct User Feedback Tents for Tech Concepts (Concepts Tents) leveraging User community to identify potential areas for improvement and/or employment of emerging technologies. - Continue series of targeted questionnaires/surveys, facilitated focus groups, workshops and TTXs to define use cases, desired operational capabilities, key attributes and concepts of employment that inform tech development and investment strategies, Operating Concepts and materiel requirements. Concept Tent reports provide tech recommendations for more detailed Tech Concept studies/experiments. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue to conduct the annual Concept Tent at CBOA, leveraging User community to identify potential areas for improvement and/or employment of emerging technologies. - Continue a series of targeted questionnaires/surveys, facilitated focus groups, workshops and TTXs to define use cases, desired operational capabilities, key attributes and concepts of employment that inform tech development and investment strategies, Operating Concepts and materiel requirements. - Establish a Joint Battle Laboratory that will increase active information sharing and role playing with Futures teams to drive force design for CBRN Joint forces and DOTMLPFP actions to inform future investment and provide venue for technological innovation to drive force concept design from a CBRN lens. <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding increased due to the new Joint Battle Lab initiation.</p> | | | |
| <p>Title: 4) User Assessment</p> <p>Description: User Assessments are designed to optimize individual technologies for the intended mission, explore how S&T prototypes and models might support future capability gaps and high priority mission deficiencies and identify candidates for rapid</p> | 1.949 | 1.851 | 1.851 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>acquisition initiatives. These projects work directly with the Warfighter to help answer the question "What is the benefit to the mission?"</p> <p>FY 2024 Plans: - Continue the annual CBOA event.</p> <p>FY 2025 Plans: - Chemical and Biological Operational Analysis (CBOA): Continue the CBDP's signature User Assessment that assesses up to 35 S&T prototypes and models in scenario-based field experiments that view S&T from both the operator and adversary perspectives. To the extent possible, scenarios will align with and address gaps in Services/Joint Force future operating concepts. - Targeted User Assessments: Continue additional smaller-scaled assessment efforts based upon technology discovery, maturity, application to Warfighter needs and available resources focused on optimizing specific S&T for anticipated missions in future operating environments. - Technology Injects: Continue leveraging existing field experiments and Service-training exercises to conduct user assessments, mitigating redundancy of effort and saving cost"</p> | | | | |
| <p>Title: 5) Battlefield Readiness</p> <p>Description: Provide innovative capabilities to the warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care. Develop field forward medical diagnostics that allow for multiplexed detection of biological and toxin threats. Leverage immunodiagnostics to identify specific targets using current or novel approaches to enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure.</p> <p>FY 2024 Plans: - Continue the development of additional panels for infectious disease diagnostic tests on the immunological diagnostic platform.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p> | | 5.094 | 4.658 | - |
| <p>Title: 6) Diagnostic Building Blocks</p> <p>Description: Lays a foundation for the entire diagnostics portfolio by exploiting areas such as machine learning (ML), synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat.</p> <p>FY 2024 Plans:</p> | | 3.962 | 4.075 | - |

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|--|--|---|----------------|----------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 | | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2023 | FY 2024 | FY 2025 |
| <p>- Continue novel efforts utilizing AI and ML for designing assays with high specificity against a broader range of chemical and biological agents to enable an agile response to emerging threats.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p> | | | | |
| <p>Title: 7) Emerging Threats</p> <p>Description: Advance the diagnosis of emerging and/or low prevalence but high threat biological agents leveraging novel technologies. Develop threat agnostic tests based on host biomarkers that identify known or emerging bacterial or viral infections. Characterize markers for antibiotic resistance or susceptibility to identify challenging threats and inform treatment decisions. Improve capabilities to identify diverse biological agents that are not well characterized using molecular or immunodiagnostic approaches.</p> <p>FY 2024 Plans: - Continue efforts that establish multiple capabilities for Warfighters to combat new and emerging threats to include identifying novel platforms that are capable of identifying broad classes of threat agents in complex matrices.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p> | | 2.264 | 2.912 | - |
| <p>Title: 8) Medical Countermeasures Initiative</p> <p>Description: Integrate advances in regulatory science, formulation and delivery technologies and processes. Also will develop animal models, drug discovery and evaluation of platforms as enablers of the advanced development of CBDP medical countermeasure products. These initiatives will lead to the establishment of multi-use platforms, novel formulations and animal models that can be leveraged during a CBRN response to accelerate medical product development and/or regulatory approval as well as reduce overall development costs.</p> <p>FY 2024 Plans: - Conduct evaluation of immune modulation strategies as stand alone, in layered defense and in formulation with vaccines. - Conduct test and evaluation of encapsulation technologies for vaccines that can co-deliver multiple antigens and adjuvants to specific host tissues and tune the immune response resulting in enhanced antigen efficacy and immediate protection with a single dose. - Conduct test and evaluation of mucosal delivery methods for delivery for vaccines that can fine-tune the immune response to vaccines with the goal being vaccines with neutralizing efficacy against a respiratory exposure to an emerging pathogen. Mucosal delivery has the ability to access unique compartments of immunity through intranasal or oral delivery and target that immunity specifically to the site of infection of a respiratory pathogen.</p> | | 19.777 | 22.261 | - |

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|---|--|---|
| Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program | | Date: March 2024 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|--|----------------|----------------|----------------|
| - Prepare for surprise by continuing to establish drug discovery and evaluation platform capability that can be leveraged during a CBRN response. - Continue to develop and advance animal models to accelerate medical countermeasure (MCM) delivery and the capacity to respond to emerging biological threats. <i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Program/project funding transferred to another thrust area. Funding moved to the Biological Warfare Defense Prophylaxis thrust areas in Project EN2 and EN3 for better project alignment. | | | |
| Accomplishments/Planned Programs Subtotals | 38.164 | 43.196 | 16.967 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| Line Item | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| • EN4: <i>Enabling Investments (ACD&P)</i> | 6.645 | 47.272 | 35.700 | - | 35.700 | 23.500 | 17.800 | 25.800 | 20.200 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

| | | |
|--|--|---|
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) ET3 / <i>Emerging Threats (ATD)</i> |
|--|--|---|

| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|------------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| ET3: <i>Emerging Threats (ATD)</i> | - | 0.000 | 10.000 | 9.000 | 0.000 | 9.000 | 9.000 | 9.000 | 9.000 | 9.000 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

Project ET3 aims to identify and develop scientific solutions, or to modernize capabilities, that allow for a more rapid response to emerging threats. This project supports the development of defense capabilities, collaborating across the Department of Defense (DoD) and specific interagency partners for doctrine, equipment, and training for the warfighter and civilian population for defense against emerging threats. Additionally, this project supports advanced development of defensive science and technology capabilities aimed at proactive characterization of threats and potentially disruptive technologies.

Individual efforts in this Project include:

- Developing new science and technology capabilities that allow for the rapid characterization of emerging threats to support operational decision making and requirements setting. Support an integrated approach to developing new or enhanced countermeasures against emerging threats through innovative science and technology solutions for detection, protection, decontamination, and medical countermeasures (MCMs).
- Efforts supply test methodologies and supporting science to verify capabilities, develop protection and hazard mitigation options, expand hazard assessment tools, and develop MCMs against emerging threats.

Chemical and Biological Emerging Threat Innovation Fund challenge DoD Labs and innovation cells to deliver transformational technologies against emerging threats that enables the force to compete, deter, and win in strategic environments described in the National Defense Strategy.

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2023 | FY 2024 | FY 2025 |
|--|---------|---------|---------|
| <p>Title: 1) Emerging Threat Innovation</p> <p>Description: The Chemical and Biological Defense Emerging Threat Innovation Fund challenges DoD Labs and innovation cells to deliver transformational technologies against emerging threats that enables the force to compete, deter, and win in strategic environments described in the National Defense Strategy.</p> <p>FY 2024 Plans: Initiate enhanced capability to more rapidly characterize, and the development of medical countermeasures against, emerging chemical and biological threats through investment in high throughput technologies. Support development of challenges advancing concept and technology development.</p> <p>FY 2025 Plans:</p> | - | 10.000 | 9.000 |

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Chemical and Biological Defense Program **Date:** March 2024

| | | |
|--|--|---|
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i> | Project (Number/Name) ET3 / <i>Emerging Threats (ATD)</i> |
|--|--|---|

| | | | |
|--|----------------|----------------|----------------|
| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 |
| Continue enhanced capability to more rapidly characterize, and the development of medical countermeasures against, emerging chemical and biological threats through investment in high throughput technologies. Continue development of challenges advancing concept and technology development. | | | |
| <i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Funding decrease to support joint battle lab efforts in Project EN3. | | | |
| Accomplishments/Planned Programs Subtotals | - | 10.000 | 9.000 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> <u>Base</u> | <u>FY 2025</u> <u>OCO</u> | <u>FY 2025</u> <u>Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
| • UN4: <i>Understand (ACD&P)</i> | 52.163 | 61.638 | 53.120 | - | 53.120 | 47.808 | 49.646 | 49.608 | 62.105 | Continuing | Continuing |
| • PT4: <i>Protect (ACD&P)</i> | 170.788 | 179.158 | 172.190 | - | 172.190 | 154.024 | 131.577 | 137.660 | 120.758 | Continuing | Continuing |
| • MT4: <i>Mitigate (ACD&P)</i> | 16.935 | 28.785 | 43.364 | - | 43.364 | 44.601 | 36.558 | 5.309 | 11.643 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

N/A