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Ethics of CRISPR

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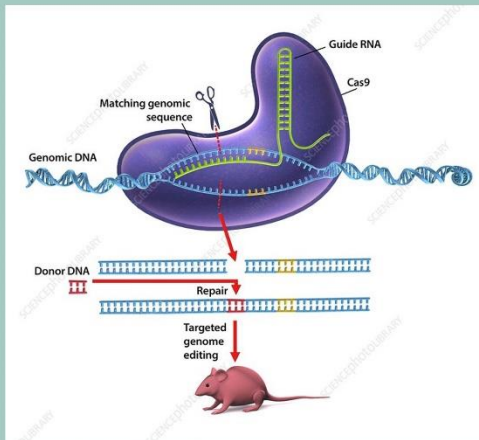
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The Implications of Editing a Gene: A Look into CRISPR

Ethan Mowery

Introduction

CRISPR-Cas9, a technology used to edit DNA, is quickly becoming a part of peoples' lives. Editing DNA has been around for years and is most common found in agriculture, but in recent years, major headway has been made in its involvement in healthcare. The laws and regulations on CRISPR only allow for modification to be done on somatic cells, non-reproductive cells. Research can be done on genome cells though, which opens the door for modification on genome cells and a rapid change in human life. In this project, the way that CRISPR can impact humankind is explained to show the implications it has on human rights.



Gunilla Elam/Sciencephoto Library
<https://www.sciencephoto.com/media/725066/view/crispr-cas9-gene-editing-diagram>

Gene Editing and Gene Therapy

Both gene editing and gene therapy are uses of CRISPR-Cas9 for both research and medical practice. Gene editing is where a part of DNA is entirely replaced by different DNA. Doing this has good and bad consequences. On one hand, humans will not have to worry about widespread disease, but on the other hand, humans will be designed and created to one's own desire. Gene therapy is a different approach to CRISPR. In gene therapy healthy genes are used to replace a mutated gene that causes disease but is also of the same DNA sequence.

Why It Matters

Businesses can not do genome editing on humans, but there is a large possibility that genome editing will eventually happen very often. There are many ethical debates about the socioeconomic implications CRISPR has and how consent will be obtained. CRISPR has many benefits to it since it can help many people in the world, but it can also be used as a weapon for financial gain and power. Many people do not know that this is a real possibility and that the implications that CRISPR has on their human rights and human dignity.



Paul Darrow - The New York Times/Redux
<https://www.britannica.com/science/genetic-engineering>



<https://astartv/post/explainer-genetically-modified-organisms-and-you/>

Lulu and Nana

Lulu and Nana are twins that were born in 2018. Unlike every other person in the world, Lulu and Nana had their genes edited illegally and are resistant to HIV-1. He Jiankui is the scientist behind this. Jiankui's actions could have immense consequences since the door to legally editing an embryo's genes is now open.



He Jiankui

https://en.wikipedia.org/wiki/He_Jiankui

Methods

In this project, to obtain the data and information I researched the business models of companies that practice genome engineering. All these companies conducted research on gene therapy, and many ran clinical trials to see the effects and effectiveness of using CRISPR to treat many diseases. These practices were related to the legal frameworks surrounding gene editing.



CRISPR Therapeutics
<http://www.crisprtx.com/>



Intellia Therapeutics
<https://www.intelliatx.com/>



Horizon Discovery Group
<https://horizondiscovery.com/>

Findings

Unsurprisingly all companies abide by the laws. Every company is mainly focused on gene therapy, but also has research that relates to completely editing a gene. All companies are also researching similar diseases and running clinical trials on them. I found that one company, Horizon Discover Group, doesn't just conduct research but also sells edited genes and an editing service for scientists and other companies to buy. The effects that gene editing and CRISPR will have are not yet known, but the implications are serious.

Goals

- Define the human rights implications of gene editing for both the present and the future of CRISPR
- Spread awareness of CRISPR, gene editing, gene therapy, and the consequences that come with him.

References

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-Wikipedia contributors, "He Jiankui," *Wikipedia, The Free Encyclopedia*, https://en.wikipedia.org/w/index.php?title=He_Jiankui&oldid=948164907