Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy											Date: April 2022	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603729N *I Warfighter Protection Adv Tech*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	31.978	40.435	4.999	-	4.999	5.100	5.202	5.306	5.412	Continuing	Continuing
2914: *Warfighter Protection Adv Tech*	0.000	4.659	4.935	4.999	-	4.999	5.100	5.202	5.306	5.412	Continuing	Continuing
9999: *Congressional Adds*	0.000	27.319	35.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	62.819

A. Mission Description and Budget Item Justification

This PE supports the advanced development and demonstration of technologies to improve warfighter performance, safety and survivability. Naval investment in these areas is essential in order to improve the ability to enhance, maintain, and sustain Warfighter effectiveness.

Today's Sailors and Marines are enabled by Naval Science and Technology (S&T). Since 1946, the Office of Naval Research (ONR) has fostered scientific research related to the maintenance of maritime superiority and national defense. ONR manages the Department of the Navy's (DON) portfolio of Naval basic and applied research, and advanced technology development investments to ensure Naval forces can effectively deter conflict, but when called upon, fight, win and come home safe. Current investments hedge against uncertainty, providing solutions to commanders today, and options for the future. The Naval S&T budget supports higher guidance defined by the National Defense Strategy, and responds to requirements identified by the Secretary of the Navy through research priorities set by the Chief of Naval Research, coordinated across the Naval Research Enterprise (NRE), and outlined in the Naval R&D Framework.

This Program Element (PE) funds Advanced Technology Development (ATD) that includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. Efforts in this PE generally have Technology Readiness Levels (TRL) of 4 (component and/or breadboard validation in laboratory environment.), 5 (component and/or breadboard validation in relevant environment.), or 6 (system/subsystem model or prototype demonstration in a relevant environment).

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	33.120	4.935	0.000	-	0.000
Current President's Budget	31.978	40.435	4.999	-	4.999
Total Adjustments	-1.142	35.500	4.999	-	4.999
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	35.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.142	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603729N *I Warfighter Protection Adv Tech*	

• Adjustments to Budget Year	-	-	4.999	-	4.999

Congressional Add Details ($ in Millions, and Includes General Reductions)	**FY 2021**	**FY 2022**
Project: 9999: *Congressional Adds*		
Congressional Add: *Novel Therapeutic Interventions Research*	3.861	0.000
Congressional Add: *Bone Marrow Registry Program*	23.458	26.500
Congressional Add: *Warfighter resilience and readiness*	0.000	4.000
Congressional Add: *Dynamic modular manufacturing*	0.000	5.000
Congressional Add Subtotals for Project: 9999	27.319	35.500
Congressional Add Totals for all Projects	27.319	35.500

Change Summary Explanation

Funding: No significant change.

Technical: Not applicable.

Schedule: Not applicable.

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603729N / *Warfighter Protection Adv Tech*	Project (Number/Name) 2914 / *Warfighter Protection Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2914: *Warfighter Protection Adv Tech*	0.000	4.659	4.935	4.999	-	4.999	5.100	5.202	5.306	5.412	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element supports the advanced development and demonstration of technologies to improve warfighter performance, safety and survivability. Naval investment in these areas is essential in order to improve the ability to enhance, maintain, and sustain Warfighter effectiveness.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Naval Noise-Induced Hearing Loss (NIHL) and Warfighter Performance	4.659	4.935	4.999	0.000	4.999
Articles:	-	-	-	-	-
Description: Improve technologies in Warfighter performance and protection in austere (e.g., high noise, hyperbaric, hypobaric) training and operational environments. Efforts include improvements to warfighter capabilities during exposure to environmental stressors and physiological monitoring of Naval forces during multi-domain training and operational environments.					
FY 2022 Plans: Auditory Neuroscience and Performance: - Continue advanced development and assessment of mitigation strategies to protect Warfighters in high noise environments, including personal protective equipment, advanced communication systems, and equipment/ platform quieting measures. Warfighter Performance: - Continue advanced technology development and assessment of materials and protective gear to reduce exposures of humans to hazardous levels of electromagnetic energy. - Initiate research on advance physiological and cognitive monitoring technologies that incorporate real-time sensing and observation of individual and team responses to environmental and operational stressors. Enable					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603729N / *Warfighter Protection Adv Tech*	**Project (Number/Name)** 2914 / *Warfighter Protection Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
artificial intelligence-driven sensors and analytics on operator health and performance prediction to command and leadership for real-time feedback in training and operational scenarios. ***FY 2023 Base Plans:*** Shaping the Maritime Acoustic Environment (This thrust was previously part of the Auditory Neuroscience and Performance FY22 plan. The name was changed to more accurately describe the research.) Continue: - Advanced development and assessment of mitigation strategies to protect Warfighters with enhanced communication systems (communications interfaces with advanced functionalities, speech to text capabilities) and situational awareness (auditory cuing and alerting for spatial audio, auditory sensor network for decision-aiding), for mission effectiveness. Complete: - Advanced development and assessment of mitigation strategies to protect Warfighters with: (i.) an improved communication systems for divers to dampen equipment noise and minimize hearing loss, (ii.) an impulse noise calculator for assessing exposure from small caliber firearms, and (iii.) a hearing protection device training protocol to mitigate hazardous noise exposures in weapons training environments. Initiate: - Development of acoustic camouflage and decoy technologies to identify and exploit acoustic signatures of Naval platforms and systems. Warfighter Performance and Protection: Continue: - Advanced technology development and assessment of materials and protective gear to reduce exposures of Warfighters to directed energy systems. - Development of advanced physiological and cognitive monitoring technologies that incorporate real-time sensing and observation of individual and team responses to environmental and operational stressors (e.g., hyperbaric, hypobaric, cold, hot, humid). - Advanced development of artificial intelligence-driven physiological and biological monitoring devices that will provide real-time prediction of performance to command and leadership in training and operational scenarios.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603729N / *Warfighter Protection Adv Tech*	**Project (Number/Name)** 2914 / *Warfighter Protection Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Complete: N/A Initiate: - Enhance and fuse multiple streams of data from aerial, ground, and physiological on-body sensor sources for asymmetric advantage in operational environments. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant change from FY 2022 to FY 2023.					
Accomplishments/Planned Programs Subtotals	4.659	4.935	4.999	0.000	4.999

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603729N / *Warfighter Protection Adv Tech*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	27.319	35.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	62.819
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Interest Items not included in other Projects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Novel Therapeutic Interventions Research	3.861	0.000
FY 2021 Accomplishments: Developed warfighter centric performance-oriented data-system architecture that permits the use of measures from unobtrusive commercial off the shelf (COTS) and government off the shelf (GOTS) sensors, training data, and other measures of health, wellbeing and psychological status to understand, manage, and optimize the performance and wellbeing, and mitigate musculoskeletal injury risk potential of warfighters. Conducted research efforts to improve survivability and quality of life for service members suffering from poly-traumatic and /or musculoskeletal injuries.		
FY 2022 Plans: N/A		
Congressional Add: Bone Marrow Registry Program	23.458	26.500
FY 2021 Accomplishments: Developed the scientific, medical and technological advances required to support military contingencies caused by injury to the blood-forming system from toxic substances. Continued to develop, test and mature the ability to address contingency events wherein civilian or military personnel are exposed to marrow toxic agents, primarily ionizing radiation or chemical weapons containing nitrogen mustard in four focus areas: Contingency Preparedness, Development of Science and Technology for Rapid Identification of Matched Donors, Immunogenetic Studies in Transplantation and Clinical Research in Transplantation. Developed an ecosystem around concurrent physiologic and environmental monitoring wearable devices to include new environmental sensors.		
FY 2022 Plans: Develop the scientific, medical and technological advances required to support military contingencies caused by injury to the blood-forming system from toxic substances. Continue to develop, test and mature the ability to address contingency events wherein civilian or military personnel are exposed to marrow toxic agents, primarily ionizing radiation or chemical weapons containing nitrogen mustard in four focus areas: Contingency Preparedness, Development of Science and Technology for Rapid Identification of Matched Donors, Immunogenetic Studies in Transplantation and Clinical Research in Transplantation. Develop		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603729N / *Warfighter Protection Adv Tech*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
an ecosystem around concurrent physiologic and environmental monitoring wearable devices to include new environmental sensors.		
Congressional Add: Warfighter resilience and readiness ***FY 2021 Accomplishments:*** N/A ***FY 2022 Plans:*** Conduct warfighter resilience and readiness advanced technology development	0.000	4.000
Congressional Add: Dynamic modular manufacturing ***FY 2021 Accomplishments:*** N/A ***FY 2022 Plans:*** Conduct dynamic modular manufacturing advanced technology development	0.000	5.000
Congressional Adds Subtotals	27.319	35.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A