June 2025 - Closed-door roundtable discussion at BIO International Convention

Reducing Biosecurity and Biosafety Risks in Vaccine Development and Safeguarding the Bioeconomy: *Opportunities and Challenges*

Coalition for Epidemics Preparedness Innovations (CEPI),
the World Economic Forum (WEF), and
the International Biosecurity and Biosafety Initiative for Science (IBBIS).

Reducing Biosecurity and Biosafety Risks in Vaccine Development and Safeguarding the Bioeconomy: Opportunities and Challenges

18 June 2025, 09:30-11:00 EST, Boston Convention and Exhibition Center, BIO2025 Conference

Format:
Closed-door Roundtable (Chatham House Rule), with ~30 senior leaders from industry, public health, security, government, and the biodefense sector.

Co-chairs:

- Andrew Hebbeler, Director of Biosecurity, Coalition for Epidemics Preparedness Innovations (CEPI).
- Brynne Stanton, Thematic Lead - Bioeconomy, World Economic Forum (WEF).
- O'Neil Hamilton, Deputy Director, International Biosecurity and Biosafety Initiative for Science (IBBIS).

Rapporteurs:

- Mayra Ameneiros, Senior Fellow, IBBIS
- Neil Cherian, Senior Biosecurity Manager, CEPI

Background:
At BIO's flagship convention, CEPI, WEF and IBBIS hosted a closed-door roundtable with around 30 senior leaders in life science, biodefense, and policy communities to discuss the urgent need to reduce biosafety and biosecurity risks amid the rapidly evolving bioeconomy, in order to foster a responsible innovation ecosystem. A key focus was placed on the responsible use of AI for protein design. This high-level roundtable consisted of three sessions, designed as a multi-stakeholder dialogue to advance global efforts in addressing emerging challenges and to share perspectives and opportunities from cross disciplinary collaboration.

Objective of the meeting:
Convene leaders to emphasize the importance of biosafety and biosecurity not only for CEPI's 100 Days Mission (rapid vaccine development) but for the safe and responsible advancement of the global bioeconomy. Over the past year, CEPI, WEF, and IBBIS have collaborated to advance biosecurity, with a strong focus on industry engagement and responsible stewardship.

Key takeaways

- Balancing innovation and responsibility is non-negotiable. The life science community must unleash the benefits of AI while actively working to minimize its biosecurity risks, with biosafety and biosecurity being central to the global bioeconomy. Otherwise, advances could be delayed or rejected by society due to fear or backlash.

- Effective biodefense requires multi-layered protection - from governance, personnel, and culture to tools and infrastructure. Traditional and robust biosafety and biosecurity practice still matters. Even as we address emerging threats from AI and other emerging technologies, we should emphasize the foundational importance of laboratory biosafety and biosecurity.

- Champions and voices from the Global South are critical. International perspectives - well beyond Europe and North America - must shape benefit-risk tradeoffs in biotechnology. Cultivating biosecurity role models across sectors can provide the rocket fuel for systemic change.

- The next epidemic or pandemic could start anywhere. Whether in nature or a lab, fostering a global culture of responsibility in research is critical. Epidemics and pandemics threaten society, regardless of how they originate. This is why we need stronger ways for industry, civil society, and governments to collaborate.

Session 1: ***Biosecurity and biosafety risks in medical countermeasures development and for the future Bioeconomy***

- Recognizing AI's transformative potential in vaccine design and other life sciences: participants discussed potential risks that may arise from AI-driven bio-innovation (e.g., nefarious/malicious use of AI-enabled biodesign technology and data) if not governed appropriately. Discussants highlighted the need for balanced innovation with safety, calling for foundational knowledge building and risk aware datasets.
- Discussants underscored the importance of creating a strong culture of responsibility as critical to harnessing advances enabled by AI in life sciences, with examples from innovative new biotechnology companies that have incorporated biosecurity and biosecurity responsibilities in their organizational vision, including through the establishment of chief biosecurity and biosafety officer roles at the senior leadership level.
- Funder representatives also urged industry-government collaboration and early-stage embedding of responsibility by startups/biotech. Representatives from industry also highlighted examples from clinical trials on the importance of continuing to work to address traditional or foundational biosecurity and biosafety risks while at the same time designing and promulgating approaches to promote responsible AI development and bio-innovation.

- After citing examples from successful outbreak responses in Africa, the group highlighted the importance of cultivating regional champions for biosecurity and biosafety to lead communities towards establishing and implementing best practices in biosecurity and biosafety risk reduction.
- Highlighting scientific community-endorsed principles for responsible AI-enabled biodesign and the recent summary report from the January 2025 meeting of AI developers and biosecurity experts, the group also discussed the need for proactive measures that funders, policymakers, and scientists should take to mitigate AI biosecurity risks.

Potential actions:

- The life science community should advocate for the development of anticipatory regulatory frameworks for AI use and commit to the responsible use of AI-driven tools, data, and models, such as the community principles for Responsible Biodesign.
- Early-stage life science startups - especially those with limited capacity - should be supported in adopting best practices for AI safety and biosecurity by providing accessible blueprints and guidance to integrate these considerations from the outset, including at both leadership and implementer levels.
- All organizations adopting AI tools should proactively expand training and standards for AI in bioscience to ensure equitable sharing of benefits and mitigate against geographic bias.
- Industry, government, and life science communities should identify and nurture champions across the Global North and South to actively model and promulgate best practices in biosecurity and biosafety for life sciences.

Session 2: ***Approaches and opportunities to maximize AI benefits and minimize risk***

- The discussion focused on AI biosecurity risk mitigation strategies and opportunities to accelerate responsible innovation. Participants shared examples of implementing access controls for AI tools to reduce risks and address capacity gaps, with an emphasis on balancing security and equity, particularly in countries lacking local infrastructure.
- Innovative approaches to reducing biosecurity threats for AI biodesign models in support of the 100 Days Mission were highlighted, including managed access systems to facilitate responsible global access to AI for vaccine design capabilities.
- Discussants advocated that equity, inclusion, and fair access to AI biodesign technologies are essential for achieving global success in the 100 Days Mission, with Global South actors playing a stronger role in developing and shaping AI biosecurity frameworks.
- The importance of exploring access models for Global South partners was emphasized, as well as the need for distributed capabilities to enable equitable sharing of scientific advances.
- Participants from developing countries and non-profits called for more proactive engagement and advocacy in shaping international AI safety standards. They emphasized the importance of a globally inclusive dialogue on the use of AI in the life sciences,

particularly given the significant role that manufacturers in developing countries play in producing medical products, and because low and middle-income countries will continue to be disproportionately impacted by bio incidents stemming from inadequate AI biosecurity risk reduction.

- As the world works to calibrate the balance between maximizing the benefits and minimizing the risks of AI-driven biodesign, it is essential to factor into the risk-benefit calculus the lives that could be saved - or lost - because of overly restrictive regulations that prevent beneficial applications from ever coming to life.
- Therapeutics are also key to the 100 Days Mission, particularly where no vaccine exists or is accessible. Existing gaps in therapeutic candidate pipelines for WHO Priority Pathogens with the highest pandemic potential were highlighted, and the potential of AI tools to accelerate early-stage discovery of therapeutic candidates was underscored. It will also be important to ensure fair and equitable practices in AI training data.
- The group also discussed recent U.S. government frameworks aimed at supporting the responsible adoption of emerging technologies, noting the current reliance on voluntary implementation of safeguards, such as nucleic acid screening practices.

Potential actions:

- Funders and life science communities should work to strengthen global AI infrastructure, especially in LMICs, where they represent the majority of the global population.
- Key considerations must be given to the longer-term costs of distributed infrastructure (such as supercomputing capacity), which may pose a barrier to the adoption and harnessing of emerging technologies in some countries.
- Industry and life science communities should advocate for international AI governance with inclusive practices, such as equitable training data for tools, models, and agents, with multi-layered approaches to AI biosecurity risk reduction, tailored to risk level and domain.
- Government, industry, and civil society should create opportunities to collaborate more closely in designing and implementing effective approaches for AI biosecurity risk reduction.

Session 3: *Approaches for a responsible transition to bioeconomy*

- Discussants emphasized that bioinnovation must actively involve the public and non-specialists in conversations about safety. They highlighted the critical need for proactive communication of both the risks and benefits of applying AI in the life sciences.
- In light of a dynamic political environment, representatives from the public sector and non-profits shared examples of unsustainable funding gaps that risk undermining global biosafety and biosecurity capacity, especially for personnel who must explore alternative careers due to funding shortfalls.
- With examples such as BIOPREVAIL, discussants highlighted key approaches partners are taking towards sustainable laboratory infrastructure, built specifically with biosafety and

biosecurity design principles for operations in low resource settings, while also creating a community of practice for biosafety and biosecurity.

- Funders highlighted initiatives such as the Bio Funders Compact and associated Bio Funders Forum that promoted prioritization of biosecurity and biosafety in decision making and grant processes and created trusted spaces for civil society and industry R&D funders to share perspectives and best practices on biosecurity and biosafety risk reduction.
- The group also called for harmonized AI data governance, support for small and mid-sized biotech, and clarified global biosecurity definitions (e.g., gain-of-function).

Potential actions:

- Life science stakeholders should advocate and champion initiatives that promote a secure and responsible innovation economy.
- Funders and the life science community must view robust biosecurity governance not just as a matter of global safety, but also as a fundamental prerequisite for the sustainable growth of the global bioeconomy. As AI-enabled tools become more widely deployed, ensuring responsible innovation and the prevention of misuse must be central to international policy frameworks.