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Assignment Title: Special senses

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Question

Elucidate the pathway involved in Taste

Answer

Taste, or gustation, is a sense that develops through the interaction of dissolved molecules with taste buds. Currently five sub-modalities (tastes) are recognized, including sweet, salty, bitter, sour, and umami (savory taste or the taste of protein).

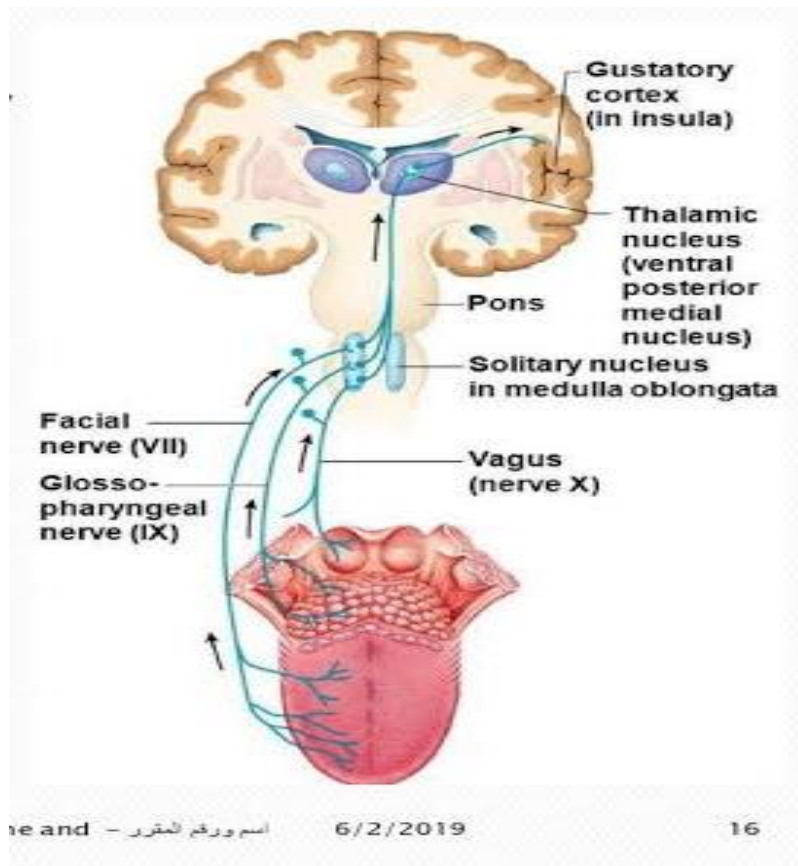
Taste is associated mainly with the tongue, although there are taste (gustatory) receptors on the palate and epiglottis as well.

The tongue contains small bumps called papillae, within or near which taste buds are situated. In the tongue's taste buds, the taste receptors receive sensory input via two important mechanisms – depolarization and neurotransmitter release. Intake of salty foods leads more sodium ions to enter the receptor, causing the said mechanisms. The same is true with intake of sour foods (hydrogen ions) and sweet foods (sugar molecules), both of which result to the closing of K⁺ channels upon their entry.

From the axons of the taste receptors, the sensory information is transferred to the three taste pathways via the branches of cranial nerves VII, IX and X. The chorda tympani of CN VII (facial nerve) carries the taste sensory input from the tongue's anterior two-thirds. Then, the rest of the taste sensations from the throat, palate and posterior tongue are transmitted by the branches of CN IX (glossopharyngeal nerve) and CN X (vagus nerve). From these cranial nerves, taste sensory input travels through the nerve fiber synapses to the solitary tract, the ventral posteromedial thalamic nuclei, and the thalamus. In these three locations, there are clustered neurons which respond to the same taste (sweet, sour, salty or bitter). The thalamus relays the information to the primary gustatory cortex located in the somatosensory cortex. The primary gustatory cortex is where the perception of a particular taste is processed.

The taste pathway

- Taste impulses from anterior 2/3 of tongue pass in cranial nerve (CN) VII.
- Impulses from the posterior 1/3 of tongue and other posterior parts of mouth are transmitted by CN IX
- Few taste signals from base of the tongue and other posterior parts are carried by Vagus nerve (CN X)



References:

<https://courses.lumenlearning.com/austincc-ap1/chapter/special-senses-taste-gustation/>

<https://explorable.com/neural-pathways-of-smell-taste-and-touch>