

The INTENT Framework:

Operationalizing the BWC's Definition
Through Tiered Biosecurity Risk Assessment

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Executive Summary

The evolving landscape of bioscience and biotechnology has reshaped the risk profile of biological weapons, necessitating a reassessment of definitions and international responses. This paper concludes that the broad, intent-based definition of biological weapons in the Biological Weapons Convention (BWC) sets a resilient and future-proof standard that can adapt to both current and future technological developments.

The authors' analysis concludes that the required solution lies not in redefining biological weapons but in operationalizing the BWC's resilient intent-based definition amid political challenges. This report identifies the difficulty in proving malicious intent and the resulting lack of a verification mechanism as the treaty's critical weakness. Historical incidents and recent ambiguities demonstrate the urgent need for actionable policy tools that address both misuse and negligence.

To this end, the authors propose the **INTENT** (indicators of technical risk, executive oversight, negligence, and transparency) framework, a tiered system to operationalize the BWC's intent-based definition through four indicators:

- **Technical risk:** Involves unjustified possession or synthesis of high-risk agents or inadequate containment measures
- **Executive oversight:** Assesses leadership structures, leadership commitment to BWC values and goals, the presence of an Institutional Biosafety Committee, proper training protocols, and oversight from senior scientists
- **Negligence:** Evaluates documentation practices, biosafety planning, dual-use research of concern (DURC) risk assessments, and personnel vetting
- **Transparency:** Looks for refusal to engage in peer review, hidden protocols, unwillingness to undergo audits, or vague research objectives

These indicators classify biological research and production facilities into four risk tiers, ranging from compliant and low-risk (Tier 1) to high-risk or opaque operations, which suggest deliberate misuse or dangerous misconduct (Tier 4). Crucially, the framework emphasizes gradual, evidence-based assessments rather than binary compliance judgments, mitigating political friction while enabling meaningful international oversight. It integrates biosafety with biosecurity aspects, allowing for investigation in cases of dangerous negligence, where malicious intent is almost impossible to prove.

The INTENT framework offers a politically feasible path forward for the BWC. It supports peaceful biological innovation while enhancing global capacity to detect and deter the development of bioweapons, ensuring security without stifling scientific innovation.

Background

The understanding of what constitutes a biological weapon has evolved. Biological agents, such as bacteria, were used through cadavers and excrement in warfare long before the advent of germ theory in the late 19th century, despite the cause of infectious diseases being unknown at the time.¹ Later, the emergence of microbiology and the scientific method enabled more specific and targeted uses of infections, altering the understanding of biological weapons. A key international milestone in this evolution was the Geneva Protocol of 1925, which prohibited the use of asphyxiating, poisonous gases and, crucially, extended this prohibition to bacteriological methods of warfare. Although it did not define biological weapons in precise terms, it marked the first collective agreement recognizing the unique threat posed by the deliberate use of disease in armed conflict. However, the Geneva Protocol restricted only use in warfare, not the development, production, or stockpiling of biological weapons, thus leaving significant gaps in prevention.²

It was only after the discovery of the importance of airborne transmission by the biological weapons programs of the United States and the United Kingdom during the Second World War, and the continued testing and development of airborne weapons during the Cold War, that perceptions of biological weapons changed dramatically. This shift established biological weapons as a distinct class of weapons of mass destruction.³ It was during these developments that the definition of biological weapons used in the BWC was drawn up in 1972, defining a biological weapon in the following terms:

microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes; weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.⁴

In the decades following the BWC's entry into force, it faced persistent challenges in verification and compliance—suspicions of clandestine programs continue to this day.⁵ But, while the biological weapons threat remained a concern, the absence of major technological disruptions meant that the core definition in the BWC remained largely uncontested.

In the 21st century, this began to change as biological science and technology entered a period of rapid advancement and transformation. Breakthroughs in synthetic biology, including gene editing, gene drives, and DNA sequencing and synthesis, together with advances in artificial intelligence (AI), have significantly increased dual-use risks.⁶ These risks are further amplified by the decreasing cost and the increasing accessibility of laboratory equipment, which has made the manipulation of life more feasible for nonstate actors.⁷

Despite these profound scientific and structural developments, the fundamental nature of biological weapons as defined in the BWC remains relevant. The broad, intention-focused definition of biological weapons used in the BWC has proven to be resilient and adaptable to technological change, and therefore, it is used throughout this paper.

Discussion

The text of the BWC focuses on intent rather than on a specific list of pathogens or technologies of concern, making the treaty flexible in what constitutes a biological weapon. Emerging technologies, such as gene drives or speculative concepts like mirror biology, when employed for hostile purposes or in armed conflict, still rely on biological agents and therefore fall within the scope of the BWC.

This scope also applies to other advanced biotechnologies, such as CRISPR-Cas9, automated laboratories, and even AI-designed pathogens. Under the BWC, the determining factor is not the nature of the technology itself, but the purpose for which it is used. Although emerging technologies, particularly AI, pose new challenges and could accelerate the development of biological weapons, the BWC remains capable of addressing these threats because of its focus on intent. AI-enabled biological risks—such as AI-designed weaponized pathogens, automated laboratories capable of scaling dangerous experiments, or large language models that lower barriers to bioweapon development—still use biological agents that, if used with hostile intent, fall under the BWC's definition of biological weapons. Thus, the BWC leaves space for research on potentially dangerous biological agents while simultaneously being broad enough to include new and emerging technologies, making it future-proof.⁸

Still, the benefits of this intent-based definition come at a cost, with two major drawbacks:

1. Parties face difficulty in proving intent and in establishing a verification mechanism and, therefore, in leveraging the BWC effectively.
2. It leaves space for disagreements between states over when agents qualify as biological weapons, further weakening a common response.

This ambiguity was exemplified when, in 1996, Cuba accused the United States of having spread the pest *Thrips palmi* via aircraft to attack its agriculture. In the following BWC meetings, there was dissent on whether insects should be recognized as biological weapons, notably with Denmark and the Netherlands stating that the BWC does not cover insects.⁹

In 2022, the United Nations (UN) Security Council came together to discuss allegations by Russia against Ukraine that stated that Russia had detected evidence for U.S.-backed biological weapons programs. Other country representatives rejected this claim, accusing Russia of using the BWC as an easy platform to spread disinformation, thus promoting its own geopolitical narratives and distracting from the war of aggression in Ukraine.¹⁰

These instances demonstrate the essential weaknesses of the BWC and how it has been used so far—a lack of legally binding validation mechanisms paralyzes any attempts at investigation, and the broad definition leaves room for disagreements on what constitutes a biological agent that can be used as a biological weapon. On top of that weakness, the rising threat of biological agent use by nonstate actors, facilitated through increasingly accessible and accurate AI-generated laboratory protocols and improvements in synthetic biology, demands improved international collaborative mechanisms.

A mere redefinition of biological weapons is insufficient to address these challenges. What is needed is the translation of this definition into real-life policy by operationalizing biosecurity oversight and governance. Furthermore, a regularly updated, shared understanding of which technologies pose a potential biological weapons risk is essential to ensure coherent international responses. Substantial efforts to develop a verification system for the BWC began in the early 1990s, led by the VEREX Group¹¹ and the Ad Hoc Group,¹² which aimed to create a legally binding protocol. However, negotiations collapsed in 2001, and for two decades, formal verification initiatives have largely stagnated. Despite this, the Ad Hoc Group's draft compromise text remains a foundational reference in current discussions.¹³

More recently, momentum has begun to return. In 2020, Kazakhstan proposed an International Agency for Biological Safety (IABS) to promote compliance in light of emerging biotechnologies.¹⁴ In 2022, the Ninth Review Conference of the BWC established a working group tasked with identifying concrete measures, including legally binding ones, to strengthen the BWC.¹⁵ Although the group has published a range of working papers, consensus remains elusive to date.

States differ on whether verification should be legally binding or based on pragmatic, incremental tools. However, there is broad agreement on the need for tailored mechanisms that can adapt to rapid scientific advances. Verification discussions increasingly recognize the difficulty of applying traditional arms control models to biological weapons, given their dual-use nature and natural origins.¹⁶ Considering these rising challenges and political tensions, progress toward a feasible and adaptable verification framework is more critical than ever. At its core, any such mechanism must be grounded in a resilient approach to operationalizing the BWC's intent-based definition of biological weapons.

Recommendations

To provide such a foundation, the authors propose a novel framework that operationalizes the current intent-based definition of the BWC: the **indicators of technical risk, executive oversight, negligence, and transparency, or INTENT framework**. This framework, which could provide a foundation for the development of a verification mechanism, is centered around three main missions:

- **Peaceful use:** Promoting the peaceful uses of biology and not restricting scientific freedom
- **Biosecurity:** Implementing safeguards to verify that biology is not used for offensive purposes and to ensure that individual bad actors cannot gain access to pathogens of concern
- **Biosafety:** Promoting high biosafety standards in line with World Health Organization guidelines

Emphasizing collaboration over control, the INTENT framework provides a practical and holistic approach to enhancing biosafety and biosecurity without amending the BWC. It is designed to assess the potential biosecurity risks posed by biological research and

production facilities and is built around four key indicators detailed in Table 1: technical risk, executive oversight, negligence, and transparency. These indicators form the basis of a tiered evaluation system that categorizes facilities according to their risk profile, enabling structure and flexibility in international assessment and engagement.

Table 1: Proposed INTENT Indicators and Examples

	Examples
Technical Risk	Possession of high-risk agents without clear justification; synthesis of virulent gene sequences with no justification over safer alternatives; absence of containment facilities
Executive Oversight	No institutional biosafety committee (IBC); minimal oversight from senior scientists; poor biosafety training for staff; leadership not committed to BWC objectives
Negligence	Absence of biosecurity, biosafety, and containment plans; lack of dual-use research of concern (DURC) risk assessments; absence of background checks for staff
Transparency	Refusal to engage in peer review; unwillingness to submit to audits; hiding protocols; vague or missing research goals

Technical risk assesses the presence and use of high-risk biological agents, particularly in contexts where safer alternatives exist or there is a lack of suitable containment facilities. Executive oversight evaluates the effectiveness of governance structures, including the presence and alignment with BWC goals of biosafety committees, training programs, and mechanisms that ensure the accountability of senior scientific staff. Negligence focuses on procedural safeguards, such as biosafety plans, DURC assessments, and personnel vetting, the absence of which may indicate dangerous complacency. Finally, transparency examines the openness of a research institution or facility to participate in peer review, share protocols, and communicate its objectives publicly. Together, these indicators enable a holistic, tiered evaluation of biological research and production facilities that can distinguish between compliant operations, risky negligence, and potential misuse without requiring direct proof of hostile intent.

Figure 1: Overview of the INTENT Framework and Examples for Assessment into Tiers

	Peaceful Uses	Biosecurity	Biosafety	
	Tier 1	Tier 2	Tier 3	
Technical Risk	Possession of high-risk agents only in quantities justified by the research aims and use of safe alternatives when possible	Possession of high-risk agents with partial justification; alternatives considered but not always used	Use of high-risk agents with questionable justification; safer alternatives often ignored	Possession of high-risk agents in large quantities unjustified by research aims despite safer alternatives available
Executive Oversight	Presence of IBC, oversight from senior scientists, regular and updated biosafety training for all staff, leadership fully aligned with BWC goals	Presence of IBC but limited activity; some oversight from senior scientists; basic biosafety training; leadership somewhat committed to BWC	No active IBC; minimal engagement from senior leadership; training is outdated or poorly retained; leadership unaware of BWC	No IBC; minimal oversight from senior scientists; no biosafety training for staff; leadership dismisses BWC
Negligence	Presence of up-to-date biosecurity and biosafety plans, DURC risk assessment for all relevant research	Biosecurity and biosafety plans exist but are outdated or incomplete; limited DURC assessments	Outdated or ignored biosecurity and biosafety plans; DURC assessments missing for most projects	No biosecurity, biosafety, or containment plans; no DURC risk assessments, no staff background checks
Transparency	Submission of resulting research for peer review; willing to submit to audits; transparent protocols; clear research goals	Research submitted for internal or limited external review; partial willingness to engage in audits	Minimal reporting; selective disclosure of methods or outcomes; resistant to external audits	Refusal to engage in peer review; unwillingness to submit to audits; hiding protocols; vague or missing research goals

Note: IBC = institutional biosafety committee.

Each of the proposed indicators is assessed on a four-tiered scale, with illustrative examples provided in Figure 1. Scores across the indicators can be averaged to produce an overall risk classification for a facility, outlined in Table 2. Facilities that average Tier 1 assessment are characterized by strong oversight mechanisms, high transparency, and strict adherence to biosafety and biosecurity protocols, indicating full alignment with international norms. Tier 2 assessment suggests that, while the research is likely peaceful in nature, biosafety and biosecurity practices are inconsistent or fall short of accepted standards. Tier 3 facilities show clear violations of biosafety and biosecurity norms, engage in concealed or poorly documented research, or conduct unexplained activities that pose credible risks. Tier 4 represents the most concerning category, where strong circumstantial evidence suggests deliberate misuse or dangerous negligence. In the context of a verification-related mechanism, classification in this tier could serve as grounds for initiating a formal investigation or international review. This tiered system enables nuanced, evidence-based assessments that move beyond binary compliance judgments, offering a more flexible and politically viable approach to strengthening oversight and accountability under the BWC.

Table 2: Proposed Risk Evaluation Tiers

Tier 1	Proper oversight, transparent practices, risk mitigation in place
Tier 2	Inadequate biosafety/biosecurity measures, even if research is peaceful
Tier 3	Clear violations of biosafety/biosecurity norms, concealment, or unexplained activities
Tier 4	Strong circumstantial evidence, pointing to harmful objectives or dangerous negligence

The framework thus assumes that intent can be implied by the absence of critical biosafety and biosecurity measures, evaluating the risk stemming from the work performed at a given biological research or production facility rather than a strict definition of intent that is practically impossible to prove. The absence of elements such as risk-benefit analyses, justified sample storage quantities, emergency response planning, gene synthesis screening, and DURC assessments suggests that research or development at this facility poses a significant risk to the international community, either through direct, hostile intent or through careless negligence.

Employing a graded system, as opposed to binary compliance decisions, could reduce diplomatic sensitivity while still enhancing accountability, because categorizing a country's facility as a Tier 3 or 4 does not constitute a direct accusation of biological weapon development. Historically, many states have been wary of binary measures of compliance in the context of biological weapons. Through the gradient nature of the framework, this paper aims to avoid some of the pitfalls of previous failed attempts at verification by accounting for the inherent ambiguities of dual-use research in the context of biology.¹⁷

Current discussions to establish a science and technology (S&T) mechanism under the BWC could further enhance this framework by providing a dedicated, institutionalized body to track, interpret, and advise on emerging biotechnologies.¹⁸ An S&T mechanism could help maintain a regularly updated understanding of what constitutes high-risk research, support the development of risk indicators under each INTENT category, and offer technical benchmarks for assessments, such as what constitutes justified sample storage quantities. Such a mechanism would enable the INTENT framework to remain dynamic and responsive to rapid scientific advancement, reduce ambiguity in evaluations, and foster consensus on evolving risks.

While the authors believe the INTENT framework would strengthen both the BWC and global biosafety and biosecurity, its implementation faces several challenges. As the past has shown, any verification-related effort risks triggering concerns over sovereignty and interference in national bioeconomies and intellectual property. The inspection of biological research and production facilities is a diplomatically charged issue and has historically been resisted by many states, often with the argument that biological weapons development can be indistinguishable from peaceful or biodefense research. The external audits that would have to be conducted under this framework might lead to fears of espionage or the loss of competitiveness of national biotech companies.

Furthermore, reaching consensus on tier thresholds and definitions, such as “sufficient oversight” or “negligence,” may prove politically sensitive, especially given differing biosafety standards and limited resources in many low- and middle-income countries. For this reason, implementation should be tied closely to capacity-building efforts, enabling all states to live up to international standards. In addition, meaningful use of the framework would require trained auditors, data infrastructure, and evaluation protocols—none of which currently exist under the BWC. Whether the INTENT framework is embedded within national systems, linked to a new mechanism, or coordinated through a body such as the proposed IABS, questions of structure, authority, and funding will need to be addressed. However, the authors believe the INTENT framework would be most effective if applied consistently throughout the year, drawing on both on-site inspections and, where possible, publicly available data. To build legitimacy and avoid perceptions of bias, the scheduling of facility visits should be coordinated at the international level, with decisions made collectively by signatory states.

The framework aims to address both biosafety and biosecurity issues. This goal is a key strength, lowering political sensitivity and allowing engagement even when intent is unclear, and ensuring accidents and negligence are taken seriously. At the same time, combining the two issues can blur the line between unintentional failures and deliberate violations, and risks stretching limited resources across very different priorities. Balancing these aims is therefore essential to keep the framework both effective and politically viable and aligned with the goals of the BWC.

Despite these challenges, the authors firmly believe that strengthening global biosecurity is a shared imperative, especially in light of the unprecedented pace and risk posed by emerging biotechnologies. Now more than ever, advancing multilateral efforts to improve biosecurity governance is essential, and the international community must act with urgency to address these evolving threats.

Conclusions

As biotechnology continues to evolve rapidly, the threat landscape for biological weapons becomes increasingly complex. However, this transformation has not rendered the BWC or its definition of biological weapons obsolete. Instead, the authors’ analysis finds that the BWC’s intent-based definition remains both flexible and forward-looking, capable of encompassing new scientific advances without requiring continuous revision. The core challenge, therefore, lies not in redefining biological weapons but in operationalizing intent to meet political and technical realities—today and in the future.

Historical and contemporary incidents reveal the persistent difficulties in attempts at strengthening the BWC. These challenges are exacerbated by the dual-use nature of the life sciences, the growing threat of misuse by nonstate actors, and the increasing accessibility of synthetic biology tools. In the absence of clear verification mechanisms, the intent-focused definition of the BWC keeps the door open to politicization and inaction.

For the first time since efforts to establish a verification mechanism under the BWC stalled in 2001, the political climate within the BWC is once again moving toward meaningful progress, thanks to the efforts of the working group. This is a pivotal moment for forward-looking ideas to shape the conversation.

The authors believe that the proposed INTENT framework offers a practical foundation for this ongoing conversation. It provides a tiered system grounded in four observable indicators: technical risk, executive oversight, negligence, and transparency. Rather than attempting to prove malicious intent outright, the INTENT framework assesses risk on the basis of research conduct and governance. Facilities are categorized into one of four risk tiers, enabling nuanced, evidence-based evaluation while avoiding binary compliance labels that can provoke political resistance.

This framework offers a scalable and politically feasible path forward. It promotes accountability and strengthens international norms without stifling peaceful scientific progress. As momentum builds within the BWC working group, now is a critical window for adopting innovative, consensus-building mechanisms. Implementing the INTENT framework—as a pilot program, part of national oversight systems, or a component of a verification body under the BWC—can bridge the gap between principle and practice. In doing so, the global community can reaffirm its commitment to biosafety, biosecurity, and the peaceful use of biology in the 21st century.

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Appendix A: Abbreviations

BWC	Biological Weapons Convention
DURC	dual-use research of concern
IABS	International Agency for Biological Safety
INTENT	indicators of technical risk, executive oversight, negligence, and transparency
S&T	science and technology
UN	United Nations
VEREX	group of governmental experts

Notes

1. Kshirod Sathua and S. J. S. Flora, "Bacterial Biological Warfare Agents," in *Handbook on Biological Warfare Preparedness* (London: Academic Press, 2020), 13–31.
2. Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (Geneva Protocol), June 17, 1925, entered into force February 8, 1928, 94 L.N.T.S 2138, <https://treaties.un.org/pages/showdetails.aspx?objid=0800000280167ca8>.
3. W. Seth Carus, "The History of Biological Weapons Use: What We Know and What We Don't," *Health Security* 13, no. 4 (2015): 219–255.
4. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (Biological Weapons Convention), opened for signature April 10, 1972, entered into force March 26, 1975, 1015 U.N.T.S. 14860, <https://treaties.unoda.org/t/bwc>.
5. W. Seth Carus, "A Century of Biological-Weapons Programs (1915–2015): Reviewing the Evidence," *The Nonproliferation Review* 24, no. 1-2 (2017): 129–153; U.S. Department of State, *Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments: 2024 Report* (Washington, DC: Government Printing Office, 2024), <https://www.state.gov/wp-content/uploads/2024/04/2024-Arms-Control-Treaty-Compliance-Report.pdf>.
6. National Academies of Sciences, Engineering, and Medicine et al., *Biodefense in the Age of Synthetic Biology* (Washington, DC: National Academies Press, 2018).
7. Stewart Patrick and Josie Barton, "Mitigating Risks from Gene Editing and Synthetic Biology: Global Governance Priorities" (paper, Carnegie Endowment for International Peace, October 16, 2024), <https://carnegieendowment.org/research/2024/10/mitigating-risks-from-gene-editing-and-synthetic-biology-global-governance-priorities?lang=en>.
8. United Nations, *Final Document of the Second Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, BWC/CONF.II/13, Geneva, September 30, 1986, [https://docs-library.unoda.org/Biological_Weapons_Convention_-_Second_Review_Conference_\(1986\)/BWC_CONF.II_13.pdf](https://docs-library.unoda.org/Biological_Weapons_Convention_-_Second_Review_Conference_(1986)/BWC_CONF.II_13.pdf).
9. Raymond A. Zilinskas, "Cuban Allegations of Biological Warfare by the United States: Assessing the Evidence," *Critical Reviews in Microbiology* 25, no. 3 (1999): 173–227.
10. United Nations Security Council, "United Nations Unaware of Any Biological Weapons Programmes in Ukraine, Top Disarmament Official Affirms, as Security Council Considers New Claims by Russian Federation," press release SC/14890, May 13, 2022, <https://press.un.org/en/2022/sc14890.doc.htm>.
11. United Nations, *Final Declaration of the Third Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, BWC/CONF.III/23 (Part II), Geneva, September 27, 1991, https://www.vertic.org/media/assets/nim_docs/Treaty/biological/subsidiary/BWC-CONF.III-23.pdf.
12. United Nations, *Special Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction Final Report*, BWC/SPCONF/1, Geneva, September 30, 1994, [https://docs-library.unoda.org/Biological_Weapons_Convention_-_Special_Conference_\(1994\)/BWC_SPCONF_01.pdf](https://docs-library.unoda.org/Biological_Weapons_Convention_-_Special_Conference_(1994)/BWC_SPCONF_01.pdf).
13. Kenneth D. Ward, "The BWC Protocol Mandate for Failure," *The Nonproliferation Review* 11, no. 2 (2004): 183–199.

14. Kazakhstan, *Conference on Kazakhstan's Initiative of an International Agency for Biological Safety (IABS): Summary of Discussions* (working paper BWC/CONF.IX/WP.4, submitted to the Ninth Review Conference of the Biological Weapons Convention, November 3, 2022), https://bwconvention.org/sites/default/files/resource/KAZ_BWC-CONF.IX-WP.4_EN.pdf.
15. United Nations, *Final Document of the Ninth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, BWC/CONF.IX/9*, Geneva, December 22, 2022, <https://docs.un.org/en/BWC/CONF.IX/9>.
16. Jez Littlewood and Filippa Lentzos, "Strengthening the Biological Weapons Convention," *Arms Control Today*, December 2024, accessed July 13, 2025, <https://www.armscontrol.org/act/2024-12/features/strengthening-biological-weapons-convention>.
17. James Reville, "Compliance Revisited: An Incremental Approach to Compliance in the Biological and Toxin Weapons Convention" (CNS Occasional Paper no. 31, James Martin Center for Nonproliferation Studies, Middlebury Institute of International Studies at Monterey, 2017), <https://www.nonproliferation.org/wp-content/uploads/2017/08/op31-compliance-revisited.pdf>.
18. Working Group on the Strengthening of the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *Compilation of Proposals Related to the Development of a Science and Technology Mechanism*, BWC/WG/2/CRP.4, Geneva, 2023, [https://docs-library.unoda.org/Biological_Weapons_Convention_-_Working_Group_on_the_strengthening_of_the_ConventionSecond_session_\(2023\)/BWC:WG:2:CRP.4.pdf](https://docs-library.unoda.org/Biological_Weapons_Convention_-_Working_Group_on_the_strengthening_of_the_ConventionSecond_session_(2023)/BWC:WG:2:CRP.4.pdf).