ARTIFICIAL INTELLIGENCE AND BIOTECHNOLOGY (AIxBIO)

AIxBio refers to the convergence of AI and biotechnology

AI systems, models, and tools are being applied to biological research and biotech development. AIxBio capabilities can emerge from both advanced frontier AI models that are highly capable across a broad range of tasks as well as AI models trained primarily on biological data. For instance, AI has been used to predict and create novel protein structures, generate amino acid sequences, analyze genetic data, and optimize industrial biotech processes.

AIxBio has the potential to yield extraordinary benefits and risks

In the future, AI technologies could transform and improve the delivery of healthcare, the development of new medicines and vaccines, the diagnosis and understanding of disease, the speed of detecting dangerous new outbreaks, and more. Bottlenecks to achieving these enormous benefits include limits to specialized expertise in the workforce at the intersection of AI and biology, access to computational power, and availability of quality data.

The present risks of AIxBio are low, but both AI and biological research are rapidly evolving. As AI capabilities increase, so do the risks of misuse of biology. For example, a malicious actor could use future advanced AI to design and synthesize dangerous pathogens, such as those with enhanced transmissibility or lethality. All major frontier AI companies and many governments have emphasized the risks of future AI systems contributing to chemical, biological, radiological, and nuclear threats. Yet there is no government guidance about what types of risks pose national security threats and are most important to evaluate for and avoid. Thus, government action in this space is especially critical and appropriate.

Governance measures should promote beneficial applications of AIxBio while preventing global mass-casualty events

To promote continued US innovation and leadership in AI development, new governance measures should be narrowly tailored to both allow the benefits of AIxBio models to advance rapidly but also prevent model capabilities from being developed and deployed that could lead to accidental or deliberate creation of pathogens capable of causing a global mass-casualty event.

Congress could act to pass narrowly scoped legislation that addresses the prevention of particularly high-consequence AIxBio risks

Key elements of this could include:

- developing AIxBio evaluation standards, with input from the private and public sectors;
- extending federal dual use research oversight policy to in silico (in model/non-wet lab) research and the private sector; and
- establishing a process to determine if particularly sensitive US biological datasets used to train AI models should be accessible only through managed access to prevent adversaries from creating pathogens capable of causing a global mass-casualty event.

The Department of Commerce and federal funding agencies will play key roles.

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