A L L Y N   A N D   B A C O N

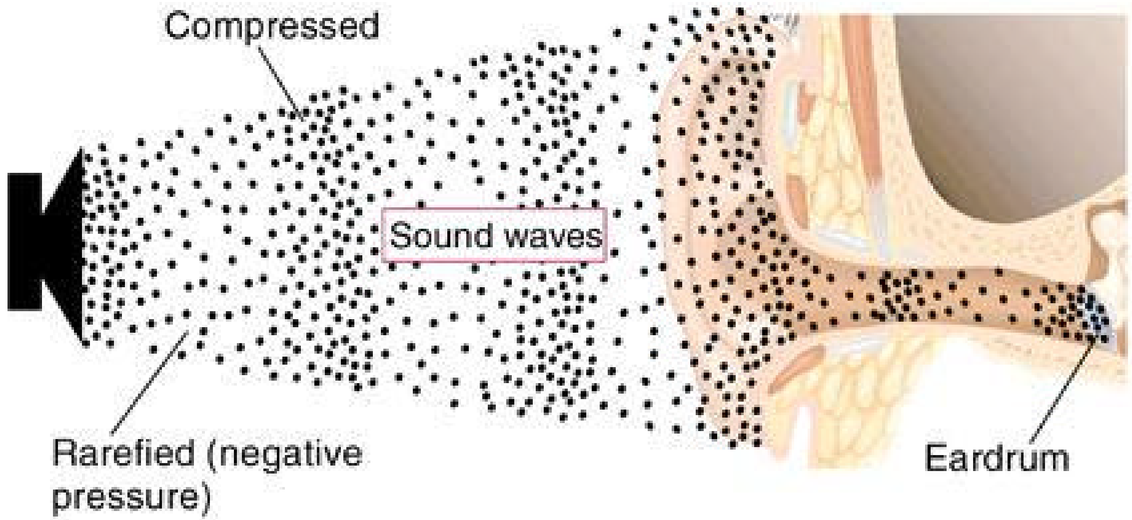
for Physiology of Behavior

by Neil R. Carlson *Seventh Edition*

CHAPTER 7

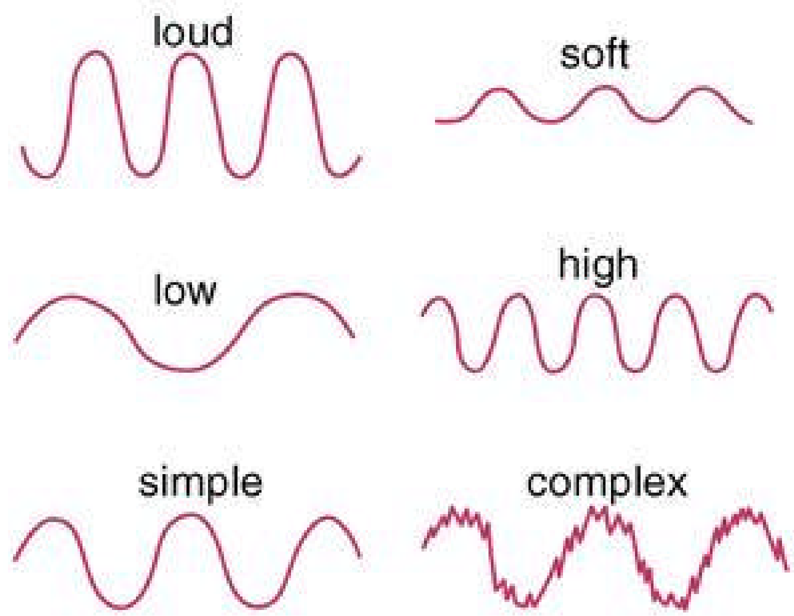
Audition, the Body Senses, and the Chemical Senses

► Sound Waves

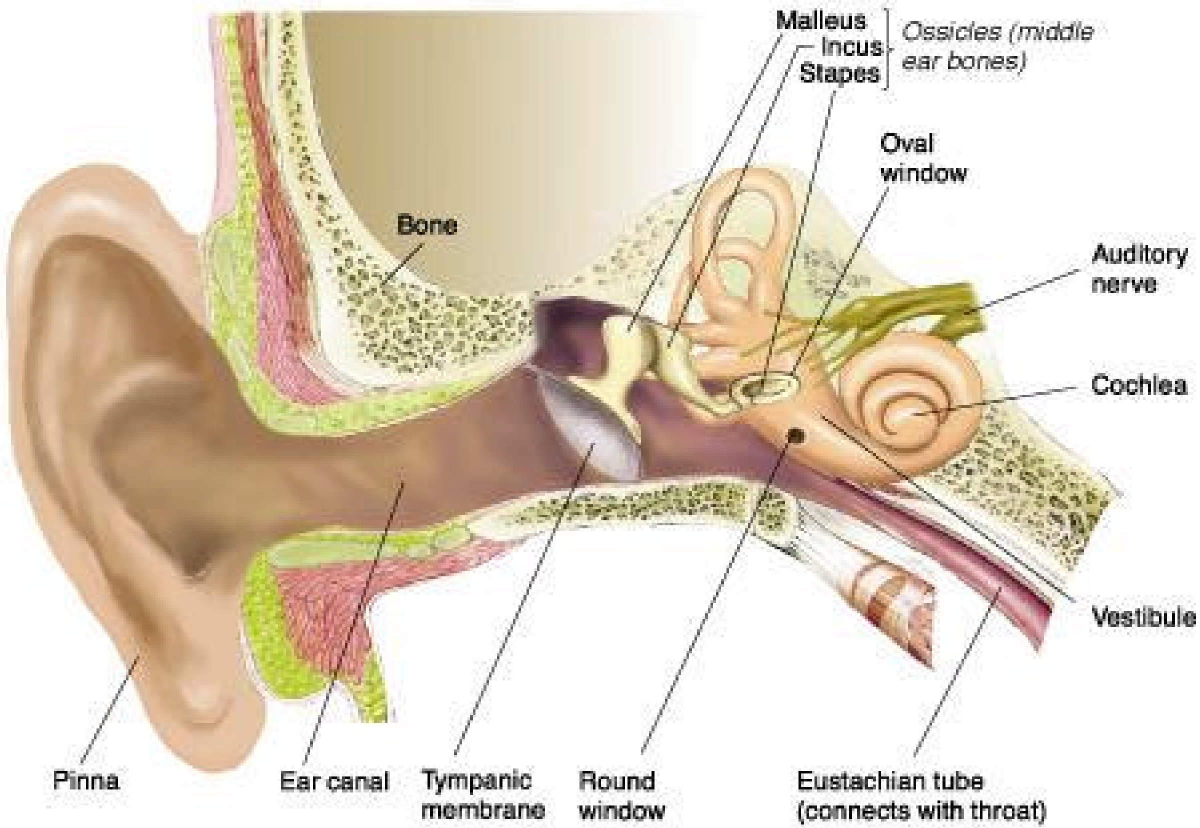

Compressed
Sound waves
Rarefied (negative pressure)
Eardrum

► The Physical and Perceptual Dimensions of Sound Waves

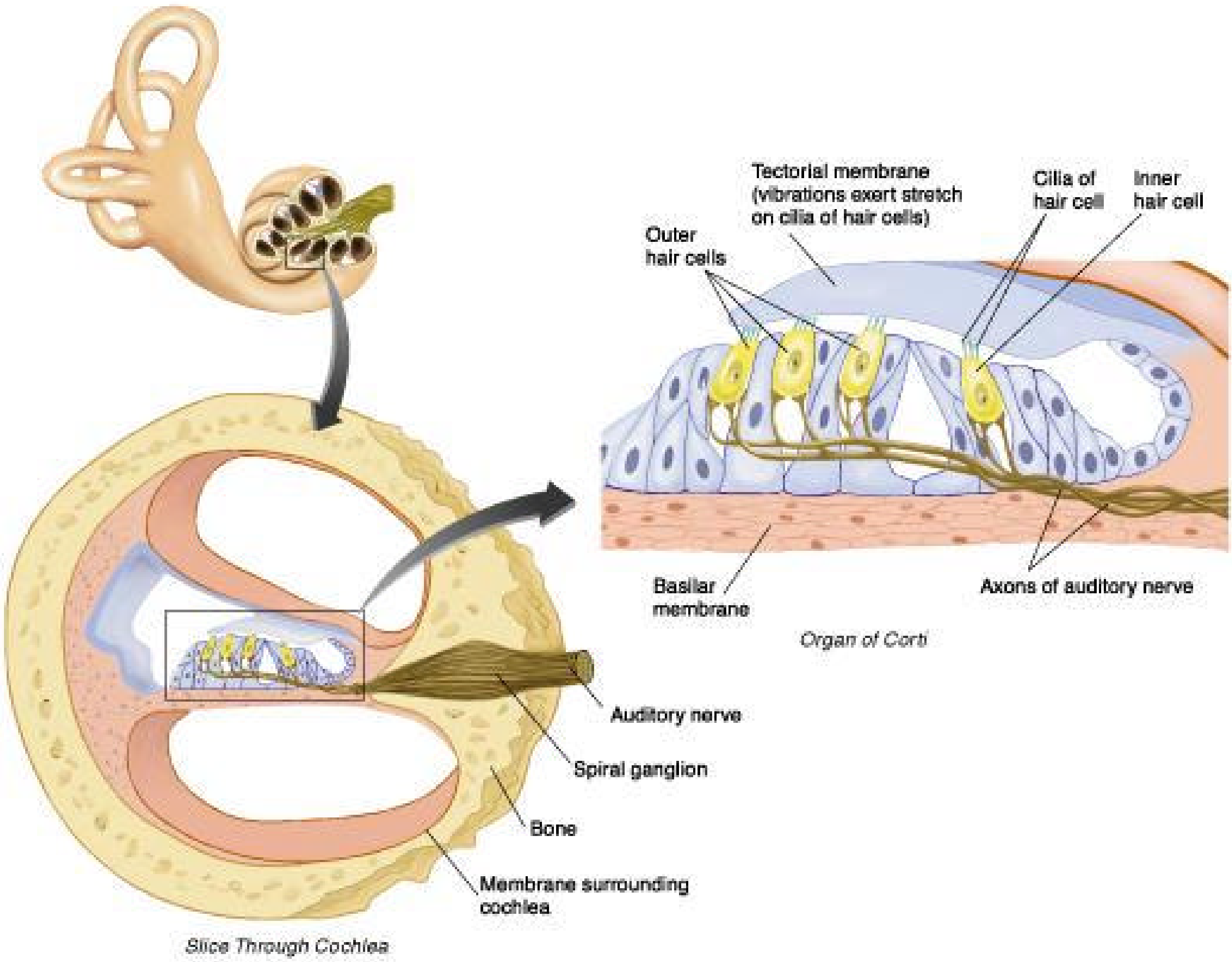
Physical Dimension	*Perceptual Dimension*
Amplitude (intensity)	Loudness
Frequency	Pitch
Complexity	Timbre



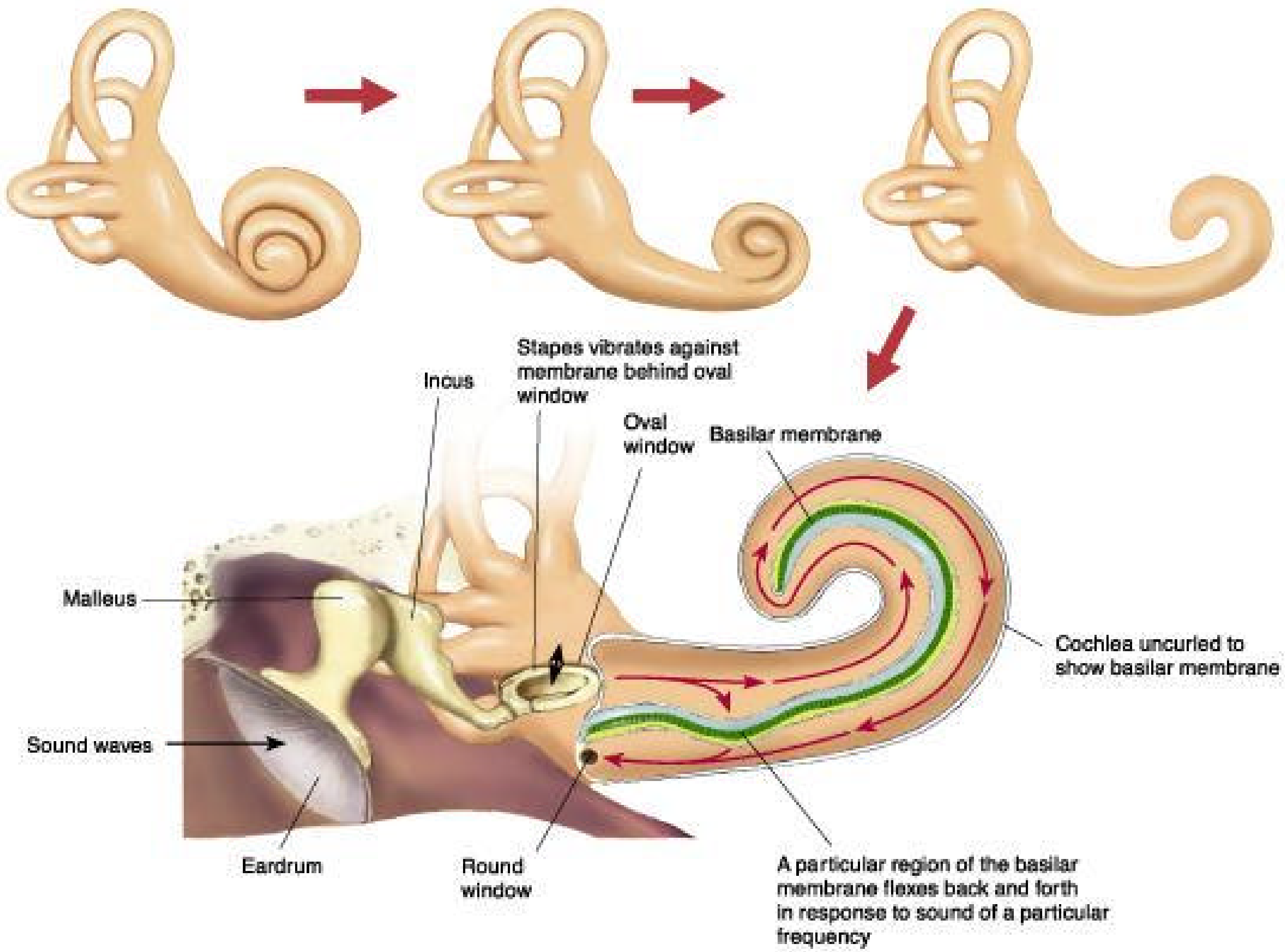
▸ The Auditory Apparatus



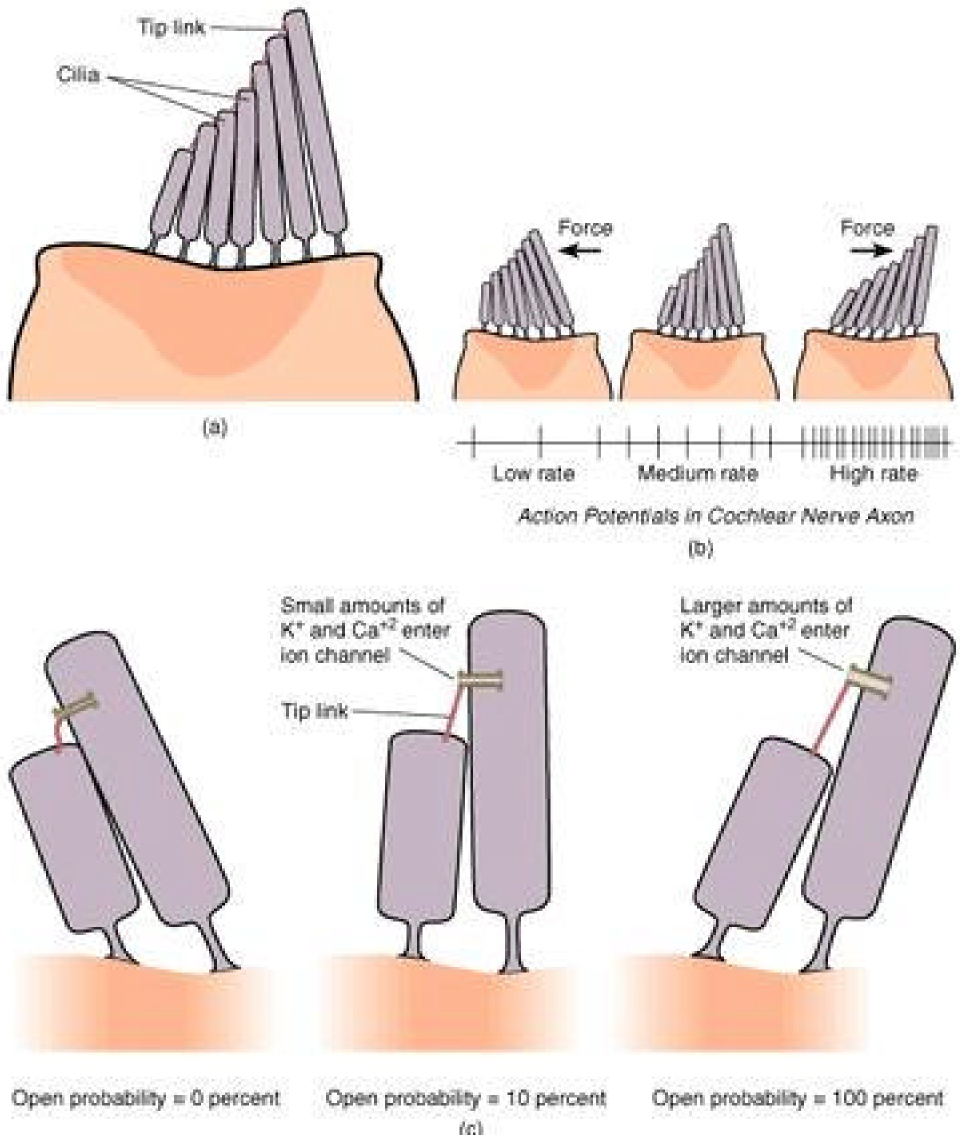
▸ Cross section through the Cochlea



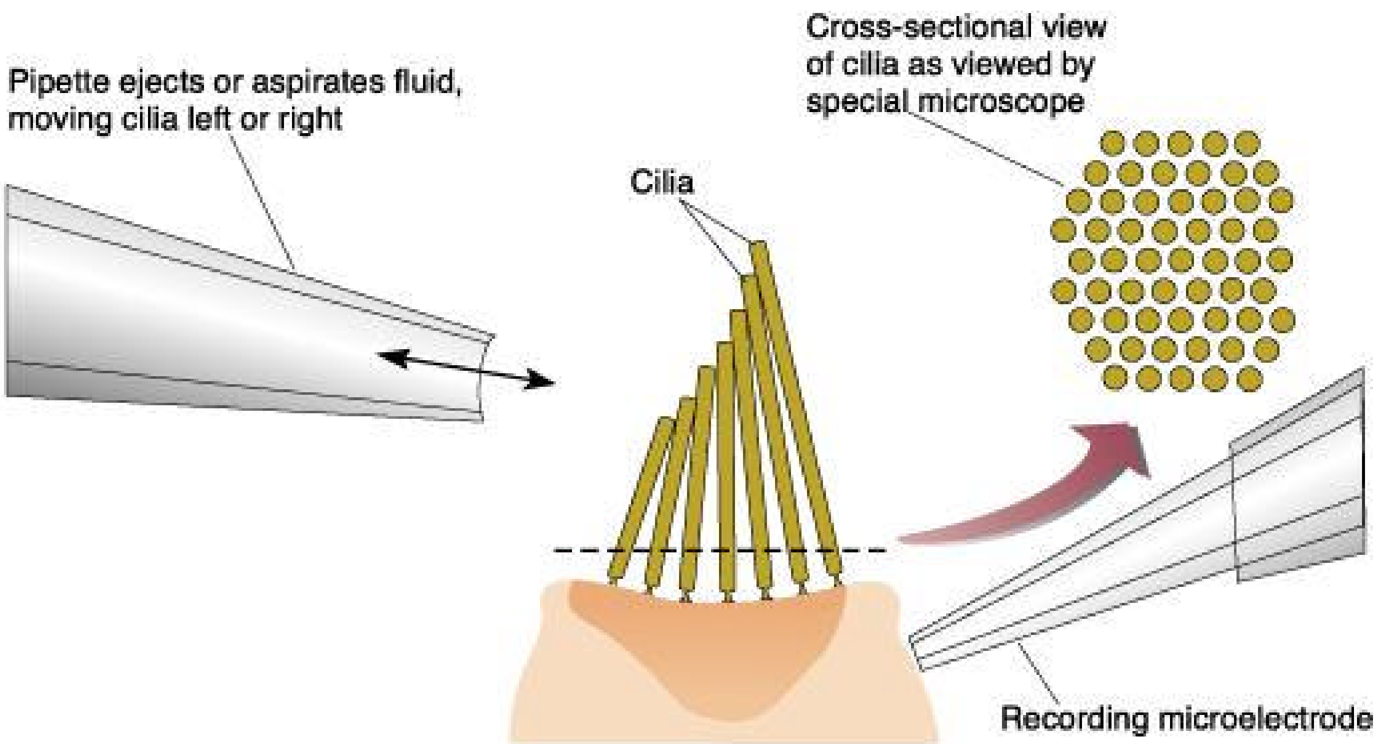
▸ Responses to Sound Waves



▶ Transduction of Hair Cells in the Inner Ear

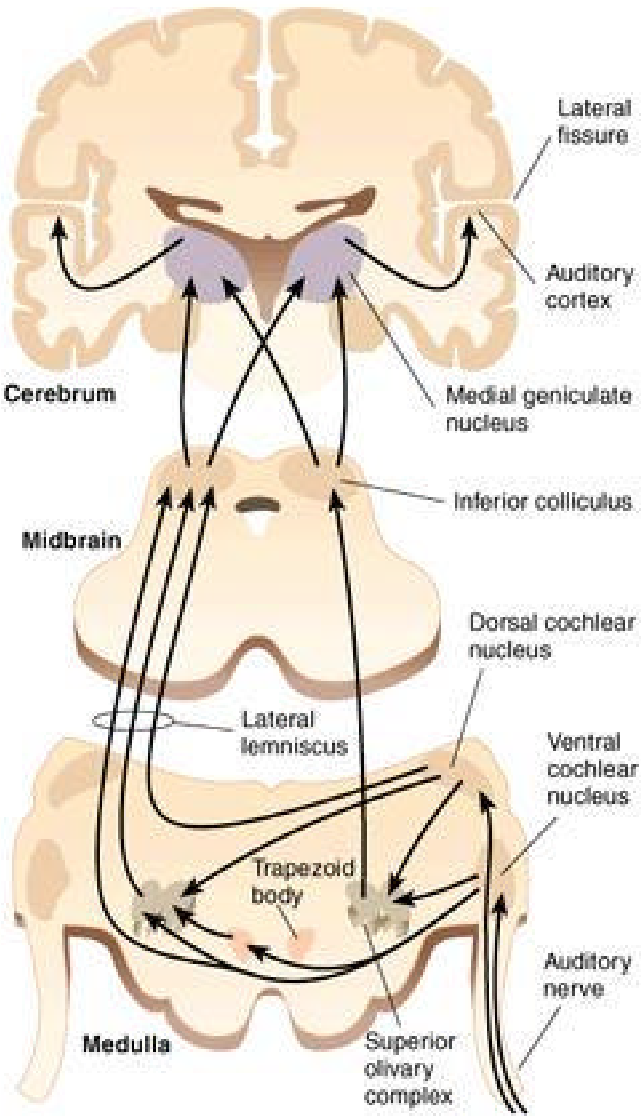


▶ The Experimental Setup used by Denk et al. (1995) to Detect the Influx of Calcium into the Cilia of Hair Cells of the Inner Ear

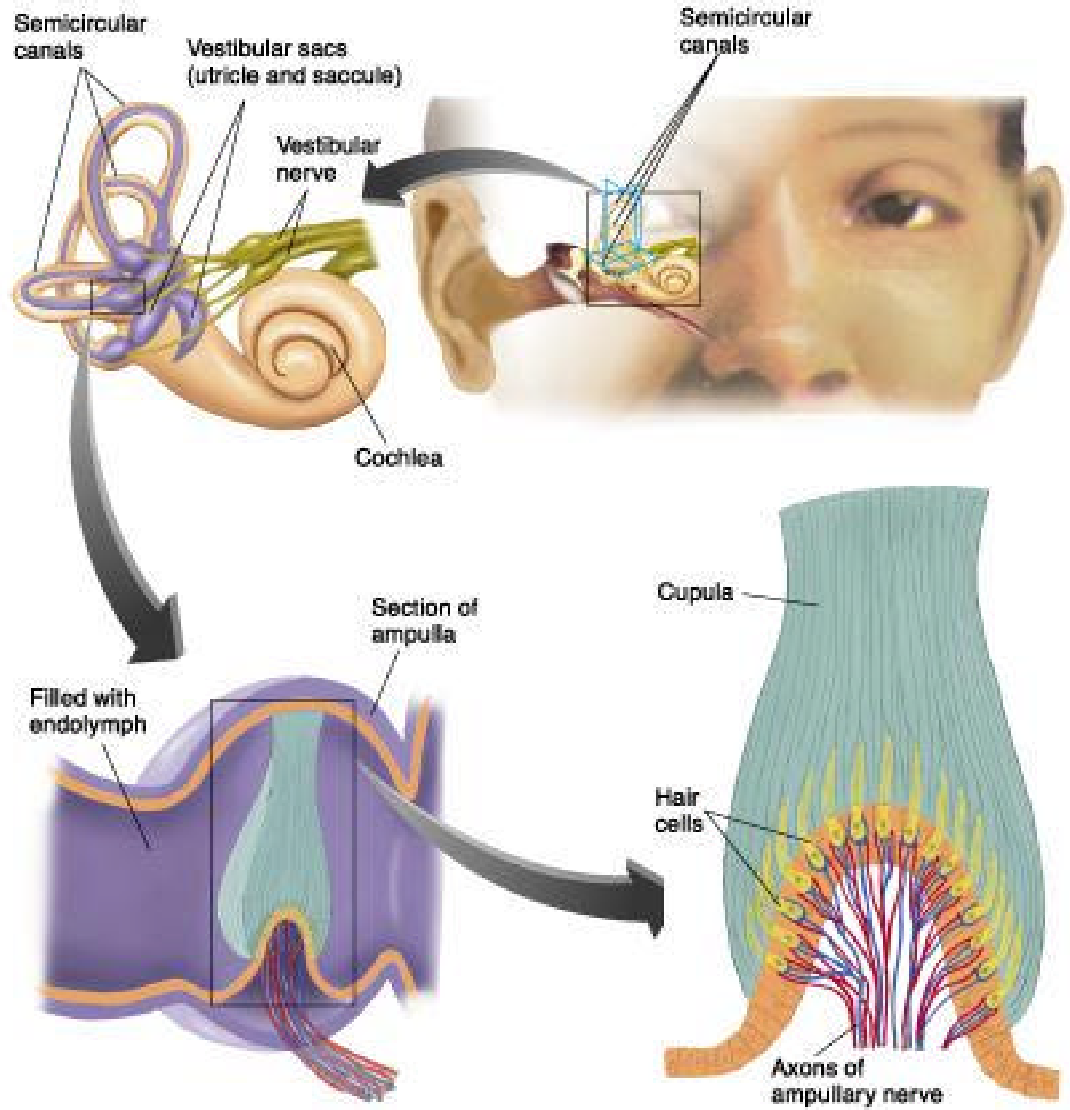


Source: Adapted from Denk, W., Holt, J.R., Shepherd, G.M.G., and Corey, D.P. Neuron, 1995, 15, 1311-1321.

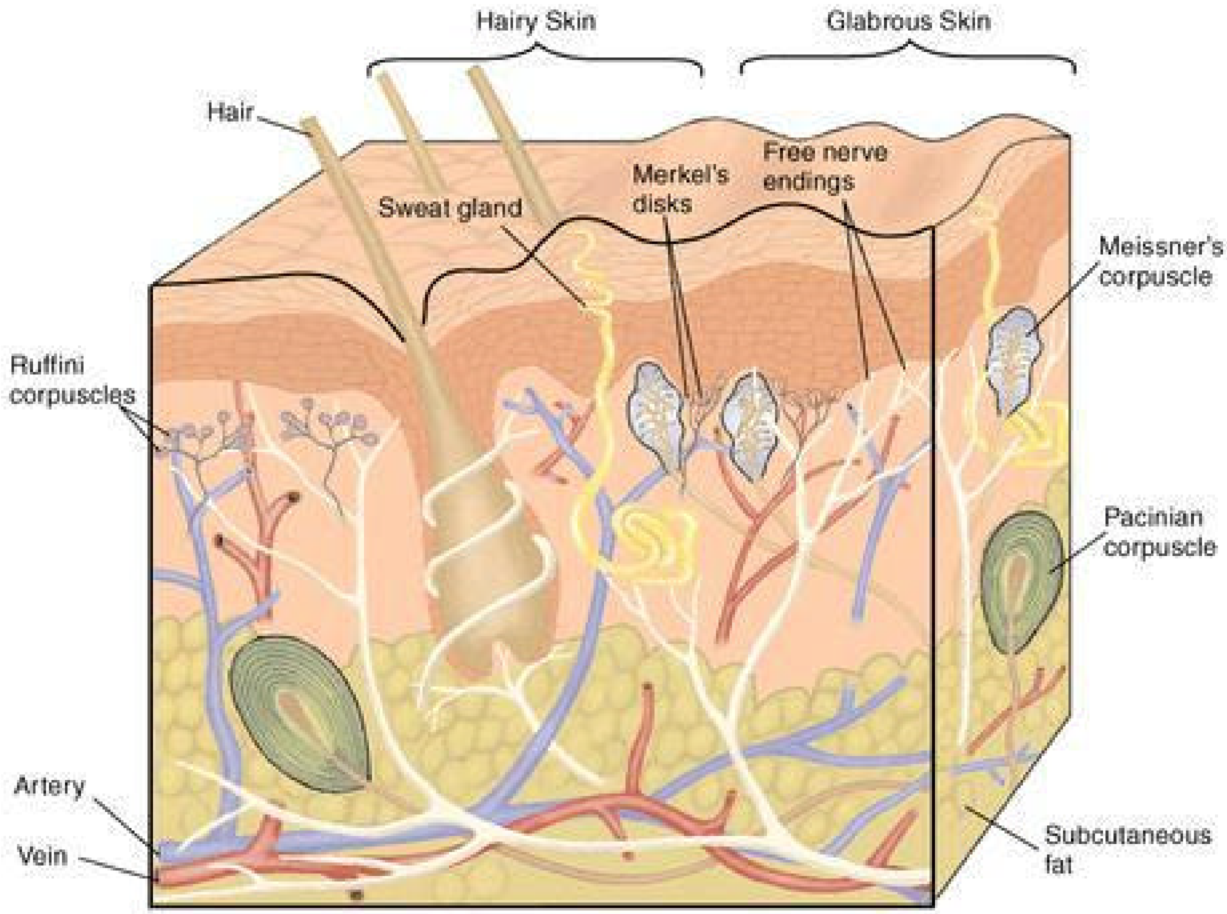
► The Pathway of the Auditory System



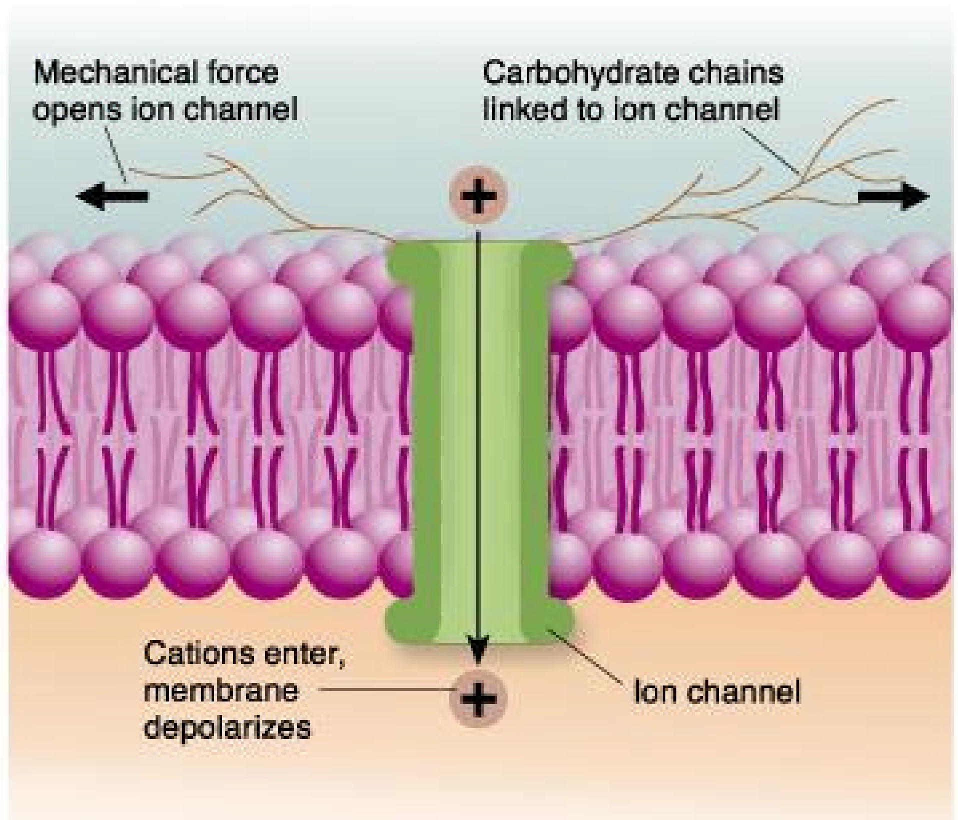
▶ Receptive Organ of the Semicircular Canals



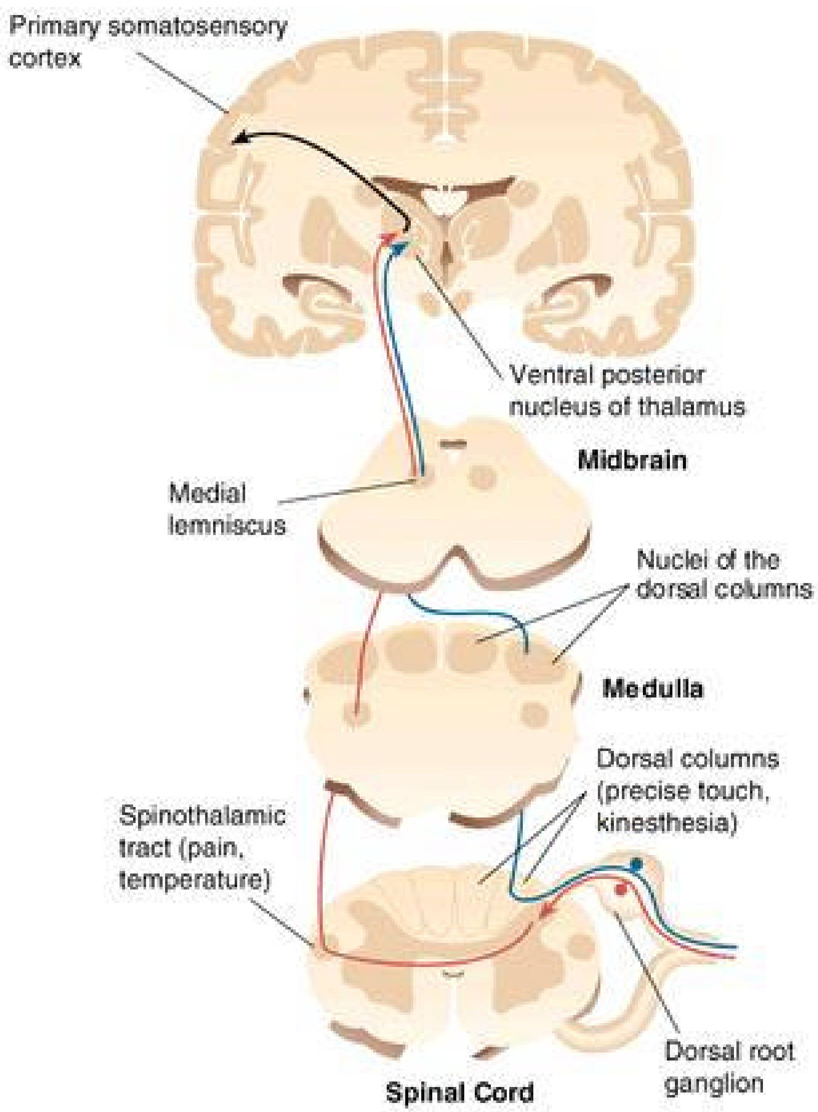
▸ Cutaneous Receptors



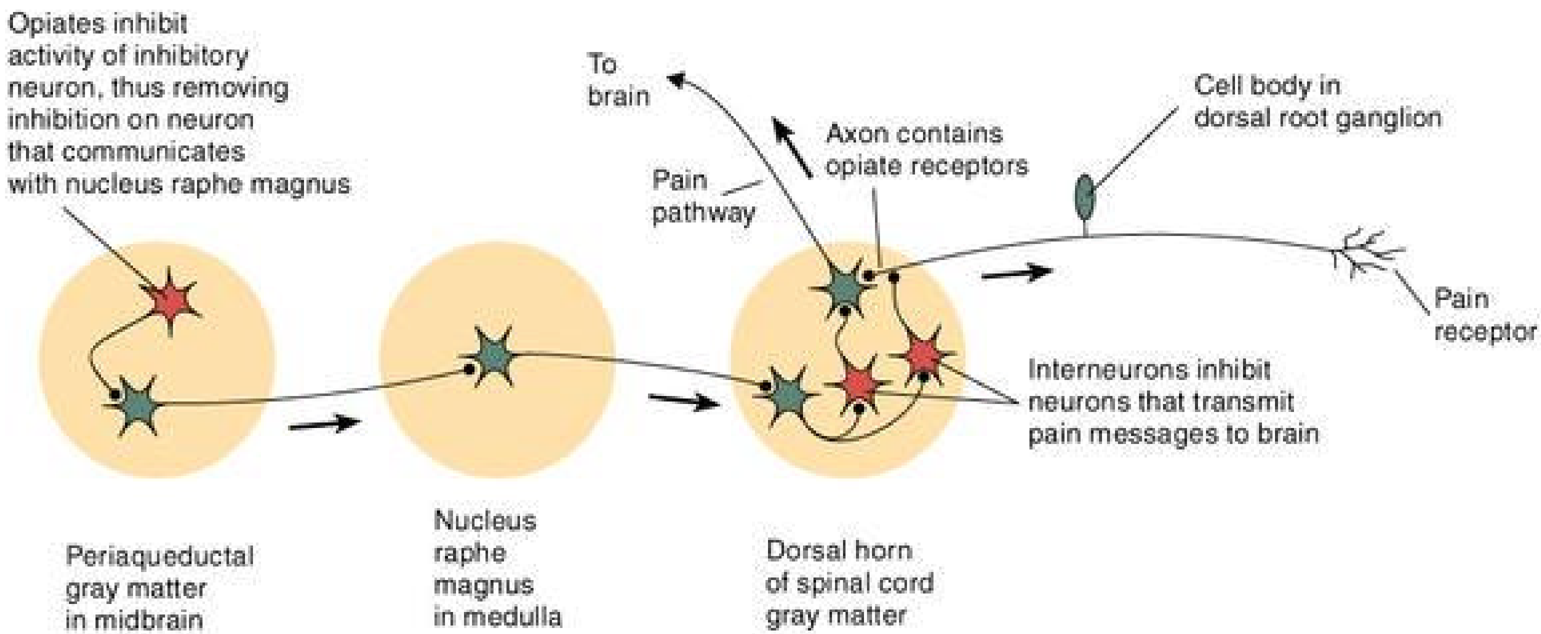
▸ Hypothetical Explanation of Transduction of Somatosensory Information



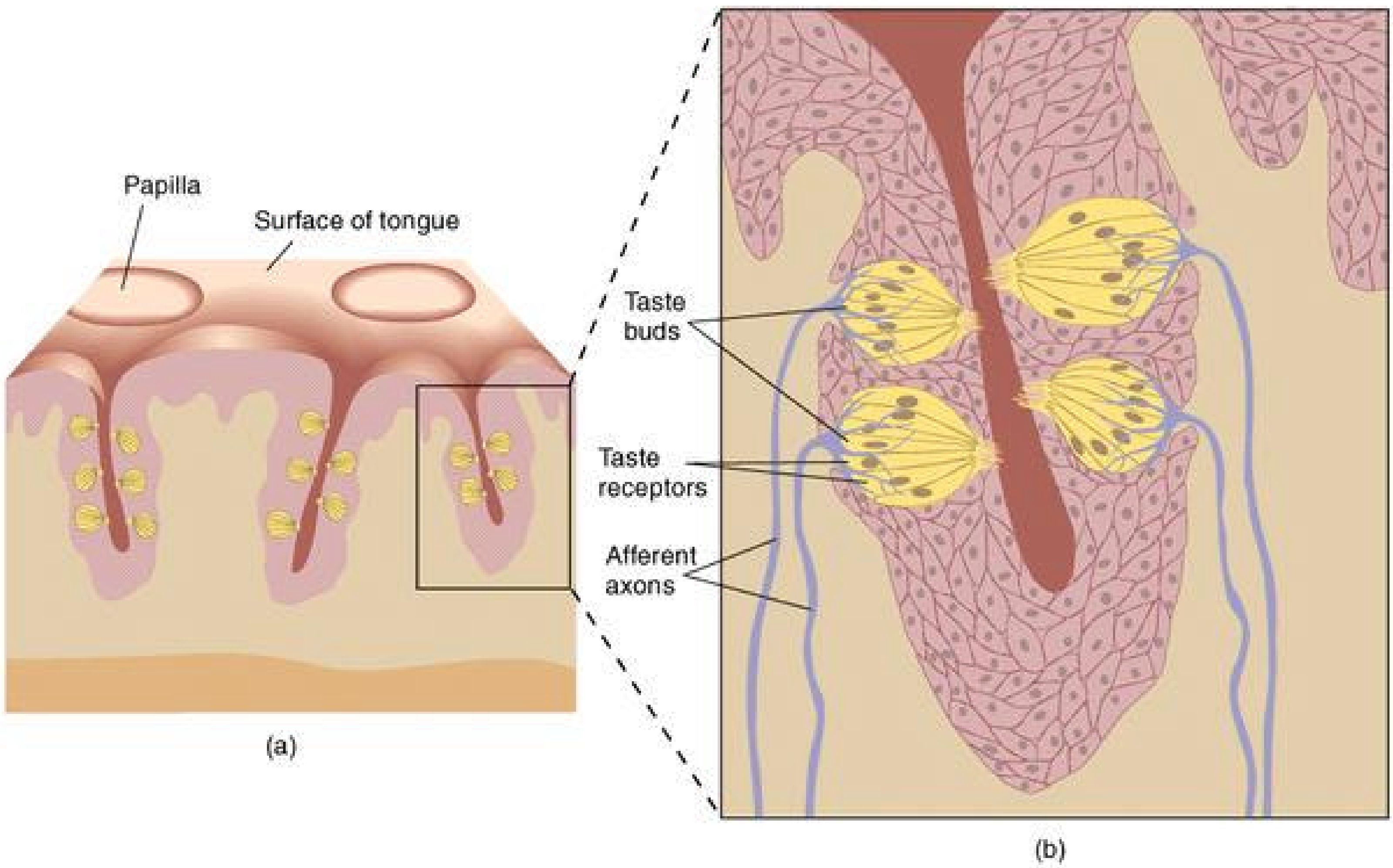
► Somatosensory Pathways from the Spinal Cord to the Somatosensory Cortex



► Neural Circuit That Mediates Opiate-Induced Analgesia

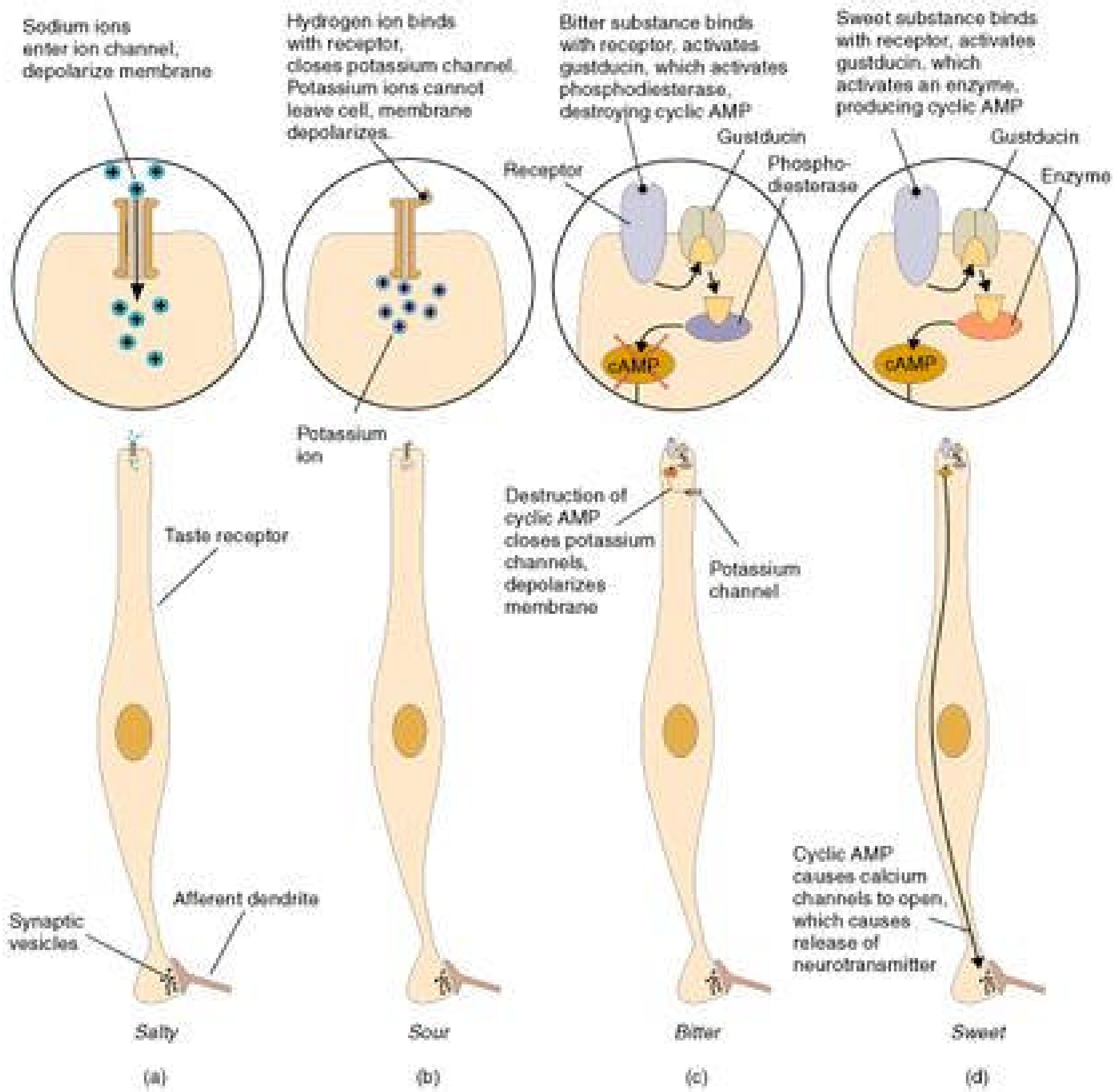


► The Tongue

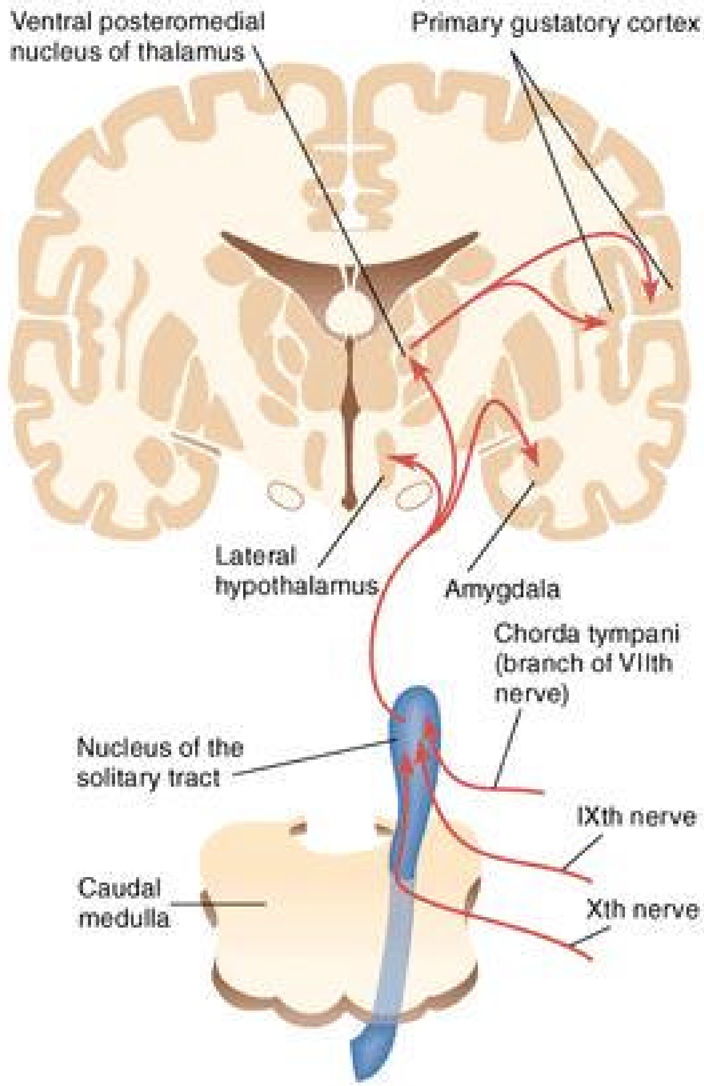


Papilla
Surface of tongue
Taste buds
Taste receptors
Afferent axons
(a)
(b)

► Transduction of Taste Information



► Neural Pathways of the Gustatory System



► The Olfactory System