NU COLLABORATION INITIATIVE

AY27 NSRI PRIORITIES

NATIONAL STRATEGIC RESEARCH INSTITUTE
at the University of Nebraska

The National Strategic Research Institute (NSRI) at the University of Nebraska (NU) seeks technical capabilities and competencies for its sponsor, U.S. Strategic Command (USSTRATCOM), as well as the broader U.S. Department of Defense (DOD) community focused on strategic deterrence and countering weapons of mass destruction (CWMD).

Seed funding is available through the NU Collaboration Initiative (NUCI) for NU researchers, faculty, students and staff to pursue single-year projects across NSRI's research portfolio. NUCI aims to enhance the competitiveness of NU faculty for federal grant funding, and it can also help position NU for contract funding through NSRI.

All applications within the NSRI mission space will be considered; however, NSRI encourages applications that address the following priorities for academic year (AY) 2027.

PRIORITIES

1. Examine and experiment with artificial intelligence (AI) and machine learning methodologies and tools to create products across NSRI's research portfolio that the DOD can integrate for strategic deterrence and CWMD.

2. Functionalize quantum sensors with biological molecules for selective detection or single molecule detection using quantum enhanced spectroscopy to identify protein folding and enzyme activity.

3. Develop next-generation medical countermeasures for chemical, biological, radiological and nuclear (CBRN) threats including pharmaceutical vaccines and therapeutics, personal protective equipment and wearable device solutions to overcome current standard-of-care shortfalls as well as address future emerging threats.

4. Conduct comprehensive risk assessments — accounting for secondary and tertiary impacts within a whole-of-society framework — focused on high-consequence pathogens affecting animal and crop agriculture, as well as human epidemics and pandemics. This includes the development of novel methodologies to identify and assess risks posed by actual or potential undiscovered environmental pathogens.

5. Enhance CBRN consequence management and critical infrastructure resilience through multi-domain response frameworks that address cascading failures, sector interdependencies and rapid recovery. Integrate emerging technologies such as AI, digital twins and autonomous systems, to assess, predict and mitigate high-impact event consequences.

6. Advance workforce development, as identified in the National Defense Strategy, within USSTRATCOM research areas and the broader CWMD enterprise. Successful completion of these projects should create additional extramural funding and employment opportunities for NU students.