

Notes for Histology

Ear 4/5/05

## **Ear**

Two mechanisms:

--Hearing – cochlear portion

--Balance – vestibular portion

Pathway of sound:

External auditory meatus > tympanic membrane > malleus > incus > stapes > oval window > scala vestibule > helicotrema > scala tympani > round window

Ceruminous glands produce cerumen (earwax)

Bony labyrinth consists of:

Semicircular canals

Vestibule

Cochlea

--All contain perilymph

Membranous labyrinth consists of:

Sacule

Utricle

Semicircular ducts

Cochlear ducts

--All contain endolymph

The cochlea spirals around the modiolus 2 ½ times and is innervated by the spiral ganglion, which is a portion of the cochlear portion of the vestibulocochlear nerve (CN VIII).

The cochlear duct is separated from the cochlea superiorly by the vestibular (Reissner's) membrane, inferiorly by the basilar membrane, and laterally by the stria vascularis, an epithelium that contains blood vessels.

Scala Vestibuli

**Oval Window**

**Vestibular Membrane**

Scala Media (Cochlear Duct) **Stria Vascularis**

**Basilar Membrane**

Scala Tympani

**Round Window**

**(Membranes in bold)**

Macula Utriculus -- detects horizontal spin --Makes you Upchuck

Macula Sacculus – detects vertical acceleration – Monitors Somersaults

--both have CaCO<sub>3</sub> crystals (otoliths) that sit on otolithic membrane

### Hair Cells

Each one has a kinocilium (sensory component) and 50 to 100 stereocilia, with the longest one being nearest the kinocilium.

Type I – flask-shaped

Type II – cylindrical

Crista Ampullaris – covered by sensory epithelium with hair cells and supporting cells

The gelatinous cupola covers the crista ampullaris and detects the movement of endolymph instead of using otoliths.