Genotype of Photic Sneeze Reflex

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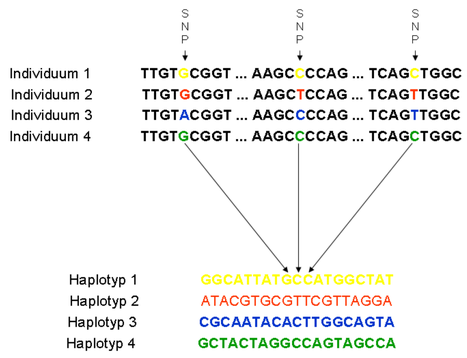
Background

- There are over 1.42 million Single Nucleotide Polymorphisms or SNPs throughout the human genome (The International SNP Map Working Group, 2001).
- Some people have a mysterious and interesting phenotype that cause them to sneeze in response to bright light this is called photic sneeze reflex (Wang, 2019).
- The alleles associated with the photic sneeze SNP is C/T.
- The CC genotype is predicted to have this reflex.



Specific Aim

Research Question: What is the genotype of individuals with photic sneeze reflex?
Hypothesis: An individual with Photic Sneeze Reflex will have CC genotype.

Methods

Recorded phenotypes/Predicted genotypes

↓

Collected DNA

↓

Polymerase Chain Reaction or PCR mix was added and Thermocycling then occurred.

↓

Gel electrophoresis

↓

Purified Remaining PCR Reaction

↓

Sequencing

Results

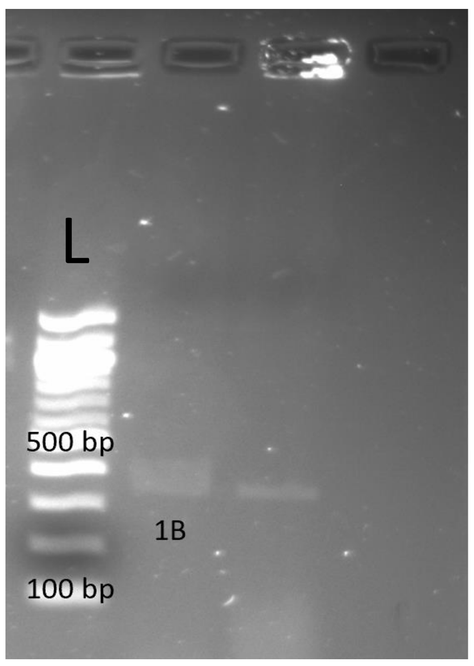


Figure 1. Gel Electrophoresis of absence or presence of photic sneeze reflex. L is the 100 base pair ladder. 1Bi is the individual t that was sampled. The bands are in between 400 and 500 base pairs.

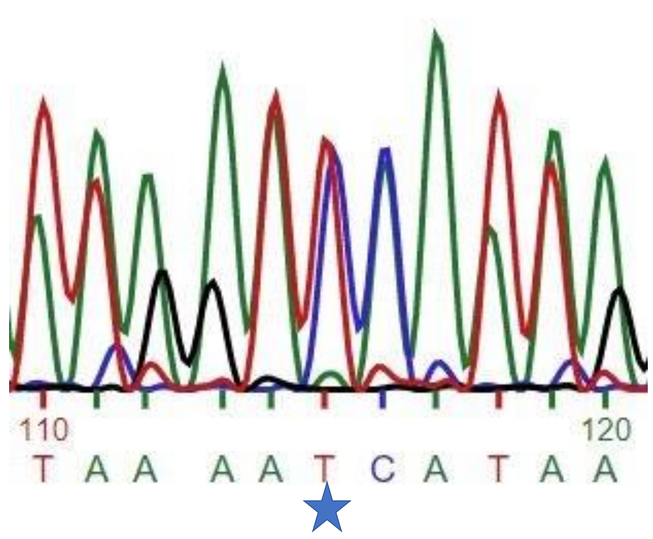


Figure 2. Chromatograph of the DNA sequence of Subjects. The DNA was sequenced and viewed. The star highlights the SNP at the T. The peaks show that the sample was heterozygous with C and t peaks meaning the individual does not have photic sneeze reflex.

Conclusions

- The photic sneeze SNP was sequenced. 1B was heterozygous CT for the SNP, therefore, the individual does not have photic sneeze reflex
- A way to improve this experiment would be to look at the SNP with more detailed equipment and more DNA that's being tested.

References

Eriksson, N., Macpherson, J. M., Tung, J. Y., Hon, L. S., Naughton, B., Saxonov, S., … Mountain, J. (2010). Web-Based, Participant-Driven Studies Yield Novel Genetic Associations for Common Traits. *PLoS Genetics*, *6*(6).
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Wang, M., Sun, X., Shi, Y., Song, X., & Mi, H. (2019). A genome-wide association study on photic sneeze reflex in the Chinese population. *Scientific Reports*, *9*(1).
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