TAMUNOWARI VALERE WABOMATE

17/MHSO1/3O1

HISTOLOGY

**ORGAN OF CORTI**

The organ of Corti, named after Alfonso Corti who first described it, is a specialized sensory epithelium that allows for the transduction of sound vibrations into neural signals it’s an organ of the inner ear contained within the scala media of the cochlea. It resides on the basilar membrane, a stiff membrane separating the scala tympani and scala media.

It contains two types of hair cells: inner hair cells and outer hair cells. Inner hair cells transduce sound from vibrations to neural signals via the shearing action of their stereocilia. Outer hair cells serve a function as acoustic pre-amplifiers which improve frequency selectivity by allowing the organ of Corti to become attuned to specific frequencies, like those of speech or music.

The tectorial membrane (from tectum meaning roof) lies over the hair cells; it serves as a shelf against which the cilia of hair cells brush upon movement. Sound waves cause the basilar membrane to move relative to the tectorial membrane. The cilia of the hair cells bend when contact is made to the tectorial membrane and the hair cell discharges.

Inner hair cells function primarily as the sensory organs for audition. They provide input to 95% of the auditory nerve fibers that project to the brain. The stiffness and size of the hair cell arrangement throughout the cochlea enable hair cells to respond to a variety of frequencies from low to high. Cells at the apex to respond to lower frequencies while hair cells at the base of the cochlea (near the oval window) respond to higher frequencies, which creates a tonotopic gradient throughout the cochlea. While inner hair cells are the output center of the cochlea, the outer hair cells are the input center. They receive descending inputs from the brain to assist with the modulation of inner hair cell function (i.e., modulating tuning and intensity information). Unlike other regions of the brain, the modulation of inner hair cells by outer hair cells is not electrical but mechanical. Activation of outer hair cells changes the stiffness of their cell bodies; this manipulates the resonance of perilymph fluid movement within the scala media and allows for fine-tuning of inner hair cell activation.

DIAGRAM

