

Computational neuroscience

with Claire Su

Talking points

Knowledge

1. What is the TAS2R38 gene?
2. What is an allele?

Comprehension

3. How do different combinations of TAS2R38 alleles influence a person's perception of the taste of brussels sprouts?
4. Why did Claire suspect there might be a connection between TAS2R38 and Alzheimer's disease?

Application

5. How could scientists and doctors use the results of Claire's research to develop new treatments for Alzheimer's?

Analysis

6. How and why does the TAS2R38 gene influence someone's risk of developing Alzheimer's?

Evaluation

7. What do you think you would most enjoy about conducting a scientific research project and sharing your results with the world, and what do you think you would find most challenging? Why?

Creativity

8. What science topics most interest you? What further aspects of these topics do you want to investigate? Write a list of scientific research questions that you have about your chosen topics. How could you design a science fair project to answer some of these questions? What data would you need, how could you collect the data, and what do you expect to find from your results?

Activity

Conduct a taste test to explore how people perceive different types of food

First, check whether any of your participants have food allergies and do not include any foods that people are allergic to.

Then, choose a selection of foods and drinks that have different tastes: bitter (e.g., brussels sprouts, dark chocolate, coffee), sour (e.g., lemons, pickles), sweet (e.g., dates, candies) and umami (e.g., mushrooms, soy sauce). It would also be interesting to test coriander/cilantro leaves, as someone's taste perception of them is strongly influenced by genetics.

If possible, you could also buy PTC (phenylthiocarbamide) paper strips to test whether your classmates are TAS2R38 supertasters, nontasters or heterozygotes. When placed on the tongue, these paper strips will taste very bitter to supertasters, slightly bitter to heterozygotes and tasteless to nontasters.

Ask your participants to taste the different foods (and PTC strips) and record how they experience them. For example, how bitter/sour/sweet do they find each food, and do they enjoy tasting it or find it unpleasant? Do they think coriander/cilantro leaves taste fragrant or soapy?

Analyse your data to look for any trends and correlations. For example, do people who dislike brussels sprouts also dislike dark chocolate and coffee? Do people who like sour foods also like umami foods?

Summarise your results. Can you draw any conclusions about how people perceive different tastes? What other factors might influence people's perceptions of different foods, and how could you account for these variables in your experiment?

More resources

- Discover how a chemist accidentally discovered that bitter taste perception is genetic:
learn.genetics.utah.edu/content/basics/ptc