



Biotechnology

Biotechnology is the application of biological systems and materials to create new technologies, products, and services that offer qualitative improvements to human and environmental health. Biotechnology encompasses many disciplines including genetics, molecular biology, bioengineering, pharmaceuticals, agriculture, [bioinformatics](#) and more. Among the most widely recognized applications of biotechnology is genomic manipulation, or [gene editing](#). Through gene editing, scientists can make highly targeted alterations to the DNA sequences of a living organism's genome. This enables better understanding of genetic and hereditary diseases and can be used to make DNA more [resilient](#) to certain viruses or bacteria. The field also enables the creation of biosynthetics, or novel materials created through organic chemistry, that exhibit superior characteristics and greater environmental sustainability than traditional petroleum-based compounds.

Proliferation Concerns

There will be increased risk that biotech advancements make the [weaponization](#) of biological and chemical agents more likely. There is no universal standard governing the proliferation of biotech, and [export controls](#) fail to keep pace with the rapid development of this sector. The spread of biosynthetic tools will [enable](#) more research labs around the world to explore pathogen research and the engineering of novel viruses. Moreover, existing safeguards and [governance regimes](#) may not be sufficient to prevent the accidental or nefarious spread of dangerous new compounds, toxins and infectious diseases. The risk of [non-state access](#) to various biotechnologies also means that bioterrorism will present as a threat, potentially in the form of intentional sabotage of agricultural systems via release of genetically modified organisms. The multiplying effect of AI-enabled research and development will also contribute to the proliferation of biotechnology in ways that have yet to be understood.