

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials - Applied Research</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	-	21.015	16.736	11.780	-	11.780	8.269	8.254	12.356	12.479	Continuing	Continuing
CP6: <i>Foundational Biotechnology Design and Dev</i>	-	21.015	16.736	10.814	-	10.814	7.260	7.264	7.343	7.416	Continuing	Continuing
SM1: <i>Scale-Up Microbial Products for Biomanufacturing</i>	-	-	-	0.966	-	0.966	1.009	0.990	5.013	5.063	0.000	13.041

Note

Project SM1/Scale-Up Microbial Products for Biomanufacturing is a new start within PE 0602386A / Biotechnology for Materials - Applied Research.

A. Mission Description and Budget Item Justification

This Program Element (PE) investigates, designs, and performs research focused on novel biotechnological methods, techniques, and materials to increase the resiliency of the military supply chain. The Army is responsible for centrally managing funding for Tri-Service Biotechnology for a Resilient Supply Chain (T-BRSC) efforts. T-BRSC leverages bio-industrial manufacturing to ensure critical domestic supply chain resilience for defense needs through domestic production of raw materials and critical products. Efforts under this PE collaborate with sister Services and select allied partners to create a cohesive biotechnology architecture to enable defense needs. Applied research projects investigate and design bio-engineered materials to ensure domestic sourcing for critical supply chain resiliency. This PE designs and validates technologies to enable rapid prototyping and evaluating of bio-engineered and bio-manufactured materials. Also under this PE are efforts determine and validate a digital architecture to secure biotech data and create computer aided design software to support the safe design and enhanced biosecurity of biotechnology products and applications.

Research in this PE is coordinated with PE 0603386A (Biotechnology for Materials - Advanced Research).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army	Date: March 2024
---	-------------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials - Applied Research</i>
--	---

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	21.811	16.736	10.956	-	10.956
Current President's Budget	21.015	16.736	11.780	-	11.780
Total Adjustments	-0.796	0.000	0.824	-	0.824
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.796	-			
• Adjustments to Budget Years	-	-	0.824	-	0.824

Change Summary Explanation

Funding increase reflects new start effort, Scale-Up Microbial Products for Biomanufacturing (SM1) to develop biomanufacturing capabilities of mission-critical materials for military use.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials - Applied Research</i>	Project (Number/Name) CP6 / <i>Foundational Biotechnology Design and Dev</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
CP6: <i>Foundational Biotechnology Design and Dev</i>	-	21.015	16.736	10.814	-	10.814	7.260	7.264	7.343	7.416	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Project works collaboratively with Joint Service partners to investigate and determine novel biotechnology methods and processes to establish a domestic resilient supply chain for defense needs. Applied research designs and conducts experiments on bio-derived, bio-functionalized, and bio-manufactured materials and biosynthetic precursors. Efforts under this Project investigate and validate models for design of defense applications. Areas of focus may include reclamation or sequestration of rare Earth/critical elements in the defense supply chain and drop-in replacements for currently employed military materials.

Work in this Project compliments Program Element (PE) 0603386A (Biotechnology for Materials - Advanced Research) / CP7 (Biotechnology Demonstration and Evaluation).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

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

	FY 2023	FY 2024	FY 2025
Title: Biotechnology Safety by Design for Defense	21.015	16.736	10.814
Description: This task designs and investigates novel and emerging biotechnologies related to bio-engineered or bio-manufactured materials and their precursors to address vulnerabilities in the critical material supply chain for military needs.			
FY 2024 Plans: Will refine models based on experiments and iterate on design to unlock more rapid, innovative, and diverse biotechnology applications than currently recognize or realize, and determine the direction of biotechnology solutions for defense needs. Operationalize safety-by-design measures to protect biotechnology capabilities throughout the product and program lifecycle through implementation of the final product. Operationalize biosecurity methods to develop the foundation for the secure use of biotechnology solutions in the future. Operationalize a digital framework enabling interchange of data amongst the collaborators across the biotechnology ecosystem to promote interoperability and critical partnership. Exploit biotechnologies to recover rare earth elements (REE) necessary for critical defense components and advanced technologies. Develop processes and improve the performance for a biotechnology pipeline.			
FY 2025 Plans: Will fund research to determine feasibility of biotechnology use in military munitions, fuel & lubricants to reduce the logistics burden by investigating the point-of-need manufacturing; design and develop biotechnology derived ceramics and composite materials to enhance the capability of DoD systems and structures in hypersonic an/or high temperature environments; research			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024		
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials - Applied Research</i>	Project (Number/Name) CP6 / <i>Foundational Biotechnology Design and Dev</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>biotechnology materials to increase the signature management capability of military fabrics; continue to exploit biotechnologies to recover rare earth elements (REE) necessary for critical defense components and advanced technologies; continue to mature software pipelines for data ingestion, data homogenization across bioindustrial manufacturing DoD/industry community allowing the interoperability and collaboration within the biotechnology ecosystem.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decrease reflects planned maturation of workflows with work continuing in PE 0603386A (Biotechnology for Materials - Advanced Research) / Project CP7 (Biotechnology Demonstration and Evaluation) and begin work in PE 0604386A (Biotechnology for Materials - Dem/Val) / Project CQ9 (Biotechnology for Materials - Dem/Val).</p>				
Accomplishments/Planned Programs Subtotals		21.015	16.736	10.814
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials - Applied Research</i>	Project (Number/Name) SM1 / <i>Scale-Up Microbial Products for Biomanufacturing</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
SM1: <i>Scale-Up Microbial Products for Biomanufacturing</i>	-	-	-	0.966	-	0.966	1.009	0.990	5.013	5.063	0.000	13.041

Note

Scale-Up Microbial Products for Biomanufacturing is a new start within the Biotechnology for Materials - Applied Research program in FY 2025.

A. Mission Description and Budget Item Justification

This project develops biomanufacturing capabilities of mission-critical materials for military use. This project enables the Army to achieve Multi-Domain Operations by securing the supply chain and bridging the gap between laboratory-scale material production and large-scale manufacturing for mission-critical materials.

This cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project supports the Army Science and Technology Ground Portfolio.

Work in this Project is performed by the Chemical Biological Center (CBC).

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

	FY 2023	FY 2024	FY 2025
Title: Scale-Up Microbial Products for Bio Manufacturing of Mission Critical Materials	-	-	0.966
Description: This effort investigates the methodologies for the generation of chemicals and/or proteins for use by other Department of Defense research and development organizations. This effort delivers materials from the laboratory-scale (less than 100 gram) to manufacturing prototype levels (between 100 gram and 1 kilogram) as well as large-scale production (greater than 1 kilogram) of mission-critical materials for military use. Products include foods, fabrics, fuels, firepower, resins, coatings, adhesives, and lubricants.			
FY 2025 Plans: Will develop and deliver 100-gram to multi-kilogram purified materials via biomanufacturing that will be ready for incorporation into existing prototypes and programs either as drop-in replacements or new solutions.			
FY 2024 to FY 2025 Increase/Decrease Statement: In FY25, this effort is a new start.			
Accomplishments/Planned Programs Subtotals	-	-	0.966

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602386A / <i>Biotechnology for Materials</i> - <i>Applied Research</i>	Project (Number/Name) SM1 / <i>Scale-Up Microbial Products for</i> <i>Biomanufacturing</i>

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

N/A

Remarks

D. Acquisition Strategy

N/A