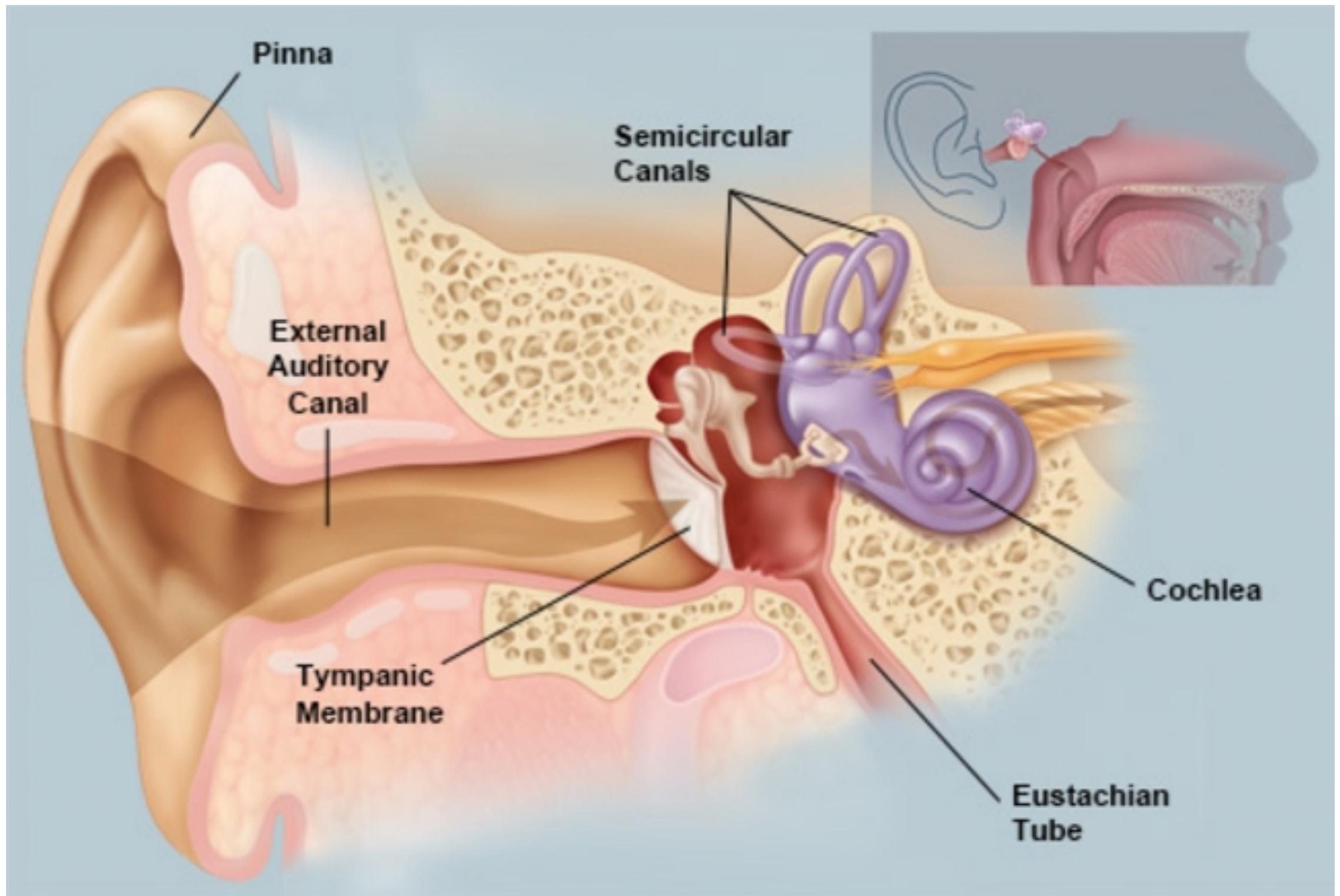


Auditory coding



Pinna

**Semicircular
Canals**

**External
Auditory
Canal**

Cochlea

**Tympanic
Membrane**

**Eustachian
Tube**

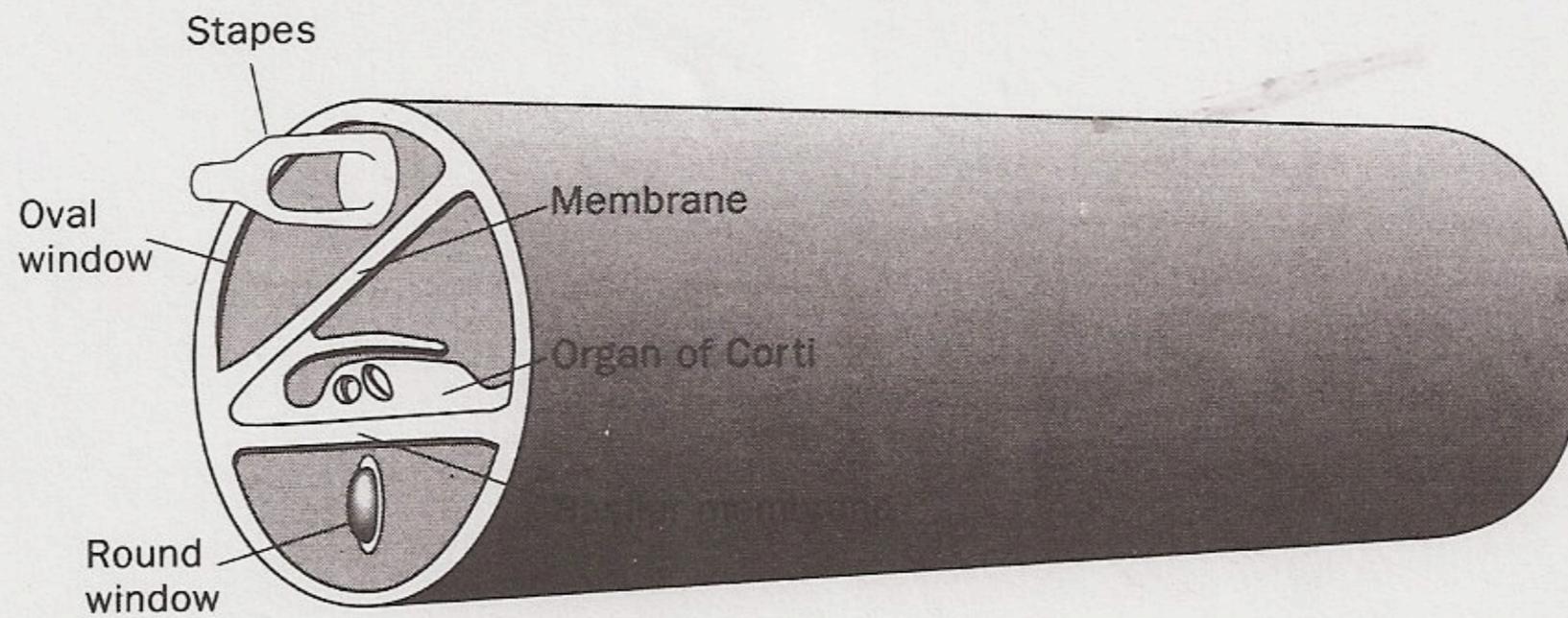
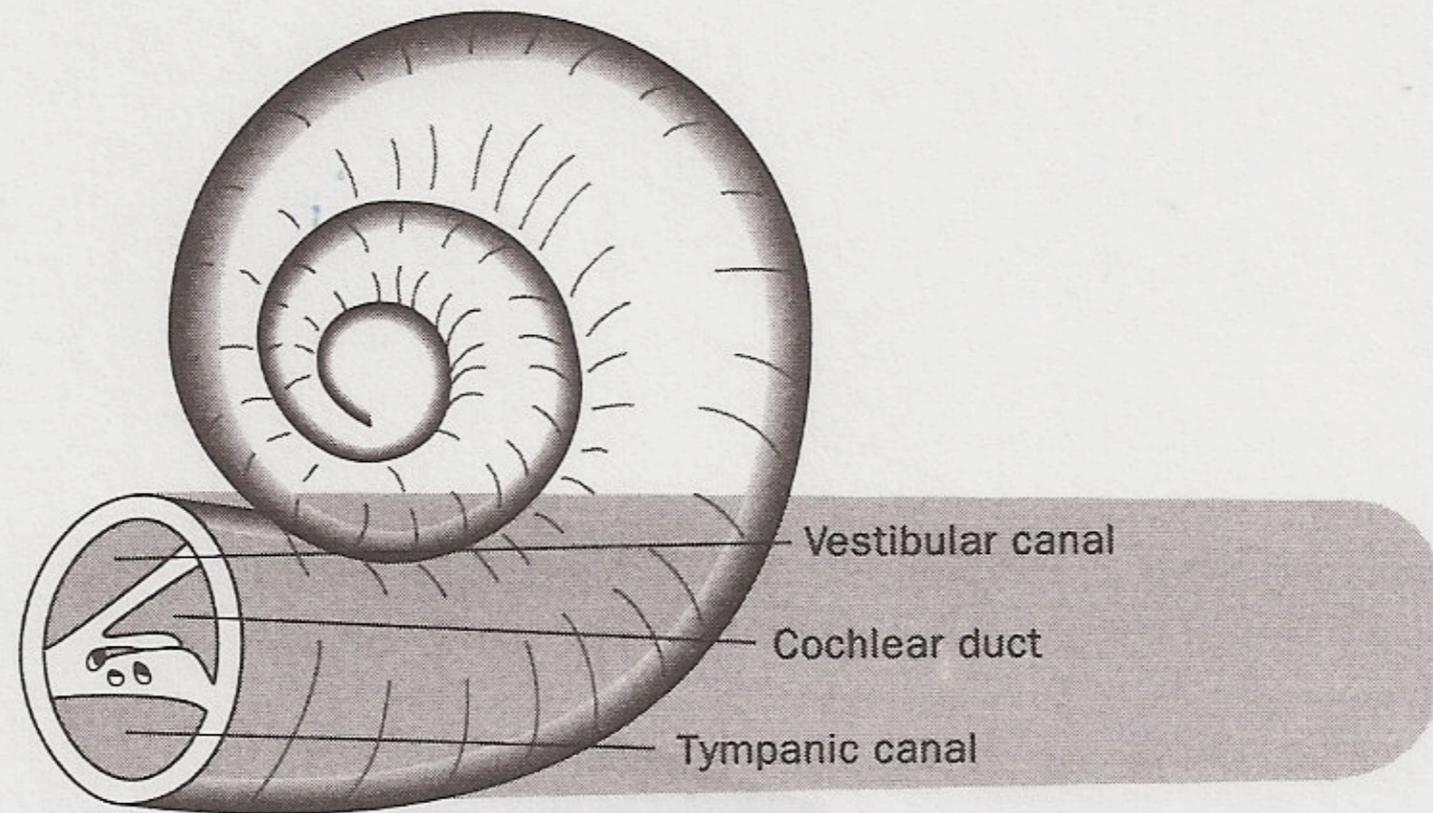
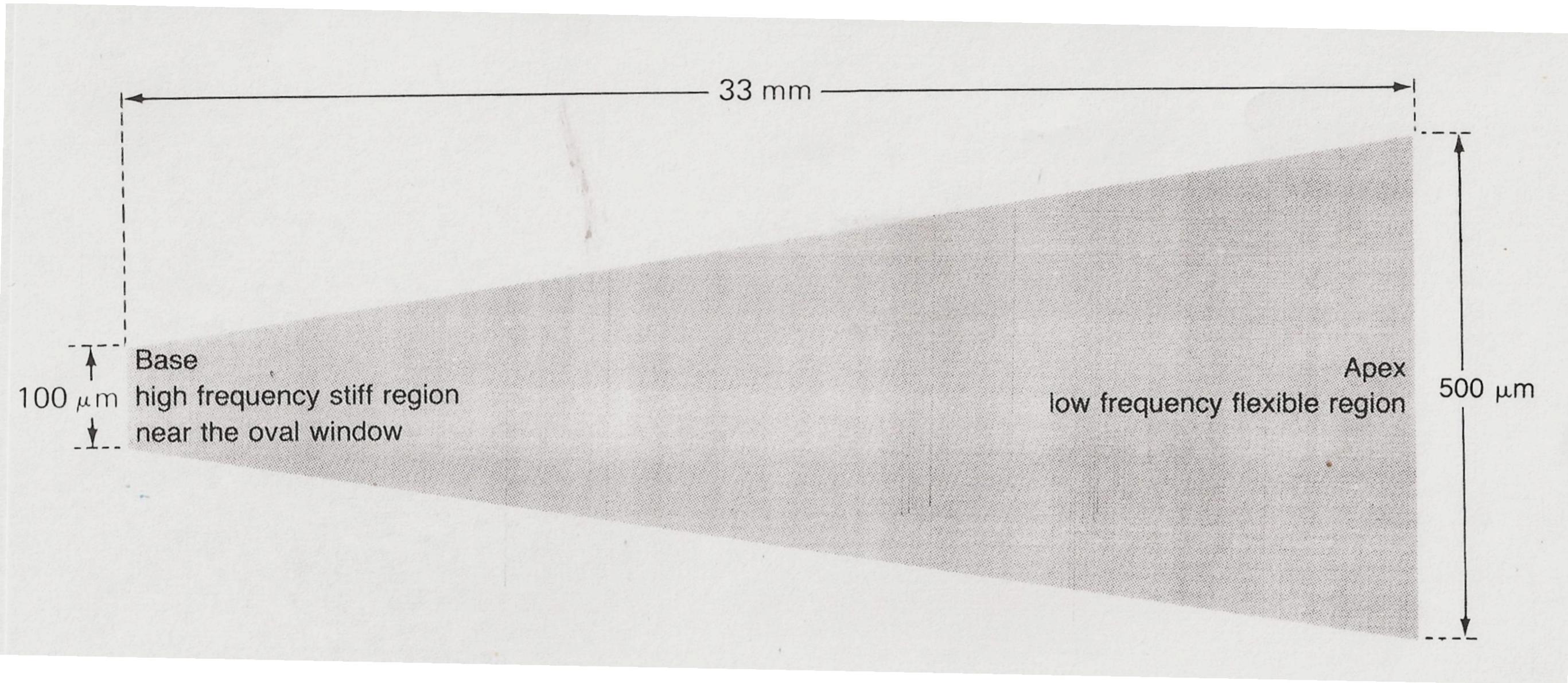
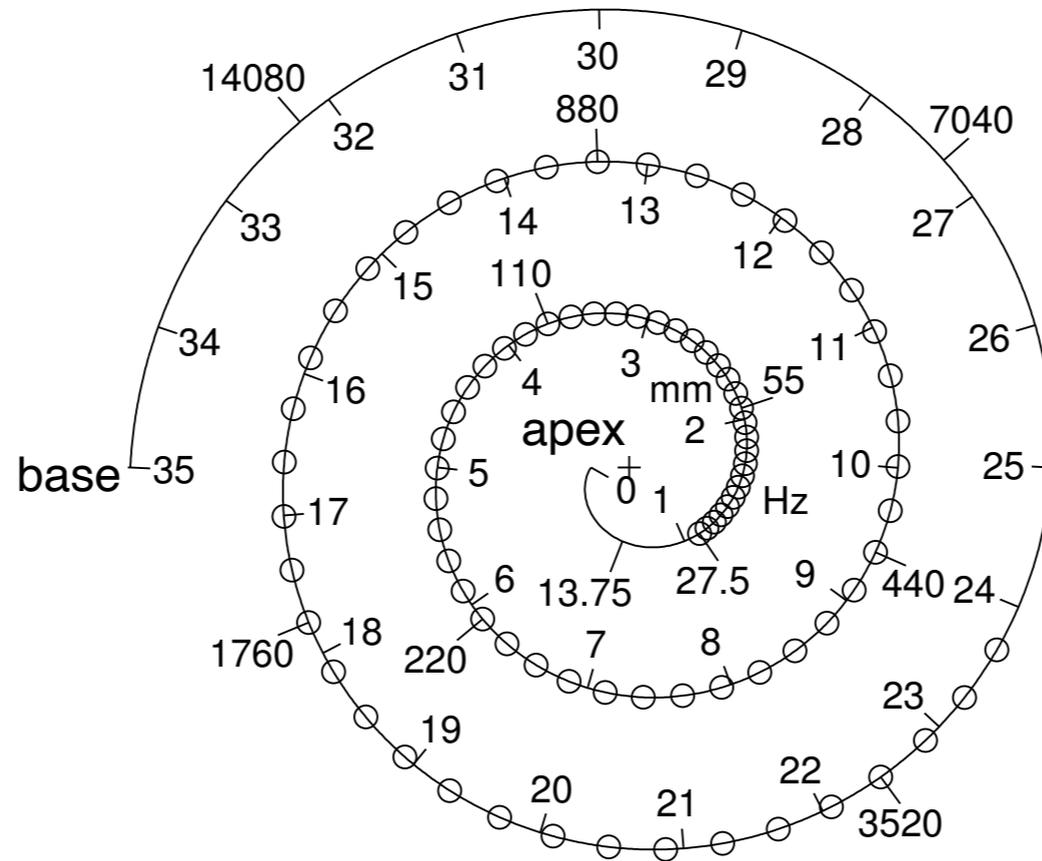
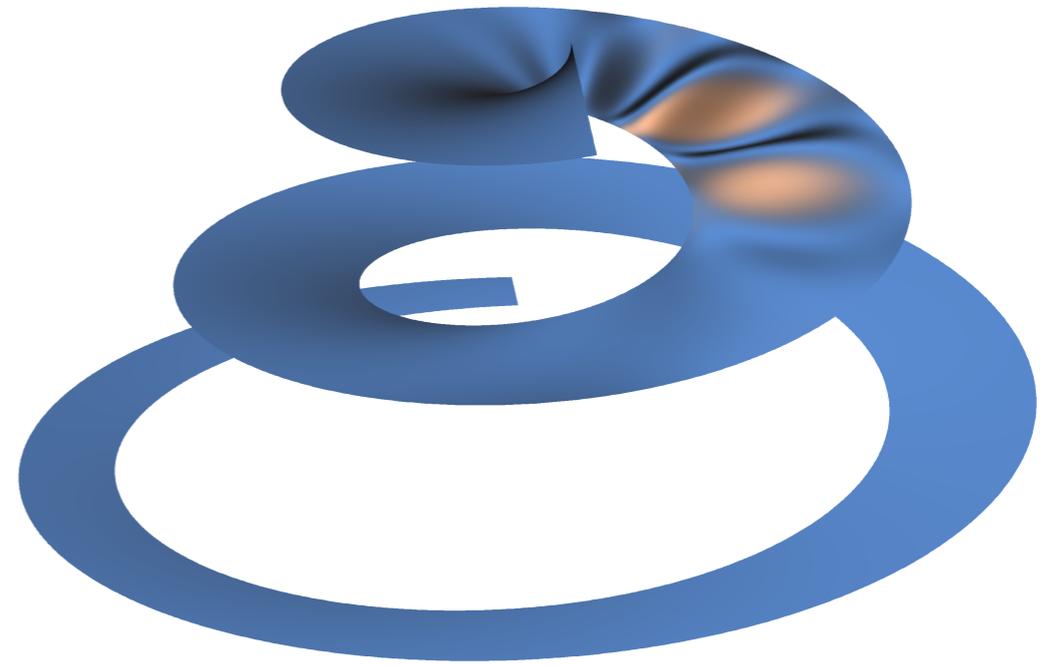
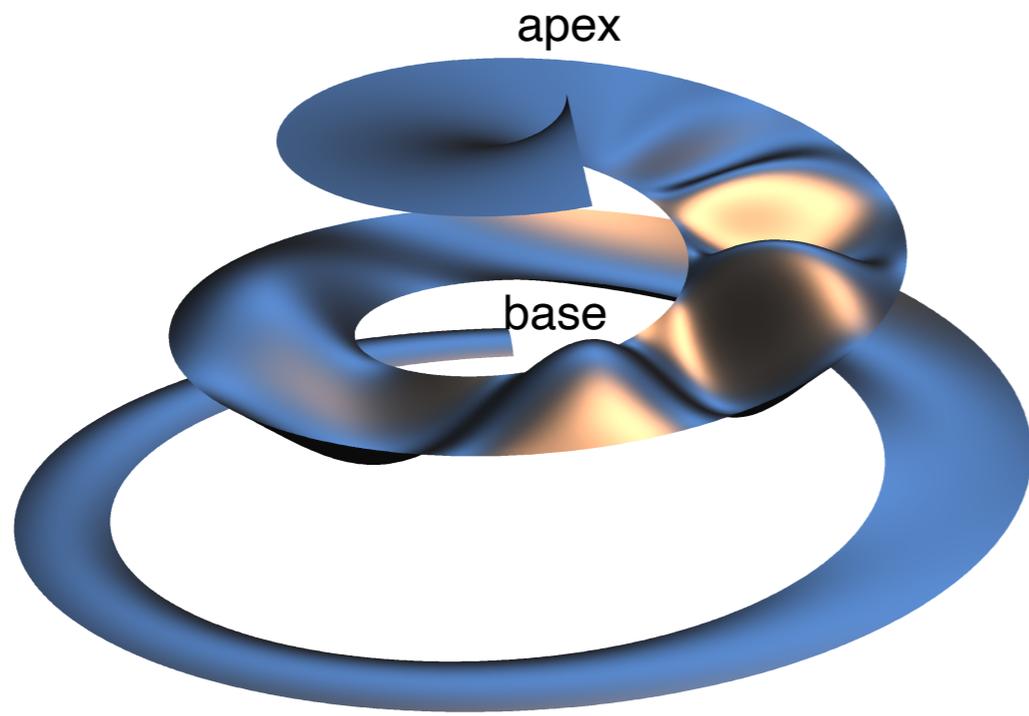
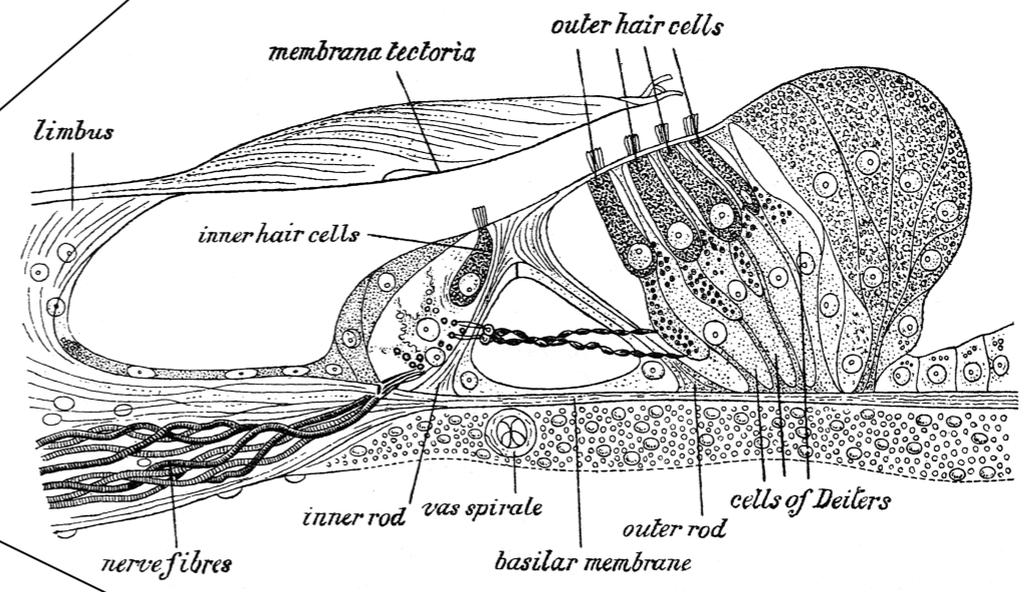
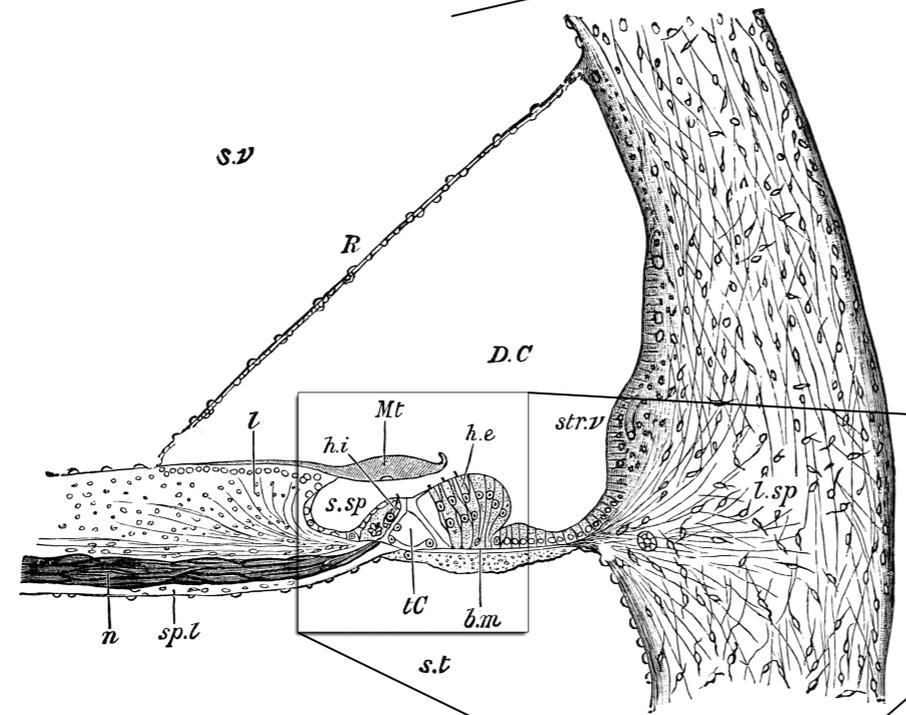
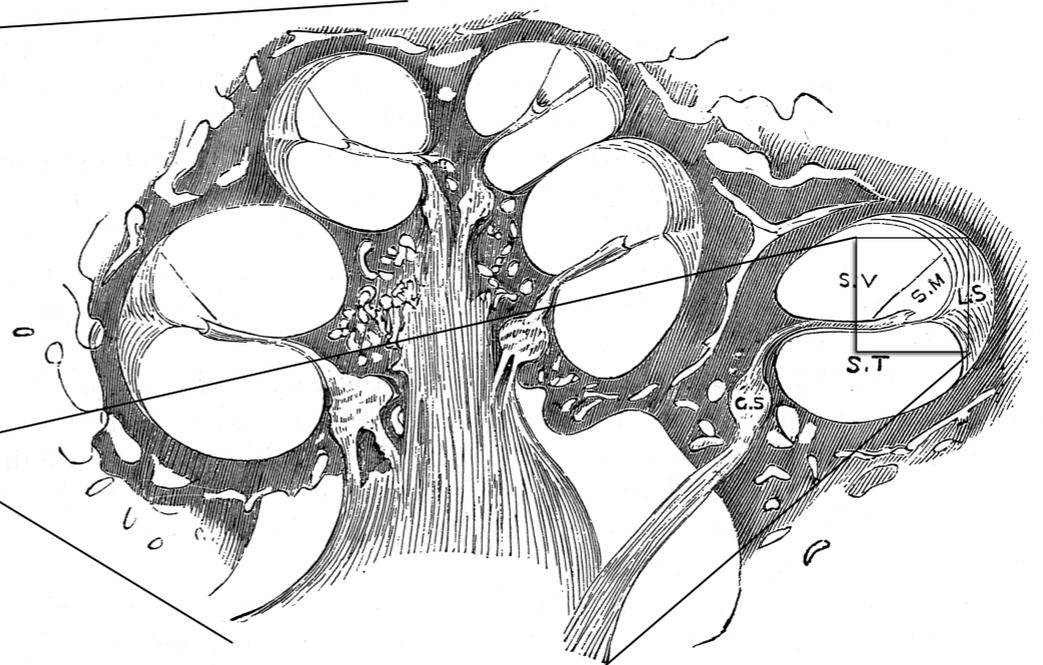
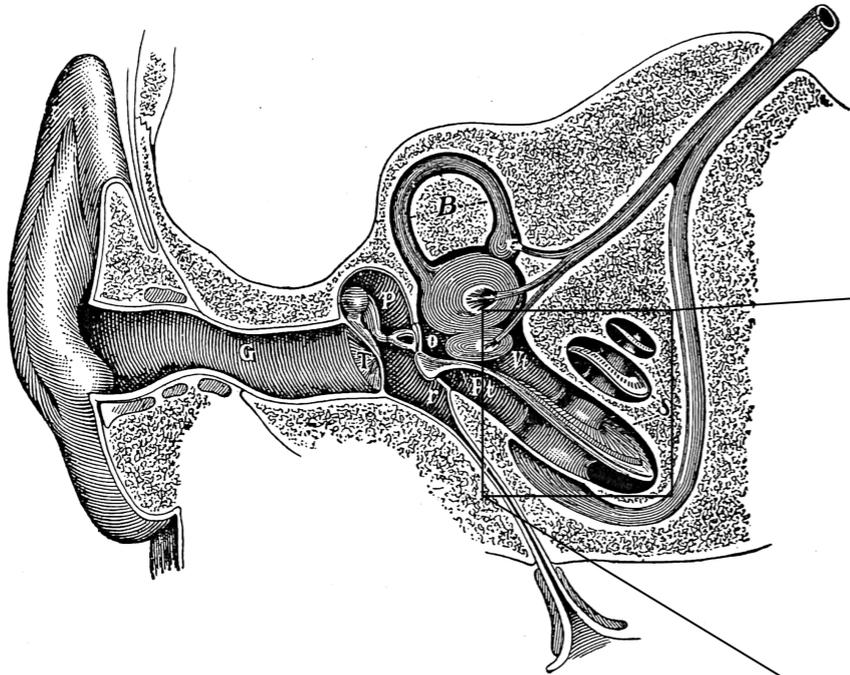


FIGURE 9.11 A section of an uncoiled cochlea.

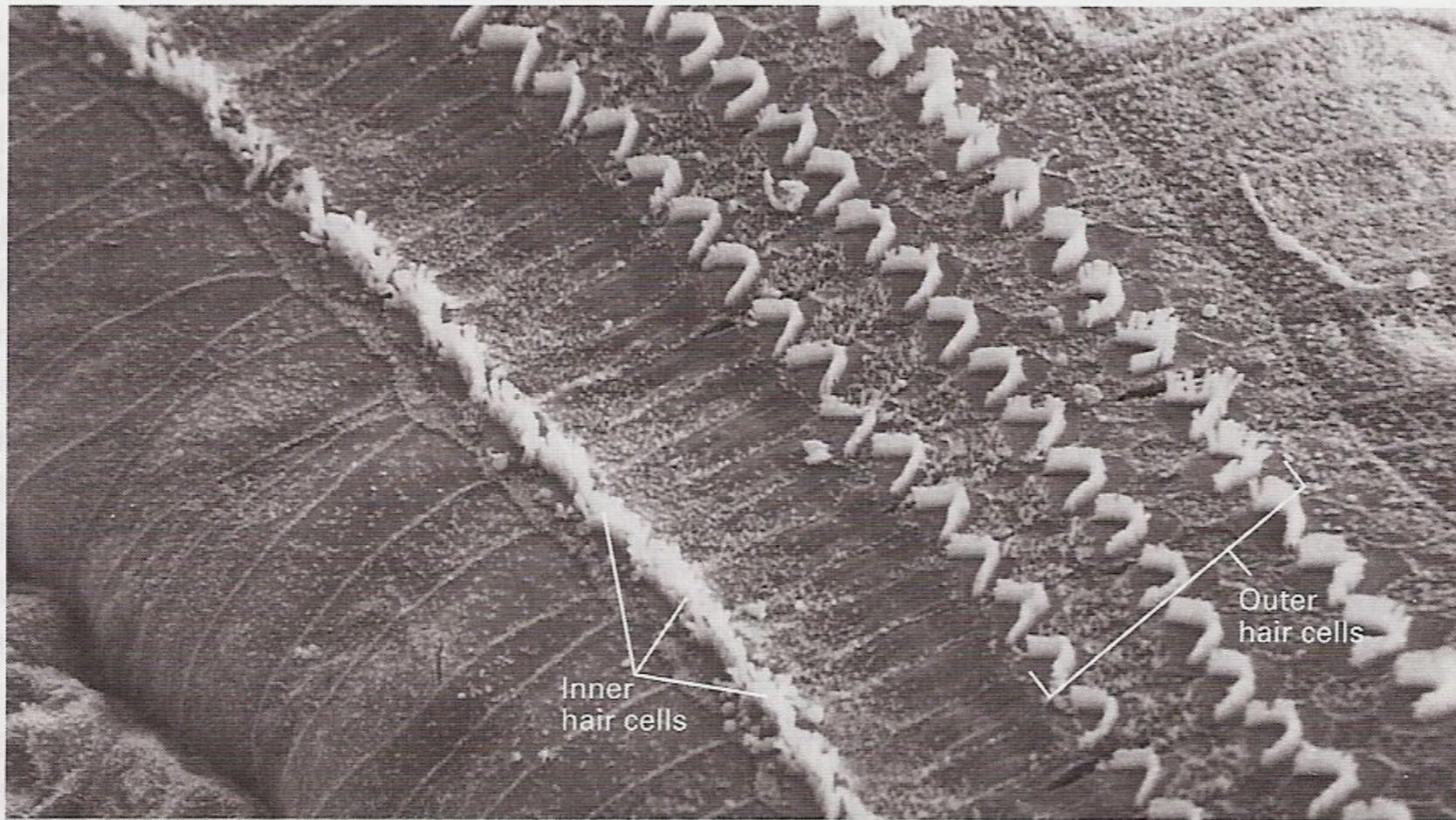
Basilar membrane



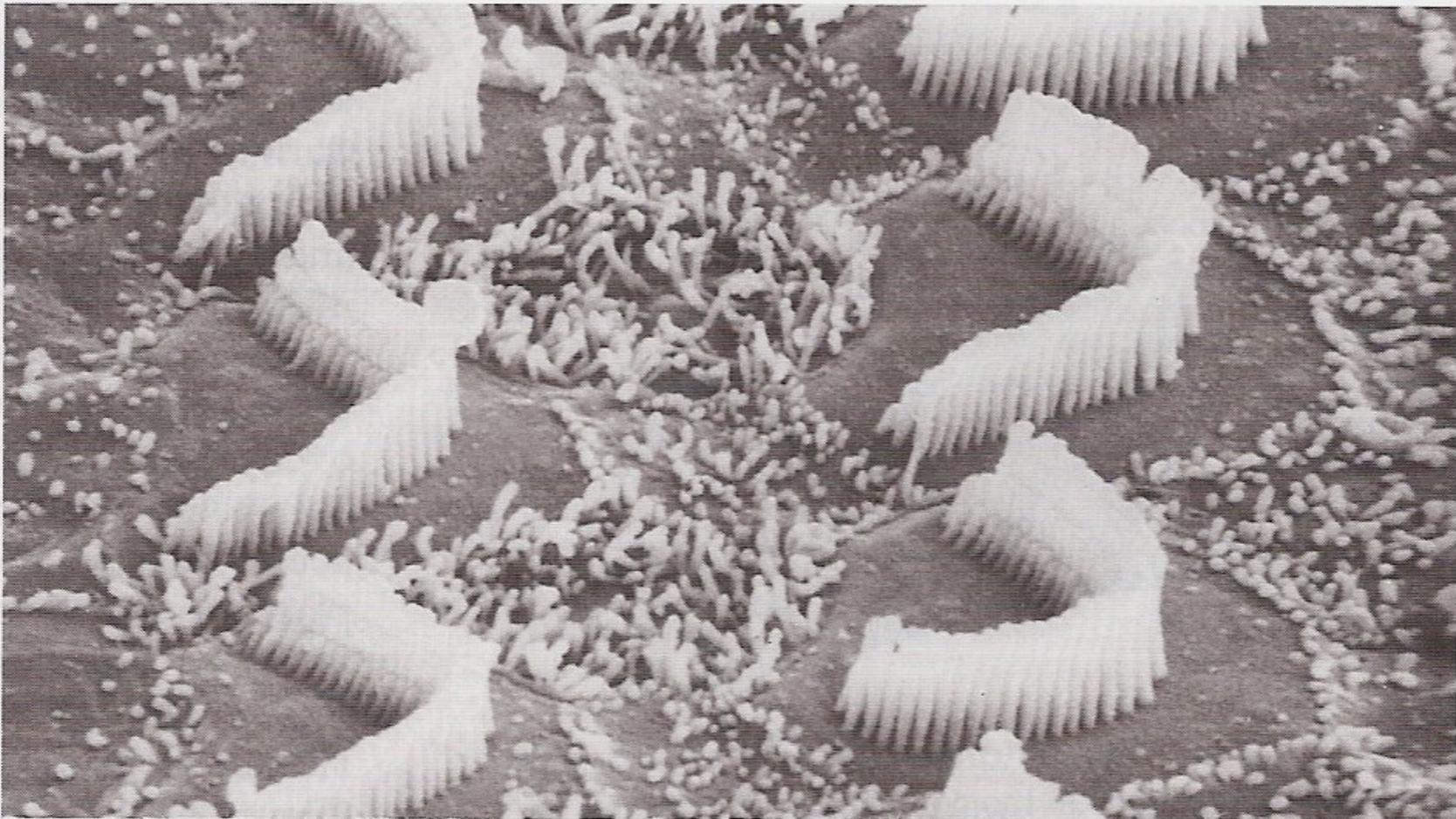




A



B

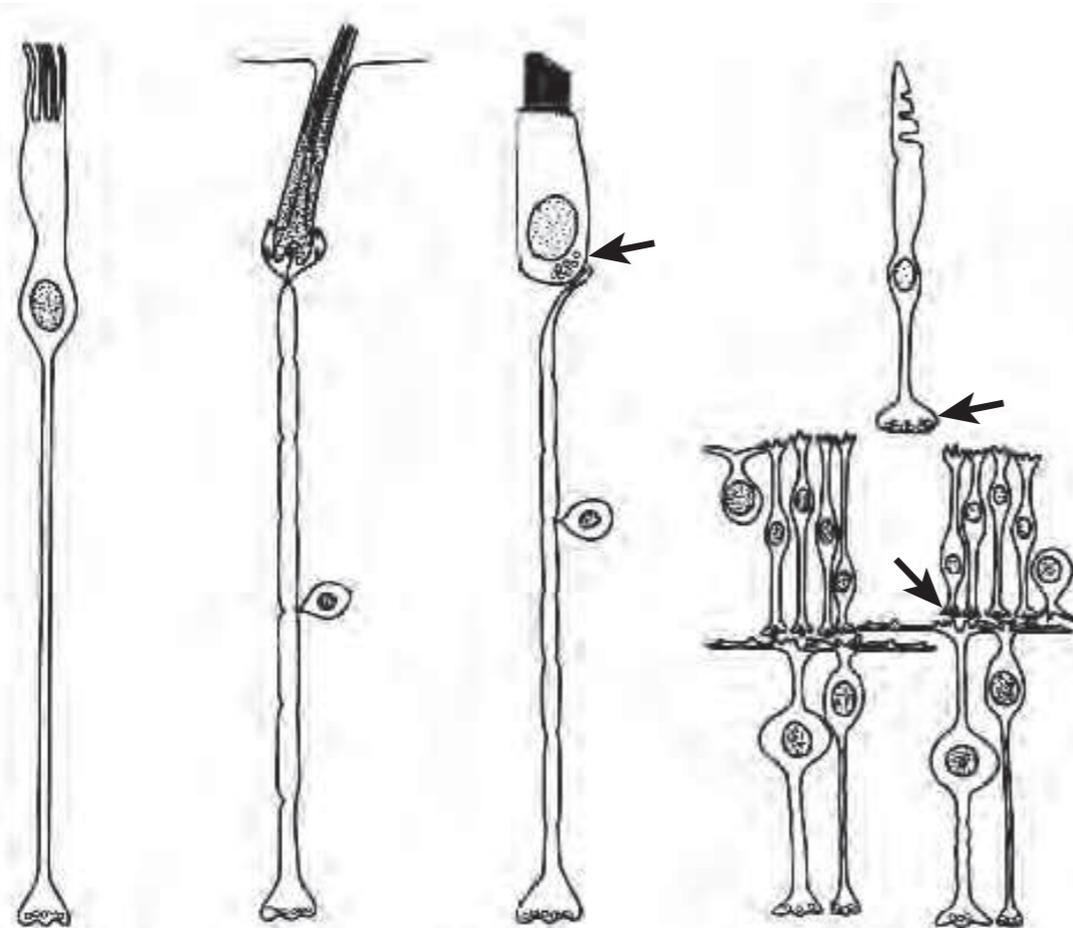


smell

touch

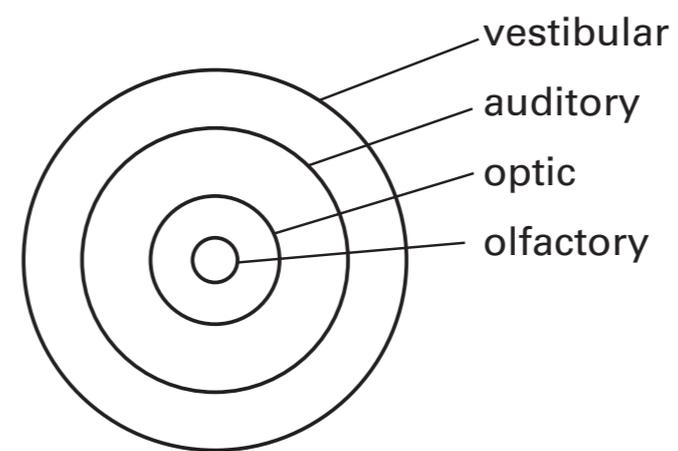
hearing

vision



axon diameter

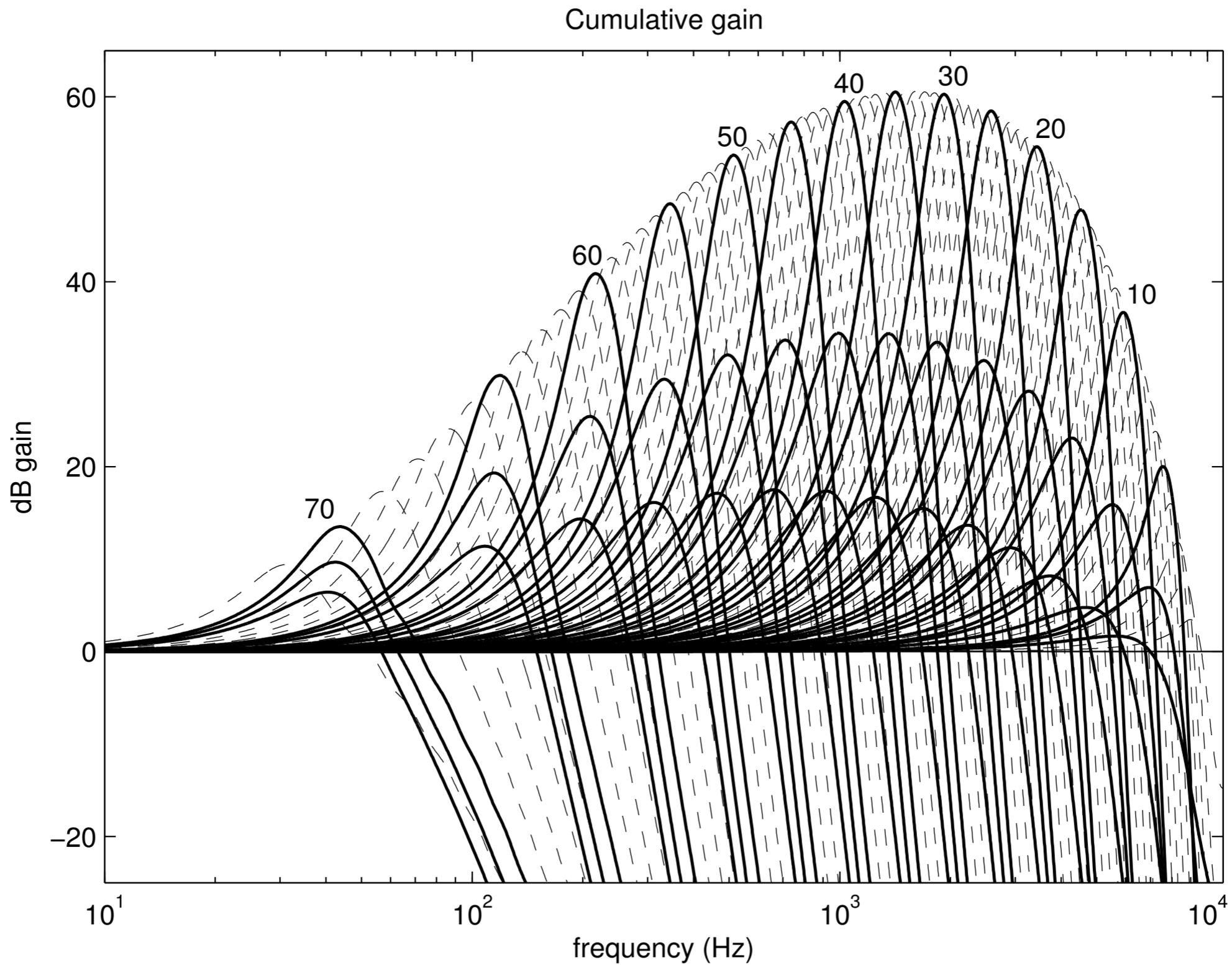
number of axons



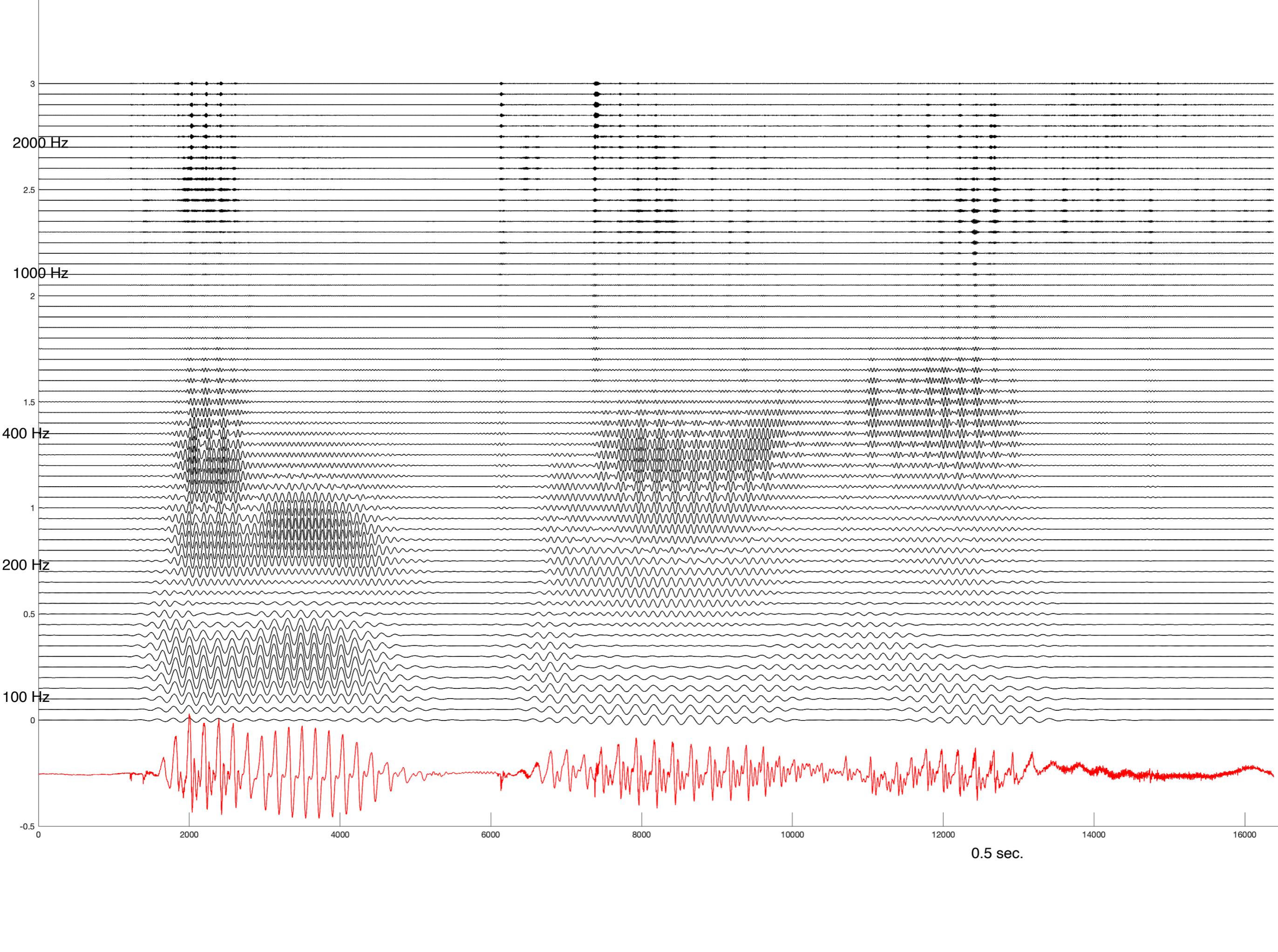
10^4
 5×10^4
 10^6
 10^7

From: Sterling & Laughlin (2017)

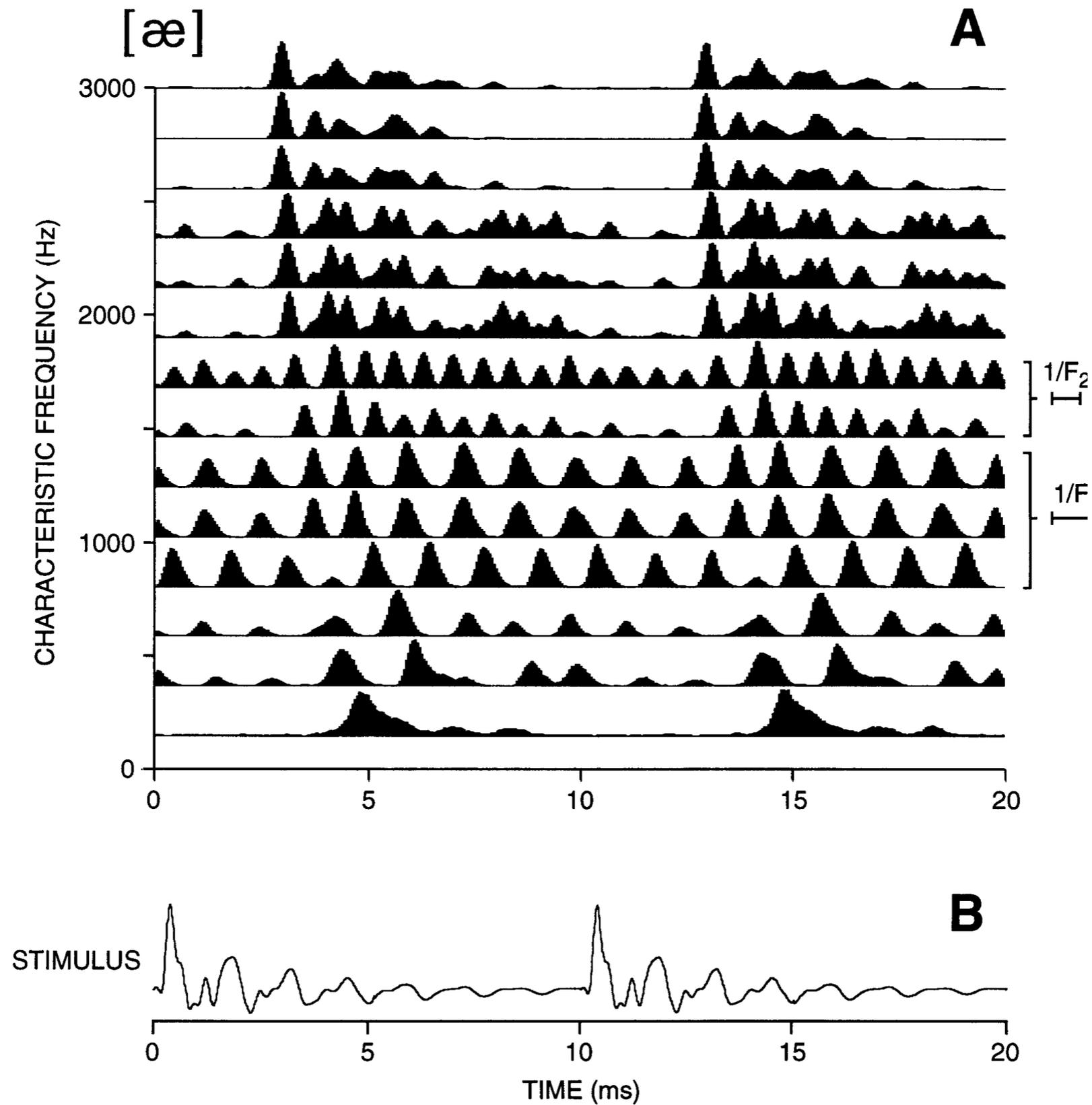
'Auditory Filters'



(from Lyon 2017)

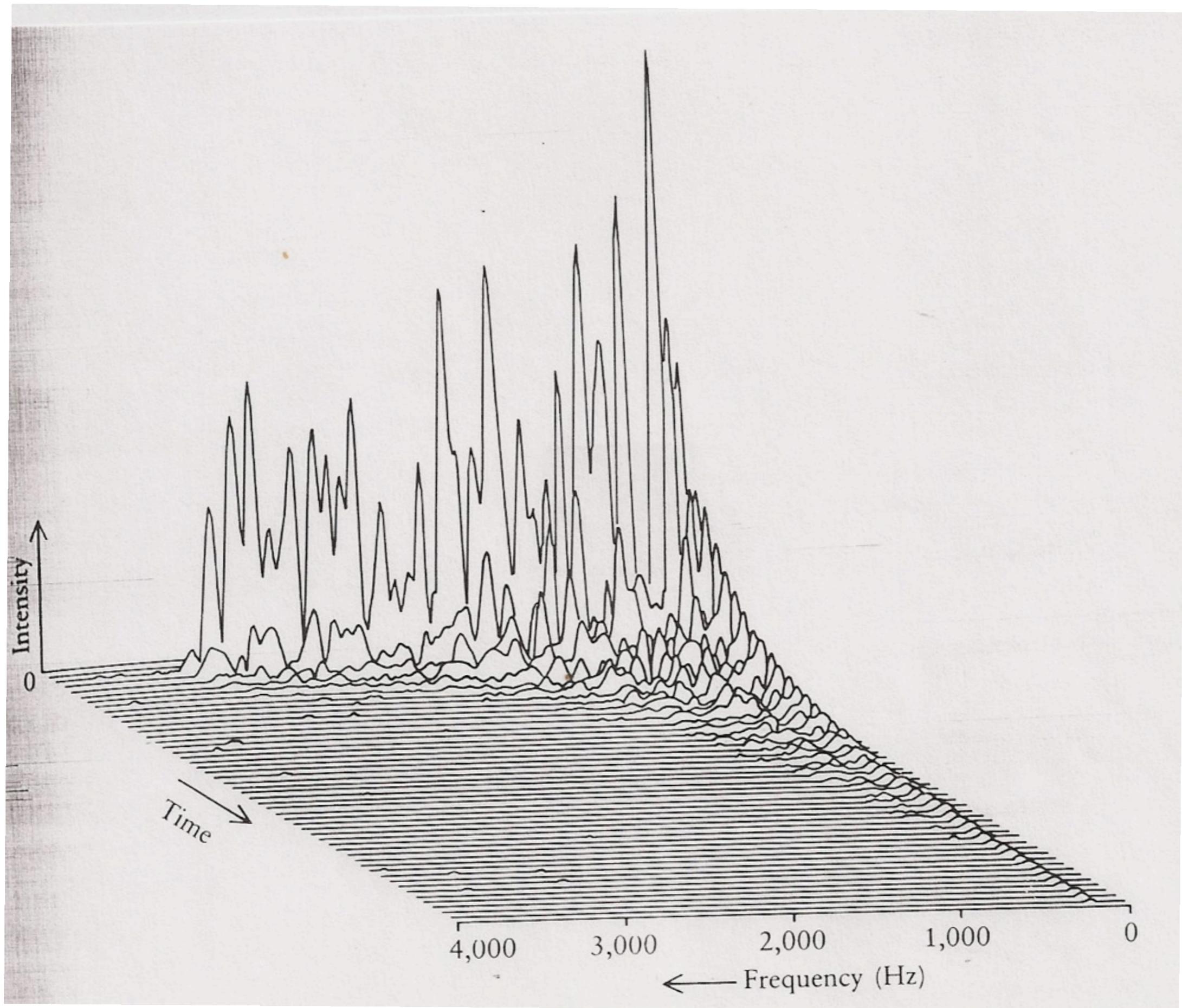


Spikes of auditory nerve fibers are phase locked to components of sound waveform



(from Delgutte 1997)

Fourier analysis
vs.
Time-frequency analysis



Effect of temporal envelope on timbre

(ASA auditory demonstrations CD, tracks 54-56)

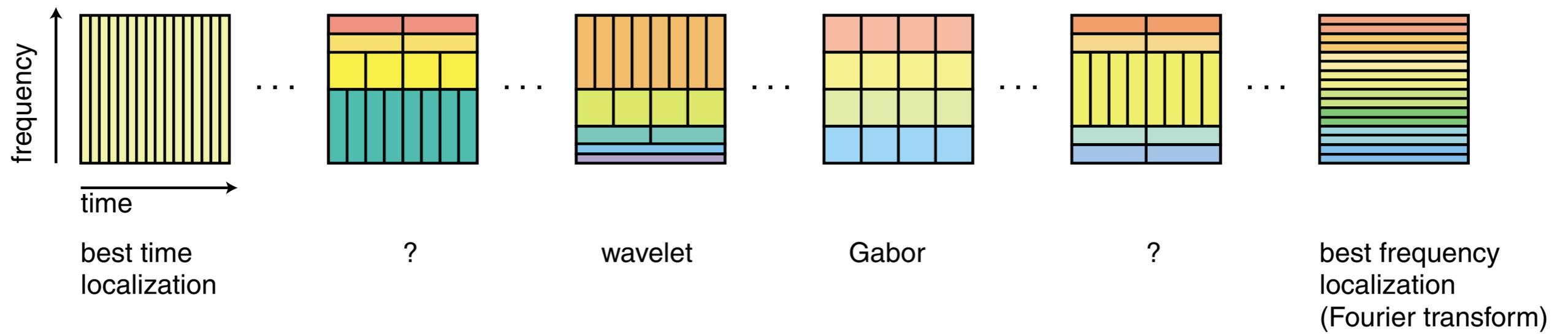
Original

Notes played backward

Recording of notes
played backward,
played backward

Circularity in pitch judgement
(ASA auditory demonstrations CD, track 52)

Tritone paradox
(Diana Deutsch musical illusions CD, tracks 14-18)



(from Olshausen & O'connor 2002)