



Clashing Codes of Conduct

Asymmetric Ethics and the Biotech Revolution

PIPS White Paper 12.2: *Executive Summary*

Caroline Duckworth, Research Fellow
Jahnavi Prabhala, Research Intern

The last several decades of research and development in biotechnology allowed for the introduction of low-cost DNA sequencing and gene editing tools. These technologies accelerate biotech innovation, with some countries' bioethical standards permitting them to rapidly pursue technologies that would be ethically restrained in the United States. Countries like Russia and China may exploit these existing ethical differences to increase U.S. dependency on foreign biotechnologies and develop controversial military technologies. The United States should adopt a three-step approach to maintain its lead in biotechnology and shape international bioethics.

International Divergence in Bioethics

A society's values shape its ethical practices, leading to variation in standards among countries. These ethical differences may allow biotechnology to advance more rapidly in some countries, putting the United States at a disadvantage in biotech development.

- *The United States: Regulation Born of Debate.* Bioethics emerged in the United States during the 1960s and 1970s in response to a progressive, individualistic counterculture that led to new expectations about the role and development of technology. A series of ethical failures combined with litigation further contributed to comprehensive change in the legal and ethical framework of human subject research and informed consent practices in the United States. This framework plus diverse perspectives often produce extensive public debates that delay the development of controversial biotechnologies, such as embryonic stem cell treatment, in the United States.
- *China: The "Wild East" of Biotechnology.* Corruption and limited enforcement undermine China's ethical standards. Its collectivist culture, in which individuals more willingly sacrifice to benefit society, is less likely to hinder biotechnology research and development. The nature of China's political system also accelerates the pace at which biotechnology develops in China, as it allows for strategic, long-term focused investment. China will export its ethical standards to other countries as it expands its global influence. This strategy will allow Beijing to begin shaping global biotechnology norms, threatening U.S. leadership in biotech.

- *Consequences of Variation in Bioethics.* Asymmetric global bioethics have led to practices such as medical tourism and ethics dumping. Many U.S. patients travel to foreign countries to seek treatments that are not yet available or approved in the United States, such as embryonic stem cell therapy. Compliance with U.S. laws and ethical regulations also drives U.S. companies to conduct biomedical research abroad in China and other developing countries to circumvent U.S. legal, ethical, and cost restrictions. The accelerating growth in biotech capability will likely continue and expand these trends.

Peer Competition in Biotechnology

China and Russia are interested in developing biotechnology to rival the United States, and both have ethical standards that will enable rapid innovation.

- *Chinese Investment.* China identified biotechnology as an investment priority in its 13th Five-Year Plan and ‘Made in China 2025’ policy, expecting its industry to exceed 4 percent of its GDP by 2020. Although the Chinese biotech industry is less than one-tenth the size of the U.S. biotechnology market, it grew rapidly at an average annual rate of 15 percent during the 12th Five-Year Plan. Chinese government expenditures combined with relaxed regulatory barriers will sustain this upward trend in the Chinese biotech industry. China may soon surpass the United States as a leader in biotechnology.
- *Russian Investment.* Although Russia lags in the race for biotech innovation, it also expanded its investment in biotechnology. In addition to establishing three domestic biotechnology policy platforms, Russia collaborated with China in a joint investment fund to finance Russia’s largest biotech lab in 2018. Increased collaboration with China could enable Russia to challenge U.S. strength in biotechnology.

Implications of Asymmetric Bioethics

Rapid biotech innovation creates several security challenges for the United States. While the timelines of threats vary, they will require long-term, dedicated efforts to address them.

- *Weaponized Dependency.* By expediting biotechnology research and development via their ethical standards, rivals increase U.S. dependency on foreign medications and treatments. Through this strategy, China could expand its chokehold on the generic prescription drug market and the developing artificial organ market. Russia also is investing in its pharmaceutical capabilities to challenge the United States in biopharmaceuticals.
- *Controversial Military Capability.* The Russian and Chinese militaries are investing in bioweapons and human enhancement, two categories of military technology that the United States may be hindered by its ethical practices. While countries with different ethical and regulatory standards may be more likely to pursue and adopt these technologies, the U.S.

public will expect extensive oversight and regulation to ensure ethical and safe use of new biotechnology. This regulation will slow the adoption of these technologies in the United States compared to other countries.

Recommendations

The United States should adopt a three-step approach to shape global bioethics and maintain its lead in biotechnology. The United States should adopt the proposed solutions while technologies have yet to mature, allowing it to use its current lead in biotech to shape international bioethics.

- *Formalize and Promote U.S. Bioethical Standards.* The United States Department of Defense (DoD) should formalize guiding principles in domestic biotechnology development by replicating its process for formalizing guiding ethics for AI use in combat and non-combat environments. In order to promote these standards abroad, the United States should re-engage with the U.N. Educational, Scientific, and Cultural Organization (UNESCO) to help guide developing states establish their own bioethical guidelines.
- *Create Consensus Through Collaboration.* The National Institutes of Health (NIH) should expand its U.S.-China Program for Biomedical Collaborative Research and include culturally conscious training on bioethics. This expansion will emphasize the importance of multilateral collaboration in science, by simultaneously increasing exposure of foreign scientists to U.S. ethical standards and invigorating the U.S. biotechnology industry.
- *Stimulate Ethical Bio-Innovation Domestically.* Defense Advanced Research Projects Agency (DARPA) should establish a task force through its Biological Technologies Office to identify which specific biotechnologies will lag in development as a result of U.S. ethical regulation. The DoD can then invest in competing, but ethical, domestic technologies.

The asymmetric ethical framework is critical to understanding the threat that biotechnology poses to the United States. By implementing this strategy, the United States will guide international bioethics and promote its own innovation, minimizing the gap between U.S. biotech capabilities and those of countries with different practices.