

**Department of Homeland Security (DHS) Science and Technology Directorate (S&T)
Chemical and Biological Defense Division (CBD) BAA 14-003/Call 0003**

1. **Announcement Number:** Open Broad Agency Announcement Number (OBAA) 14-003/Call 0003

2. **FBO Solicitation Number:** HSHQDC-14-R-B0009

3. **Solicitation Event Dates/Time (Local Eastern Time) :**

- White Paper Opening Date – 23 January 2015
- White Paper Closing Date – 20 February 2015 3:00 PM
- Notification of Selection/Non Selection of White Papers– 11 March 2015
- Notification to Submit Full Proposals– 13 March 2015
- Full Proposal Due Date– 10 April 2015
- Notification of Selection/Non Selection of Full Proposals– 8 May 2015

There will be no exceptions to the time and date on which responses are due, unless determined otherwise by the Government. White Papers and Full Proposals received after the designated closing date/time will not be considered.

Note: This Call will be conducted in accordance with the Two-Phased Evaluation Process as described under Section 1.6 of the OBAA. The OBAA Solicitation HSHQDC-14-R-B00009 was posted on Federal Business Opportunities on June 16, 2014. See

Link <https://www.fbo.gov/index?mode=form&id=59fb4fd55df126478cb38df3945696f2&tab=ntype>

This Call will consist of the solicitation, receipt, and evaluation of both White Papers and Full Proposals. Under this evaluation, Phase 1 will consist of the solicitation, receipt, and evaluation of the White Papers (using standardized DHS Chemical Biological Defense Division “Project Proposal Form” format) from potential performers. Entries in the various sections of the Project Proposal Forms (White Papers) should be concise and conform to the specified formatting and word count limitations. No formal transmittal letter is required for the Phase 1 responses. Once the white paper peer/scientific review process has been completed, offerors will be notified via e-mail, or in writing, whether as a result of its white paper submission, the offeror is “encouraged” or “not encouraged” to submit full proposals.

A down-selection process will then be conducted by DHS and those Phase 1 White Paper Proposal Form (OBAA Attachment A) proposals encouraged to submit full proposals will be invited to participate in Phase 2, which will consist of the solicitation, receipt, and evaluation of a Full Proposal, limited to 30 pages, excluding the Formal Transmittal Letter, Cover Page, Summary of Costs and Related Information, Table of Contents and resumes/biographical information for proposed performers. Once the Full Proposal peer/scientific review process has been completed, offerors will be notified via e-mail, or in writing, that its proposal has been selected, selected but not funded, or not selected for award.

4. **OBAA Call Technical Topic Area (TTA) of Interest:**

Chemical and Biological Research and Development CBD.05—Bioforensics and Chemical Forensics: Research and development of next generation and novel technologies to characterize biological and chemical threat agents for source attribution in support of FBI and NBFAC requirements in a criminal investigation. These include novel technologies to characterize the organism, the agent, or the sample matrix.

4.1. Research Opportunity Description

4.1.1. DHS S&T: Bioforensics Research and Development (R&D) Whole Genome Approach to Microbial Forensics

Background

The U.S. Department of Homeland Security (DHS) is committed to using cutting-edge technologies and scientific talent in its quest to make America safer. The DHS Directorate of Science and Technology (S&T) is tasked with researching and organizing the scientific, engineering, and technological resources of the United States and leveraging these existing resources into technological tools to help protect the homeland. The Chemical and Biological Defense Division of S&T supports this mission by identifying and developing technologies for the DHS operational components that are needed to reduce the probability and potential consequences of a biological pathogen or a chemical attack on the nation's civilian population, its infrastructure, or its agricultural system.

The Homeland Security Act of 2002 (Public Law 107-296) states that DHS S&T will “support basic and applied homeland security research to promote revolutionary changes in technologies; advance the development, testing and evaluation, and deployment of critical homeland security technologies; and accelerate the prototyping and deployment of technologies that would address homeland security vulnerabilities.” Pursuant to this mission, the Chemical Biological Division (CBD) seeks technologies to prevent and defend against a chemical and biological attack. In addition, the division is charged with pursuing research to improve response and restoration, conduct threat risk assessments, and invest in bioforensics research and development. The focus of this Broad Agency Announcement (BAA) is in the area of bioforensics research.

The threat of terrorist or criminal use of pathogenic organisms and their toxins remains of great concern in the United States. There are vulnerabilities and needs to perform microbial forensic analyses for attribution purposes in a rigorous scientific manner. As part of the effort to deter biological terrorism and strengthen the law enforcement response to such an act, Homeland Security Presidential Directive (HSPD) 10, “Biodefense for the 21st Century” established a dedicated central microbial forensic laboratory known as the National Bioforensics Analysis Center (NBFAC), as part of the Department of Homeland Security to provide bioforensics analysis of evidence associated with the event. The NBFAC operates in partnership with the Federal Bureau of Investigation (FBI), the lead investigative agency in acts of terrorism. This BAA seeks research in the following technical focus areas (TFAs) to support the missions of the NBFAC and FBI for evidentiary analysis and interpretation of results to support a criminal investigation. The ultimate goal of this joint mission is the capture, indictment, and prosecution of the perpetrator(s) of the biocrime or terrorist attack.

The NBFAC has instituted a robust, operational molecular biology program with enhanced capabilities to conduct genomic analysis of biological threat agents. The Bioforensics Research and Development Program supports NBFAC operational threat agent identification and characterization through investments in microbial forensics research and next generation technologies to include molecular biology, genomic comparison techniques, genotyping assays and physical/chemical analysis of sample matrix to better understand the origin, evolutionary history, production method and dissemination mechanism associated with the malicious use of biological agents.

4.1.2. Description of White Paper Technical Topic Areas

Pursuant to this mission, the Bioforensics R&D Program seeks products and research in four technical topic areas:

- 1) High affinity products for select agent identification and neutralization;
- 2) Domain-specific products for select agent identification;
- 3) Sequence subtraction databases for viral metagenomics analyses; and
- 4) Bacterial population genetics of select agent pathogens

An Offeror may submit a White Paper to one, two, three, or four technical topic areas, but it is requested that an approach which may be applicable to all technical topic areas not be co-mingled into a single White Paper.

4.1.2.1. Technical Topic Area 1: High affinity products for select agent identification and neutralization

The goal of Technical Topic Area 1 is to develop new products for DHS to identify Ricin (RCA60, RCA120), Abrin, and *C. botulinum* toxins with high confidence. The heterogeneous nature of polyclonal sera can be problematic for the identification of specific biological toxins. New monoclonal antibodies, peptides, or small molecules are needed that act against defined toxins, resulting in increased specificity for toxin identification.

The Bioforensics R&D program is in need of new reagents such as monoclonal antibodies, peptides, or small molecules that block the catalytic domain for select protein toxins. This effort should prioritize production of high affinity, biological activity neutralizing products for Ricin and Abrin to be used in biological activity assays, followed by serotype-specific, high affinity products for use in *C. botulinum* (serotypes A - H) immunoassays. The government will procure the antigens for this effort. With regard to *C. botulinum*, serotypes A – G will be provided, but proposed efforts including H are also being solicited. A list of proteins will also be provided for the performer to include in a specificity panel. At a minimum, all antibodies, hybridomas, expression constructs, cell lines, and heavy/light chain sequences used and developed as part of this effort will be the property of the government.

Offerors should propose research projects that address the following:

- Development of monoclonal antibodies, peptides, or small molecules that are specific to the A and B chains of both Ricin (RCA 60, RCA120) and Abrin. Additionally, monoclonal antibodies, peptides, or small molecules must be developed that block the active site on the A chain of RCA 60 and RCA 120, and the active site of the Abrin toxin A chain, respectively, and neutralize biological activity.
- Development of monoclonal antibodies, peptides, or small molecules that are serotype-specific to *C. botulinum* types A-G. Additionally, monoclonal antibodies, peptides, or small molecules must be developed that block the active site of *C. botulinum* toxins type A-G and thus neutralize biological activity.
- Additional work on the development of monoclonal antibodies, peptides, or small molecules for the detection of marine toxins, such as saxitoxin, and *C. botulinum* type H (serotype to be obtained by performer) may also be awarded.
- The antibodies, peptides, or small molecules produced must exhibit high specificity for target antigens with minimal cross-reactivity and no non-specific binding. Antigen binding should also be of sufficiently high affinity to support antigen capture immunoassays of intact toxins in clinical/forensic samples. For relevant clones, 100 mg of purified antibody is desired.

4.1.2.2. Technical Topic Area 2: Domain-specific products for select agent identification

The goal of Technical Topic Area 2 is to develop new products for DHS to identify individual domains of Ricin (RCA60, RCA120), Abrin, and *C. botulinum* (BoNT) toxins with high confidence and in a selective manner.

Ricin, Abrin, and BoNT are highly distinct, with unique functional targets, mechanisms, cell types, and receptors. These toxins, including BoNT serotypes, have unique catalytic active sites, as well as distinct targeting and receptor-binding domains. Developing reagents against individual domains will allow the positive identification of specific toxins and serotypes with high specificity and selectivity.

Offerors should propose research projects that address the following for BoNT (serotypes A-H), Ricin and Abrin (but are not limited to):

- Antibodies, peptides, or small molecules specific and selective for a single domain or functional group.
- Antibodies, peptides, or small molecules that target the active sites and receptor binding functions of toxins.

4.1.2.3. Technical Topic Area 3: Sequence subtraction databases for viral metagenomics analyses

The goal of Technical Topic Area 3 is to develop sequence “subtraction” databases that will support the Department of Homeland Security’s capability to identify novel viruses that impact humans and agriculture. The databases will be used to remove host cell nucleic acid sequences from bioinformatic analyses to support viral discovery and in-depth characterization of viruses. The eukaryotic genome sequences of biological agent hosts, vectors, and reservoirs, as well as cell lines used for tissue culture will need to be generated in order to populate the databases. A large sequencing center will have the capacity to support high throughput sequencing in collaboration with the government to support closing this important gap. At a minimum, the resulting sequences should be high quality draft. All organisms and cell lines will be provided by the government for this effort, and the sequence data will be submitted to NCBI.

Offerors should propose research projects that address the following organisms/cell lines of interest (in order of priority):

1. *Aedes albopictus* C6/36 cell line.
2. Jurkat human T-cell line.
3. Huh7 cell line.
4. Hep G2 cell line.
5. *Xenopsylla cheopis*.
6. Sugar cane.

4.1.2.4. Technical Topic Area 4: Bacterial population genetics of select agent pathogens

The goal of Technical Topic Area 4 is to perform in-depth research on the bacterial populations of select agents where there are critical knowledge gaps. Successful prosecution of biocrimes is contingent upon a thorough understanding of the biology and structure of the bacterial population/species in question, as sample attribution is directly linked to the diversity of that population/species. Microbial forensic analyses need to be founded on an accurate understanding of existing levels of diversity, as well as the various mechanisms and patterns that drive genetic diversity accumulation. The Department of Homeland Security has a significant interest in understanding the population characteristics of *C. botulinum* and *B. anthracis* (the latter from North African and Middle Eastern regions only). All isolates and matrices (e.g. soils, source samples) positive for these bacterial agents and acquired for this BAA will be sent to the government as reference samples for addition to their repository collection.

Offerors should propose research projects that address the following:

- High throughput, next-generation sequencing of the select agents.
- SNP analyses (identification, discovery, genotyping) within and across populations.

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- Phylogenetic analysis within and across populations.
 - Geographic distribution and correlation to phylogeny.
5. **Number of Selections:** It is anticipated that multiple selections will be made depending on the quality of the White Papers and availability of funds.
6. **Anticipated Ceiling:** Although subject to official fiscal appropriation and availability, it is anticipated that approximately \$1.986 million of Fiscal Year (FY) 2015 funds will be available for any resultant awards under this BAA Call. **The Government will reserve the right to incrementally fund any resultant contracts awarded from this BAA Call as provided by the FAR 52.232-22, "Limitation of Funds."** Contracts or other agreements that obligate funds will not have an initial period of performance that exceeds 12 months from the date of contract award. However, Offerors will be able to propose a base year effort with additional option years.
7. **Anticipated Award Type:** Award type is anticipated to be in the form of Cost Reimbursement type contracts. However, the Government reserves the right to award firm-fixed price contracts, cooperative agreements, Other Transactions (OTs) (if authorized by law at time of award), or interagency agreements to appropriate parties should the situation warrant.

In the event an offeror or subcontractor is a Federally Funded Research and Development Center (FFRDC), Department of Energy National Laboratory, or other Federally funded entity, DHS/S&T will work with the appropriate sponsoring agency to issue an interagency agreement pursuant to the Economy Act (31 U.S.C. 1535) or other appropriate authority.

8. **Anticipated Award Dates:**
The 3rd Quarter of Fiscal Year 2015 is when the government anticipates making any resultant contract awards under this Call for those White Papers that are selected. However, the award date for any resultant contract award may vary based on the quality of the proposals received and the availability of funds.
9. **White Paper Instructions:** Offerors shall submit their White Papers in accordance with BAA 14-003, Section 5.3 - Format and Content of White Paper (Attachment A White Paper Proposal Form).
10. **Full Proposal Instructions:** Offerors shall submit their Full Proposals in accordance with BAA 14-003, Section 5.4 - Format and Content of Full Proposals.
11. **Evaluation Criteria:** White Papers AND Full Proposals will be evaluated in accordance with the evaluation criteria contained in the BAA 14-003, Section 1.6 – Call and Response Approach, (Two Phased Evaluation).
12. **Foreign Concerns:** Foreign persons are advised that their participation may be subject to Export Control restrictions. Any such restrictions shall be reviewed on an individual award basis.
13. **Questions:** Any questions concerning this call must be submitted via email to the Contract Specialist at tanisha.walcott@hq.dhs.gov and copy the Contracting Officer at Michael.Jones@hq.dhs.gov no later than **January 30, 2015 3:00 PM EST** in the following format:

Question #	Reference	Contractors' Question
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**Department of Homeland Security (DHS) Science and Technology Directorate (S&T)
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1	General (if there is no specific document reference)	
2	(Example) BAA 14-003, page 15, Section 5.2, first paragraph, second sentence	
3	(Example) BAA 14-003/Call 0003, page 2, Section 9, first sentence	

Please include “Questions for BAA 14-003/ Call 0003” in the subject line. All questions and responses will be posted on the Federal Business Opportunities website <http://www.fbo.gov> and <https://baa2.st.dhs.gov> . Questions will only be accepted or answered electronically.