

PREPARED STATEMENT OF

EDWARD H. YOU

Founder and Principal

EHY Consulting LLC

Testimony before the U.S.-China Economic and Security Review Commission

Hearing on “Taking a Bigger Byte: China’s Expanding Strategy for Data Dominance”

April 30, 2026

Background

Advances in biotechnology, artificial intelligence, and data systems over the past decade have significantly expanded the scope and importance of the global bioeconomy. What was once largely confined to healthcare and agriculture now intersects with broader issues of industrial capacity, economic competitiveness, and national security.

In my previous government service, I focused on safeguarding emerging biotechnologies and assessing risks associated with the convergence of biological and digital systems. In my current role, I continue to examine how these convergences are shaping global competition, particularly as nations seek to integrate data, biology, and industrial systems into cohesive strategic architectures.

A central development over the past decade is the transformation of biological data from a research input into a strategic asset—one that enables continuous learning, iterative development, and scalable capability.

1. China’s Data Acquisition Strategy in Health

China’s approach to biological and health-related data reflects an evolution from data collection to system-level utilization. Over the past decade, China has expanded access to and use of biological data through large-scale clinical systems, digital health platforms, research collaborations, and integration with biomanufacturing processes.

China’s focus on biological data and biotechnology is also shaped by a set of real-world challenges that intersect with long-term economic and societal stability. These include pressures on agricultural productivity associated with climate variability, demographic

trends affecting workforce sustainability, food security considerations, and environmental impacts resulting from decades of rapid industrialization.

At the same time, the continued expansion of artificial intelligence and data infrastructure has increased demand for energy and resource efficiency, particularly in the context of recent disruptions in global energy markets.

In this environment, the convergence of biotechnology and artificial intelligence offers potential pathways to address multiple challenges simultaneously—ranging from agricultural optimization and resource efficiency to advanced therapeutics and industrial bioproduction.

This convergence is reflected in China’s most recent policy direction, including the 15th Five-Year Plan, which emphasizes biotechnology and biomanufacturing as strategic priorities within a broader framework of economic and technological development.

These developments have enabled increasingly integrated, data-driven systems that support artificial intelligence-enabled diagnostics, accelerated drug development, and continuous process optimization. A key feature of this evolution is the increasing importance of clinical and operational data.

While genetic data remains valuable, clinical trial outcomes, treatment responses, and manufacturing process data—particularly in advanced therapeutic areas such as cell and gene therapies—may provide more immediate and operationally consequential insight for capability development.

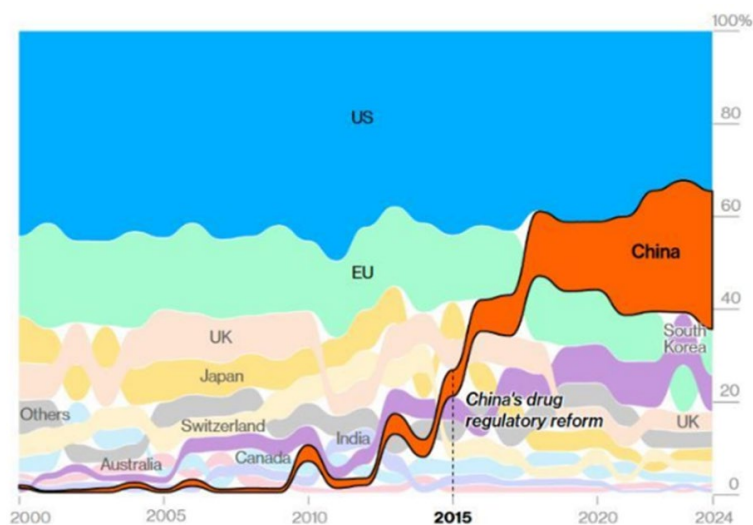


Figure 1. Share of innovative drugs entering development by country over time.

Source: Adapted from publicly available industry analyses (e.g., IQVIA Institute for Human Data Science).

As shown in Figure 1, the inflection in China’s innovative drug development activity following regulatory reform reflects not only increased investment, but also a reduction in friction between research, clinical development, and commercialization.

In advanced therapeutic domains such as CAR-T, the scale of clinical activity generates high-value datasets that contribute to iterative learning and platform refinement.

These systems enable not only data collection, but the integration of clinical, operational, and research data into iterative development processes that support both therapeutic innovation and industrial-scale bioproduction.

Taken together, these trends reflect a broader shift from data as static information to data as a driver of dynamic learning systems.

2. U.S. Vulnerabilities in Biomedical and Health Data

China’s access to U.S.-related biological and health data occurs through multiple mechanisms, including research collaborations, commercial engagements, clinical trial participation, and globally distributed development models.

These interactions are often lawful and mutually beneficial. However, they may contribute to structural asymmetries over time, particularly as value in biotechnology increasingly derives from the accumulation and integration of clinical and process-level data.

These dynamics highlight several structural vulnerabilities in how biomedical and health data is generated, shared, and governed within the United States.

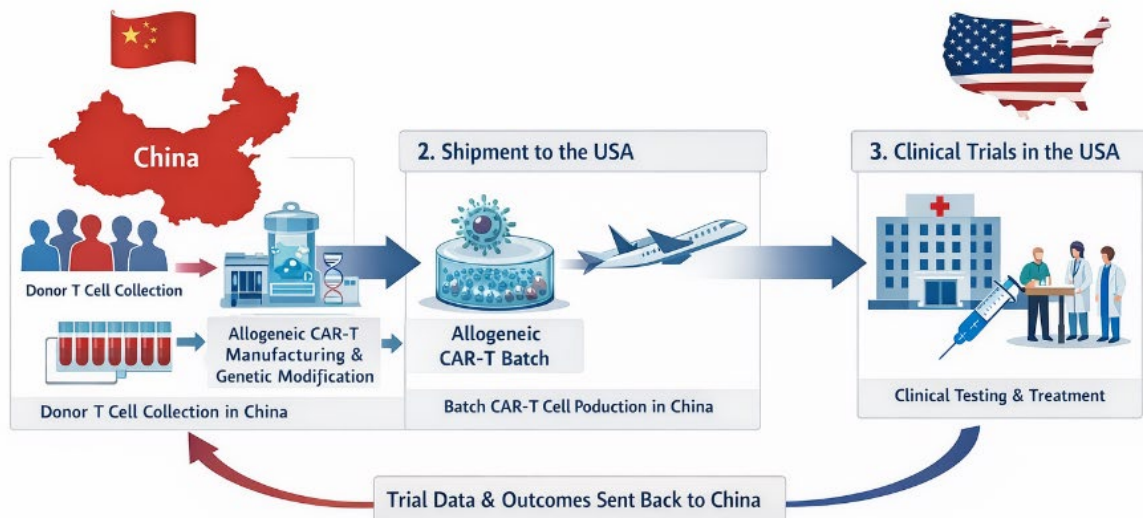


Figure 2. Distribution of global CAR-T clinical trial activity by country, illustrating the concentration of clinical data generation outside the United States in advanced therapeutic development.

Source: Author's illustration based on publicly available clinical trial data and industry analyses.

As illustrated conceptually, manufacturing, clinical validation, and data generation may occur across jurisdictions. This highlights how high-value clinical and operational data generated within one regulatory framework can contribute to broader development systems.

This dynamic reflects a structural misalignment between existing policy frameworks and the realities of modern biotechnology systems.

3. From Follower to Innovator: Implications

Over the past decade, China has evolved from a fast follower to a more integrated innovator in biotechnology, with data acquisition and utilization playing a central role in that transition.

China's strategy is distinguished not by isolated capabilities, but by integration across multiple domains. Policy direction highlights coordination among biomedicine, agriculture, industrial biotechnology, and artificial intelligence.

These domains are increasingly connected through shared data systems and aligned infrastructure, enabling a reinforcing cycle of data generation, analysis, production, and refinement.

Over time, the system that can most effectively operate this cycle gains a compounding advantage in both innovation and scalability.

These dynamics have implications for U.S. competitiveness, particularly as innovation becomes increasingly dependent on integrated data systems rather than isolated technological advances.

4. China's Data Strategy in Agriculture

Agriculture represents an increasingly important component of this integrated system. Advances in precision agriculture are transforming farming into a data-driven activity capable of forecasting crop yields, environmental conditions, and supply disruptions.

At the same time, global developments affecting energy markets are increasing the linkage between agriculture and industrial systems. Agricultural commodities are

increasingly functioning not only as food sources, but as inputs into biofuels and industrial bioproducts.

In this context, agricultural data becomes strategically relevant not only for food security, but also for energy resilience and industrial capacity. This suggests that agriculture should be considered as part of a broader strategic infrastructure rather than solely as a commodity sector.

China's approach to agricultural modernization further illustrates this integration. The government's Five-Year Smart Farming Initiative emphasizes the deployment of artificial intelligence, satellite-based navigation systems, and large-scale data analytics to optimize agricultural production.

These systems are supported by a combination of satellite data, navigation systems, and emerging capabilities associated with the low-altitude economy, including drone-based monitoring and data collection.

These systems enable more precise management of inputs such as water, fertilizer, and crop selection, while also generating continuous data streams related to yields, environmental conditions, and supply variability.

In this context, agriculture is not only being modernized as a sector, but increasingly incorporated into a broader data-driven system that supports resource planning, supply chain visibility, and long-term bioeconomic development.

5. Cross-Sector Integration and the Bioeconomy

A defining feature of China's approach is the integration of data across sectors, including health, agriculture, and industrial systems.

This integration extends beyond data collection and into the structuring of systems that govern how data is used, shared, and scaled.

Participation in international standards-setting bodies represents an important dimension of this issue. Organizations such as ISO, ITU, IEEE, ICAO, and the Codex Alimentarius Commission play critical roles in shaping data structures, interoperability, and system architectures.

Participation in these forums provides insight into technological priorities and influences how systems are structured and adopted at scale. In this sense, standards participation provides both a signal of intent and a pathway for shaping global adoption.

China's focus on standards development is also reflected in longer-term strategic planning efforts such as the "China Standards 2035" initiative, which identifies artificial intelligence, quantum technologies, and biotechnology as priority areas for future standards development.

This highlights the recognition that standards-setting is not only a technical activity, but a mechanism for shaping how emerging technologies are structured, adopted, and scaled globally.

6. Policy Considerations for Congress

The following considerations are offered in response to the Commission's mandate to provide policy recommendations to Congress.

Addressing these challenges does not require restrictive measures, but rather improved alignment between technological realities and policy frameworks.

Multiple recent assessments, including those from the National Security Commission on Emerging Biotechnology, have highlighted the need for improved coordination across agencies, strengthened biomanufacturing capacity, and more integrated approaches to assessing the bioeconomy as a driver of strategic competition.

Consideration may also be given to expanding the scope and methodology by which risks associated with biotechnology are assessed, particularly from a national security perspective.

Current approaches often focus on discrete technologies or specific threats. However, as biotechnology increasingly intersects with data systems, artificial intelligence, and industrial capacity, there may be value in adopting more integrated analytical frameworks that assess these developments as components of broader systems.

Such an approach could help identify not only gaps and vulnerabilities, but also areas where strategic investment may be needed to support long-term competitiveness. This includes recognizing emerging "greenfield" areas where early positioning may enable the United States to retain first-mover advantage in key domains of the bioeconomy.

Policy frameworks may also benefit from expanding the definition of strategically relevant biological data to include clinical outcomes, manufacturing processes, and agricultural data.

Improved visibility into cross-border data flows may support better understanding of how data contributes to long-term capability development.

In addition, continued support for infrastructure that enables the translation of innovation into scalable capability—including biomanufacturing capacity and distributed biofoundry models—may strengthen resilience and competitiveness.

Recognition of agriculture as a component of strategic infrastructure, and sustained engagement in international standards-setting bodies, may further support long-term positioning.

In this context, agricultural commodities such as grains are increasingly functioning not only as traditional food sources, but also as inputs into energy systems through biofuels and related applications. This evolution suggests that agriculture is no longer solely a commodity sector, but increasingly a strategic asset with implications for energy resilience, industrial inputs, and broader bioeconomic capacity.

Finally, reducing friction between research, regulation, and commercialization may improve the ability of the United States to translate innovation into deployable capability.

Conclusion

The issue of data dominance in the bioeconomy is not simply a matter of access. It is a question of how data is integrated into systems that enable continuous learning, iterative development, and scalable production.

China's approach reflects an effort to align these elements into a coordinated system. The United States retains significant advantages in innovation and research, but maintaining long-term competitiveness will require a more integrated approach to understanding and governing the convergence of biology, data, and industrial systems.

Ultimately, the central question is not who has access to data, but who is building the systems that can learn from it, scale it, and translate it into sustained strategic capability.