Researched Persuasive Writing and Speaking

Gene Editing: A bright light at the end of a dark tunnel

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Gene editing refers to techniques that can be used to alter the genetic material of an organism by replacing sections of the genome at specified locations. The most popular of these techniques is CRISPR, or clustered regularly interspaced short palindromic repeats ("What are genome...", 2018). This approach involves researchers attaching a small DNA sequence to an enzyme that cleaves genetic material at the desired location in the organism's genome. The organism's own DNA repair system is then used to complete the desire changes ("What are genome...", 2018). Research using CRISPR has been successful, and current studies focus on creating a better understanding of disease processes for maladies like hemophilia, cystic fibrosis, or sickle cell disease (Otieno, 2015). Due to the positive possible outcomes for clinical disease treatment, research about potential uses of CRISPR should continue.

Current research in gene editing is promising, even though it focuses on animal trials. One such trial tested replacement of the gene for autosomal dominant retinitis pigmentosa in rats. Results showed an average of 35% increase in visual acuity in injected eyes, none of which showed further disease progression, and some eyes showed improvement (Bakondi et al, 2016). Researchers in China have begun human trials using CRISPR technologies, with approximately 86 participants. Though the trials have not been completed, doctor's are reporting improvement of patients' condition. While years of chemotherapy were inadequate in shrinking a patient's nasal tumor, a few months of CRISPR injections began to shrink it (Rana et al, 2018). In America and Europe, fears of possible use prevent regulatory agencies from allowing scientists to move toward human trials.

Most of these fears stem from off-target effects on the genome or possible uses, like embryonic gene editing (Otieno, 2015). Off-target, or unintended, effects are caused by possible repeats in the organism's genome. In the case of CRISPR, this would cause cuts and repair in unintended locations, causing unforeseen changes in the patient's health ("What are genome...", 2018). This issue can be combatted using carefully considered human trials. Starting with fewer numbers of participants means that patients' can be carefully monitored for changes resulting from off-target effects. Researchers can then increase their sample size once the safety of the patient is ensured. Furthermore, embryonic gene editing is not at the forefront of scientist's minds. The general public is concerned about the use of gene editing as a way to correct undesirable, but not life threatening, traits in an embryo (Otieno, 2015). While this is a possibility in the future, it is not currently an issue, as scientists are still exploring what diseases this technique could help cure. Additionally, each study has to be reviewed by an independent ethics committee that could cease any study with potentially unethical implications before it has a chance to start.

The possible uses of gene editing seem endless, and, as with any other technology, there are potential unethical uses. However, as scientists continue to learn more about CRISPR and gene editing, the possible unethical uses of the technology are outweighed by the ability to cure previously deadly diseases. There is still a great deal to be learned about all of its benefits, and for this reason, research into gene editing should continue in order to make an informed decision as to its future use in humans.

References

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