

- B 12. Allows pressure in the middle ear to be equalized with the atmospheric pressure
- M 13. Vibrates as sound waves hit it, transmits the vibrations to the ossicles
- C 14. Contains the organ of Corti
- B 15. Connects the nasopharynx and the middle ear
- K 16. N 17. Contain receptors for the sense of equilibrium
- G 18. Transmits the vibrations from the stirrup to the fluid in the inner ear
- D 19. Fluid that bathes the sensory receptors of the inner ear
- H 20. Fluid contained within the osseous labyrinth, which bathes the membranous labyrinth

16. Figure 8-3 is a diagram of the ear. Use anatomical terms (as needed) from the key choices in Exercise 15 to correctly identify all structures in the figure provided with leader lines. Color all external ear structures yellow; color the ossicles red; color the equilibrium areas of the inner ear green; and color the internal ear structures involved with hearing blue.

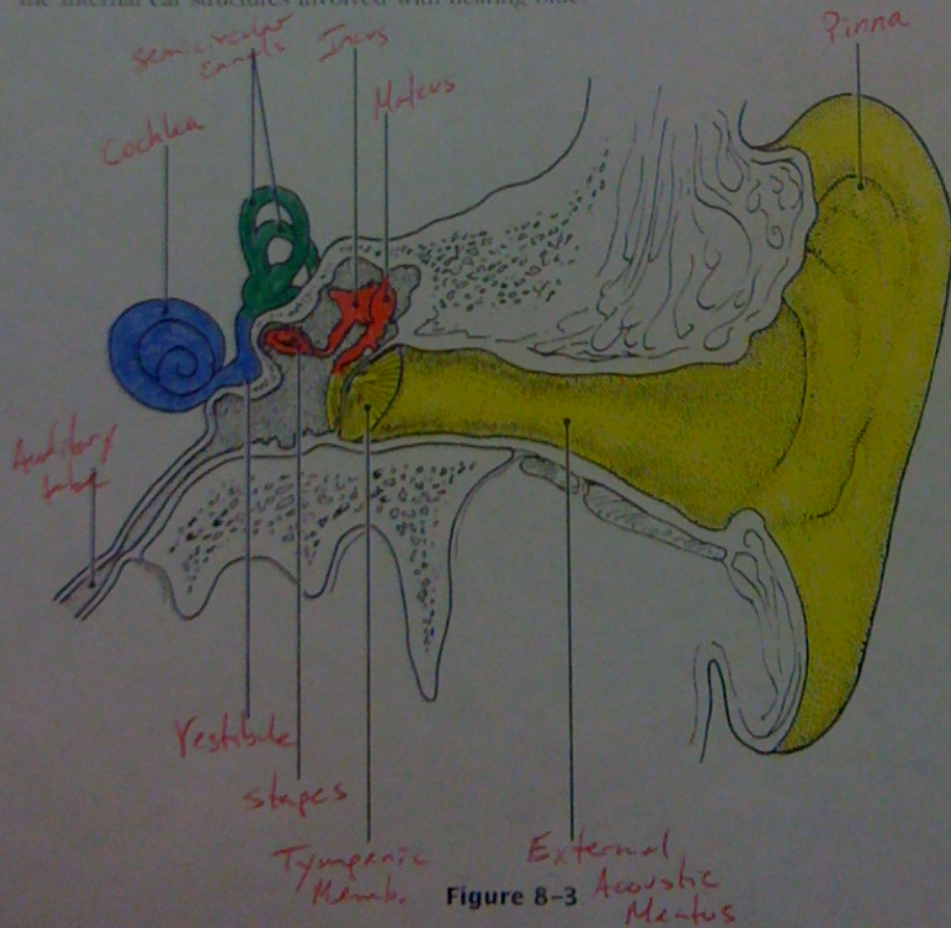


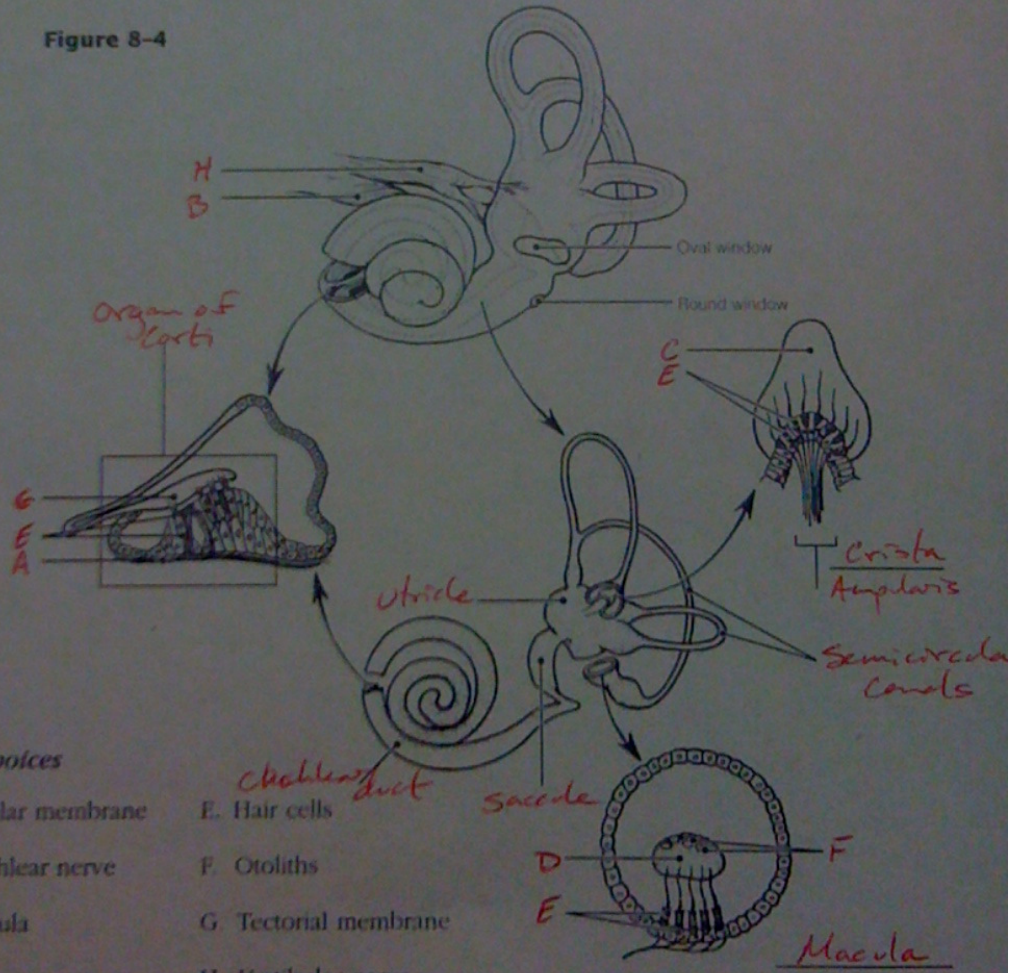
Figure 8-3

17. Sound waves hitting the eardrum set it into vibration. Trace the pathway through which vibrations and fluid currents travel to finally stimulate the hair cells in the organ of Corti. Name the appropriate ear structures in their correct sequence and insert your responses in the answer blanks.

Eardrum → Malleus → Incus →
stapes → Oval window → Perilymph →
Membrane → Endolymph → Hair cells

18. Figure 8-4 is a view of the structures of the membranous labyrinth. Correctly identify the following major areas of the labyrinth on the figure: *membranous semicircular canals, saccule and utricle*, and the *cochlear duct*. Next, correctly identify each of the receptor types shown in enlarged views (organ of Corti, crista ampullaris, and macula). Finally, using terms from the key choices below, identify all receptor structures provided with leader lines. (Some of these terms may need to be used more than once.)

Figure 8-4



Key Choices

- | | |
|---------------------|-----------------------|
| A. Basilar membrane | E. Hair cells |
| B. Cochlear nerve | F. Otoliths |
| C. Cupula | G. Tectorial membrane |
| D. Gel | H. Vestibular nerve |

19. Complete the following statements on the functioning of the static and dynamic equilibrium receptors by inserting the letter or term from the key choices in the answer blanks.

Key Choices

- | | | |
|---------------------|-------------------|------------------------|
| A. Angular rotatory | E. Gravity | I. Semicircular canals |
| B. Cupula | F. Perilymph | J. Static |
| C. Dynamic | G. Proprioception | K. Utricle |
| D. Endolymph | H. Sacculle | L. Vision |

- Dynamic 1. The receptors for (1) equilibrium are found in the crista ampullaris of the (2). These receptors respond to changes in (3) motion. When motion begins, the (4) fluid lags behind and the (5) is bent, which excites the hair cells.
- Semicircular Canals 2.
- Angular/Rotatory 3. When the motion stops suddenly, the fluid flows in the opposite direction and again stimulates the hair cells. The receptors for (6) equilibrium are found in the maculae of the (7) and (8). These receptors report the position of the head in space. Tiny stones found in a gel overlying the hair cells roll in response to the pull of (9). As they roll, the gel moves and tugs on the hair cells, exciting them. Besides the equilibrium receptors of the inner ear, the senses of (10) and (11) are also important in helping to maintain equilibrium.
- Endolymph 4.
- Cupula 5.
- Static 6.
- Sacculle 7.
- Utricle 8.
- Gravity 9. Proprioception 10. Vision 11.

20. Indicate whether the following conditions relate to conduction deafness (C) or sensorineural (central) deafness (S). Place the correct letter choice in each answer blank.

- Conduction 1. Can result from a bug wedged in the external auditory meatus
- Sensorineural 2. Can result from damage to the cochlear nerve
- Sensorineural 3. Sound is heard in one ear but not in the other, during both bone and air conduction
- Conduction 4. Often improved by a hearing aid
- Both 5. Can result from otitis media
- Conduction 6. Can result from otosclerosis, excessive earwax, or a perforated eardrum
- Sensorineural 7. Can result from a blood clot in the auditory cortex of the brain

24. On Figure 8-5A, label the two types of tongue papillae containing taste buds. On Figure 8-5B, color the taste buds green. On Figure 8-5C, color the gustatory cells red, the basal cells blue, and the cranial nerve fibers yellow. Add appropriate labels to the leader lines provided to identify the *taste pore* and *microvilli* of the gustatory cells.

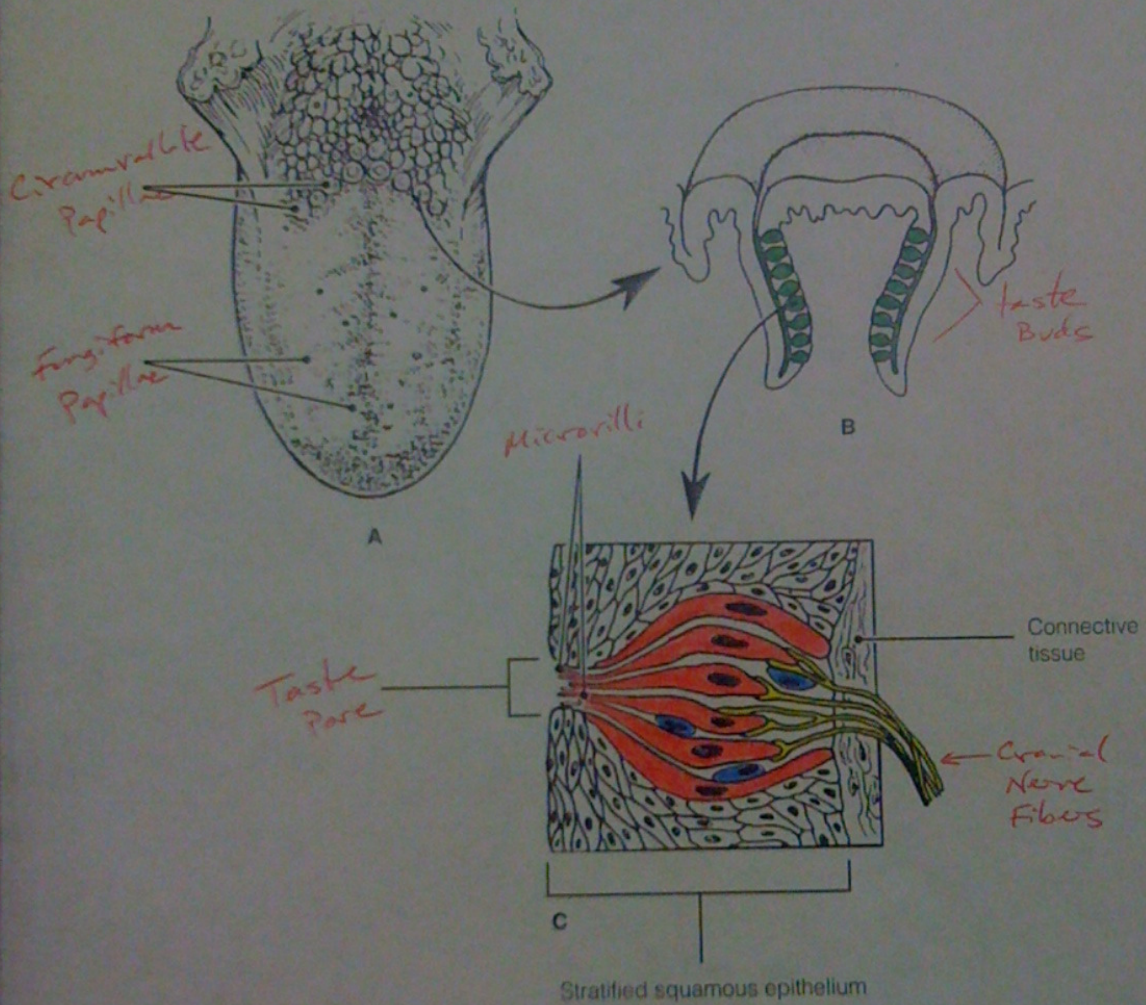


Figure 8-5

25. Figure 8-6 illustrates the site of the olfactory epithelium in the nasal cavity (part A is an enlarged view of the olfactory receptor area). Select different colors to identify the structures listed below and use them to color the coding circles and corresponding structures in the illustration. Then add a label and leader line to identify the olfactory "hairs" and add arrows to indicate the direction of impulse transmission. Finally, respond to the questions following the diagram.

- Olfactory neurons (receptor cells)
- Olfactory bulb
- Fibers of the olfactory tract
- Cribriform plate of the ethmoid bone
- Olfactory nerve filaments

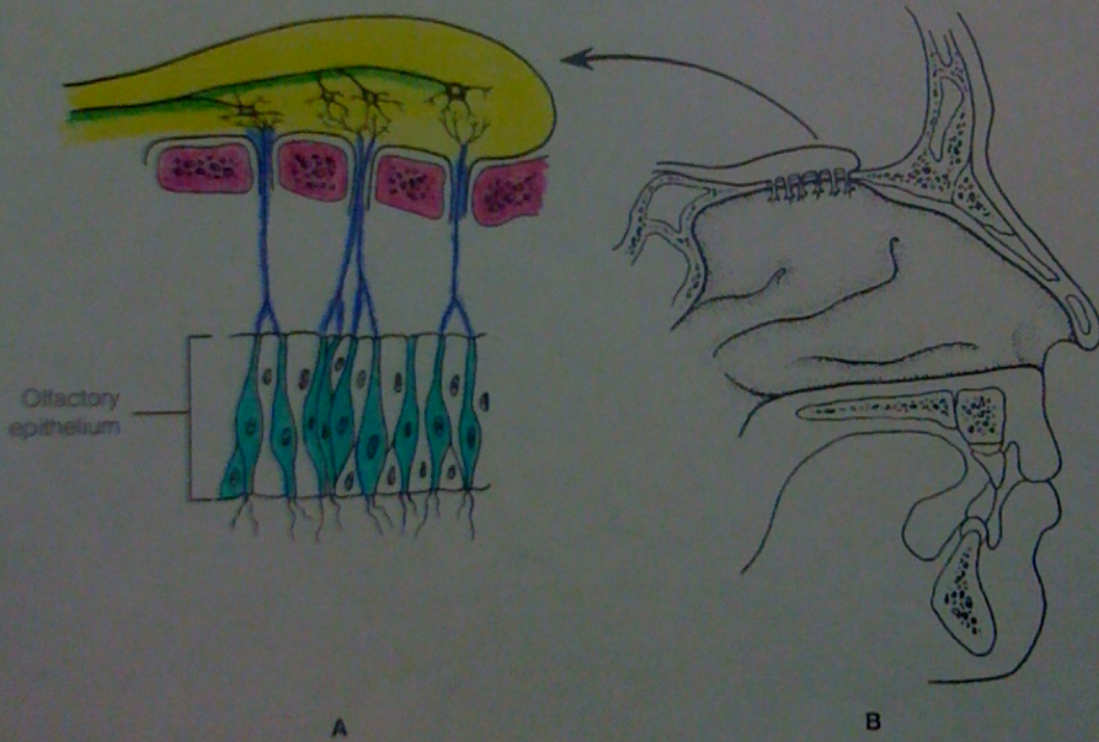


Figure 8-6

1. What substance "captures" airborne odors (that is, acts as a solvent)? Mucus
2. How are olfactory neurons classified structurally? Bipolar