



Defense Health Agency (DHA) Clinical Communities Speaker Series

SEPT 2023 CCSS: Innovation-Based Updates in Modern Health Care Practice

S03: New and Emerging Biotechnologies in Military Medicine: Technical Capabilities and Ethical Considerations

Resource List

The journal article, [Ethical issues of using CRISPR technologies for research on military enhancement](#) (2018), presents an overview of the key ethical questions of performing gene editing research on military service members. The recent technological advance in gene editing capabilities provided by CRISPR/Cas9 and their path towards first-in-human trials has reignited the debate on human enhancement for non-medical purposes. This article explores possible applications of CRISPR to military human gene editing research and how it could be specifically applied towards protection of service members against biological or chemical weapons. Risk–benefit analysis, informed consent, and inequality of access as it relates to CRISPR applications for military research are discussed.

[Ethics of gene therapy in the military: Promise and potential problems](#) (2020) discusses ethical concerns about the use of gene therapy in the military. The most important concerns about gene therapy stem from its potential risks, much like for other new therapeutics. There is cause for concern when proposed enhancements involve long-term medications or genetic modification, as seen with current programs in military enhancement. Ruling on the ethics of gene therapy in the military depends in part on judgments about how the technology or treatment will be used and for what ends. Even though the potential benefits to our soldiers and military understandably motivates this research, the first widespread uses of gene therapy may be more appropriately tested and implemented outside of the military.

The United Nations Educational Scientific and Cultural Organization (UNESCO) has a dedicated webpage for their [Ethics of artificial intelligence \(AI\)](#) (2022) program. UNESCO provided the first-ever global standard on AI ethics in 2021. The protection of human rights and dignity is based on the advancement of fundamental principles such as transparency and fairness. UNESCO interprets AI as systems with the ability to process data in a way which resembles intelligent behavior. This is crucial as the rapid pace of technological change would quickly render any fixed, narrow definition outdated, and make future-proof policies infeasible. While values and principles are crucial to establishing a basis for any ethical AI framework, recent movements in AI ethics have emphasized the need to move beyond high-level principles and toward practical strategies.

The U.S. Department of Defense (DoD) published an article announcing the release of Executive Order (EO) “Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy”. The article, [New biotechnology executive order will advance DoD biotechnology initiatives for America’s economic and national security](#) (2022), details how this EO will bolster efforts by the DoD and other Federal agencies to ensure U.S. economic and national security by leveraging biotechnology. Emerging biomanufacturing capabilities will help the DoD address logistical challenges across multiple DoD mission areas. Biotechnology will enable the Department to source mission-critical materials domestically without relying on fragile supply chains. The DoD aims to accelerate biotechnology towards prototyping, operational demonstration, and production at a faster rate.



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