



Broad Agency Announcement Biological Technologies

BIOLOGICAL TECHNOLOGIES OFFICE

Office-Wide BAA

HR001124S0034

September 11, 2024

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any resultant award negotiations will follow all pertinent law and regulation, and any negotiations and/or awards for procurement contracts will use procedures under FAR 15.4, Contract Pricing, as specified in the BAA.

Overview Information:

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Biological Technologies Office (BTO)
- **Funding Opportunity Title** – Biological Technologies
- **Announcement Type** – Initial Announcement
- **Funding Opportunity Number** – HR001124S0034
- **Assistance Listing Number:** 12.910 Research and Technology Development
- **Dates/Time - All Times are Eastern Time Zone (ET)**
 - Posting Date: **September 11, 2024**
 - Proposal Abstract Due Date and Time: Abstracts may be submitted on a rolling basis until **September 10, 2025, at 4:00 PM ET**.
 - Full Proposal Due Date and Time: Proposals may be submitted on a rolling basis until **September 10, 2025, at 4:00 PM ET**.
 - Closing Date: **September 10, 2025**
- **Anticipated individual awards** - Multiple awards are anticipated.
- **Types of instruments that may be awarded** - Procurement contracts, cooperative agreements, or other transactions.
- **NAICS Code:** 541714
- **Agency contact**
 - Contracting Officer: Katie Freeman, DARPA/Contracts Management Office
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Section I: Funding Opportunity Description

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any resultant award negotiations will follow all pertinent law and regulation, and any negotiations and/or awards for procurement contracts will use procedures under FAR 15.4, Contract Pricing, as specified in the BAA.

BTO's mission is to develop capabilities that leverage the unique properties of biology – adaption, replication, resilience and complexity, to revolutionize how the United States defends the homeland and prepares and protects its warfighters. Research in BTO creates biotechnological capabilities that provide tactical care and restore function to injured warfighters, increase operational resilience, develop novel functional materials, and detect and protect against threats to maintain force readiness.

BTO is interested in submissions related to the following topic areas:

General Topics:

- Biological technology topic areas that fit the national security scope of BTO's mission.
- Research into market opportunities, constraints, and communities affecting financing and commercialization of bioindustrial and biomedical technologies.

Machine Learning (ML) and Artificial Intelligence (AI):

- Developing and advancing our understanding of the impact and principles underlying biological data generation, assessment and incorporation into the biological foundation models, or mixed-mode foundation models. This includes taking information theoretic approaches as well as understanding the scaling laws of these data for various types of models.
- Advancing the capabilities of broad or narrow biological or mixed-mode foundation models far beyond the state of the art.
- Developing and proving non-experimental models or hybrid experimental/non-experimental assessment strategies for biological foundation model assessment.
- Exponentially accelerating the time scale of biological system simulation from the subcellular through multicellular, organismal and environmental systems.
- Developing ML and AI-enabled technologies to improve the accuracy, precision, and efficiency of warfighter decision-making in complex and dynamic environments (e.g., on and off the battlefield).
- The development of virtual testbeds, digital twins, and/or synthetic data to accelerate or improve the predictive modeling of human performance.

Human Performance:

- Understanding and improving treatment of and resilience in neurological health, transformative neural processing, fatigue, cognition, and optimized human performance and teaming, including in extreme conditions.

- Discovering interventions that utilize biotechnology, biochemistry, molecular biology, microbiology, neuroscience, psychology, cognitive science, social and behavioral science, and related disciplines to assess and optimize human performance and teaming (e.g., trust).
- Developing and leveraging technologies to advance continuous or near-continuous monitoring of physiology to elucidate mechanisms of human readiness, cognitive status, and resilience.
- Understanding and improving interfaces between the biological and physical world to enable seamless biohybrid systems and devices.
- Developing approaches to enhance physiological resilience and performance in extreme conditions (e.g., cold weather climates) or to reduce musculoskeletal injuries via interventions that do not require genomic modifications.
- Developing technologies for rapid assessment of psychophysiological status.

Materials, Sensors, Processing:

- Designing novel materials, sensors, or processes that mimic or are inspired by biological systems.
- Creating tools such as foundation models or prediction engines to understand the underlying rules defining biomolecular and biomaterial or hybrid biotic/abiotic material structure/function properties (individual properties or groups of properties) in order to predict desired outcomes for novel material development. Importantly, these predictions should hold from the molecular scale to the macro scale.
- Developing new computational and experimental tools and predictive capabilities for engineering of biological systems, such as cells, tissues, organs, organisms, and complex communities, to both develop new products and functional systems, as well as to gain new insights into underlying mechanisms.
- Developing technologies to leverage biological systems and enhance the acquisition and maintenance of critical and strategic organic and inorganic materials.
- Developing sustainable and controllable technologies that integrate biological systems into the built environments.
- Understanding and leveraging complex biological systems into underlying functional rules and processes to provide models that govern interactions of biological systems from biofilms to organs or ecosystems.
- Developing new platform technologies that integrate, automate, and miniaturize the collection, processing, and analysis via direct or indirect interrogation of biological and chemical samples.
- Developing hybrid biological/engineered systems that integrate biological organisms, components, biologically-encoded circuitry, biogenic materials, or exploit biological phenomena to surpass capabilities of abiotic equivalents.
- Developing novel technologies to remotely sense, process, or analyze weak biological signals occurring in the natural background environment.

- Developing novel biological sensor platforms with reduced size, weight, and power requirements of equivalent, electro-optical or electro-mechanical systems with orders of magnitude increase in equivalent performance.

Ecosystem and Environmental:

- Understanding emerging threats to global food and water supplies and developing countermeasures that could be implemented on regional or global scales.
- Developing and leveraging new insights into non-human biology across and between populations, e.g., microbes, insects, plants, marine life, and how they interact with their environment.
- Leveraging biology to provide new tactical and strategic operational advantages, concealment and camouflage approaches, and bio-inorganic capabilities.
- Developing approaches using biology, biogeochemistry or materials science to mitigate or sequester anthropogenic carbon dioxide, chemicals, and contaminants in terrestrial, marine, and post-disaster environments.
- Testing and validating new theories, methods and computational models that identify and quantify factors and principles underlying collective and interactive behaviors of biological organisms at all scales, from individual cells to complex ecosystems.
- Developing technologies that leverage synthetic biology, living cellular systems, ecological diversity, or properties of biology to support operations in extreme environments and experimental methodologies to evaluate potential benefits of such innovations.
- Creating *in silico* or organically-based models, model systems, and/or tools that exceed the naturally evolved pace of biological processes from chemistry, molecular genetics and metabolomics, to microbial evolution and community building, to human systems.
- Understanding the dynamics of population and ecosystem behavior to preserve equilibrium, provide strategic opportunity, mitigate impacts, or avoid catastrophe.
- Developing and leveraging new technologies for ecosystem restoration and the stabilization of agricultural production and post-disaster recovery.

Biosecurity and Biosafety:

- Developing new technologies and approaches that ensure biosafety and biosecurity of biological hardware and data, as well as the safety and security of artificial intelligence (AI) technologies that can accelerate the biological research and development process.
- Developing innovative technologies that characterize novel, engineered, and/or natural emerging pathogens to prevent their spread or understand their origin.
- Developing new technologies to treat, prevent, forecast, and detect the emergence and spread of infectious diseases that have the potential to cause significant health, economic, and social burden.

Biomedical and Biodefense:

- Understanding causal relationships that underlie acute and chronic disease states to support warfighter health.

- Developing new technologies for the rapid, automated, and resilient manufacturing, delivery, and distribution of critical molecules for applications in therapeutics, chemical and biological defense.
- Developing new technologies to support next-generation cellular therapeutic applications.
- Developing new platform technologies for targeted, effective, spatiotemporally controlled delivery of large and small molecules and biologics.
- Leveraging biotechnology to create new platform solutions that combat antimicrobial resistance, generate novel drug and cell-based therapeutics, and treat warfighter injury and illness.
- Developing novel diagnostic, prophylactic, and therapeutic approaches for warfighter injury that can be provided even in austere settings and extreme conditions.

Section II: Evaluation Criteria

- Proposals will be evaluated using the following criteria listed in **descending order of importance**: Overall Scientific and Technical Merit; Potential Contribution and Relevance to the DARPA Mission; Cost and Schedule Realism.
- **Overall Scientific and Technical Merit:**
The proposed technical approach is innovative, feasible, achievable, and complete. The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks, and planned mitigation efforts are clearly defined and feasible.
- **Potential Contribution and Relevance to the DARPA Mission:**
The potential contributions of the proposed effort bolster the national security technology base and support DARPA's mission to make pivotal early technology investments that create or prevent technological surprise. The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology.
- **Cost and Schedule Realism:**
The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Statement of Work and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed sub-awardee(s) are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs and the basis for the estimates). It is expected that the effort will leverage all available relevant prior research to obtain the maximum benefit from the available funding. For efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior

personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

- For additional information on how DARPA reviews and evaluates proposals through the Scientific Review Process, please visit: [Proposer Instructions and General Terms and Conditions](#).

Section III: Submission Information

- This announcement allows for multiple award instrument types to include Procurement Contracts, Cooperative Agreements, and Other Transaction Agreements. Some award instrument types have specific cost-sharing requirements. The following websites are incorporated by reference and contain additional information regarding overall proposer instructions, general terms and conditions, and each specific award instrument type.

Proposers must review each website prior to submitting an abstract or proposal:

- **Proposer Instructions and General Terms and Conditions:** [Proposer Instructions and General Terms and Conditions](#)
- **Procurement Contracts:** [Procurement Contracts](#)
- **Cooperative Agreements:** [Cooperative Agreements](#)
- **Other Transaction Agreements:** [Other Transactions](#)
- This announcement contains an abstract phase. Abstracts are strongly encouraged but not required. Abstracts may be submitted on a rolling basis until September 10, 2025, at 4:00 p.m., as stated in the Overview section. Additional instructions for abstract submission are contained in **Attachment A**.
- Full proposals may be submitted on a rolling basis until September 10, 2025, at 4:00 p.m., as stated in the Overview section. **Attachments B, C, and D** contain specific instructions and templates and constitute a full proposal submission. Please visit [Proposer Instructions and General Terms and Conditions](#) for specific information regarding submission methods through the Broad Agency Announcement Tool (BAAT) and grants.gov (as applicable).
- This opportunity has historically been renewed on an annual basis, so we anticipate the publication of a similarly scoped funding opportunity immediately following the expiration of this solicitation, HR001124S0034. If a proposal abstract was submitted at/near the deadline and favorably received, the follow-on full proposal could be submitted in response to the new solicitation. For this reason, we still STRONGLY encourage submitting a proposal abstract and awaiting feedback prior to the submission of a full proposal, even as the deadline nears.
- **BAA Attachments:**
 - **(required) Attachment A:** Abstract Instructions and Template
 - **(required) Attachment B:** Proposal Instructions and Volume I Template (Technical and Management)

- **(required) Attachment C:** Proposal Instructions and Volume II Template (Cost)
- **(required) Attachment D:** MS Excel™ DARPA Standard Cost Proposal

Section IV: Special Considerations

- This announcement, stated attachments, and websites incorporated by reference constitute the entire solicitation. In the event of a discrepancy between the announcement, attachments, or websites, the announcement shall take precedence.
- All responsible sources capable of satisfying the Government's needs, including both U.S. and non-U.S. sources, may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities, Small Businesses, Small Disadvantaged Businesses and Minority Institutions are encouraged to submit proposals and join others in submitting proposals. However, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities. Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.
- As of the time of publication of this solicitation, all submissions are anticipated to be unclassified.
- Periodically, DARPA may endeavor to hold "Pitch Day(s)." A "Pitch Day" entails DARPA soliciting proposals for a specific, targeted aspect under one or more of the BAA's thrust areas. Proposers ultimately would pitch their proposals to DARPA via oral presentations. Any "Pitch Day" established under this BAA would be advertised via a separate Special Notice announcement linked to this BAA and posted on www.sam.gov, and will include specific instructions and evaluation criteria.
- Federally Funded Research and Development Corporations (FFRDCs), University Affiliated Research Centers (UARCs), and Government entities interested in proposing to this BAA should first contact the Agency Point of Contact (POC) listed in the Overview section prior to the closing date to discuss eligibility. Complete information regarding eligibility can be found in [Proposer Instructions and General Terms and Conditions](#).
- As of the date of publication of this solicitation, the Government expects that program goals as described herein may be met by proposed efforts for fundamental research and non-fundamental research. Some proposed research may present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Based on the anticipated type of proposer (e.g., university or industry) and the nature of the solicited work, the Government expects that some awards will include restrictions on the resultant research that will require the awardee to seek DARPA permission before publishing any information or results relative to the program. For additional information on fundamental research, please visit [Proposer Instructions and General Terms and Conditions](#).

- Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This language can be found in [Proposer Instructions and General Terms and Conditions](#).

For certain research projects, it may be possible that although the research to be performed by a potential awardee is non-fundamental research, its proposed sub-awardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research while its proposed sub-awardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed efforts are fundamental research and why the proposed efforts should be considered fundamental research.

- DARPA's Fundamental Research Risk-Based Security Review Process (formerly the Countering Foreign Influence Program (CFIP)) is an adaptive risk management security program designed to help protect the critical technology and performer intellectual property associated with DARPA's research projects by identifying the possible vectors of undue foreign influence. DARPA will create risk assessments of all proposed Senior/Key Personnel selected for negotiation of a fundamental research grant or cooperative agreement award. The DARPA risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award. For additional information about this process, please visit [Grants/Cooperative Agreements](#).
- Per Section 8123 of the Department of Defense Appropriations Act, 2015 (Pub. L. 113-235), all grant awards must be posted on a public website in a searchable format. To comply with this requirement, proposers requesting grant awards must submit a maximum one (1) page abstract that may be publicly posted and explains the program or project to the public. The proposer should sign the bottom of the abstract confirming the information in the abstract is approved for public release. Proposers are advised to provide both a signed PDF copy, as well as an editable (e.g., Microsoft Word) copy. Abstracts contained in grant proposals that are not selected for award will not be publicly posted.
- Proposals could potentially include Human Subjects Research (HSR) and/or Animal Use. Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed in [Human Subjects and Animal Subjects Research](#), to include providing the information specified therein as required for proposal submission.
- The APEX Accelerators program, formerly known as the Procurement Technical Assistance Program (PTAP), focuses on building strong, sustainable, and resilient U.S. supply chains by assisting a wide range of businesses that pursue and perform under contracts with the

Department of Defense (DoD), other federal agencies, state and local governments, and government prime contractors. See <https://www.apexaccelerators.us/> for more information. The APEX Accelerators program helps businesses as follows:

- Complete registration with a wide range of databases necessary for them to participate in the government marketplace (e.g., SAM).
 - Identify which agencies and offices may need their products or services and how to connect with buying agencies and offices.
 - Determine whether they are ready for government opportunities and how to position themselves to succeed.
 - Navigate solicitations and potential funding opportunities.
 - Receive notifications of government contract opportunities on a regular basis.
 - Network with buying officers, prime contractors, and other businesses.
 - Resolve performance issues and prepare for audit, only if the service is needed, after receiving an award.
- Project Spectrum is a nonprofit effort funded by the DoD Office of Small Business Programs to help educate the Defense Industrial Base (DIB) on compliance. Project Spectrum is vendor-neutral and available to assist businesses with their cybersecurity and compliance needs. Their mission is to improve cybersecurity readiness, resilience, and compliance for small/medium-sized businesses and the federal manufacturing supply chain. Project Spectrum events and programs will enhance awareness of cybersecurity threats within the manufacturing, research and development, as well as knowledge-based services sectors of the industrial base. Project Spectrum will leverage strategic partnerships within and outside of the DoD to accelerate the overall cybersecurity compliance of the DIB. The web portal, <https://www.projectspectrum.io/#/>, provide resources such as individualized dashboards, a marketplace, and Pilot Program to help accelerate cybersecurity compliance.
 - DARPAConnect offers free resources to potential performers to help them navigate DARPA, including “Understanding DARPA Award Vehicles and Solicitations,” “Making the Most of Proposers Days,” and “Tips for DARPA Proposal Success.” Join DARPAConnect at www.DARPAConnect.us to leverage learning and networking resources.
 - DARPA has streamlined our Broad Agency Announcements and is interested in your feedback on this new format. Please send any comments to DARPA solicitations@darpa.mil.