



Outcomes and Comments

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Observations

- Governance of dual use life sciences research requires a layered system
 - Cross-cutting actions & actions at stages across the research life cycle
- Roles involving many types of actors and many segments of the community
- Desire for an information hub
- Need for sustained engagement
 - Opportunities to share lessons learned and to reassess governance systems as new developments arise

Ideas for Future Actions

Category	Ideas and Next Steps Suggested at the Workshop
Provide Venues to Further Dual Use Discussions	<p>Encourage existing multilateral forums on emerging science and technology to incorporate and discuss the issue of dual use life sciences research.</p> <p>Consider convening a regular event, workshop, or interest group to discuss issues in the governance of dual use life sciences research.</p>
Build Shared Understandings of Key Governance Components	<p>Foster shared definitions of what is encompassed by dual use life sciences research as well as understanding across languages (where there can be differences in terminology, for example).</p> <p>While the details will vary with context, foster common understandings of essential elements that could be included in national systems for governance and oversight of dual use life sciences research.</p>
Build Networks	<p>Identify and foster champions who can promote awareness of dual use among their national scientific communities and government agencies. Such champions might serve as points of contact in each country.</p>
Incorporate Dual Use Guidance into the Programs of Work of Other Organizations	<p>A number of organizations and networks that do not have a primary focus on biosecurity may still be relevant to addressing aspects of this broad issue. Promote inclusion of information or guidance on dual use life sciences research where appropriate in their discussions, reports and guidelines.</p>
Improve Policy Options and Implementation	<p>Incorporate expertise from the social and behavioral sciences into the process of developing and implementing life sciences governance policies.</p> <p>View research oversight as a "Design-Build-Test-Learn" cycle (an approach common to engineering fields) and discuss implementation, lessons learned, and how to adjust the system on a more regular basis.</p> <p>Convene those involved in publication and dissemination of scientific research to address dual use practices in an era of prepublication.</p> <p>Foster systematic discussions of the changing technical landscape of the life sciences (such as advances in sequencing and synthesis technologies, use of biofoundries, the role of DIY biology, potential advances in technical mitigation controls, etc.) and how dual use oversight systems can prepare to address them.</p>
Produce Materials and Provide Resources	<p>Compile and analyze principles for governance of research from existing sources. From these, develop a set of principles for the governance of dual use life sciences research.</p> <p>Assemble systematic descriptions of national dual use oversight systems to foster analysis and comparative discussions.</p> <p>Circulate a discussion paper among networks to orient diverse communities to the topic of dual use life sciences research and to continue to foster development of common understandings and approaches.</p> <p>Assemble teaching resources and case examples.</p> <p>Create an informational video with key messages.</p>

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Assessing Risks and Benefits

- A continuing challenge
- Approaches to undertaking assessments
 - Social and behavioral science areas such as decision science can inform
 - Qualitative frameworks useful in this context
 - Structure discussions
 - Clarify assumptions, open questions, areas of agreement and disagreement, reasoning

Biodefense in Age of Synthetic Biology

Usability of the Technology

- Ease of use
- Rate of development
- Barriers to use
- Synergy with other technologies

Usability as a Weapon

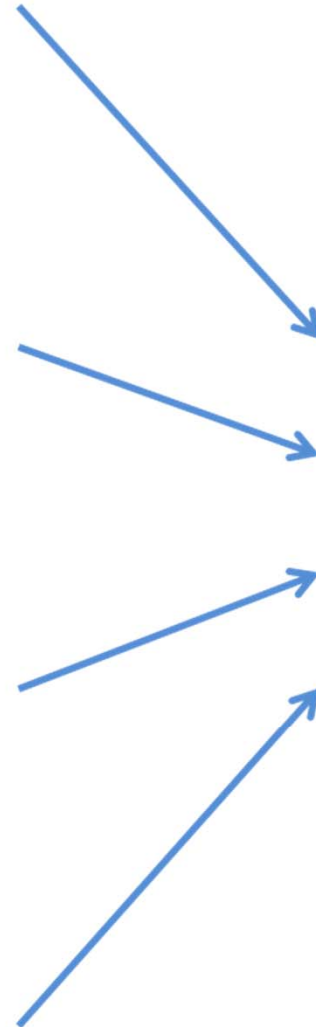
- Production and delivery
- Scope of casualty
- Predictability of results

Requirements of Actors

- Access to expertise
- Access to resources
- Organizational footprint requirements

Potential for Mitigation

- Deterrence and prevention capabilities
- Capability to recognize an attack
- Attribution capabilities
- Consequence management capabilities

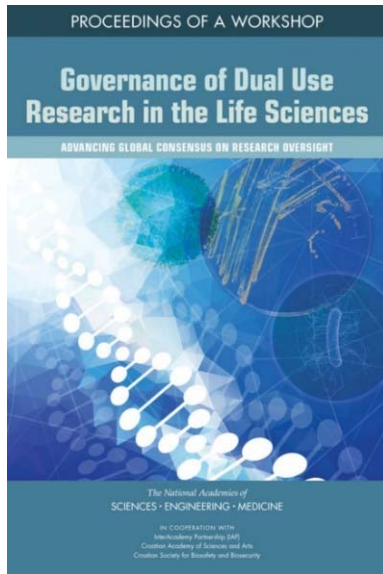


**Level of Concern
about the Capability**

Looking Ahead

- U.S. National Academies remains interested in contributing to the conversations on biosecurity and dual use research, and to working with others on these issues
- We welcome your thoughts and comments!

For More Information



Workshop Proceedings and 4-page Highlights available for free PDF download

www.nap.edu/25154

Workshop agenda, participant list and presentations

<http://nas-sites.org/dels/events/dual-use-governance/>

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