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"Balancing Biotechnology Innovation and Biosecurity:
Securing U.S. Leadership in a Global Race"
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Chairman McCormick, Ranking Member Sykes, Members of the Subcommittee — thank you for convening a discussion that carries real implications for our security, our economic future, and, most importantly, for everyday Americans.

I serve as a Visiting Fellow at the Hoover Institution's Bio-Strategies and Leadership Initiative. As you are aware, in addition to my role with Hoover, I hold a range of public and private-sector roles, including as a Commissioner on the U.S.-China Economic and Security Review Commission and in advisory capacities in the private sector, that expose me to a wide range of information and perspective on this and other strategic challenges. The views I express today are my own.

I have spent most of the last decade studying how China is working to overtake the United States in the technologies and industries it believes will define the current century — often through asymmetric means. There is a military dimension to that effort, but it is not Beijing's principal weapon. China is pursuing a comprehensive, state-directed strategy to build levers of control over our data, the emerging economic corridors, and the manufacturing base of the future and it competes as an ecosystem, not as isolated firms. Biotechnology is squarely inside that campaign, pursued by a full-scope effort across research, data, manufacturing, talent, and finance.

In October 2025, Hoover released a report, Biosecurity Really: A Strategy for Victory, with the central premise that biosecurity is a solvable problem if we treat it as one. This report was released because advancing and securing biotechnology are linked together. The report itself offers nine recommendations — a blueprint — and members of the team have since identified clear metrics to measure our progress against them.

The same advances that create biological risk are also the only means of retiring it — surveillance, vaccines, diagnostics, and treatments. In 2004, Biodefense for the 21st Century stockpiled enough smallpox vaccine for every American, vaccinated over 450,000 service members, and expanded the Strategic National Stockpile so that treatment packages could reach anywhere in the country within 12 hours. In recognition of the threat, the United States removed the value to an adversary of deploying such a weapon against Americans.

The problem we face today has advanced significantly since 9/11. As Biodefense for the 21st Century warned, preventing and controlling future biological-weapons threats will be even more challenging: the dispersion of technology, the application of artificial intelligence, and advances across biotechnology and the life sciences — including the spread of expertise to create modified

or novel organisms — raise the prospect of new toxins, live agents, and biomodulators that would demand new detection methods, preventive measures, and treatments. These are not new problems; they have advanced. Current detection and intelligence efforts continue to struggle with the dual-use nature of biological technologies and infrastructure, and with the likelihood that adversaries will use denial and deception to conceal illicit activity. Novel tools and safeguards must be considered to address the rapid expansion of these technologies beyond our borders.

From Chatbots to Biological Weapon Pressure Cookers. The danger is escalating from question-and-answer to active assistance — and the queries are coming from abroad. In just the past six months, biosecurity experts warned it was "disturbingly easy" to get chatbots to advise on making pathogens more dangerous; scientists and AI executives signed an open letter demanding new controls on DNA fabrication because AI can now speed the design of toxins and viruses; researchers reported using AI to build viruses not found in nature; and one leading AI lab announced it had blocked several attempts to use its models to weaponize pathogens.

Today's general-purpose chatbot is a reference tool that experts agree is unlikely, on its own, to help a lone actor invent a deadly pathogen. The newer, biology-specific models are a different machine — closer to a pressure cooker if the status quo remains. Trained directly on the DNA of millions of species, Stanford and the Arc Institute's Evo2 has generated hundreds of thousands of novel viral genomes and yielded sixteen real, viable viruses — harmless ones that infect only E. coli — and its creators acknowledge that a version not deliberately constrained could, in principle, design a variant of a pathogen like smallpox.

Meanwhile the federal backstop meant to catch this — mandatory screening of synthetic-DNA orders — was suspended last year and has not been replaced. As my Hoover colleague Drew Endy told the Times, the net uplift today remains "modest," but that will change as models specialize in biology. This is the shape of a weapons race we can still get ahead of — but only if we "leapfrog ahead… and secure biology" now, rather than wait to be surprised.

The instinct, when a technology can be turned to harm, is to slow it down or wall it off. History has repeatedly shown that approach stunts innovation. In 1865 Britain's Locomotive Act — "Red Flag Act — required a man to walk sixty yards ahead of every motorcar waving a red flag, at four miles per hour; Britain eased the flag in 1878 but kept the broader regime until 1896, and handed the early automobile industry to France, Germany, and the United States.

Contrast piped gas: as the United States modernized it spread into American homes offering a variety of benefits despite the danger being real. The US did not rip gas out of the walls. We required a cheap, universal safeguard — odorization — so a leak announces itself. The technology kept scaling; the standard made it safe. We have never made a transformative technology safe by refusing to build it; we have made it safe by building the standard alongside it. Verifiable screening of synthetic-DNA orders is the odorant of our age.

In its 2025 Annual Report to Congress, the U.S.-China Economic and Security Review Commission reached a similar conclusion: we urged Congress to make building a resilient bioeconomy industrial base — and unlocking biology as a general-purpose technology before the decade's end — a strategic national objective. Securing biology and leading it are two sides of the same coin. The Commission warned that we are on a path to depend on our principal strategic competitor, China, for the very tools our biodefense will rely on.

I returned from China a little over a month ago as part of a U.S. delegation. Comparing my takeaways with those of private-sector executives and other experts who have made similar trips recently — each of us there on different business — the standout point was unmistakable: China feels confident, and it is content to have us remain right where we are.

Today, the United States is still in the lead in some aspects of biotechnology, but our remaining lead has a rapidly dwindling shelf life. We hold the economic fundamentals — innovation, capital markets, productivity — and we are losing on coordination and speed. This is not a challenge we can afford to ignore.

The position we are in is the product of a deliberate strategy on China's side and institutional neglect on ours. For too long the United States treated biology as a pharmaceutical lane with a bioweapons problem, at best, and as a compliance file at worst — not as a strategic domain to be owned. We did not arrive here in the last two years, or because of any single budget cycle. The crossover has been building for over two decades, and it is only now beginning to show.

In 2020, China passed the United States in the total number of clinical trials, and in 2023 in trials for novel medicines — figures my Hoover colleague Drew Endy presented to the Senate Commerce Committee this July. In 2025, roughly a third of the pharmaceutical industry's global licensing spend went to sourcing new medicines from Chinese companies. Barron's reported this week that China's biotech industry has become as much a challenger to America's technological leadership as China's artificial intelligence upstarts, backed by US investors.

A useful way to see where we stand is the U.S.–China Biomedical Competitiveness Scorecard published this June. It found China leading on clinical trials, manufacturing, and supply chains, and the United States still leading on technology transfer, talent, and finance. That is the honest picture, and it matches what I have increasingly seen across Hoover, the Commission, and private-sector engagement: our lead is in the laboratory, not on the factory floor. Recent evidence suggests that China is on track to bring online more new industrial biomanufacturing capacity than the rest of the world combined.

This massive leap forward is due to a mindset aimed at driving forward. They have built an ecosystem designed to make them the world leader — their regulation and infrastructure, coupled with China's speed to approve and its tailor-made manufacturing base, together compress the design-build-test-learn cycle in biotechnology in ways that capital alone cannot answer.

Multiple federally funded commissions, the academic community, and the private sector have independently reached the same conclusion and roughly the same deadline — the next 19 months to three years is the time for swift action to avoid losing long-term U.S. leadership and opportunity.

The competition is simple to state and hard to execute: the United States must invest more smartly, build better, and deploy faster if we wish to compete and win on biotechnology. China is taking an "Operation Warp Speed"-like approach for all of biotechnology. What is our approach? Where is it situated? Who owns it?

The National Security Commission on Emerging Biotechnology (NSCEB) concluded in April 2025 that "to remain competitive, the United States must take swift action in the next three years." Hoover's independent BSL report, released in October of last year, set an even tighter clock: begin every Stage 1 action "within one thousand days." And the private sector sees the same window from the economic side — one joint assessment projects the U.S. bioeconomy, excluding healthcare, will nearly double to roughly $400 billion within that timeframe.

America's advantages are real and structural. What is missing is not capability — it is the clear intent and the architecture to match the speed at which modern biology now moves.

The United States lacks a full-scale effort equal to the importance and the timeframe it faces. For the sake of time, I will not list the full slate of recommendations across the NSCEB, the Commission, and Hoover; here are a few worth highlighting today that would meaningfully extend the window — now measured in months (19), not years — to maintain U.S. economic and scientific leadership.

First, biological intelligence. The United States still lacks a coordinated, real-time capability to see biological threats — natural, accidental, or deliberate — as they emerge. We invented technical intelligence for the nuclear and space age; we have not built its equivalent for the biological one. Nucleic-acid synthesis screening, which this Subcommittee has advanced through H.R. 3029, is one leading edge of that capability, but much more is needed. This is not regulation for its own sake — it is how we know what biological threats are likely to arrive, and when and where. We cannot secure what we cannot see.

Second, supply chains. Our exposure to risk is not only toxins and pathogens; risks run through supply chains. The concentration of active pharmaceutical ingredients and precursor chemicals in a small number of overseas suppliers, principally in China, is a strategic vulnerability that does not require an adversary to build a weapon. It only requires them to close a valve. The remedy is redundancy — and the tools to build it, including decentralized, agile biomanufacturing platforms, already exist in early commercial form. What they need is deliberate federal investment and a predictable regulatory runway.

Third, measurement. We cannot secure, scale, or win what we cannot measure. Before we choose metrics, we have to define what victory looks like; then we have to be able to make the tools and implement the processes to measure it. Today the country has no dedicated national capability for biological measurement of the kind we long ago built for physics and for materials. The Commission's 2025 Annual Report ranked establishing that capability — a Biological Measurement Laboratory at NIST — among its most urgent recommendations. The bipartisan SCALE Biology Act, introduced in this chamber in May, would build it. Paired with Chairman McCormick's workforce legislation and the Cloud LAB Act, the United States could create and sustain a world-leading, integrated technology, metrology, and employment stack for the future bioeconomy. The clock is ticking.

Fourth, innovation leadership. Let me be direct: China's edge is not in the underlying science — American platforms in gene editing, mRNA, and AI-driven discovery remain the global standard. China's edge is speed of deployment and a tolerance for ambiguity; its first-in-human approval timelines are now a fraction of ours. The greatest risk to American leadership is not that we lose the science. It is that fragmented, slow-moving federal oversight makes us forfeit ground we never needed to give up.

That is why the legislative architecture before Congress this year matters. H.R. 3029 builds the technical foundation — voluntary, standards-based, industry-informed. The Senate's S. 3741 builds the enforceable floor beneath it, and directs the cross-agency accounting of fragmented biosecurity authorities that the National Security Commission on Emerging Biotechnology has called for and that mirrors the consolidation the Commission urged in its 2025 report. These are not competing approaches; they are sequential ones, and I would urge the Subcommittee to treat them that way.

Beyond Hoover's prior recommendations, I would add two more recommendations, and one gap Congress should address. First, on U.S. investment in China's bio-ecosystem. If we are serious about the scenario before us, we should finish the job on outbound investment. According to recent reporting, roughly a third of global drug-licensing spend is now flowing to Chinese firms; American pension dollars should not be helping finance a takeover of the very industry we are trying to protect. Adding biotechnology to our outbound-investment rules is a logical next step to securing American competitiveness in this growing market — and our future safety.

Second, on tax treatment. The 48D credit is semiconductor-focused. A 2025 Commission recommendation urged Congress to consider similar credits for other strategic sectors — quantum computing, biotechnology, advanced materials — to build resilience across the technology stack. Congress should explore extending 48D beyond semiconductors.

The gap Congress should address. H.R. 1 moved on several fronts vital to closing critical vulnerabilities — tax credits for domestic onshoring, energy-resilience restrictions on foreign entities, and resources for critical-minerals investment are essential. But the law created no standalone mechanism for coordinated R&D, supplier integration, and procurement, and it did not address the biotechnology window or the strategic competition and its impact on the future U.S. economy. Biotechnology will help determine the next generation of medicine, enable space exploration, and much else; Congress should fold it into its wider strategic agenda.

Two closing points. First, money alone will not solve this; what matters is spending what we allocate where it will have the most impact. Redirecting even a fraction of our application-focused research toward the foundational science, tooling, and measurement that everything else is built on would do more for American leadership than a larger check spent the same old way. Second, the prize is not only defensive. Unlocking biology as a general-purpose technology could add as much as a third to our national economy — growing the American bioeconomy, economy-wide, from roughly one trillion dollars toward ten over the next twenty years. This is one of the rare national-security investments that pays for itself. The global biotechnology market size calculated $2.45 trillion in 2025, grew to USD 2.79 trillion in 2026, and is projected to reach around USD 9.06 trillion by 2035.

I will close with an image that stays with me. China holds a standing monthly meeting whose only purpose is to find what is slowing its biotech firms down, and to remove whatever is in the way. Its cities compete against one another to host the next company. Meanwhile, we are still deciding what department or agency has responsibility — or whether we want to be in the game.

The assets to win this competition are already in American hands. What remains is the discipline to organize them — and the seriousness to match a competitor who is very serious indeed.

Thank you. I look forward to your questions.