

Attachment 1 – DAGSI Research Topic Template

1. **Research Title:** Biological Tools for Health and Performance Monitoring and Augmentation
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**
Mechanical and Aerospace Engineering
Chemistry
Biochemistry

4. **Objectives:** The objective of this project is to identify naturally occurring means to monitor and control mechanisms that affect the human response to different physical and cognitive stressors.

5. **Description:** Service members may operate in unique and, at times, extreme environments that impose significant physiological and cognitive demands. These conditions can produce immediate effects that degrade performance and, over time, contribute to adverse long-term health outcomes. The body's response to such stressors involves multiple mechanisms, many of which are mediated through cellular communication across molecular, cellular, and systemic levels. Identifying the signaling molecules and regulatory pathways involved in these responses may reveal mechanisms that support adaptation, recovery, and healing. Such insights could inform interventions designed to accelerate recovery, reduce harmful effects, and sustain mission effectiveness. This project will identify regulatory mechanisms and associated pathways involved in responses to stress, fatigue, and cognitive overload, with the goal of informing potential targeted interventions.

6. **Research Classification/Restrictions:** Unclassified

7. **Eligible Research Institutions:** the Ohio State University, University of Dayton, Miami University, University of Cincinnati, Case Western Reserve University

NOTE: PA Approval # AFRL-2026-1832, cleared on October 15, 2026