

NAME \_\_\_\_\_ LAB TIME/DATE \_\_\_\_\_

REVIEW SHEET  
exercise

# Special Senses: Olfaction and Taste

# 26

## Localization and Anatomy of Taste Buds

1. Name five sites where receptors for taste are found, and circle the predominant site:

tongue papillae \_\_\_\_\_, epiglottis \_\_\_\_\_, pharynx \_\_\_\_\_,  
soft palate \_\_\_\_\_, and cheek mucosa \_\_\_\_\_

2. Describe the cellular makeup and arrangement of a taste bud. (Use a diagram, if helpful.) A structure consisting of centrally located gustatory (receptor) cells surrounded by supporting cells.

## Localization and Anatomy of the Olfactory Receptors

3. Describe the cellular composition and the location of the olfactory epithelium. 1" square area on roof of nasal cavity on each side of nasal septum. Receptor cells (bipolar neurons) surrounded by supporting cells.

4. How and why does sniffing improve your sense of smell? Draws air superiorly into contact with the olfactory mucosa. (Most air entering the nasal passages passes inferior to the receptors.)

## Laboratory Experiments

5. Taste and smell receptors are both classified as chemoreceptors, because they both respond to chemicals in aqueous solution.

6. Why is it impossible to taste substances with a dry tongue? Substances must be in aqueous solution.

7. State the most important sites of your taste-specific receptors, as determined during the plotting exercise in the laboratory:

salt student data \_\_\_\_\_ sour student data \_\_\_\_\_

bitter student data \_\_\_\_\_ sweet student data \_\_\_\_\_

8. The basic taste sensations are mediated by specific chemical substances or groups. Name them:

salt influx of Na<sup>+</sup> \_\_\_\_\_ sour H<sup>+</sup> (hydrogen ions) and blockage of K<sup>+</sup> (or Na<sup>+</sup>) channels

bitter G protein gustducin causing increased intracellular Ca<sup>2+</sup> \_\_\_\_\_ sweet G protein gustducin causing K<sup>+</sup> channels to close

9. Name three factors that influence our appreciation of foods. Substantiate each choice with an example from the laboratory experience.

1. smell Substantiation \_\_\_\_\_

\_\_\_\_\_

2. texture Substantiation \_\_\_\_\_

\_\_\_\_\_

3. temperature Substantiation \_\_\_\_\_

\_\_\_\_\_

Which of the factors chosen is most important? Smell

Substantiate your choice with an example from everyday life. \_\_\_\_\_

\_\_\_\_\_

Expand on your explanation and choices by explaining why a cold, greasy hamburger is unappetizing to most people.

When hot, a hamburger is “juicy” and has an enticing aroma. When cold, the fat congeals, giving the hamburger a greasy taste and texture.

10. Babies tend to favor bland foods, whereas adults tend to like highly seasoned foods. What is the basis for this phenomenon?

Taste buds (and olfactory receptors) are less acute and are replaced more slowly as we age. Thus, more highly seasoned foods are necessary if the food is to be palatable (to most adults).

11. How palatable is food when you have a cold? It's not.

Explain. Smell is half of taste. When you have clogged nasal passages, you lack this added sensory input.

\_\_\_\_\_

12. What is the mechanism of olfactory adaptation? Receptors stop responding to a continuous unchanging stimulus. (However, if

the stimulus or intensity is changed, the receptors will again begin to respond.)

\_\_\_\_\_

In your opinion, is olfactory adaptation desirable? Yes. Explain your answer.

Continuous nonimportant (unchanging) olfactory stimuli would be distracting and (probably) irritating.

\_\_\_\_\_