

DARPA-BAA-16-17

Frequently Asked Questions

GENERAL INFORMATION

1. Is Dr. Strychalski available for a call to discuss our proposed approach?

The best way to receive feedback on an approach is through the submission of a proposal abstract prior to the deadline specified in the BAA. The BAA describes the program, including metrics, in detail. If you have specific questions, please submit them by email to DARPA-BAA-16-17@darpa.mil. Please be aware that your question and its answer may be published on this FAQ page, after the question has been revised to remove proprietary information.

2. Will the Proposers Day slides be posted online?

Yes, information relayed during the Proposers Day will be made available on the BTO section of the DARPA Opportunities page: <http://www.darpa.mil/work-with-us/opportunities>.

3. Is an abstract submission required?

No, but proposers are *strongly encouraged* to submit an abstract.

4. If my research is not geared specifically to meet the Biological Control Program goals. Is there a solicitation that I can respond to?

Yes. DARPA/BTO has an open solicitation (DARPA-BAA-15-35) for this purpose. Responses are being collected through April 28, 2016.

PROGRAM STRUCTURE

5. What is the timeline for this program?

Proposal abstracts are due March 18, 2016. Full proposals are due April 29, 2016. Proposers are encouraged to submit full proposals before the submission deadline to avoid last minute technical delays in the submission process.

DARPA will select awards and notify the awardees as soon as possible. DARPA does not speculate or make any promises on this notification date or the duration of the contracting process. We are hopeful that awards will be issued as early as September 2016, but the process may extend into October 2016 or later depending on contracting and performer responsiveness to the contract officer's requests.

Program kickoff is anticipated for late October or early November 2016.

6. What is the amount of available funding for this BAA?

We anticipate awarding up to approximately \$38M over the life of the program.

7. What is the expected size of an award?

DARPA has not predetermined award amounts. Proposers are required to provide a well-justified budget appropriate for the scope of the proposed work. Your cost should be based upon how much

money is required to perform the tasks you feel are necessary to meet the objectives of DARPA-BAA-16-17. Proposals will be scrutinized for unnecessary or inflated expenses. If your proposal is selected for award, a government contract officer will negotiate the terms of the contract. During this negotiation, every aspect of your statement of work and cost proposal will be reviewed. Please ensure that you have followed all of the instructions in DARPA-BAA-16-17, including the required checklist in Appendix 1. This will enable the government contract office to expedite negotiations.

8. Is DARPA considering grants for this effort?

No. The types of instruments that may be awarded are procurement contracts, cooperative agreements, or Other Transactions.

9. How many teams are expected?

Multiple awards are anticipated.

10. Can you be specific about the role of the IV&V partners? Can you explain or give an example how the performers will engage or work with the IV&V partners?

The IV&V team will consist of subject matter experts (SMEs) from FFRDCs or other government entities. To avoid potential conflicts of interest, FFRDCs and other government entities will not be eligible for IV&V work, if selected for proposer work. The goal of engaging the IV&V teams is to avoid irreproducible experimental results.

As described in BAA Section 1.3, the IV&V teams will experimentally test the reproducibility and performance of capabilities for the control of biological systems developed in Phase 1 and Phase 2 for TAs 1 and 2. As performer teams will be expected to collaborate closely with the IV&V team, proposals must budget and include plans for delivering to the IV&V team all materials, protocols, and domain knowledge necessary to experimentally reproduce demonstrated capabilities for control in Phase 1 and Phase 2. Should duplication of the testbed and/or associated specialized equipment present an unreasonable cost, teams should outline a secondary plan to allow the IV&V team access to the team's laboratory, as necessary, to test and validate progress. Proposer teams do not need to budget for IV&V partner travel.

11. How do we balance the need to take risks and think big with the need to provide deliverables on schedule?

DARPA explicitly reaches for transformational change instead of incremental advances. Proposals which do not involve significant or fundamental advances on state-of-the-art approaches may be considered non-conforming. While there is no plan for down selection of performer teams for this program, we will discontinue funding to teams that do not keep pace with the proposed schedule.

12. There are many references to program results and deliverables, but no explicit list of expected deliverables. Can you clarify what you expect to see in terms of program deliverables?

Proposer-defined metrics allow maximal flexibility in the proposed approach. For this reason, it is important to propose qualitative and, preferably, quantitative metrics to track progress. For example, proposals should clearly describe quantitative metrics for expected capabilities to be demonstrated at the end of each Phase.

PROPOSALS

13. Will teaming be required?

While teaming is not required, teaming is *strongly encouraged* to meet the program goals across all Phases and Technical Areas (TAs) (see BAA Section 3.3 for full details).

14. Is there a minimum number of investigators or organizations required for each team?

No. However, it is expected that successful teams will require deep expertise in both theoretical and experimental science and technology, for example, in fields of biology relevant to the proposed testbed and demonstration system, fields of engineering relevant to the proposed testbed and measurement methods, and control engineering.

15. Can a performer or individual participate in more than one team? Can an organization be a principal investigator on one proposal and in a separate submission a subcontractor/sub-prime?

Yes. Proposers may join any number of teams as a subcontractor and still submit a separate proposal as the PI (with or without subcontractors). The proposer should be very clear as to how hours will be charged in each proposed effort and describe what safeguards are in place to ensure that time is not double billed.

16. Can Federally Funded Research and Development Centers (FFRDCs) and government entities submit proposals or apply as prime?

Yes, FFRDCs and government entities can submit proposals if they meet certain criteria specified in BAA Section 3.1.1. Note that to avoid potential conflicts of interest, FFRDCs and other government entities, if selected for proposer work, will not be eligible for IV&V work.

17. Do proposed personnel have to be U.S. citizens?

No. We welcome the best ideas and research from any source. Principal Investigators (PIs), co-investigators, students, postdocs, employees, subcontractors, and institutions do not have to be U.S. citizens or based in the U.S. All proposed and awarded work must comply with U.S. laws and regulations. See BAA Section 3.1.2 Non U.S. Organizations for details.

18. Can a non-U.S. institution be a prime contractor?

Yes. All proposed and awarded work must comply with U.S. laws and regulations. See BAA Section 3.1.2 Non U.S. Organizations for details.

19. Should I submit via DARPA's BAA website or grants.gov?

DARPA-BAA-16-17 allows for use of both. DARPA does not have a preference, though fewer submission problems typically occur using DARPA's system. Please note, however, that proposals requesting cooperative agreements must be submitted via grants.gov. We encourage you to submit your proposal a few days ahead of the deadline. Regardless of the submission mechanism, expect that DARPA will not award grants.

20. Grants.gov does not allow me to attach editable documents as specified in the BAA. How do I provide the Executive Summary Slide (Attachment 1), the Gantt chart (Attachment 3), and the Budget Template (Attachment 4)?

Please submit these documents as PDF files on grants.gov. The BAA coordinator (DARPA-BAA-16-17@darpa.mil) will follow up with you after your proposal is submitted to request the MS Excel, Word, and PowerPoint files *via* email.

21. Do page limits include table of contents, resumes, and bibliographies?

No. Please see BAA Section 4.3 “Formatting Characteristics” for a description of the content encompassed by the page limits.

22. The SOW template contains a lot of blank space and will utilize valuable pages in the technical proposal – can the template be reduced in any way?

The version included within Volume 1 may be condensed compared to the editable (full) version attached separately.

23. How will the proposals be evaluated?

A team of government reviewers will evaluate applications based on the evaluation criteria described in BAA Section 5.1 “Evaluation Criteria.” The review criteria are rank ordered, with the most important criterion listed first. The reviewers will have scientific or technical expertise relevant to the goals of the Biological Control Program and may represent multiple government agencies.

24. Should proposals directly address Independent Verification and Validation (IV&V)?

Yes, please address whether your capabilities are likely to be reasonably transferred to the IV&V team(s). Or, if your testbed is too specialized or expensive to replicate reasonably, offer a plan to host the IV&V team in your laboratory. Proposer teams do not need to budget for IV&V partner travel.

25. Can I propose to only one TA?

No. Each team must fully address all Phases and TAs. Successful teams will engage both theorists and experimentalists in active collaboration across TAs to meet the goals of the program, with approximately equal emphasis in the proposed approach on theoretical and experimental components. Proposals that address only a subset of Phases or TAs or that do not involve teams with deep expertise across the relevant theoretical and experimental fields of science and technology will be considered non-conforming.

26. Are subcontractors required to complete the SOW template?

Proposers should submit one Statement of Work (SOW) that encompasses all the activities of the prime and all subcontractors. The numbering of tasks should be consistent across the SOW, Gantt chart, Work Breakdown Structure (WBS), and Budget.

27. Can you clarify what level of detail is required for subcontractors?

All subcontractor proposal documentation must be prepared at the same level of detail as that required of the prime contractor.

COST/FUNDING

28. Can DARPA partially fund a proposal?

Yes. DARPA reserves the right to fully fund or partially fund a proposal. More details can be found in Section 2 “Award Information.”

29. Do I have to provide a budget for all three phases?

Yes. Provide complete budgets for all three Phases. All phases should contain the level of detail requested in Section 4.3.2.2 “Volume II, Cost Proposal.” Develop a cost proposal that reflects your likely course for the entire proposed effort. Contracts will be negotiated to award Phase 1, and will pre-negotiate options for the subsequent Phase(s). These options will be executed, if DARPA is satisfied with your results and has available funds for your effort. By negotiating these options within the scope of DARPA-BAA-16-17, we can avoid substantial delays and problems that might arise from beginning negotiation on subsequent phases at a later date.

There will be opportunities to revise contracts at the awarding of each option. All parties will find it reasonable to update their expected costs, scope, and deliverables based on the progression of the Biological Control Program. These subsequent negotiations will require the concurrence of all parties and will not be unilateral.

30. Are the awards structured with decision points at the end of each phase (like SBIR) or will the award and contract cover the entire program (all Phases)?

Award instruments will be negotiated to cover the entire program, *i.e.* all Phases.

31. Should my budget only include direct costs?

No. Please be sure to include all Other Direct Costs (ODCs), indirect costs, G&A, and other indirect expenses that will be charged to the government, should you be selected.

32. Is the budget template (attachment 2) mandatory?

No. Whether you choose to use this template, Section 4.3.2.2 “Volume II, Cost Proposal” encourages you to provide the level of detail exemplified in the template. You may find it easier to use the template than to create an alternative.

33. I have questions about completing the Budget Template (Attachment 4).

Please reference the following tutorial videos, to assist you in completing the Budget Template:

Part I: Example Budget: <http://youtu.be/Np-OHcLnfDA>

Part II: Editing and Customizing the Blank Budget Template: <http://youtu.be/Obr7H8bYIG4>

You will notice that these videos reference the HAPTIX BAA (DARPA-BAA-14-30). However, the instructions are also applicable to the Biological Control BAA.

You can edit any cell (data or formula) as necessary to fit the template to the structure of your specific project. The cell color legend is included to show cells containing formulas, *i.e.* white cells, and cells used for data entry, *i.e.* grey cells.

34. I am not very familiar with how to use MS Excel. What concepts are key to understand in order to use the template?

Although the template can appear detailed and complex, it is compiled using very simple MS excel concepts. It is necessary to understand the formulas for basic arithmetic functions, how to link data within and across tabs, and absolute reference. A helpful tutorial on absolute reference can be accessed through the following link: <http://youtu.be/NmVMjQzseLA>.

TECHNICAL

35. What is your attitude towards (fill in the blank) technology?

We cannot comment on specific technologies. Proposed technologies and approaches must fit within the boundaries and spirit of the Biological Control Program.

36. Can my testbed be contained within another organism (e.g. gut microbiome of a mouse)?

If an organism itself is to serve as the testbed for Phase 1 and Phase 2, measurements and environmental control, in a manner consistent with the performance milestones and metrics of the Biological Control Program, are likely beyond current technological capabilities. However, such demonstration testbeds for the application of DoD relevance in Phase 3 may be appropriate.

37. Please clarify what you mean by all-biological control. Does learning about mechanism of behavior and reliability and differentially triggering it work?

Nonbiological inputs may be used to tune the system but may not be used to “actuate” behavior. For example, while an external light could be used to define the desired output range, the control loop that senses and actuates biological activity to achieve the desired range must be composed solely of biological parts. For example, a graduate student turning the light off and on repeatedly until the system reached the desired state would not constitute all-biological, embedded control.

38. The BAA calls for closed-loop control, but many cell-signaling systems use a different control logic (e.g., push-pull). Can we build controlled systems that use other control logics used by living cells?

Yes. Given that the control logics are designed rationally, composed of biological components, and fully embedded in the system, they meet the requirements of the program.

39. Can we propose a cell-free system as a model system for cell-based technology? In this case, would have to propose an actual cell-based technology for Phase 3?

Yes. Cell-free systems may be used as a model system. No, the technology for Phase 3 need not be cell-based.

40. How explicit and detailed do we need to be about applications with DoD relevance (Phase 3)?

Outline as explicitly as possible a credible and sensible application that clearly demonstrates the impact of your capabilities for biological control for national security.

41. Would it be responsive to design a system at a meta-level, for example, designing a system for directed evolution of controllability (as opposed to designing controllability directly)?

No. High-throughput screening is not congruent with the intent or spirit of the Biological Control Program. However, rationally designed systems that control adaptation and evolution are acceptable.

42. Is the aim to find new control mechanisms or to use already known control elements in a quantitative manner?

Both approaches are acceptable.

43. I understand that screening/directed evolution is not allowed. However, iterative design has been an important aspect of rational design in synthetic biology. Is it accepted here, i.e. constructing a system and then refining model parameters for basic components?

Screening approaches do not meet the intent or spirit of the Biological Control Program.

44. In Phase 2, TA1, you require 5 or more steady state outputs and 5 or more dynamic outputs, Could you clarify what you mean by dynamic? Could this be for instance, simply different rise times, overshoots, etc., or do you want arbitrary, complex dynamics?

Biological systems exhibit many dynamic behaviors that may be relevant to controlling a system-level behavior of interest. Proposer-defined metrics should describe, as appropriate, the ability to generate dynamic outputs relevant to those dynamic behaviors.

45. Are there any specific requirements for the software used in the modeling, simulation, testbed and demonstration phases?

No. Software should be well-documented, readily intelligible, and accessible to the team and program participants, as appropriate.

46. Are there any specifications or requirements for “safety” control systems or safety interlock systems?

No. To ensure the safe development of capabilities for control of biological systems, work performed in this program will proceed in laboratory settings only.

47. Traditional control systems sometimes rely on mechanical restrictions on the space that systems can operate in. How much emphasis in the proposal should be placed on sense-then-actuate to control (based on the reactions observed), versus first actuating to restrict the space, then sensing and adjusting? For example discretizing the analog behavior versus forcing discrete behavior?

Proposed approaches should be appropriate to the goals of the specific proposal and overall program.