

EAR

I. EAR: Organ of Hearing (Audition) & Equilibrium (balance); 3 Parts:

A. External ear

1. Auricle (pinna) – collects sound waves
2. External auditory canal (acoustic meatus)- transmits sound waves to
3. Tympanic membrane = eardrum – vibrates when struck by sound waves

B. Middle ear

1. Pharyngotympanic (Eustachian) tube - connects to nasopharynx (upper throat)
2. 3 ossicles (bones)
 - a. Malleus = hammer: attached to eardrum &
 - b. Incus = anvil: attached to malleus & to
 - c. Stapes = stirrup: attached to incus and to the oval window (a thin membrane which transmits vibrations to the inner ear)

Otitis Media – middle ear infection, throat infection travels to middle ear via pharyngotympanic tube, eardrum bulges out due to fluid accumulation = painful

- #### C. Inner ear: composed of 3 fluid-filled bony labyrinths lined by fluid-filled membranous labyrinths.

1. Vestibule (Bony Labyrinth): round, centrally located.
It contains 2 Membranous Labyrinths = Utricle & Sacculle.

Each contain a sensory receptor (a group of neurons) = Macula

The fluid in the membranous labyrinths moves the maculae during head tilts (in response to gravity) and during linear (straight-line) acceleration & deceleration of the head.

2. Semicircular canals (3 Bony Labyrinths): They are oriented at right angles to each other.
Each one contains a Membranous Labyrinth = Semicircular Duct.

The fluid in the semicircular duct moves the crista ampullaris during angular (rotational; twirling & spinning) acceleration and deceleration

3. Cochlea (Bony Labyrinth)

- a. Scala vestibuli: it is separated from the cochlear duct by the vestibular membrane

- b. Scala tympani: it is separated from the cochlear duct by the basilar membrane

- c. Scala media (Membranous Labyrinth) = cochlear duct.

It contains the sensory receptor for hearing = Spiral Organ (Organ of Corti)

The Spiral Organ is situated between two membranes (tectorial and basilar membranes). The membranes are vibrated by the movement of the fluid within the cochlear duct and the "hair cells" are activated.

When the eardrum vibrates, the ossicles move, the oval window vibrates, and fluid waves are generated in the scala vestibuli, they "bounce" a small portion of the basilar membrane and the "hair cells" in that area are activated.

Which of the following is the sensory receptor for detecting linear (straight-line) movement?

- a. Stapes
- b. Spiral organ (organ of Corti)
- c. Crista ampullaris
- d. Macula
- e. Oval window