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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Defense Health Agency **Date:** April 2022

Appropriation/Budget Activity 0130: <i>Defense Health Program I BA 2: RDT&E</i>	R-1 Program Element (Number/Name) PE 0605502DHA I <i>Small Business Innovative Research</i>
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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	63.015	71.952	96.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
470: <i>Small Business Innovative Research</i>	55.248	63.080	84.272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
471: <i>Small Business Technology Transfer</i>	7.767	8.872	11.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) program was established in the Defense Health Program (DHP), Research, Development, Test and Evaluation (RDT&E) appropriation during FY 2001, and is funded in the year of execution. The objective of the DHA SBIR Program includes stimulating technological innovation, strengthening the role of small business in meeting DoD research and development needs, fostering and encouraging participation by minority and disadvantaged persons in technological innovation, and increasing the commercial application of DoD-supported research and development results. The program funds small business proposals chosen to enhance military medical research and information technology research.

The Small Business Technology Transfer (STTR) program was established in the Defense Health Program (DHP), Research, Development, Test and Evaluation (RDT&E) appropriation during FY 2015, and is funded in the year of execution. The STTR Program, although modeled substantially on the SBIR Program, is a separate program and is separately financed. Central to the program is expansion of the public/private sector partnership to include the joint venture opportunities for small businesses and nonprofit research institutions. The unique feature of the STTR program is the requirement for the small business to formally collaborate with a research institution in Phase I and Phase II. STTR's most important role is to bridge the gap between performance of basic science and commercialization of resulting innovations. The mission of the STTR program is to support scientific excellence and technological innovation through the investment of Federal research funds in critical American priorities to build a strong national economy. The program's goals are to stimulate technological innovation, foster technology transfer through cooperative research and development between small businesses and research institutions, and increase private sector commercialization of innovations derived from federal research and development.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	71.952	96.122	0.000	0.000	0.000
Current President's Budget	71.952	96.122	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Health Agency										Date: April 2022		
Appropriation/Budget Activity 0130 / 2					R-1 Program Element (Number/Name) PE 0605502DHA / <i>Small Business Innovative Research</i>			Project (Number/Name) 470 / <i>Small Business Innovative Research</i>				
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
470: <i>Small Business Innovative Research</i>	55.248	63.080	84.272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defense Health Agency (DHA) Small Business Innovation Research (SBIR) Program can participate in any of the three (FY.1, FY.2, and FY.3) Department of Defense (DoD) SBIR Broad Agency Announcements (BAA). The process begins with a call for topics to the Joint Program Committees (JPCs), multi-Service committees established to manage research, development, test and evaluation for DHA sponsored research. DHA SBIR topics are submitted directly to the US Army Medical Research and Development Command (USAMRDC) and then forwarded to the JPCs for review and internal ranking. Topic Authors brief their topics at a Topic Review Meeting attended by DHA Research & Development Directorate (J9) SBIR Program Director (PD) and personnel from the supporting USAMRDC offices. Approved DHA SBIR topics are published in DoD SBIR BAAs. Small businesses submit proposals against topics which are then evaluated by a Technical Evaluation Team (TET) made up of a Team Chief and Technical Evaluators. TETs recommend proposals for selection. All recommended proposals are reviewed by the JPCs and the DHA SBIR PD. Phase I proposal selections are announced and contract negotiations begin. Phase I contracts are awarded up to \$250K for 6 months. Follow-on Phase II projects can be awarded up to \$1.1M for 24 months. This process ensures the SBIR program addresses the multi-agency science and technology priorities.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Small Business Innovation Research (SBIR) Program	63.080	84.272	0.000	0.000	0.000
Description: The program funds small business proposals chosen to enhance military medical research and information technology research. The following reflects the FY 2021 research area topics sought for proposals. FY 2021 Accomplishments: For FY 2021, twenty-one DHA SBIR topics were developed for the 2021.1 and 2021.3 DoD SBIR Broad Agency Announcement (BAA). Funding for each topic is based on the technical merits of the proposals submitted. Topics included: 2021.1 DHA SBIR Topic DHA211-001 - Efficient Measurement of Intermediate-Level Impulse Noise and Sub-concussive Blast Exposure on Service Members in Operational Military Environments. This DHA SBIR initiative funded research to develop a personal sampling device that allows novice users to accurately measure and document intermediate-level impulse noise and sub-concussive blast exposures experienced by Service Members in realistic operational environments. This effort solicited a total of thirty seven SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of two Phase I proposals were selected under this topic. Awards were made in July 2021.					

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Appropriation/Budget Activity 0130 / 2	R-1 Program Element (Number/Name) PE 0605502DHA / <i>Small Business Innovative Research</i>	Project (Number/Name) 470 / <i>Small Business Innovative Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>2021.1 DHA SBIR Topic DHA211-002 - Prevention Device Suitable for Exposure to Blast or Concussive Forces. This DHA SBIR initiative funded research to develop a preventive technology to reduce the risk of brain injury from blast that is relevant to operational and/or training settings. This effort solicited a total of twenty one SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made by August 2021.</p>					
<p>2021.1 DHA SBIR Topic DHA211-003 - Underwater Blast Lung Computational Model. This DHA SBIR initiative funded research to develop a computational model of the human lung as it responds to underwater blast insult in order to predict injury in explosive ordnance disposal (EOD) personnel exposed to underwater explosion (UNDEX). This effort solicited a total of twenty three SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made by August 2021.</p>					
<p>2021.1 DHA SBIR Topic DHA211-004 - Algorithm and Associated Integration Hardware for Capturing Context-sensitive Metadata for Health Risk Assessments. This DHA SBIR initiative funded research to develop a technology for automatic association of environmental conditions and activities with chemical and physical exposures based on feedback from body worn and area monitors to augment health risk assessments. This effort solicited a total of nineteen SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made by August 2021.</p>					
<p>2021.1 DHA SBIR Topic DHA211-005 - Wearable Radio Frequency Weapon Exposure Detector. This DHA SBIR initiative funded research to develop a low cost, low weight, small size wearable radio frequency (RF) weapon exposure detector. This effort solicited a total of forty nine SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were</p>					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>announced in May 2021. A total of seven Phase I proposals were selected under this topic. Awards were made in July and September 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-006 - Portable Computerized Dynamic Posturography and Balance Training System to Deliver Sensory Organization Tests in Clinic and Field Environments. This DHA SBIR initiative funded research to develop a portable, customizable, computerized dynamic balance and measurement system that allows programmable levels of instability to deliver accurate Sensory Organization Tests in clinic, home, or field environments. This effort solicited a total of twenty seven SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made in July 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-007 - Radioprotector Medical Countermeasure to Prevent the Effects of Acute Radiation Syndrome. This DHA SBIR initiative funded research to develop a radioprotector medical countermeasure (MCM) to the Joint Force with effective prophylactics to recover from and survive Acute Radiation Syndrome (ARS) resulting from ionizing radiation exposure. This effort solicited a total of nine SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of three Phase I proposals were selected under this topic. Awards were made by August 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-008 - Novel Antibiotic for the Treatment of Multidrug-Resistant Pseudomonas Aeruginosa Infections. This DHA SBIR initiative funded research to develop a small molecule, antibacterial drug candidate for the treatment of service members in the Military Health System infected by multidrug-resistant (MDR) Pseudomonas aeruginosa to include in vitro and in vivo efficacy in models of wounds, burns, sepsis and/or ventilator-associated pneumonia (VAP). This effort solicited a total of twenty SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of two Phase I proposals were selected under this topic. Awards were made in June 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-009 - Oxygen Generation for Deployed Army Casualty Care. This DHA SBIR initiative funded research to develop a lightweight device that generates medical grade oxygen for deployed medical facilities and personnel. This effort solicited a total of eighteen SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in</p>					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made in August 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-010 - DNA-encoded Antibody Gene Transfer for HIV Immunoprophylaxis or Maintenance Therapy. This DHA SBIR initiative funded research to develop a platform for DNA-encoded monoclonal antibody delivery in large animal models of HIV infection and a prototype delivery device for use in humans. This effort solicited a total of two SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of one Phase I proposal was selected under this topic. Award was made in July 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-011 - Advanced Blood Transportation Container. This DHA SBIR initiative funded research to develop a container or container system for transporting blood to and throughout the battlefield. This effort solicited a total of twenty eight SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of three Phase I proposals were selected under this topic. Awards were made in July 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-012 - Handheld Non-Contact Laser Ultrasound Medical Scanner. This DHA SBIR initiative funded research to develop a non-contact Laser Ultrasound (ncLUS) imaging scanner in the form of a stand-alone lightweight handheld device. The acquired images are to be displayed in real-time using a handheld screen, archived and accessible for reviewing on demand in retrospective analyses. This effort solicited a total of twelve SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. Phase I proposal selections were announced in May 2021. A total of four Phase I proposals were selected under this topic. Awards were made by September 2021.</p> <p>2021.1 DHA SBIR Topic DHA211-013 - Body-Conformal Terahertz Medical Imager. This DHA SBIR initiative funded research to develop a Terahertz (THz) medical imager in the form of a small, flexible, layered rectangular blanket, with internal functional components, that can be wrapped around the torso of a wounded patient and</p>					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>provide images of internal anatomy. This effort solicited a total of four SBIR Phase I proposals. Proposals were accepted through the 2021.1 DoD SBIR BAA pre-released in December 2020. Proposals were received in March 2021 followed by Technical Evaluation Team evaluations in April 2021. There were no Phase I proposals selected under this topic.</p> <p>2021.3 DHA SBIR Topic DHA213-001 - Head and Neck Protection System for Acute and Chronic Injury Mitigation. This DHA SBIR initiative will be to develop prototype systems to mitigate acute head and neck injuries due to high G loading in the ejection environment and mitigate chronic neck fatigue and pain associated with prolonged low G use of Helmet Mounted Display Systems. This effort solicited a total of twenty eight SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of three Phase I proposals were selected under this topic. Awards will be made in March 2022.</p> <p>2021.3 DHA SBIR Topic DHA213-003 - Advanced Nasopharyngeal Airway. This DHA SBIR initiative will be to design and produce an advanced nasopharyngeal airway (NPA) that provides more effective and reliable upper airway patency in unconscious patients than existing NPAs, which can be easily inserted and removed by medics/first responders such as combat life savers with varying skill levels. This effort solicited a total of sixteen SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of three Phase I proposals were selected under this topic. Awards will be made in March 2022.</p> <p>2021.3 DHA SBIR Topic DHA213-004 - Bougie-Integrated Endotracheal Intubation Stylet. This DHA SBIR initiative will be to design and build a bougie-integrated endotracheal intubation (ETI) stylet that improves operator first pass success rates by resolving anatomic challenges associated with indirect and direct laryngoscopy. The technology should provide enhanced ETI performance and autonomy for providers of varying skill levels operating in austere and remote environments. This effort solicited a total of nine SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of two Phase I proposals were selected under this topic. Awards will be made in March 2022.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>2021.3 DHA SBIR Topic DHA213-005 - Chemical Sterilant for Far Forward, Austere Environments. This DHA SBIR initiative will be to develop and validate a chemical sterilant solution that can sterilize surgical instruments and other materiel through immersion. Product could be a powder or concentrated liquid that when mixed with potable water, creates the requisite solution capable of the desired sterilization. This effort solicited a total of eleven SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of one Phase I proposal was selected under this topic. Awards will be made in March 2022.</p>					
<p>2021.3 DHA SBIR Topic DHA213-006 - Sterilizer, Field, Special Materiel for Far Forward, Austere Environments. This DHA SBIR initiative will be to develop and validate a sterilization cabinet that can sterilize heat-sensitive surgical instruments and other materiel. This effort solicited a total of twenty eight SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of three Phase I proposals were selected under this topic. Awards will be made in March 2022.</p>					
<p>2021.3 DHA SBIR Topic DHA213-007 - Anionic Nanoparticle Carriers for Neuron-targeting of Synthetic and Protein Drugs. This DHA SBIR initiative will be to construct a population of uniformly sized anionic nanoparticles (NPs) with consistent size, composition, and charge that can be loaded with traditional water-soluble synthetic drugs and, alternatively, protein therapeutics in the lumen and on the surface of the vesicles. This effort solicited a total of seventeen SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of two Phase I proposals were selected under this topic. Awards were made in March 2022.</p>					
<p>2021.3 DHA SBIR Topic DHA213-008 - Digital Human Model for use in Simulation Environments for Tactile Human/Robot Interaction. This DHA SBIR initiative is to develop a biomechanically correct human parametric model to be used in digital simulation environments, capable of interacting with robotic manipulators in computer simulation and express stress metrics in the form of contact forces on the body and force-torques at the body joints. This effort solicited a total of nine SBIR Phase I proposals. Proposals were accepted through the 2021.3</p>					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of three Phase I proposals were selected under this topic. Awards will be made in March 2022.</p> <p>2021.3 DHA SBIR Topic DHA213-009 - Prolonged Care: To Demonstrate a Wearable Wound Infection Treatment Delivery Device. This DHA SBIR initiative is to reimagine the combat wound medication packet (CWMP) in a wearable format capable of delivering treatment for the prevention of infection in a prolonged care (PC) setting. The technology shall be in an easy-to-use format, durable instrumentation, lightweight, and compatible with PC. The approach should enable treatment administration for 72 hours near the wound bed. The end goal for this effort is to assemble a system of systems to prevent the development of infection in an austere environment when the provision of surgical intervention is delayed. This effort solicited a total of fifteen SBIR Phase I proposals. Proposals were accepted through the 2021.3 DoD SBIR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of three Phase I proposals were selected under this topic. Awards will be made in March 2022.</p> <p>FY 2022 Plans: FY 2022 Plans: The program funds small business proposals chosen to enhance military medical research and information technology research. The following reflects the FY 2022 research area topics sought for proposals.</p> <p>FY 2022 Accomplishments/Plans: For FY 2022, nine DHA SBIR topics were developed for the 2022.1, 2022.2, and 2022.4 DoD SBIR Broad Agency Announcement (BAA). Funding for each topic is based on the technical merits of the proposals submitted.</p> <p>Topics included: 2022.1 DHA SBIR Topic DHA221-001 - Prolonged Care: To Demonstrate a Medicated Combat Tourniquet Capable of Wound Infection Treatment Delivery. This DHA SBIR initiative is to reimagine the current fielded tourniquet beyond prevention of exsanguination and demonstrate next generation designs capable of delivering treatment for the prevention of infection in a prolonged care setting. The technology must retain or improve upon the original functionality and shall be in an easy-to-use format, require minimal instrumentation, lightweight, and compatible with prolonged care. The treatment delivery approach should enable deep tissue penetration of, but not limited to, antimicrobial agents post-compression towards the wound bed. The end goal for this effort is</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>to assemble a system of systems to prevent the development of infection in an austere environment when the provision of surgical intervention is delayed over 72 hours (hrs). This effort solicited a total of fifteen SBIR Phase I proposals. Proposals were accepted through the 2022.1 DoD SBIR BAA pre-released in December 2021. Proposals were received in February 2022 followed by Technical Evaluation Team evaluations in March 2022. Phase I proposal selections will be announced in March 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made in June 2022.</p> <p>2022.1 DHA SBIR Topic DHA221-002 - Scalable Multi-person Hearing Protection Device Fit-testing System. This DHA SBIR initiative is to develop a system that can simultaneously fit-test multiple people with hearing protection devices (HPDs). The system should be usable in clinical and non-clinical settings to quickly test the fit of HPDs from various manufacturers. This effort solicited a total of nine SBIR Phase I proposals. Proposals were accepted through the 2022.1 DoD SBIR BAA pre-released in December 2021. Proposals were received in February 2022 followed by Technical Evaluation Team evaluations in March 2022. Phase I proposal selections will be announced in March 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made in June 2022.</p> <p>2022.1 DHA SBIR Topic DHA221-003 - Olfactory Neuroepithelium Functional Diagnostic Tool. This DHA SBIR initiative is to develop a device to determine thickness of mucus on top of the mucosa and then be able characterize important properties of the cellular layers of the olfactory cleft mucosa as has been demonstrated with optical coherence tomography (OCT) and confocal laser endomicroscopy (CLE) in the pulmonary tract¹. This would include proportion of supporting cells, fibrosis, and neuronal composition. The ability to assess olfactory neuroepithelium cellular structure enables assessment of the degree of insult from injury, leading to better treatment and improved patient outcomes. The resulting diagnostic device (medical product) will be employed at level III or IV care for diagnostic assessments after injury. This effort solicited a total of four SBIR Phase I proposals. Proposals were accepted through the 2022.1 DoD SBIR BAA pre-released in December 2021. Proposals were received in February 2022 followed by Technical Evaluation Team evaluations in March 2022. Phase I proposal selections will be announced in March 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made in June 2022.</p> <p>2022.1 DHA SBIR Topic DHA221-004 - Blind 3D Kinematic Measurement of High-Rate Complex Surface Deformation. This DHA SBIR initiative is to develop and demonstrate technologies capable of measuring complex surface response kinematics at the interface between the torso and body armor system. This effort solicited a total of eight SBIR Phase I proposals. Proposals were accepted through the 2022.1 DoD SBIR BAA</p>					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
pre-released in December 2021. Proposals were received in February 2022 followed by Technical Evaluation Team evaluations in March 2022. Phase I proposal selections will be announced in March 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made in June 2022.					
2022.2 DHA SBIR Topic DHA222-001 - Developing a Hardened Portable EEG System for Aircrew Physiological Monitoring in Flight. This DHA SBIR initiative is to design, build, and demonstrate a portable, dry EEG system that is integrated into the HGU-68/P flight helmet and capable of producing reliable and interpretable data in the flight environment which presents considerable sources of noise such as electronic noise, vibration from mechanical components, acceleration forces, changes in temperature and pressure, and non- neurological signals (e.g., muscle activity). This effort will be included in the 2022.2 BAA, to be pre-released 19 April 2022. Proposals will be received in May/June 2022 followed by Technical Evaluation Team evaluations in June 2022. Phase I proposal selections will be announced in July 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made by 30 September 2022.					
2022.2 DHA SBIR Topic DHA222-002 - To Demonstrate a Technology for Early Detection and Monitoring of Wound Infections. This DHA SBIR initiative is to develop and validate a technology solution for the early detection and monitoring of wound infections in a prolonged care setting. The technology must improve upon the current ability to identify a wound infection. The end goal is to detect infections early and inform wound infection treatment as early as possible in order to ensure the most positive patient outcome. This effort will be included in the 2022.2 BAA, to be pre-released 19 April 2022. Proposals will be received in May/June 2022 followed by Technical Evaluation Team evaluations in June 2022. Phase I proposal selections will be announced in July 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made by 30 September 2022.					
2022.4 DHA SBIR Topic DHA224-D001 - Remote Frostbite Prevention System. This DHA SBIR initiative is to develop a wireless, readily-scalable, real-time skin temperature sensing system that end-users can use to identify cold stressed workers with hands, feet, and other extremities that are at risk of freezing cold injury. This effort will be included in the 2022.4 BAA, to be pre-released 10 March 2022. Proposals will be received in April 2022 followed by Technical Evaluation Team evaluations in May 2022. Phase II proposal selections will be announced in May 2022. A total of two Direct to Phase II proposals are anticipated to be selected under this topic. Awards will be made by 31 August 2022.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Health Agency		Date: April 2022
Appropriation/Budget Activity 0130 / 2	R-1 Program Element (Number/Name) PE 0605502DHA / <i>Small Business Innovative Research</i>	Project (Number/Name) 470 / <i>Small Business Innovative Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>2022.4 DHA SBIR Topic DHA224-D002 - Therapeutic Modalities for the Mitigation of Neck/Back Pain during Flight Operations. This DHA SBIR initiative is to design, build, and demonstrate a portable, ergonomically appropriate, and powered device for the relief of neck/back pain during long-haul flight operations. The proposed device shall: 1) not employ lithium-ion batteries in conjunction with the enriched oxygen environment of the aircraft cockpit/cabin; 2) provide relief on-demand as needed via on/off switch; 3) require no manipulation on the part of the aircrew outside turning on or off; 4) be compatible for use across all current-generation flight seats independent of platform type (fixed-wing ejection seat (FWES), fixed-wing non-ejection seat (FWNES), or rotary-wing/tilt rotor (RW/TR) and aircrew position (cockpit vs cabin); and finally, 5) not interfere with the operation of flight, safety, and life-support gear. Additionally, the proposed device may: 1) provide heat at targeted areas; 2) be obtainable without a prescription. This effort will be included in the 2022.4 BAA, to be pre-released 10 March 2022. Proposals will be received in April 2022 followed by Technical Evaluation Team evaluations in May 2022. Phase II proposal selections will be announced in May 2022. A total of two Direct to Phase II proposals are anticipated to be selected under this topic. Awards will be made by 31 August 2022.</p> <p>2022.4 DHA SBIR Topic DHA224-D003 - Adaptive Technology to Optimize Rehabilitation of Lower Extremity Musculoskeletal Injuries throughout Recovery. This DHA SBIR initiative is to develop a technology (e.g. brace, exoskeleton) that adapts to facilitate recovery throughout rehabilitation of service members with lower extremity musculoskeletal injury to enable return to duty throughout rehabilitation of service members with lower extremity musculoskeletal injury to enable return to duty. This effort will be included in the 2022.4 BAA, to be pre-released 10 March 2022. Proposals will be received in April 2022 followed by Technical Evaluation Team evaluations in May 2022. Phase II proposal selections will be announced in May 2022. A total of two Direct to Phase II proposals are anticipated to be selected under this topic. Awards will be made by 31 August 2022.</p> <p>FY 2023 Base Plans: FY 2023 Plans: No funding programmed. The DHA SBIR program is funded in the year of execution.</p> <p>FY 2023 OCO Plans: FY 2023 Plans: No funding programmed. The DHA SBIR program is funded in the year of execution.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: No funding programmed. The DHA SBIR program is funded in the year of execution.</p>					
Accomplishments/Planned Programs Subtotals	63.080	84.272	0.000	0.000	0.000

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

N/A

Remarks

D. Acquisition Strategy

Test and evaluate commercially developed prototypes funded by the SBIR program to ensure military and regulatory requirements are met prior to production and fielding, to include FDA licensure and Environmental Protection Agency registration.

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Appropriation/Budget Activity 0130 / 2					R-1 Program Element (Number/Name) PE 0605502DHA / <i>Small Business Innovative Research</i>			Project (Number/Name) 471 / <i>Small Business Technology Transfer</i>				
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
471: <i>Small Business Technology Transfer</i>	7.767	8.872	11.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Small Business Technology Transfer (STTR) is a program that expands funding opportunities in the federal innovation research and development arena. Central to the program is expansion of the public/private sector partnership to include the joint venture opportunities for small businesses and nonprofit research institutions. The unique feature of the STTR program is the requirement for the small business to formally collaborate with a research institution in Phase I and Phase II. STTR's most important role is to bridge the gap between performance of basic science and commercialization of resulting innovations. The program funds small business proposals that partner with a research institution, are technically meritorious, and enhance Joint Program Committee (JPC) research and development efforts. The DHA STTR Program can participate in any of the three (FY.A, FY.B, and FY.C) Department of Defense (DoD) STTR BAAs. The process begins with a call for topics to the JPCs. DHA STTR topics are submitted directly to US Army Medical Research and Development Command (USAMRDC) and then forwarded to the JPCs for review and internal ranking. Topic Authors brief their topics at a Topic Review Meeting attended by the DHA Research & Development Directorate (J9) STTR Program Director (PD) and personnel from the supporting USAMRDC offices. Approved DHA STTR topics are published in the DoD STTR BAA. Small businesses submit proposals against topics which are then evaluated by a Technical Evaluation Team (TET) made up of a Team Chief and Technical Evaluators. TETs recommend proposals for selection. All recommended proposals are reviewed by the JPCs and the DHA STTR PD. Phase I proposal selections are announced and contract negotiations begin. Phase I contracts are awarded up to \$250K for 6 months. Follow-on Phase II projects can be awarded up to \$1.1M for 24 months. This process ensures the STTR program addresses the multi-agency science and technology priorities.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Small Business Technology Transfer (STTR) Program	8.872	11.850	0.000	0.000	0.000
Description: STTR Program offers funding opportunities in federal research and development to small businesses. The program aims to stimulate technological innovation in DoD research and development, strengthen the role of small business in meeting DoD research and development needs, foster and encourage participation by minority and disadvantaged persons in technological innovation, and increase the commercial application of DoD-supported research or research and development results. The following reflects the FY 2021 research area topics sought for proposals.					
FY 2021 Accomplishments: For FY 2021, three DHA STTR topics were developed for the 2021.C DoD STTR Broad Agency Announcement (BAA). Funding for each topic is based on the technical merits of the proposals submitted. Topics included:					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>2021.C DHA STTR Topic DHA21C-001 - Dissolvable Materials for Photochemical Tissue Bonding. This DHA STTR initiative funded research to develop material compositions which dissolve in blood in times from ten minutes to one hour, which are compatible for use in the body, which can be shaped as needed, and which can be produced in commercial quantities at reasonable cost. This effort solicited a total of nine STTR Phase I proposals. Proposals were accepted through the 2021.C DoD STTR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of two Phase I proposals were selected under this topic. Awards will be made in March 2022.</p>					
<p>2021.C DHA STTR Topic DHA21C-002 - Rapid Purification for Therapeutic Use of Bacteriophages That Target Gram-Negative Bacterial Species. This DHA STTR initiative funded research to develop and demonstrate a technology to rapidly purify bacteriophages (phages) of Gram-negative bacteria to a level suitable for human therapeutic use, free of endotoxin and of other bacterial remnants including other pyrogens and pathogen-associated molecular patterns (PAMPS), for application in treating recalcitrant multidrug resistant infections of the Warfighter. This effort solicited a total of two STTR Phase I proposals. Proposals were accepted through the 2021.C DoD STTR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of one Phase I proposal was selected under this topic. Award was made in March 2022.</p>					
<p>2021.C DHA SBIR Topic DHA21C-003 - Material Solutions to Bacteriophage Stabilization and Application in Austere Environments. This DHA STTR initiative funded research to develop technology that stabilize bacteriophage (phage) cocktails for long-term storage and use in austere environments. The proposed material solution would aid in improving effectiveness of phage therapy, and ease of use by ensuring long-term stability of phage at a range of temperatures (-20 to 45oC). Phage spray drying, packaging in nanoparticle, hydrogel polymer matrix, or a combination thereof, or other relevant technologies will be considered. This effort solicited a total of three STTR Phase I proposals. Proposals were accepted through the 2021.C DoD STTR BAA pre-released in August 2021. Proposals were received in October 2021 followed by Technical Evaluation Team evaluations in November 2021. Phase I proposal selections were announced in December 2021. A total of two Phase I proposals were selected under this topic. Awards will be made in March 2022.</p>					
<p>FY 2022 Plans: The following reflects the FY 2022 research area topics sought for proposals.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>FY 2022 Accomplishments/Plans: For FY 2022, one DHA STTR topic was developed for the 2022.B DoD STTR Broad Agency Announcement (BAA). Funding for each topic is based on the technical merits of the proposals submitted. Topics included:</p> <p>2022.B DHA SBIR Topic DHA22B-001 - Integrated Blast Acquisition Test Surrogate. This DHA STTR initiative is to develop an anatomically accurate low cost blast surrogate to test and evaluate current and next-generation personal protective equipment (PPE). This effort will be included in the 2022.B BAA, to be pre-released 19 April 2022. Proposals will be received in May/June 2022 followed by Technical Evaluation Team evaluations in June 2022. Phase I proposal selections will be announced in July 2022. A total of two Phase I proposals are anticipated to be selected under this topic. Awards will be made by 30 September 2022.</p> <p>FY 2023 Base Plans: No funding programmed. The DHA STTR program is funded in the year of execution.</p> <p>FY 2023 OCO Plans: No funding programmed. The DHA STTR program is funded in the year of execution.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: No funding programmed. The DHA STTR program is funded in the year of execution.</p>					
Accomplishments/Planned Programs Subtotals	8.872	11.850	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks N/A
D. Acquisition Strategy Test and evaluate commercially developed prototypes funded by the STTR program to ensure military and regulatory requirements are met prior to production and fielding, to include FDA licensure and Environmental Protection Agency registration.