

1. **Research Title:** Biosensor development for rapid and non-invasive health and performance assessment
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**

Biomedical Engineering, Biochemistry, Material Science, [Bio]Manufacturing Engineering, Chemical Engineering, Environmental Engineering, Electrical Engineering
Previous work in chemistry, electrochemistry, engineering, and sensor development is desired
MS preferred

4. **Objectives:** Understand the biosensor landscape and overcome the technical hurdles leading to the development and performance evaluation of biosensors in lab. Formulate plans for mass manufacturing and determine constraints, evaluate sterilization effects on biosensors performance in testing in animals/humans, and explore/develop sensor data processing in real-time or for rapid point-of-care measurement.
5. **Description:** Microelectronic and biosensor advancements have led to sensor diagnostics flooding the market, however, their accuracy, form-factor, and the data that they provide may not be useful to the USAF/SF. These technologies include wearables like smart watches, continuous glucose meters for diabetics, environmental monitoring for chemical or biological agents, or point-of-care devices like rapid antibody tests for illnesses. This project will require research in understanding the current technical climate of sensors/biosensors for health and human performance, determination of pathways to advance biofluid sampling and collection, aid in threat recognition, create unique electrode fabrication, ruggedize technology for device fielding, and/or create novel (bio)sensor for a specific human health and performance objective. Projects should build upon the reported biosensing successes and create strategies to overcome the challenges that limit their commercialization and practical use.
6. **Research Classification/Restrictions:** Unclassified/Unrestricted
7. **Eligible Research Institutions:** Any of the eighteen Ohio research universities are eligible to apply for a fellowship award.

PA Approval #: AFRL-2024-4943: The material was assigned a clearance of CLEARED on 10 Sep 2024.