

## REQUEST FOR PROPOSALS

# NSRI Student Biological Research Acceleration and Innovation Network [S-BRAIN] Research Awards



The U.S. Department of Defense (DOD), through a contract with the National Strategic Research Institute (NSRI) at the University of Nebraska, will support student research efforts around two topics:

- Global health and infectious disease
- Agricultural defense

This mechanism is designed to encourage student researchers and their mentors to develop ideas to meet needs in these emerging topical areas for the DOD. Projects should be proposed as one-year efforts with a single aim. In subsequent years, projects may be extended or renewed through a competitive application. This award program is part of a broader initiative that NSRI will be announcing in January 2024.

Individual projects are expected to be no more than \$75,000 in direct costs and will last no more than 12 months from the date of award. Three to four awards are expected from this call. Two categories of proposals will be considered: graduate student developed proposals and faculty developed proposals.

1. **Graduate student developed proposals:** Student proposals will be prioritized. They should be developed in collaboration with a faculty mentor but should be primarily the product of the student. The project must be executed by the student proposing the work and not transferred to another student.
2. **Faculty developed proposals:** Proposals developed by faculty must identify a student(s) (graduate or undergraduate) who will be enrolled at NU in 2024-25 to perform the work.

The budget may include:

- Up to a full year of 1.0 FTE student stipend
- Up to one month of support for their faculty advisor
- Reasonable supplies and materials
- Travel to present at a national or international conference

Proposals should be submitted no later than 5 p.m. CT, February 15, 2024 via email to [sarten@nsri.nebraskaresearch.gov](mailto:sarten@nsri.nebraskaresearch.gov). Evaluation will conclude by March 1, 2024. The award process begins immediately. Awards will be via Firm Fixed Price Contract from NSRI. Quarterly and final reports are required, and funded students are expected to present findings at the NSRI Fellows Conference in spring 2025. There is no U.S. citizenship requirement for this mechanism.

## TOPIC DETAILS

### **Global health and infectious disease.**

Proposals in this category may address, but are not limited to, topics related to global health, disease surveillance, biodefense, pandemic defense, and basic and applied research into viral, bacterial or fungal diseases with potential impact to the DOD.

**Agricultural defense.** Proposals in this category may address, but are not limited to, topics related to securing the food supply for deployed military personnel or U.S. civilians, defense against plant or animal diseases of human importance, zoonotic diseases.

## EXAMPLES OF PROJECTS OF INTEREST

**Next-generation medical countermeasures for either human or animal diseases:** Development of next-generation medical countermeasures for potential infectious diseases to overcome current standard-of-care shortfalls.

**Point-of-need diagnostics:** Tests that rapidly identify an infection wherever the test subject is located to mitigate the need for transportation of samples to centralized laboratories with days or weeks before rendering results. The ultimate goal is to develop point-of-need diagnostics that can be integrated with disease surveillance data systems.

**Ubiquitous sequencing:** Metagenomic sequencing capabilities that read all genetic material from a sample and detect pathogens without looking for a specific pathogen are essential to identifying novel pathogens whether natural or engineered. Novel sequencing modalities, prioritizing methods enabling miniaturization and a decrease in reagents or reagent-free sequencing are desired.

**Massively multiplexed detection:** Pan-viral and pan-microbial assays are desired. The detection of viral pathogens for any host, including agricultural plants and animals, rapidly and with confidence would provide a capability to complement metagenomic sequencing and pathogen-specific point-of-need diagnostics. CRISPR-based massively multiplexed panels show promise in this area.

**Non-invasive sensors for disease monitoring:** Biomarker sensors that are implantable or attached and passively monitored by proximity readers are sought that can detect changes from established baselines, indicative of early onset disease. Measured biomarkers could include physiological, biometric, biophysical, biochemical, mobility and circadian rhythm. It is desirable to couple these biomarker sensors with GPS data. Under this category we will entertain research proposals that explore the potential to monitor plants for early recognition of disease using stand-off detection (e.g. drone-mounted sensors).

### Surrogate development for human, plant and animal pathogens:

Critical research to develop vaccines, therapeutics, diagnostics and management strategies can be expensive and delayed due to regulatory requirements that constrain work with select agents and/or require strict regulatory control measures. We seek proof-of-concept studies that identify candidates of high predictive value for more robust studies to validate their use as surrogates for research to develop countermeasures for any of these controlled pathogens. Of particular interest are surrogates for Foot and Mouth Disease Virus and African Swine Fever Virus. For a complete list of select agents and toxins refer to [selectagents.gov/sat/list.htm](https://selectagents.gov/sat/list.htm).

Pilot studies that assess risk, including secondary and tertiary impacts, across a whole of society framework for:

- Introduction of a high-consequence agricultural pathogen impacting either animal production or crop production.
- Human epidemic or pandemic.

Focus should be on developing the risk assessment methodology and automation that involves the intersection of threat and vulnerability with resultant risk that can be used to assess a variety of threats, rather than an assessment of a specific threat.

## PROPOSAL FORMAT

Proposals should be no more than four pages (not including references).

- A minimum 1/2 inch margin on all sides
- 11-point font size or larger
- No more than 15 characters per linear inch (including spaces)
- No more than 6 lines per vertical inch (in Word this means a minimum line spacing of 'exactly 12 pt.' Please consider readability when selecting line spacing.)

There are no limits on your reference list length. Be complete yet concise, avoiding redundancy.

Include the following sections:

1. Brief introduction and overview of the problem
2. Relevance to the DOD
3. Statement of aim
4. Experimental approach
5. Expected outcome(s)
6. Potential problems and alternative approach
7. Budget summary (not including indirects) categorized into graduate student labor, faculty labor, materials and travel (detailed material budget is not required)

Questions may be directed to [Ichudomelka@nsri.nebraskaresearch.gov](mailto:Ichudomelka@nsri.nebraskaresearch.gov).