Notice of Intent to Review Marketplace Solutions

SHOPPING NOTICE: DARPA-SN-26-89
MARKETPLACE: Defense Advanced Research Projects Agency (DARPA) Expedited Research Innovation System (ERIS)
REQUIRING ACTIVITY: DARPA, Biological Technologies Office (BTO)
NOTICE DATES: June 8, 2026 – December 8, 2026

TOPIC AREA: Advanced technologies for the improved resilience of US operations throughout the prepare, deployment, execute, and return cycle. This topic supports technologies for human health and performance optimization. This topic supports biotechnologies for production of supplies, in situ resource utilization, and creation of operational advantages, including in austere locations. This topic supports technologies in the convergence of Artificial Intelligence and Machine Learning (AI/ML) with chemistry and biology, including foundation models and data factories.

1.0 PURPOSE

Between the dates listed above, DARPA BTO will be actively "shopping" the ERIS Marketplace for innovative, post-competitive, awardable solutions that address the need for a new class of rapidly switchable, non-optogenetic protein domains for real-time cellular control. This effort seeks to develop a robust and versatile molecular tool for massless information transfer across a cell membrane, intended to supplement existing synthetic biology platforms.

This is an active and immediate search for solutions. Submissions will be reviewed on a rolling basis as they are received, and the Government reserves the right to make one or more awards prior to the closing date of this notice.

2.0 PROBLEM & SCOPE

The development of advanced synthetic biology systems, such as the nucleic acid compiler (NAC) envisioned in the Generative Optogenetics (GO) program, requires precise spatiotemporal control over protein function. While optogenetics provides a powerful method for cellular control, it is limited by potential spectral crosstalk between photosensitive domains. New orthogonal signaling modalities are required to expand the complexity and capability of these systems.

DARPA is exploring the development of bio-compatible, modular protein domains, specifically engineered for *in vivo* expression within a host cell, that can be regulated by a massless, non-optical external signal (e.g., magnetic fields, focused ultrasound, etc.) with kinetics and reliability sufficient for integration into complex enzymatic machinery.

- **Current Obstacles:** Existing non-optogenetic cellular control systems lack the combination of speed, repeatability, and modularity required for high-frequency operations like enzymatic control. Magnetogenetic tools, while promising, have not yet been systematically optimized for sub-second on/off switching and high-cycle repeatability, nor have they been demonstrated as a truly versatile, plug-and-play domain for different protein regulation mechanisms (e.g., induced dimerization vs. allosteric control).

- **Desired Research Focus**: This research seeks to advance the state-of-the-art in non-optogenetic protein control by developing and demonstrating a novel protein domain that can be reliably and rapidly controlled

by a massless signal. The primary goals are to achieve activation/deactivation kinetics of ≤ 2 seconds, demonstrate robust performance of at least 300 repetitions in a living cell, and prove the domain's versatility by demonstrating its function on both split-protein (dimerization-based) and allosteric (conformation-based) protein configurations. While approaches based on magnetogenetics (e.g., electromagnetic preceptive gene) are of high interest, other innovative modalities that meet the performance goals are encouraged. Approaches that multiplex non-optogenetic protein control are also encouraged. However, proposals seeking to expand, optimize, or multiplex existing optogenetic, light-based, or chemical systems are explicitly out of scope for this effort.

3.0 DESIRED CAPABILITIES AND EXPERTISE

While ***all submissions will be evaluated against the standard criteria published in the ERIS Master Solicitation***, BTO will be specifically looking for solutions that demonstrate strength in the following areas. These are not new evaluation criteria but rather highlight the specific attributes of interest for this opportunity.

- **Defining the Problem & Current State of the Art:** Strong submissions will demonstrate a deep understanding of the problem space. Clearly define the scope of the technical challenge and compare the proposed solution to the kinetic and reliability limitations of the current state-of-the-art in magnetogenetics, sonogenetics, or other relevant fields.

- **Advancing the State of the Art (Technical Innovation):** The most compelling solutions will be those that offer a significant technical leap in achieving rapid, repeatable, and versatile protein regulation. We are looking for innovative approaches to protein engineering, domain design, and signal transduction that overcome the limitations of existing solutions. The proposal should articulate a clear plan to reach the specified kinetic and repeatability metrics.

- **Team Capability (Expertise and Vision):** We are seeking teams with a strong vision and demonstrated expertise relevant to solving this complex problem. Proposing teams should possess significant, combined expertise in synthetic biology, protein engineering, and biophysics. A proven track record of developing novel molecular tools and quantitatively characterizing their performance in living cells is highly desirable.

- **Impact (Defense and Commercial Use Case):** Solutions should demonstrate a clear potential to become a foundational tool in synthetic biology. Submissions should discuss how their innovation could unlock new capabilities in fields such as biomanufacturing, cell-based therapeutics, and biosensing for both defense and commercial applications. The development of a modular, high-performance control domain would be broadly transformative.

4.0 HOW TO RESPOND

This notice is a call for solutions to be flagged for review.

For Existing Awardable Solutions:
Existing ERIS Solution providers who believe their current ERIS solution(s) meet the above characteristics may flag their existing solution video for inclusion in this market research activity by emailing ERIS@darpa.mil with the following:

- Subject Line: Shopping Notice Response: **DARPA-SN-26-89-** [Your Company Name]
- Body: The Title and Video URL of your existing awardable solution.

For New Submissions:
Prospective ERIS Solution Providers interested in having their solutions included in this market research activity must submit a video solution through the standard ERIS submission process in either the June, July, August, September, October, November, or December 2026 collection period. If the submitted solution is determined awardable in the respective assessment period (July, August, September, October, November, December 2026, or January 2027), through the standard ERIS assessment process, then the Solutions Provider may flag their awardable solution video for inclusion in this market research activity.

If you have a new solution, please submit it to the Topic Area, listed below, via the ERIS portal.

> *"Advanced technologies for the improved resilience of US operations throughout the prepare, deployment, execute, and return cycle. This topic supports technologies for human health and performance optimization. This topic supports biotechnologies for production of supplies, in situ resource utilization, and creation of operational advantages, including in austere locations. This topic supports technologies in the convergence of Artificial Intelligence and Machine Learning (AI/ML) with chemistry and biology, including foundation models and data factories".*

To ensure it is associated with this notice, please use the following format for your video title:

- Video Title Format: DARPA-SN-26-89: [Your Solution Title]
  (Example: DARPA-SN-26-89: AI Accelerator Analysis Tool)

After submitting, please also send a notification email to ERIS@darpa.mil with:

- Subject Line: Shopping Notice Response: DARPA-SN-26-89 - [Your Company Name]
- Body: The Title of your new submission and its Date of Submission.

Solutions submitted during this window that are deemed "awardable" through the standard ERIS assessment process will be included for consideration by BTO. An award for this effort is anticipated to be around $400,000 for a 12-month period of performance.

5.0 RESOURCES

- ERIS Master Solicitation: SAM.gov link
- 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 DARPAConnect.us to leverage on-demand learning and networking resources.
- To Submit a New Solution: DARPA Connect ERIS Portal