Potential of Gene Editing
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Research Question

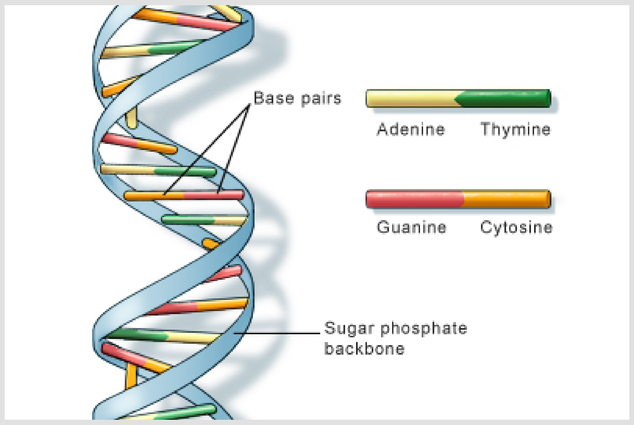
To what extent can gene editing prevent the need of multiple solutions for various diseases in the future based on the progression throughout the past?

Introduction

Gene editing has shown great promise in treating and preventing diseases. Recently, specific types of sickle cell anemia have been able to get treated by DNA sequencing. As gene-editing technologies like CRISPR-CAS9 progress, they may offer a future where solutions like vaccines might be replaced by genetic modifications, potentially reducing the need for repeated or continuous treatments for various diseases.

Methodology

Researched about past achievements of gene editing to formulate a trend of growth to predict the future achievements gene editing can accomplish



The research is based on these four essential base pairs mutations which are then edited to make the gene function properly again. The template sequence is the mutation strand and alignment sequence is the correct strand. DNA sequencing compares the template sequence with alignment and fixes the strand.

Coded a 2d array game which is focused on 3 diseases with example template strand and complementary strand. The user has to fix the template strand to make it similar to the complementary strand. This game is designated to help the user truly understand the importance of DNA sequencing.

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Choose a disease to fix:
1. Cystic Fibrosis
2. Sickle Cell Anemia
3. Huntington's Disease
1
Normal sequence (Normal DNA of the gene):
A T G G T G A G T G A G G T T T G G A G G C G T G A G
C T G G T G A G T G A G G T T T G G A G G C G T G A G
Mutated Sequence (Mutated DNA of the gene):
A T G G T G A G T G A G G T T T G G A G G C G T G A G
C T G G T G A G T G A G G T T T G G A G G C G T G A G
Welcome to the DNA Sequence Correction Game!
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Found diseases which can be fixable by gene editing and predict if they are curable by gene editing. Additionally, found diseases which are incurable by gene editing and theocratically perform gene editing to prove the reason why DNA sequencing is not the best option to try solve those diseases as they have multicell mutations.

Results

The development of CRISPR and other gene-editing technologies have been growing exponentially. The trends of past progression are present based off my research through scholarly articles. Additionally, after conducting a blast search of target sequence for Marfan syndrome, I proved DNA sequencing cannot cure such diseases as of now due to their multicellular mutations.

Recommendations/ Conclusion

Despite the rapid advancements, there are limitations. Gene editing technologies still face challenges such as off-target effects, ethical concerns, and regulatory hurdles. Furthermore, the potential for unforeseen consequences, such as the technology advances, requires careful consideration.

Acknowledgements

- https://blast.ncbi.nlm.nih.gov/Blast.cgi
- https://marfan.org/conditions/marfan-syndrome/
- https://pmc.ncbi.nlm.nih.gov/articles/PMC9261417/