Human Genetic Modification

Name

Institutional Affiliation

Thesis Statement

Genetic modification has profound advantages that are beneficial to the entirety of the human race.

How far should scientists go to modify humans through genetic engineering?

Somatic genetic modification possesses a vast array of medical benefits. The process involves the manipulation of one’s genome via a process called gene editing. The common opposing argument disproves germline genome modification, which poses several monumental legal and socio-ethical considerations. These aspects range from infringements of the unborn child’s rights, costs, ramifications on one's quality of life, and the preservation of dignity (Van Dijke et al., 2018).

Recent advancements in genome editing could potentially address health issues, such as chronic and inherited illnesses. Some conditions occur due to the inheritance of a deleterious variant present in both parents. Conversely, some occur due to the inheritance of a single copy dominant variant. Novel techniques, such as the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR), could eliminate various illnesses (NIH, n.d.). This aspect could address hemophilia, Tay-Sachs disease, and sickle-cell anemia, among others.

Modern gene targeting techniques supersede traditional gene therapy in terms of efficiency and a more comprehensive array of applications. This notion provides more flexibility in altering the gene sequence within a given cell’s deoxyribonucleic acid (DNA). Further, the precise integration of given gene expressions is advantageous as it is safe and lacks disruptive effects on neighboring genes. This aspect preserves a gene's vigorous expression while reducing potential oncogenesis risks (National Academies of Sciences, Engineering, and Medicine, 2017). Furthermore, modern genetic engineering addresses homologous and non-homologous gene repair approaches. This aspect leads to the achievement of cell repair, which could restore tissue functionality and vibrancy.

References

National Academies of Sciences, Engineering, and Medicine. (2017). Human genome editing: science, ethics, and governance. National Academies Press. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK447271/

NIH. (n.d.). US National Library of Medicine. *What are genome editing and CRISPR-Cas9?* Retrieved from https://ghr.nlm.nih.gov/primer/genomicresearch/genomeediting

Van Dijke, I., Bosch, L., Bredenoord, A. L., Cornel, M., Repping, S., & Hendriks, S. (2018). The ethics of clinical applications of germline genome modification: a systematic review of reasons. *Human Reproduction*, *33*(9), 1777-1796. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6454467/