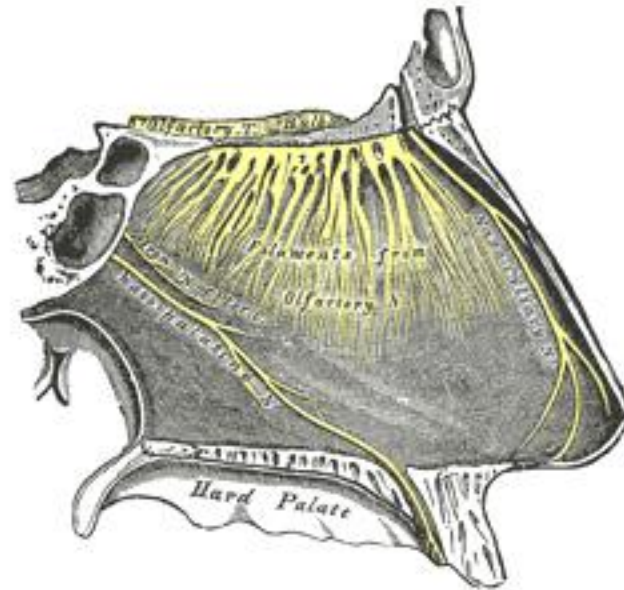


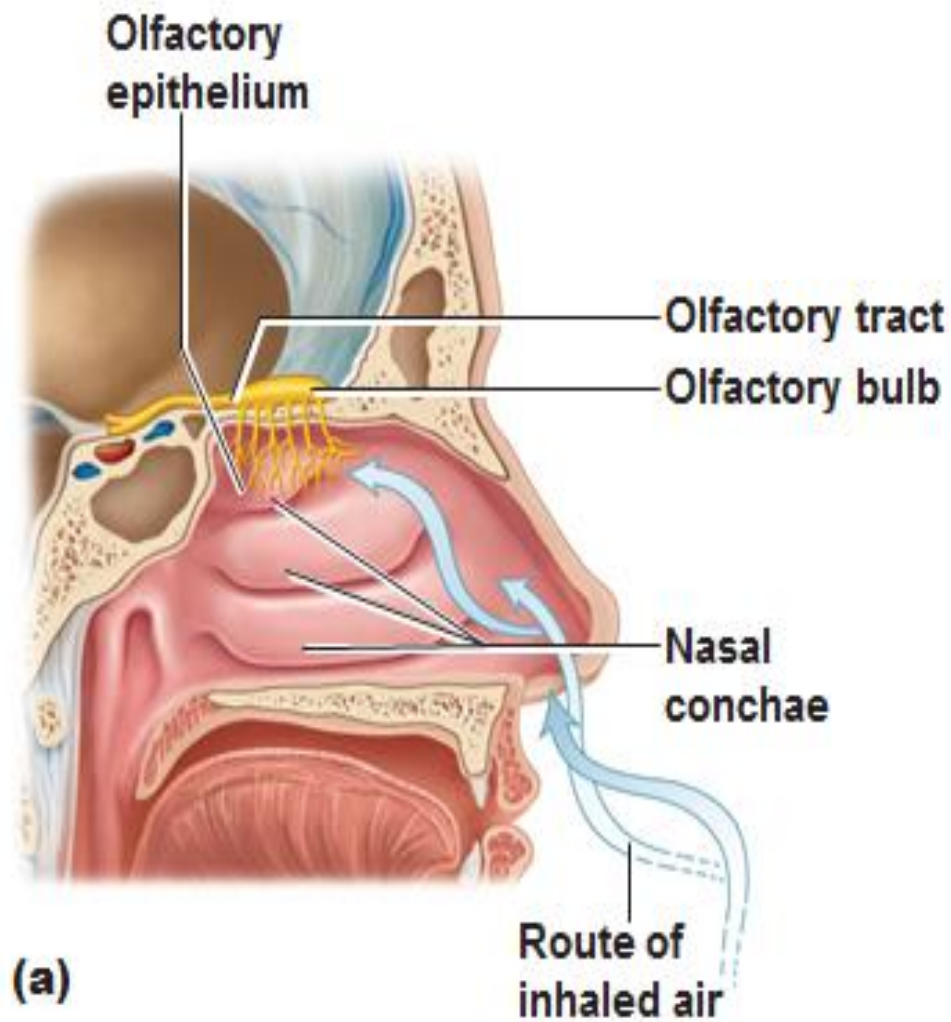
Olfactory



The sense of smell

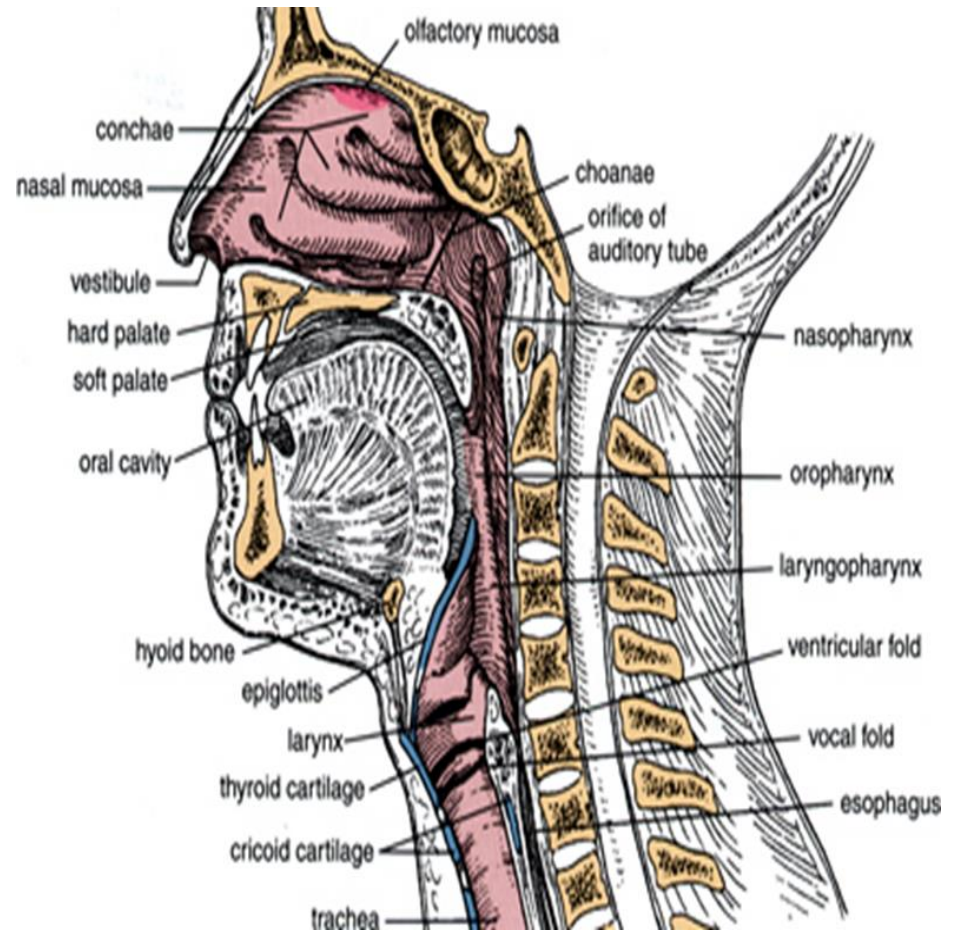
Sense of Smell

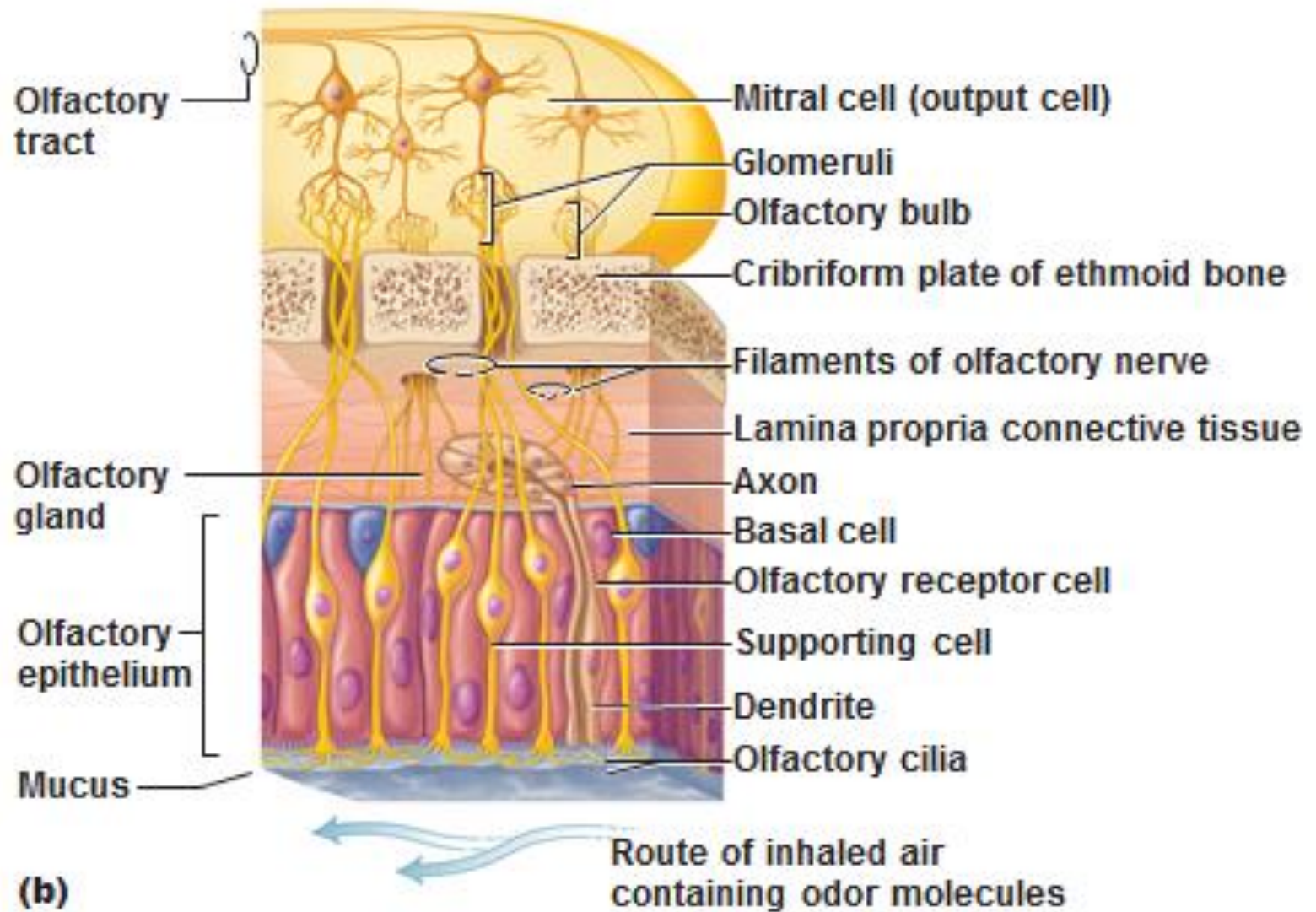
- The organ of smell—olfactory epithelium in the roof of the nasal cavity
- Olfactory receptor cells—bipolar neurons with radiating olfactory cilia
- Bundles of axons of olfactory receptor cells form the filaments of the olfactory nerve (cranial nerve I)
- Supporting cells surround and cushion olfactory receptor cells
- Basal cells lie at the base of the epithelium



Olfactory Mucous Membrane

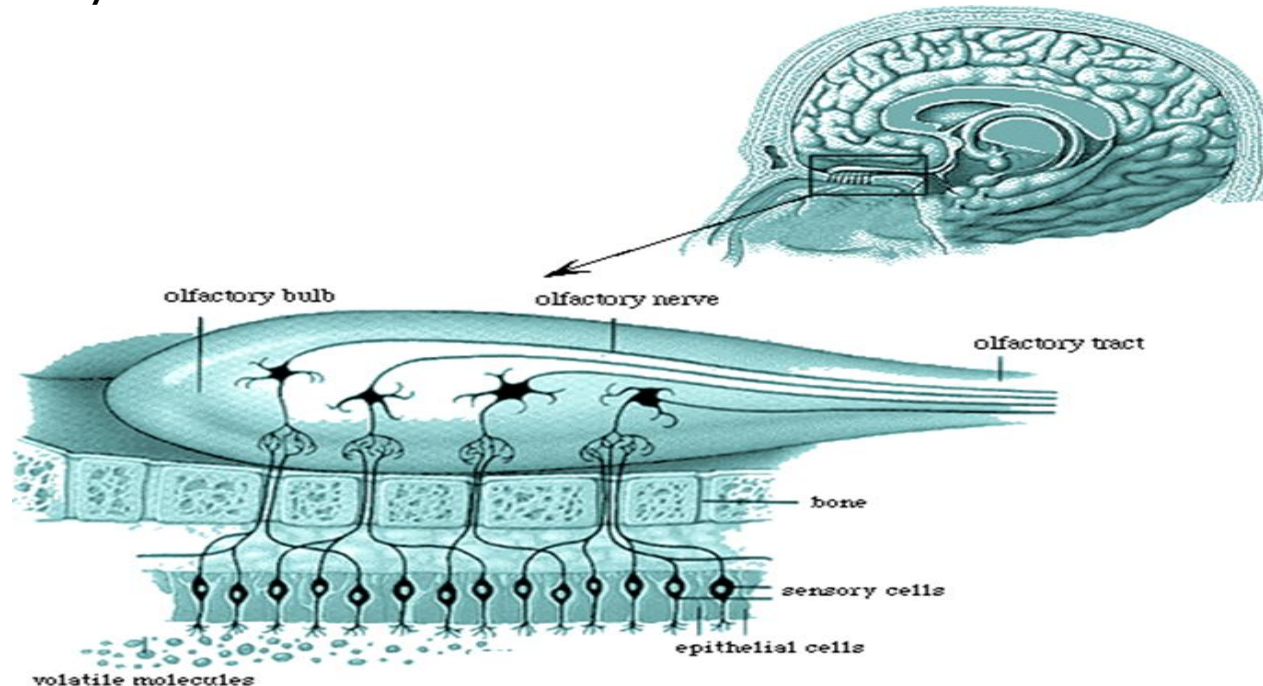
- Olfactory receptor cells
- Area of 5cm² in roof of nasal cavity near the septum
- 10 to 20 million receptor cells
- Each olfactory receptor is a neuron
- Olfactory mucous membrane is the place in body where NS is closest to external world





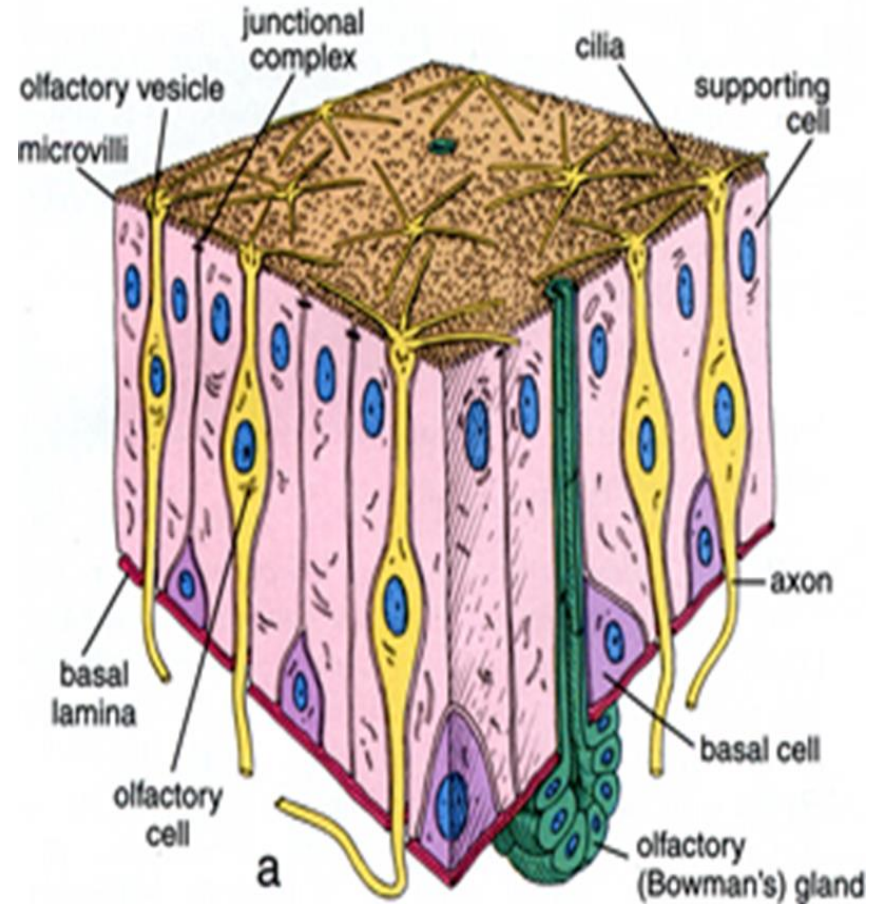
Composition of Olfactory epithelium

- Each neuron has a thick dendrite with an expanded end called olfactory rod
- From rods cilia project to the mucous surface
- Each receptor neuron has 10-20 cilia
- Axons of olfactory receptor neurons pierce cribriform plate of ethmoid bone and enter olfactory bulbs
- Olfactory neurons have half-time of few weeks.

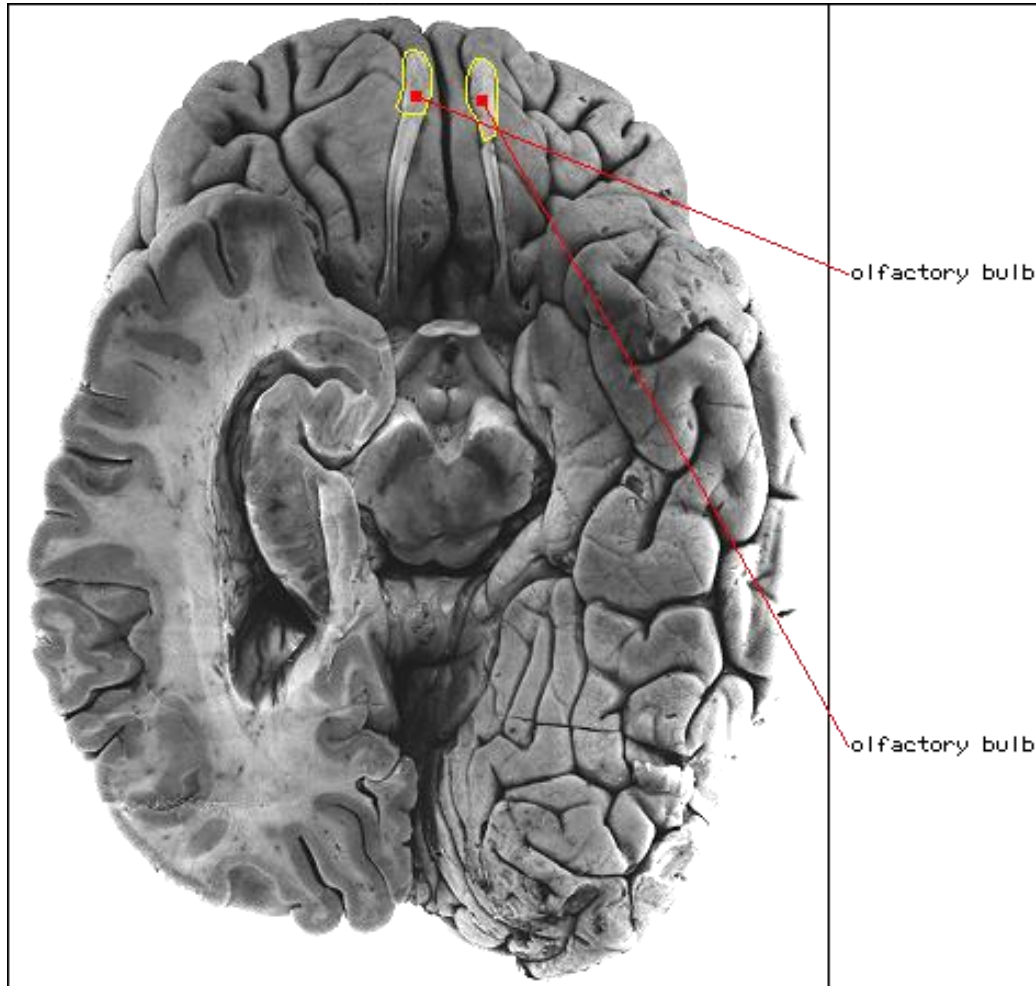


Mucus producing Glands

- Olfactory mucous membrane is constantly covered by mucus
- Mucus is produced by Bowman's glands, placed just under the basal lamina of the membrane

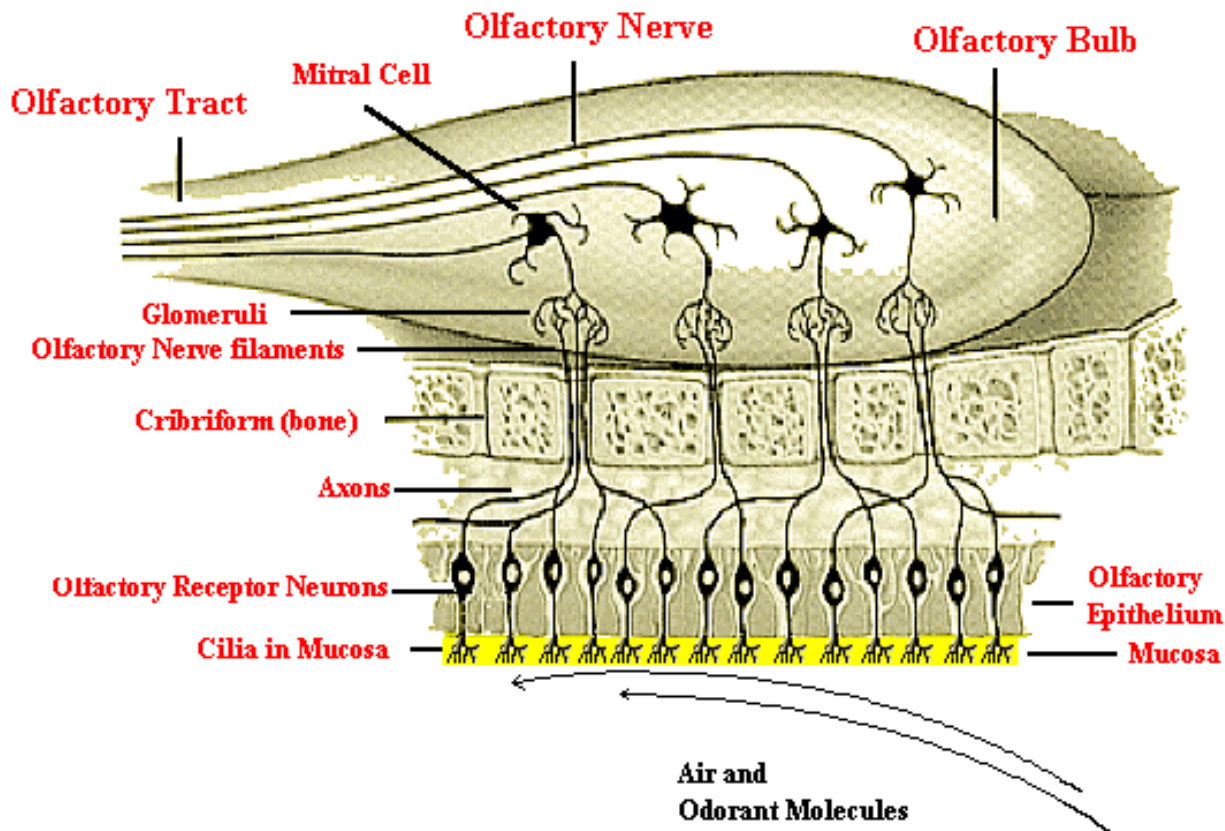


Olfactory Bulbs



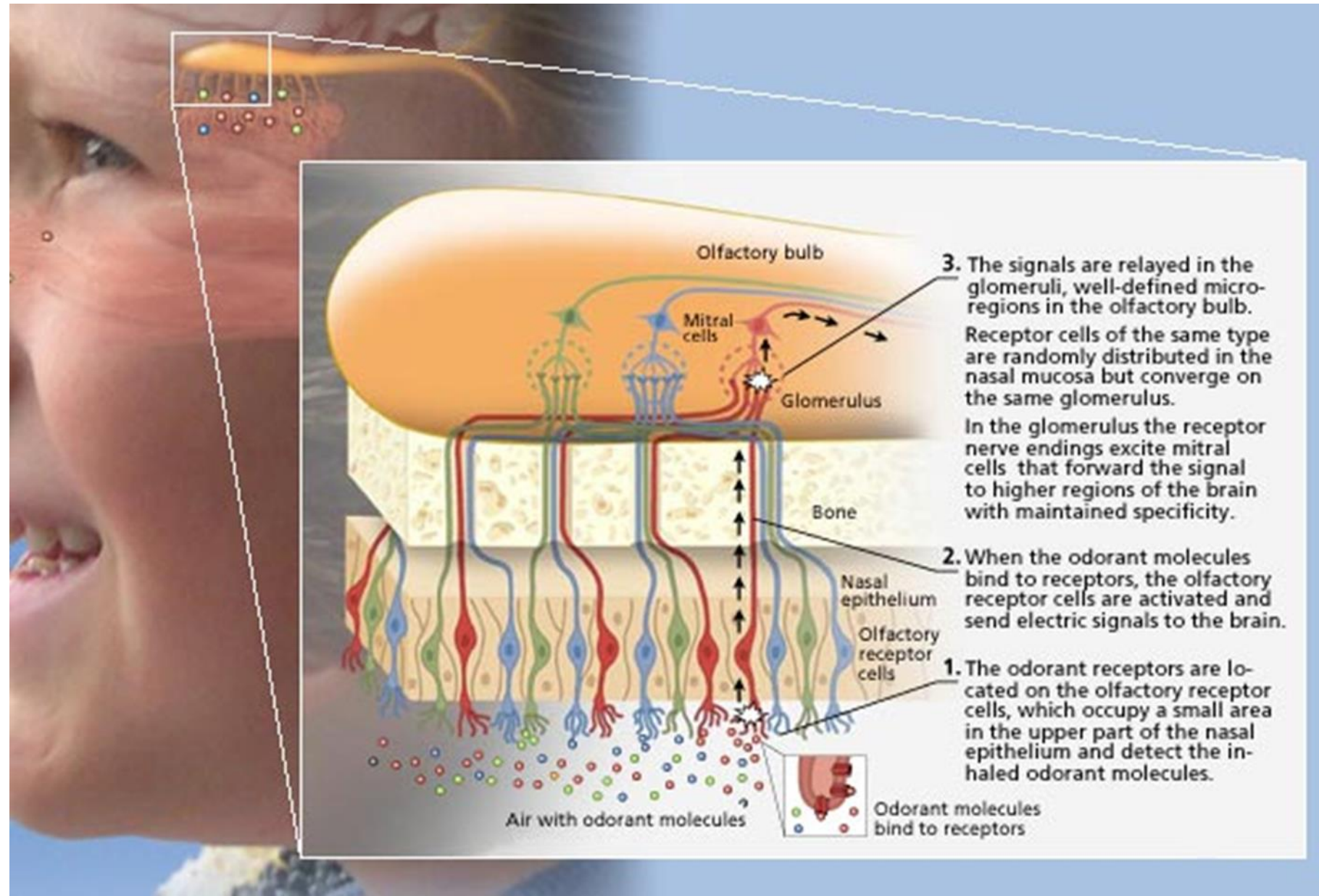
The olfactory bulbs relay sensory signals to the olfactory tract.

small axons from the olfactory epithelium synapse with receptor neurons and interneurons in the olfactory bulbs.

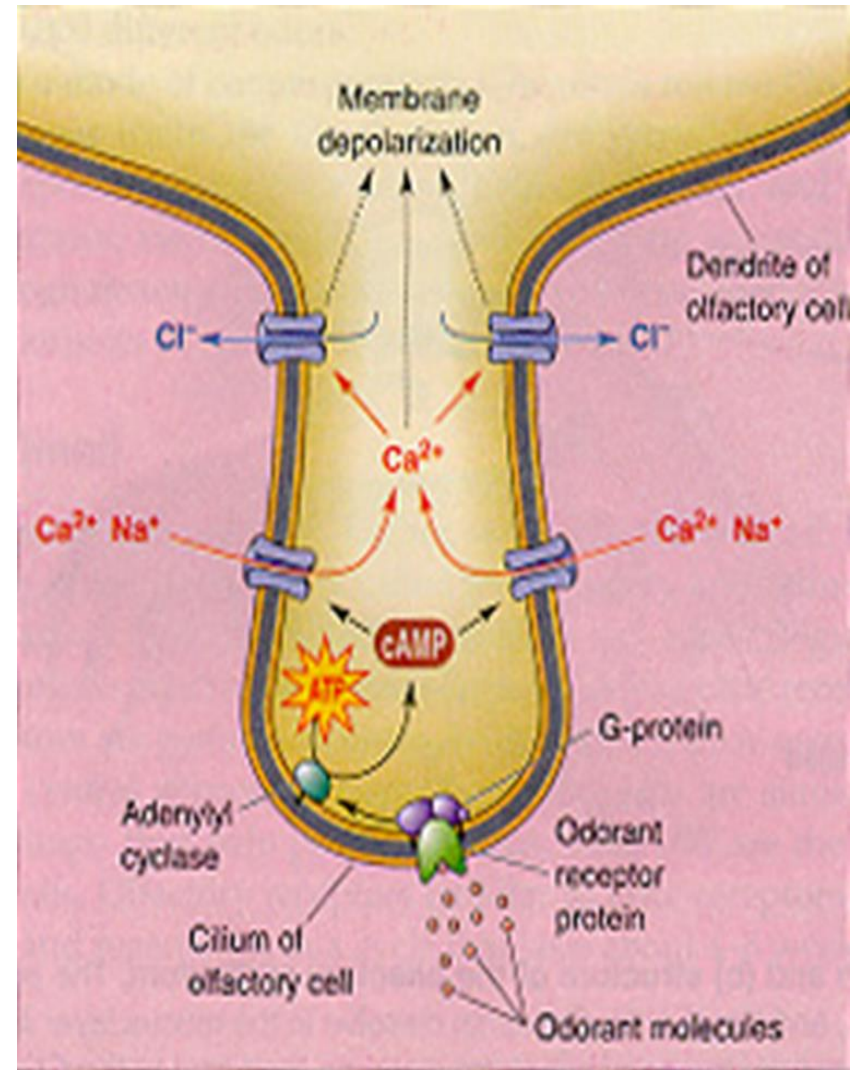


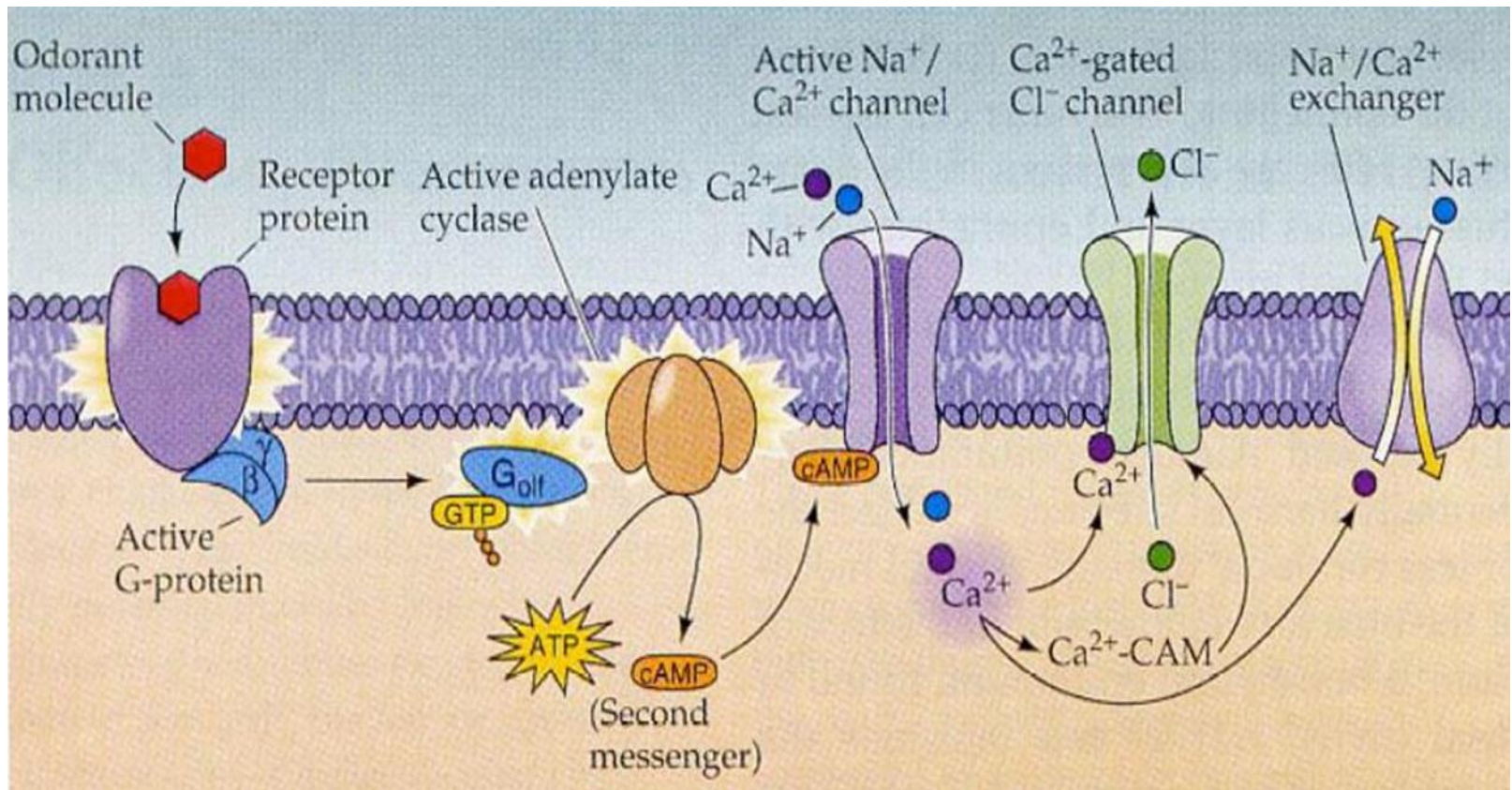
- Olfactory receptor neurons extend dendrites from which several long cilia radiate down into the olfactory epithelium and into the mucus, where the air and odorant molecules stimulate the neuron.

STIMULATION OF THE OLFACTORY CELLS



G-protein is stimulated -triggers activation of Adenyl cyclase (enzyme speeds up the conversion of ATP to cAMP – cAMP then binds to action channels in membrane of cilia- this causes channels to open and Ca ions to enter cilia – influx of Ca ions activates Cl channels to open and Cl leaves. Membrane becomes depolarized and AP is created. The action potential travels down the axon of olfactory receptor cell eventually meets with the other axons and forms the olfactory nerve (CN I)





Transmission of smell signals to CNS

