Tier 2 Priority: Enhanced Human Performance – Operating in CBRN Environments STaR Shot Problem Statements.

Enhancing Human Performance (EHP) is a high priority objective of the Science and Technology (S&T) efforts sponsored under the Next Generation Technologies Fund (NGTF). In this call for proposals the NGTF EHP theme is seeking concept demonstrators, and innovations from Australian Small to Medium size Enterprises (SME) that enhance a warfighter’s resilience to chemical, biological, radiological and nuclear (CBRN) warfare agents. This resilience may be achieved through superior training and preparation of the human for the strenuous cognitive and physical tasks associated with operations in CBRN environments, or through significant improvements to the human’s cognition, endurance and protection whilst operating in CBRN environments. All proposals to enhance a warfighter’s performance and resilience in CBRN environments will be considered. However, preference will be given to proposals that may lead to the development of:

1. Field-deployable training devices or personal device-deployable protocols targeting cognitive and or physical readiness – backed by evidence of validity and/ or with built-in efficacy assessment. What novel methods can be used and demonstrated to assess an individual’s readiness for a CBRN mission?
2. Significant enhancements to the “under-suit environment” (temperature, humidity, airflow, etc.) to enable warfighters who wear MOPP-4 individual protection equipment to stay and work for several hours in high-temperature and high-humidity environments.
3. Recovery-enhancing wearable or ambient technologies such as adaptive lighting, stress-reduction/calm-induction and personalised sleep management technologies.
4. Countermeasures to acute and chronic fatigue such as biomarkers of alertness (including metabolomics) and personalised circadian scheduling tools.
5. Novel tools and methods that can reliably, safely and effectively enhance a warfighter’s resilience and endurance during operations in CBRN environments. These tools and methods need to be either demonstrable with regard to their reliability, safety and effectiveness or underpinned by credible evidence.
6. Studies on how immersive simulation technology can be used to provide realistic training for personnel required to operate in CBRN environments. Any claims regarding training efficacy will need to be substantiated by credible research pertinent to the study’s topic.
7. Novel tools, devices and approaches for meeting the warfighter’s nutritional requirements including consideration of protection and safe ingestion of foods suited to CBRN environments.