The Prevalence of the PTC Gene Among Various Ethnicities at Marlborough

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Abstract

Our research project is based upon the prevalence of the PTC gene among various ethnicities at Marlborough. The purpose of our experiment is to see which ethnicity carries the most PTC, a gene that tastes bitterness. We tested different ethnicities to see which one tested with a higher result to the PTC gene, and tested whether the PTC gene directly relates to your self-identified ethnic group. We were curious to see how many contrasting ethnicities would ultimately react to the PTC strip, and wanted to learn if ethnicity could be a factor of how a certain person would react to the bitterness. Additionally, the purpose of our experiment was to understand if the reaction to bitterness and if it would be distinct, and how it could vary at Marlborough. We purchased PTC strips and held the experiment three times. We had everyone taste the strips and then record their results immediately afterwards, which included their ethnicity and reaction to the strip in terms of tasting no bitterness, bitterness, and extreme bitterness. The subjects that we tested included different ethnicities such as European/Caucasian, African American, Hispanic, Asian, and Mixed. Based on our results, we learned that most of the ethnicities reacted to PTC with a 50% chance of tasting bitterness or higher. We learned that people in the Hispanic ethnicity group reacted the strongest with the PTC strip. 100% of the Hispanic people that we tested carried PTC.

Introduction

In our research project, we learned how the relative frequency of TAS2R38 (PTC gene) varies among the populations of self-identified ethnicities at Marlborough. The PTC gene is a gene that affects taste buds. It determines whether you can taste PTC or not. For example, cilantro is an example of a food where if you have the PTC gene, you will be able to taste it at a very strong level, so some people like the taste of cilantro, while others cannot bear the taste. We wanted to get a better understanding of which ethnicities are more likely to carry this gene. In the reference source titled “Selection on the Human Bitter Taste Gene, TAS2R16, in Eurasian Populations”, the study examines the bitterness taste ability associated with TAS2R38, the PTC gene, and how it has changed over time in Eurasian populations. We surveyed many people of different ethnicities. The experiment was simple, we gave each participant a strip of a paper-like material that would taste like a range of different levels of bitterness determining if the person carried the PTC gene. After we collected all of our data, we got a constant number from each group and reviewed our data.

Purpose

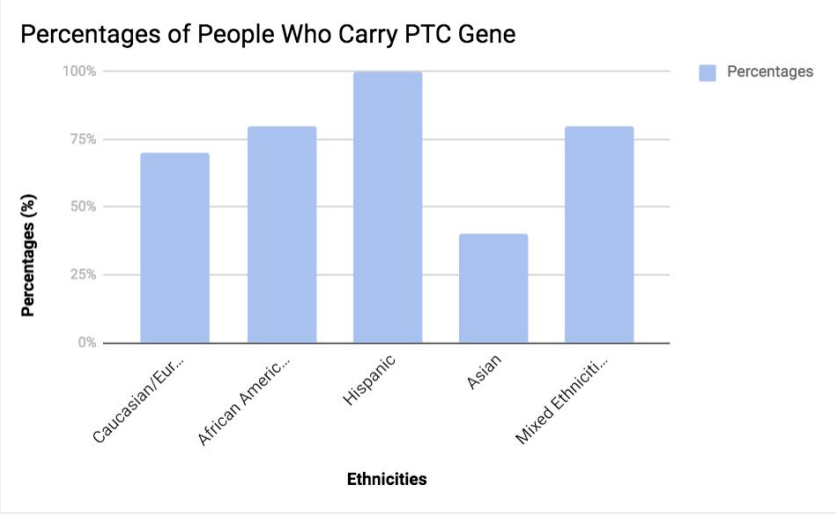
The purpose of this research project is to understand how different ethnicities react to the PTC strip, and how it relates to genetics. All of us were interested in the realm of genetics, which is why we decided to choose this topic specifically as our research work. Our specific question is, “How does the relative frequency of TAS2R38 (PTC gene) vary among the populations of self identified ethnicities at Marlborough?” We want to know who will react to the bitterness of the PTC strip and who will think of it as an unflavored piece of paper. Additionally, we want to find out that, of the people who do taste bitterness, what things they have in common, such as their ethnicities.

Materials and Methods

We first purchased PTC strips from Amazon and then held the experiment three times. We had multiple students of different ethnicities taste the PTC strips and record if they had a reaction or not, showing if they had the PTC gene. After we collected the data we needed, we then turned that data into percentages, showing which ethnicities have a higher percentage of people who carry the PTC gene than others .

Results

After our experiment, the data we collected from the different ethnicities including Caucasian/European, African American, Hispanic, Asian, and Mixed ethnicities ranged from different numbers. Once we had a constant number of 5 participants for each ethnic group, we made the results into percentages based out of 100. If someone tasted the bitterness of the PTC strip, that meant that they carry the PTC gene. With all of the data collected, we learned that 70% of people that are European/Caucasian tasted the bitterness, 80% of people that are African American tasted the bitterness, 100% of people that are Hispanic tasted the bitterness, 40% of people that are Asian tasted the bitterness, and finally 80% of people that are Mixed ethnicities tasted the bitterness.



Discussion

At the end of our study, we learned that 70% of European/Caucasians tasted the bitterness, 80% of African Americans tasted the bitterness, 100% of Hispanics, tasted bitterness, 40% of Asians tasted the bitterness, and 80% of Mixed Ethnicities tasted the bitterness from self-identified results. All of these percentages range from 40% to 100% and vary between how each ethnicity will react to the bitterness of the PTC strip. The results of our data relate to our original research question because it shows the varying numbers and percentages that come from each different Ethnicity. Our results relate to the original research question, “How Ethnicities Vary Based on the PTC Gene (TAS2R38) at Marlborough?” because we learned that the percentage of people who carry the PTC gene-based on their self identified ethnicity. We learned that of the five ethnicities chosen, the ethnicity that tasted the most amount of PTC is Hispanic, then African American and Mixed Ethnicities, then European/Caucasian, and lastly Asian. We initially did not have enough participants to complete the required amount of results for each ethnicity. Some of the results we received were of people from mixed backgrounds, which would ultimately not contribute to finding an answer to our research question. We ended up receiving an overwhelming amount of results for one specific ethnicity, as well as results where participants preferred not to identify their ethnicity, which could also not contribute to answering the research question. A follow-up experiment could be to see which age groups are mainly affected by the PTC gene. We would still use and apply the same factors to the project except now we would have a different focus. For example, in a follow-up experiment, we could compare factors such as age, eye color, and twin factors.

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