Tested Studies for Laboratory Teaching
Proceedings of the Association for Biology Laboratory Education
Vol. 35, 378-379, 2014

Good Reason to Hate Broccoli!

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Expanded Abstract

What is it about eating we love? Tasting something!! For some,however, there is no taste. That is where we began our study. Utilizing the Denver Museum of Nature and Science (DMNS), a lab kit from Carolina Biological, and simple taste experiments we have interwoven a study on why some folks can taste a bitter compound and others can't. The investigation started with a simple question of whether or not you like broccoli (which can be for many reasons) and led to the sequencing of the taster gene from cheek cells.

The first part of this experience involved very little experimentation. The initial testing involved using PTC paper to test one's ability to taste a bitter compound and used the gLMS scale to help identify the strength of that taste for each person. The subject was also asked to identify their ancestors to a particular region of the world and if they have smoked or burnt any of their taste buds (aka fungiform papillae).To count the number of fungiform papillae, their tongues were painted blue with a q-tip with blood food dye in the concentration of 1:15 or 10 mL of blue food dye in 150 mL of distilled water. Fungiform papillae do not take up the dye and look roundish and pink. The count involved the number found at the tip of the tongue within a 1 cm circle. The best way to do this is to get a photograph of the tongue. Lastly, the BMI of each person was calculated:

$$\text{Weight(kg)}/\text{height}^2\text{(m)} = \text{BMI}.$$

All of the data collected were examined to see if there was a correlation between any of the variables tested with the taste, or lack of taste, for broccoli.

The actual sequencing of the gene involved taking an inside cheek sample and isolating the Single Nucleotide Polymorphism. Carolina Biological has a kit for this(PTC Extraction and Amplification Kit w/ 0.2 mL tubes, catalog number 211377 for $203.00). There are enough materials to run 15 students through the procedure. We recommend using 2.0% agarose for the gel to get the optimal results. You will also need the following that is not included in the kit: electrophoresis apparatus, thermal cycler, micropipettor, 1.5 mL microcentrifuge tubes, 15 mL conical tubes, saline solution and paper cups.

The Denver Museum of Nature and Science updates and posts data and information concerning the genetics of taste (**http://www.dmns.org/science/museum-scientists/nicole-garneau/the-genetics-lab**). The scientists are excellent resources for this activity. Please contact the authors if you have questions or would like more information.

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Citing This Article

Meyers, D. and S. Jekel. 2014. Good Reason to Hate Broccoli!. Pages 378-379 in *Tested Studies for Laboratory Teaching,* Volume 35 (K. McMahon, Editor). Proceedings of the 35th Conference of the Association for Biology Laboratory Education (ABLE), 477 pages. http://www.ableweb.org/volumes/vol-35/?art=35