

Genetic Engineering: Balancing the Benefits and Risks for Society

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Commentary

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ABOUT THE STUDY

Genetic engineering, also known as genetic modification or gene editing, is the process of altering the DNA of an organism, whether it be a plant, animal, or human. This technology has been used in various fields, from medicine to agriculture, and has the potential to bring about significant benefits to society. However, it is not without controversy and ethical concerns.

One of the primary benefits of genetic engineering is in the field of medicine. Scientists have used gene editing to create new treatments for various diseases, including cancer, cystic fibrosis, and sickle cell anemia. For example; in 2017, the FDA approved the first gene therapy treatment for cancer, which involves genetically engineering a patient's own T-cells to attack cancer cells in their body. This breakthrough has the potential to revolutionize cancer treatment and save countless lives. In addition to medicine, genetic engineering is also being used in agriculture. Genetically modified crops have been developed to increase yields and reduce the need for pesticides. This has the potential to help feed a growing global population while also reducing the impact of agriculture on the environment.

However, genetic engineering is not without its drawbacks and concerns. One of the main concerns is the potential for unintended consequences. When scientists alter the DNA of an organism, there is a risk that other aspects of the organism's biology could be affected, leading to unforeseen problems. For example, a genetically modified crop could inadvertently harm the ecosystem by disrupting the food chain or spreading uncontrollably.

Another major concern is the ethical implications of genetic engineering. One of the most controversial aspects of genetic engineering is the potential to create "designer babies" or children with preferable traits selected by their parents. This could lead to a society where the wealthy can pay for genetically modified children while the poor are left with natural, unmodified children. This could further exacerbate existing inequalities in society.

Furthermore, there is a risk that genetic engineering could be used for nefarious purposes, such as creating biological weapons or genetically engineering humans for military or intelligence purposes. This could lead to a dangerous arms race and a world where genetic modification is used to create super humans or to discriminate against certain groups based on their genetic makeup. Despite these concerns, genetic engineering continues to advance and is being used in new and innovative ways. For example, in 2021, researchers in the UK announced that they had genetically modified mosquitoes to prevent the spread of malaria. This breakthrough could have a significant impact on global health if it proves successful in the field. However, it is important that we proceed with caution when it comes to genetic engineering. We must weigh the benefits against the risks and ensure that the potential consequences are thoroughly studied before implementing any new genetic engineering techniques. Regulation and oversight are also critical in ensuring that genetic engineering is used for the greater good and not for harmful purposes. Governments and international organizations must work together to develop clear guidelines and standards for genetic engineering, and must enforce these regulations to prevent abuse.

Genetic engineering has the potential to bring about significant benefits to society, from eliminating genetic diseases to increasing food production. However, we must also be aware of the risks and potential consequences. It is important that we proceed with caution and have open discussions about the ethical implications, hence with proper regulation and oversight, genetic engineering can be a powerful tool.