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# PUBLIC SUBMISSION

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Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

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## Submitter Information

**Name:** Bryan Tegomoh

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## General Comment

Name: Bryan Tegomoh, MD, MPH

Organization: University of California, Berkeley

Title: Pathogen Agnostic Genomic Surveillance for Biosecurity and Public Health

Statement of Purpose:

This proposal outlines a targeted priority for the 2025 National AI R&D Strategic Plan: accelerating the development of transparent, robust AI systems tailored to pathogen agnostic genomic surveillance. By combining AI safety principles with public health genomics, we can detect, characterize, and forecast emerging infectious threats; both natural and engineered; while safeguarding against misuse.

Key Research Priorities:

1. Pathogen Agnostic Machine Learning Models

- Develop AI that flags novel or engineered pathogens without pre existing labels by learning patterns in genomic “dark matter.”
- Incorporate adversarial robustness techniques to prevent evasion by intentionally modified sequences .

2. Distributed, Privacy Preserving Genomic Analytics

- Enable states and low resource settings to contribute sequence data through federated learning frameworks, preserving privacy and reducing single point failures.
- Integrate zero trust audit trails to ensure transparency and accountability of AI driven flags, drawing on Hendrycks’s emphasis on monitoring and fail safes.

3. Integrated Early Warning and Response Systems

- Fuse genomic, mobility, and clinical data streams with causal inference AI to forecast outbreak trajectories before clinical case surges.
- Build human AI collaborative dashboards that prioritize explainability, enabling epidemiologists to interrogate model reasoning and trigger targeted interventions.

4. AI Safety and Governance for Biosecurity

- Embed alignment checks, anomaly detection, and tail risk evaluations into bio AI pipelines to mitigate accidental or malicious misuse, per the “Disaster Risk Equation” framework .
- Develop community standards and certification processes for bio AI tools, ensuring only authorized labs and public health agencies can access high risk functionalities.

Broader Impacts:

- Strengthens U.S. leadership in AI driven public health and biosecurity, an area where private incentives are weak but national stakes are existential.
- Creates open source tools and best practice frameworks that can be rapidly deployed in low and middle income regions, advancing equity in global health security.
- Demonstrates a model for integrating AI safety engineering into domain specific AI, setting a precedent for other critical sectors.