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**COURSE: Neurohistology**

**MATRIC NUMBER: 17/MHS01/319**

**QUESTION**

With the aid of a diagram, write an essay on the histology of an organ of Corti.

**ANSWER**

The **organ of Corti** or **spiral organ,** where sound vibrations of different frequencies are detected. Located in the inner ear within the cochlea which contributes to auditions. Consists of **hair cells and other epithelial structures supported by the basilar membrane and is under the tectorial membrane (an acellular gel into which hair cell stereocilia are immersed**. Here the sensory hair cells have precisely arranged V-shaped bundles of rigid stereocilia; which each loses its single larger kinocilium during development. Two major types of hair cells here:

* **Outer hair cells:** These cells are **acoustical pre-amplifiers**. Connected to type II amyelinic neurons, the connections are very convergent. They have contractile activity. About 12,000 in total. Occur in 3 rows near the saccule but increases to 5 rows near the apex of cochlea. Each outer hair cells are arranged in V-shaped bundle of sterocilia.
* **Inner hair cells:** These are cells specialized in the **mechanoelectrical transduction**. Connected to type I neuron peripheral fibres of spiral ganglion. About 3500 in total. Are shorter and form a single row. Each are arranged in a linear array of shorter sterocilia

Both outer and inner hair cells have synaptic connections with afferent and efferent nerve endings with the inner row of cells more innervated. The cell bodies of the afferent bipolar neurons constitute the **spiral ganglion located in the bony core of the modiolus**.

Two major types of columnar supporting cells are attached to the basilar membrane in the organ of Corti.

1. **Inner and outer phalangeal cells:** they extend apical processes and surround and support basolateral parts of both inner and outer hair cells and the synaptic nerve endings.
2. **Pillar cells:** stiffened by heavy bundles of keratin and outline a triangular space, the inner tunnel, between the outer and inner complexes of hair cells and phalangeal cells.. the stiff inner tunnel plays a major role in sound transmission.

The supporting cells are of four different types: Corti pillars, Hensen cells, Deiters cells and Claudius cells.