Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Human Trait Variation Activity

Any two humans DNA is 99.9% identical. This means that only .1% of DNA codes for all of the diversity within the human species. How similar is our class to one another? Today we are going to look at many traits, or characteristics, that are determined by our genes. One of the things we are looking at will be taste. Have you ever wondered why some people like broccoli and some do not? Or Brussel Sprouts? Our genes actually code for different taste receptors based on what version (or allele) of the gene we get from our parents.

PTC (phenylthiocarbamide) is a chemical that is considered “bitter” in taste. This chemical is not found naturally in foods. Why would our genome need to have a gene that would determine our ability to taste this chemical? Scientists are not completely sure. PTC has a molecular structure that is similar to chemicals found in poisonous plants. One thought is that this gene played a part in the taste receptors for these other poisonous chemicals. There seems to be a correlation between PTC tasting and the dislike of broccoli. Even if you wish that broccoli was a dangerous vegetable, though, it isn’t.

The dominant allele (T) can taste PTC and the recessive allele (t) cannot.

**Pre-Lab Questions**

1. What is a genotype? What is a phenotype?
2. What does it mean for an allele to be dominant? What does it mean to be recessive?
3. What are the two possible genotypes for an individual that can taste PTC?
4. What is the genotype of an individual that cannot taste PTC?

Procedures:

1. Write yes or no in the box for each of the following traits. To determine if you can taste PTC, get a taste strip from the supplies at the counter. Be sure you are not chewing gum, or just took a drink of soda or other flavored beverage.

|  |  |
| --- | --- |
| Characteristic | Yes/No |
| Mid-digit Hair |  |
| Widows Peak |  |
| Free Earlobe |  |
| Cleft Chin |  |
| Taste PTC |  |

Using the Human Trait Wheel at your table, what # are you? \_\_\_\_\_\_\_\_ Add a checkmark to the class list above your number on the board. Do any of your classmates have the same number as you?

**Post Lab Questions:**

1. Draw a Punnett square for the following cross: Dad is heterozygous and **can** taste PTC and mom cannot taste PTC.

|  |  |
| --- | --- |
|  |  |
|  |  |

1. What are the possible genotypes of their offspring? What are the possible phenotypes?
2. What % of offspring will be able to taste PTC?
3. What are the parental genotypes for the following Punnett Square? Will the offspring be able to taste PTC?

|  |  |
| --- | --- |
| Tt | Tt |
| Tt | Tt |

1. What determines the traits (proteins) that are seen or expressed in an organism?