

## **IMPACT STATEMENT**

The proposed research project is important and relevant to the FY23 PRMRP Topic Area of Infectious Diseases, as it aims to develop the BioNORAD platform to predict and identify the emergence of new strains of influenza viruses. This platform has the potential to significantly improve global surveillance and response capabilities for emerging pandemic threats, which is a growing concern in today's interconnected world.

The FY23 PRMRP Strategic Goal addressed in the proposed research is Epidemiology: Identify strategies for surveillance or develop modeling tools and/or biomarkers to predict outbreaks or epidemics. The BioNORAD platform aligns with this strategic goal by employing advanced machine learning algorithms and interdisciplinary insights to create an early warning system for pandemic threats. This system will enable proactive measures to protect both military and civilian populations, strengthening global health security.

The potential short-term impact of the proposed research includes the development of a robust, scalable, and actionable platform to predict and identify emerging influenza strains. This will enable more efficient allocation of resources for vaccine development, antiviral treatments, and other medical countermeasures, ultimately improving patient care and health outcomes.

In the long-term, the BioNORAD platform has the potential to revolutionize the field of infectious disease surveillance and response, leading to better preparedness for future pandemics. Moreover, the interdisciplinary nature of this project could foster innovations and breakthroughs in machine learning, information theory, evolutionary theory, epidemiology, and proteomics, with broad applications beyond influenza.

The proposed research has the potential to generate preliminary data that can be used as a foundation for future research projects. As the BioNORAD platform is developed and validated, the insights gained will inform the design of new surveillance strategies, modeling tools, and biomarkers for predicting outbreaks or epidemics. This will enable researchers to explore novel approaches to combating infectious diseases, ultimately contributing to improved global health security.

In summary, the proposed research project is highly relevant to the FY23 PRMRP Topic Area of Infectious Diseases and addresses the FY23 PRMRP Strategic Goal of Epidemiology. The development of the BioNORAD platform has the potential to make significant short-term and long-term impacts on the field of study and patient care, while also laying the foundation for future research projects in the areas of infectious disease surveillance, modeling, and prediction.