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Gene Editing Advancments

Technology has evolved into an incredible development and has now sprung a new revolution in human history. In m*ultiplex genome engineering using CRISPR/Cas systems* report by Cong Et Al. (2013), the technology of CRISPR is broken-down through an experimental process. The process encompassed the testing of two different types of type II CRISPR/Cas systems. Likewise, the text illustrates the technology's exact breakdown of how it came to be and every piece of its puzzle. Lastly, the report depicted the innovative technological advancement of CRISPR to be able to uphold a wide range of applicability, which stems from the fundamental elements it embodies. Through the need for gene editing technologies, the understanding and manipulation of DNA replication occurs with technological advancements, which accurately shows the effectiveness and wide range of applicability of CRISPR.

There are various reasons to have genome editing technologies, such as to find solutions to cure hereditary diseases. These diseases include sickle cell anemia, hemophilia, Tay-Sachs disease, cystic fibrosis, and many others. The solution would need to encompass the rewriting of the infected person's DNA. For, it is the genes of the specific person that codes the disease. Additionally, other technologies have the same basis as CRISPR; however, CRISPR is the first in its line of business to be cost-efficient, easily manipulated, and accessible to the public (Cong Et Al. 2013). These reasons equip the need for the undertaking of CRISPR and offer insights into the reasoning behind its conception.

With the need for CRISPR technology comes the discussion of how DNA alterations work. First and foremost, CRISPR functions by manipulating the process of DNA replication through precisely facilitating RNA-guided site-specific DNA replication (Cong Et Al. 2013). The ability to direct precise cleavage at specific locations enables the new sets of instructions to be passed on to any newly formed daughter cells (Cong Et Al. 2013). Besides, this efficient RNA-guided genome modification only requires a minimal three-component system (Cong Et Al. 2013). The understanding of the process of this technology and its fundamental elements allows comprehension of its effectiveness.

By accurately representing the technology of CRISPR, this provides a wide range of its applicability. For the report, "observed a 1.6% deletion efficacy... thus demonstrating the CRISPR/Cas system can mediate multiplexed editing within a single genome" (Cong Et Al. 2013). Because this technology has been successful other genetic traits can be manipulated. This technology can solve any genetic disease, by rewriting the genetic code in every single cell, in any organism chosen. CRISPR is a powerful tool with high versability. This technology can even extend past medicinal purposes for personal use. The technology's potential can manipulate nonharmful traits such as hair color, body size, and much more.

Requiring gene-editing technologies demands the understanding of its conception, how it works, and the potential of where it can go. This advancement in technology has a great potential to create a new era for human history. For, this advancement has the power to rewrite the means of what it is to be a human. The technology can be utilized beneficially, for it can offer humans the ability to colonize other planets. However, the technology can be used negatively, for it can create a Nazi-like master race for a shift in traits produced.

Citations

Cong, Le, et al. “Multiplex Genome Engineering Using CRISPR/Cas Systems.” *Science*,

American Association for the Advancement of Science, 15 Feb. 2013, https://science.sciencemag.org/content/339/6121/819.