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## **Another Battlefield in the Great Power Technology Competition: China's Geostrategic Approach in Biotechnology and Implications for Southeast Asia**

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### **SYNOPSIS**

*Biotechnology, a [transformative technology](#), has the potential to reshape geopolitics, economics and society in the 21st century, impacting healthcare, agriculture, environment, energy and national security. As China and the United States vie for dominance in biotech innovation, Southeast Asia faces significant opportunities as well as risks.*

### **COMMENTARY**

For decades, the biotechnology sector has thrived on globalisation and collaboration, with the United States and China playing pivotal roles. For instance, the United States benefits from low-cost production of pharmaceuticals by Chinese contract manufacturers and the supply of [active pharmaceutical ingredients \(APIs\)](#) from China, while China gains from talent developed by US institutions and funding opportunities from the US capital market.

However, biotechnology has increasingly emerged as a focal point in the geostrategic rivalry between China and the United States. China's ambitions to lead in global innovation and technology are viewed as a direct challenge to US dominance in the tech sector.

To elevate the manufacturing capabilities of Chinese firms and enhance their value-added potential, President Xi Jinping has underscored the importance of fostering indigenous innovation. In the [Outline of the 14th Five-Year Plan \(2021–2025\) for](#)

[National Economic and Social Development and Vision 2035](#), biotech is positioned as a critical "pillar" for advancing the country's industrial system.

China's tech development strategy, bolstered by significant state intervention, is increasingly viewed [as a challenge](#) to the liberal global order. The United States perceives China's market practices, such as weaker intellectual property protection, as [detrimental to innovation](#).

Separately, China's access to extensive patient data facilitates advancements in artificial intelligence. These have accelerated breakthroughs in biotechnology and are seen as [giving the country a competitive edge](#). However, China has recently tightened its data governance and enacted the [data security](#) law and [biosecurity law](#). It is not clear how these measures would affect Chinese firms but they restrict cross-border data transfers by foreign companies and research institutes operating in China, thus putting other countries at a disadvantage. Overall, China's tech development strategy has enabled it to catch up with the United States, especially in genomics.

The COVID-19 pandemic heightened [US concerns](#) about China as a threat. China's key role in biotechnology and its [dominance in exports of API and essential medical supplies](#) during the crisis alarmed the United States about over-reliance on China in the biotech supply chain. Consequently, the United States has implemented measures to strengthen its biotech sector and reduce dependence on Chinese biomanufacturing.

Since the Trump administration, biotech has been one of the key focal points in the trade conflict with China. It was included in the United States' export control framework for [critical technologies](#) under the 2018 Foreign Investment Risk Review Modernization Act. The Biden administration has further escalated this rivalry, implementing an [executive order](#) in 2022 targeting Chinese biotech firms and enacting policies to boost American biotech while restricting Chinese operations in the United States.

To lessen reliance on Chinese materials, the US National Security Council established the [Biopharma Coalition](#) (Bio-5) with US allies including the European Union, India, Japan and South Korea. The proposed [Biosecure Act of January 2024](#) aims to prevent US companies from collaborating with Chinese biotech firms, which could significantly impact regional and global biotech supply chains, particularly affecting China.

### **China's Geostrategic Approaches for Biotech Competition in Southeast Asia**

As tech competition moves into the biotech section, China is increasingly shifting its focus to nearby regions to alleviate US-induced supply chain pressures and grow its biomanufacturing sector. This shift from a US-centric approach to a more regional strategy enables China to capitalise on rising demand in Southeast Asia for affordable biotech products, reduce costs and enhance its biotech influence.

To implement its regional strategy, China has entered into multiple free trade agreements that enhance its biotech trade with Southeast Asia. For example, several Southeast Asian countries maintain close cooperative ties with China's pharmaceutical industry. China has become [the largest supplier of APIs](#) to countries like Indonesia, Thailand and Vietnam. In Vietnam, [nearly 99.9% of APIs](#) are imported,

with China being the predominant source of these pharmaceutical raw materials. Additionally, Southeast Asian nations, rich in medicinal resources and with a long tradition of using traditional Chinese medicine, heavily rely on China's exports for these materials and equipment.

China has also been active in providing medical and other biotech products to Southeast Asian countries, enhancing its influence. For instance, during the COVID-19 pandemic, in the name of the Health Silk Road, the Chinese biotech company Sinovac partnered with Indonesia's Bio Farma to [produce and distribute the CoronaVac COVID-19 vaccine](#) in Indonesia. Similarly, another Chinese company, Sinopharm, collaborated with Thailand to implement vaccination programmes. This "vaccine diplomacy" has [bolstered China's influence](#) in the region amid the global health crisis.

In the bio-agriculture sector, China has set up [several platforms](#) to advance its technical standards in Southeast Asian countries with significant agricultural and food security needs. For instance, China launched the [China-Indonesia Hybrid Rice Technology Cooperation Project](#) to enhance rice production capacity in Indonesia. In the less developed Mekong region, China established the Technical Committee for Standardisation of Common Technologies in the Lancang-Mekong Region to facilitate the mutual recognition of bio-agriculture R&D standards.

Additionally, China promotes its bio-agricultural technology through bilateral initiatives such as the China-Laos Agricultural Science and Technology Demonstration Park and the China-Vietnam Specialty Agricultural Products Science and Technology Demonstration Park. By addressing the "[fundamental](#)" needs of Southeast Asian countries, China can leverage its bio-agricultural technology to strengthen its regional influence.

China has also promoted its biotech influence and boosted opportunities for its biomanufacturing industry through [the biotech promotion and industry cooperation plan](#) under the banner of the Belt and Road Initiative (BRI). In the process, multiple domestic actors like ministries, research institutes and biotech firms are taking the lead in promoting Chinese biotech.

For example, the Chinese Academy of Science (CAS) created the CAS Innovation Cooperation Centre in Bangkok (Bangkok Center thereafter) in 2017. Pointing out that ASEAN is the core source of [strategy](#) (zhan lve he xin yuan dian) in China's Belt and Road Technological Transfer Centre, CAS notes that the [Bangkok Center](#) provides Chinese biotech in a wide range of areas where Chinese scientists can access clinical trial facilities and data.

Under the Chinese leadership's [strategic focus](#) on leveraging technology to strengthen relationships and secure supply chains, Chinese biotech firms are actively partnering with their counterparts in Southeast Asia. For example, the Chinese genomics company BGI has advanced genomic technology and operational standards through collaborations in [Singapore and Thailand](#). Notably, BGI has initiated a [new research project](#) with Thailand's National Center for Genetic Engineering and Biotechnology and its Thai joint venture, Singhai Gene, to provide testing for individuals at high risk of atherosclerotic cardiovascular disease.

Additionally, BGI has supported social welfare initiatives, such as treating thalassemia in Indonesia and promoting perennial rice cultivation to drive agricultural innovation and sustainable development in Vietnam, Laos and Thailand. These activities, as [highlighted](#) by regional managers, are aligned with state directives under the BRI and the notion of a China-ASEAN community with a shared future, aimed at enhancing China-ASEAN relations.

### **Impacts on Southeast Asia**

With Southeast Asia already a focal point of strategic competition between China and the United States, biotech competition is now another dimension to the contest between the two countries to expand their respective influence.



With both China and the United States seeking to secure and control critical components of global biotech supply chains, biotech development in Southeast Asia will certainly face great power competition pressures.

*Image from Pixabay.*

On appearance, Southeast Asia stands to gain from the biotech advancements driven by China and the United States. The region could benefit from increased access to cutting-edge technologies, investments in biomanufacturing, and opportunities for R&D as the two powers compete in the region.

To avoid geopolitical risks in future regional market competition, Chinese biotech firms are increasingly looking to Southeast Asia. For instance, Chinese bio companies like [Wuxi Biologics](#) and [Junshi Bio](#) seek to diversify their investments by investing in Singapore. Non-Chinese biotech companies such as [BioNTech](#) also perceive Southeast Asia as an appealing location to re-establish supply chains due to its proximity to China and regional networks like the Regional Comprehensive Economic Partnership that the region has built over the past decade through bilateral and multilateral means.

Nonetheless, the biotech competition has significant implications for global supply chains, with both China and the United States seeking to secure and control critical components. Biotech development in Southeast Asia will certainly face great power competition pressures, which could complicate regional countries' efforts to maintain strategic autonomy. Additionally, the region's reliance on external technologies and expertise could make it vulnerable to supply chain disruptions.

To mitigate these risks, Southeast Asian countries need to continue to diversify their supply chains, invest in domestic biotech capabilities, and strengthen regional cooperation to enhance regional resilience.

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