Special senses

- Vision
- Hearing
- Smell
- Taste

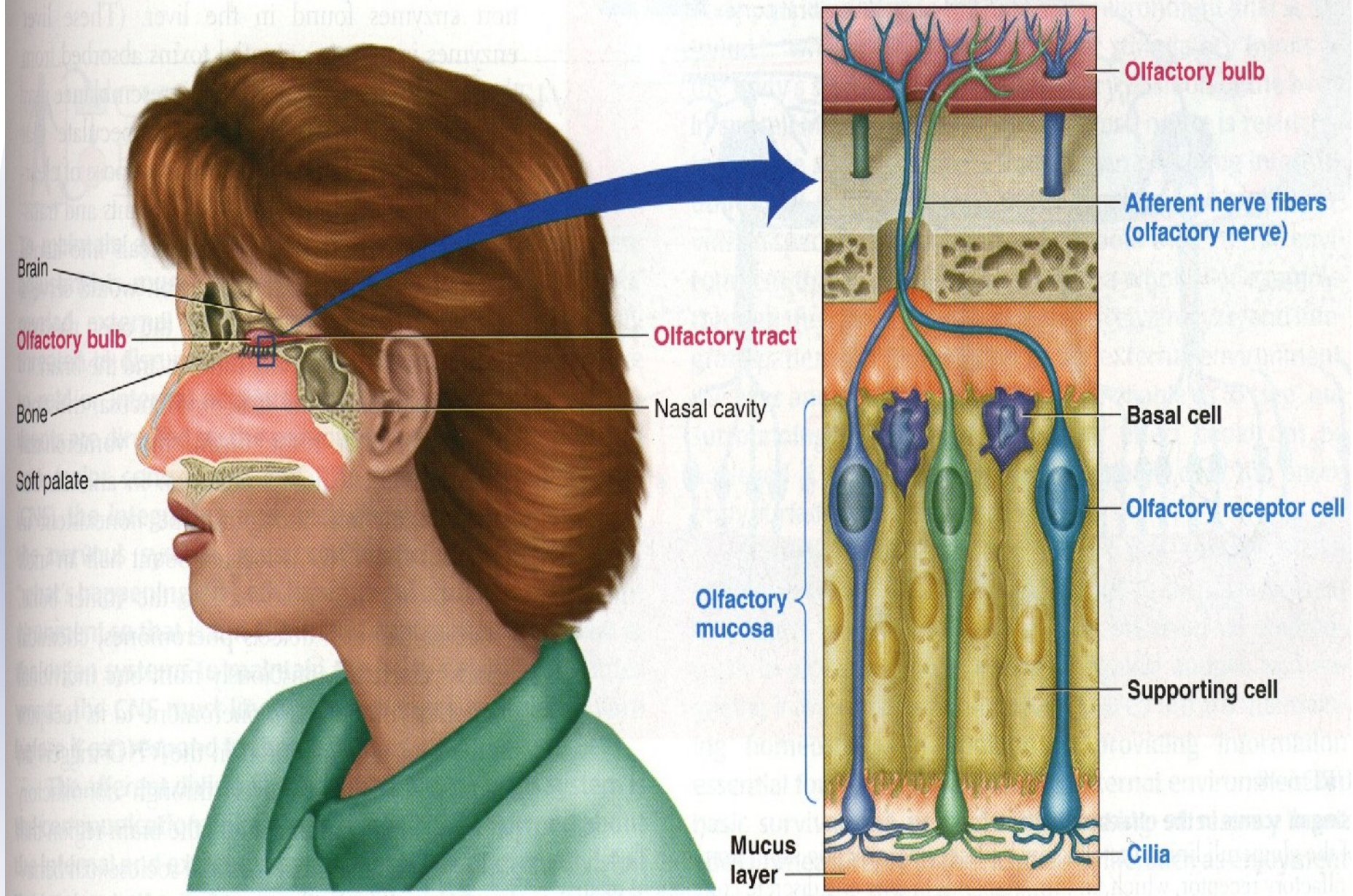
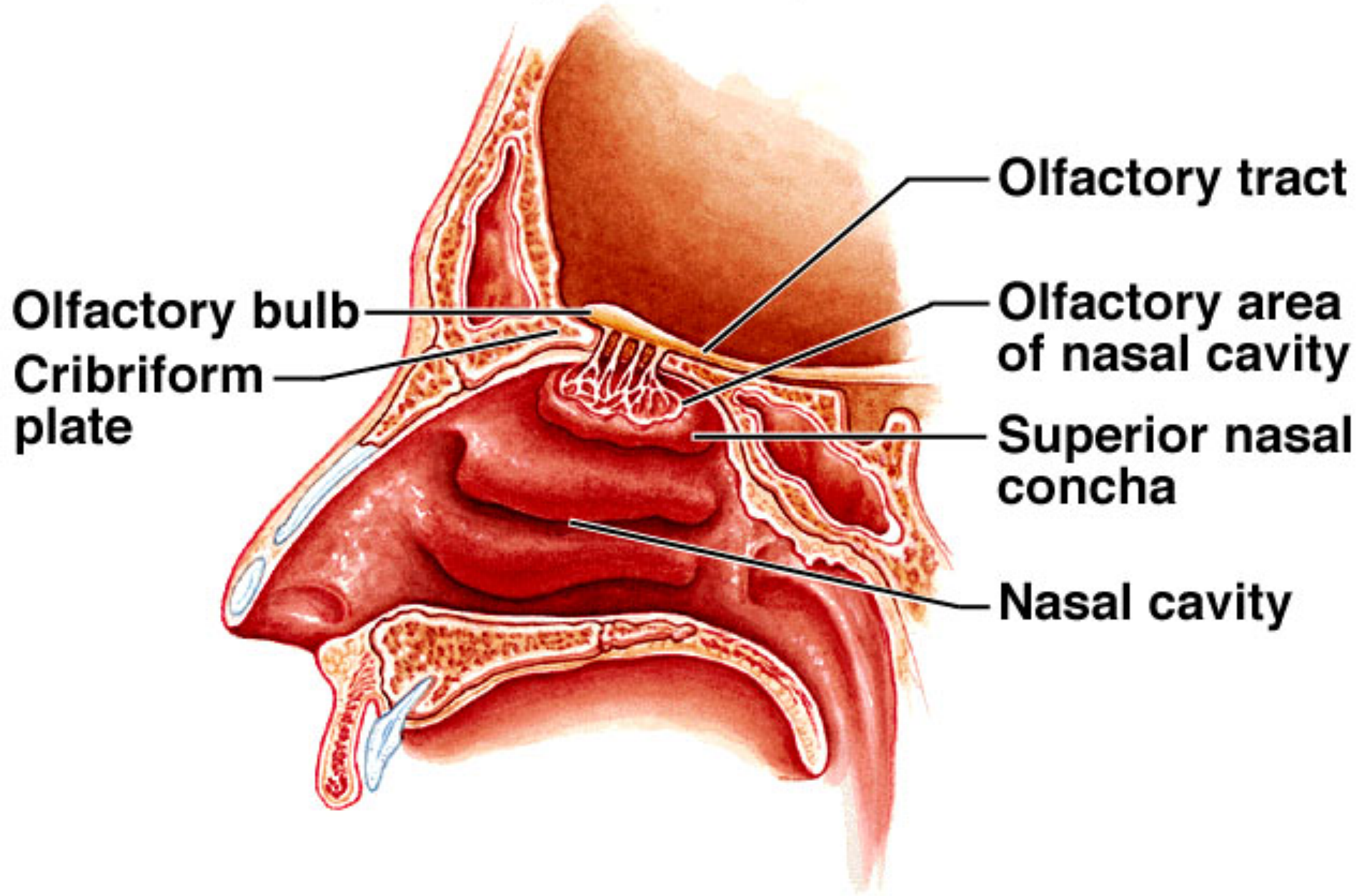
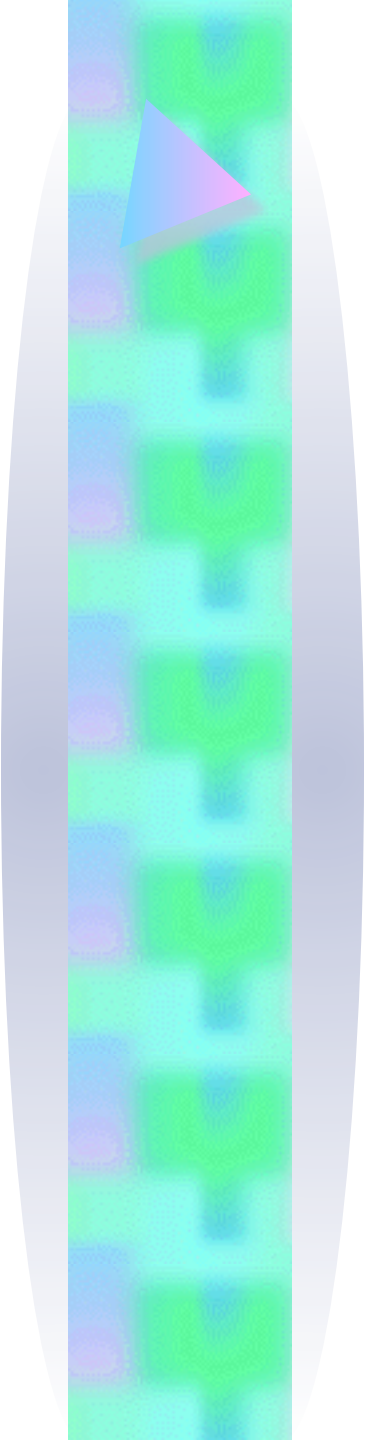


FIGURE 6-47

Location and structure of the olfactory receptors

Olfactory Receptor Cells





Smell

- **Anatomy**
  - **Olfactory mucus: in the roof of nasal cavity near the septum**
  - **Contain olfactory receptors (bipolar neurone)**
  - **Axons collected in bundles called fila olfactoria**

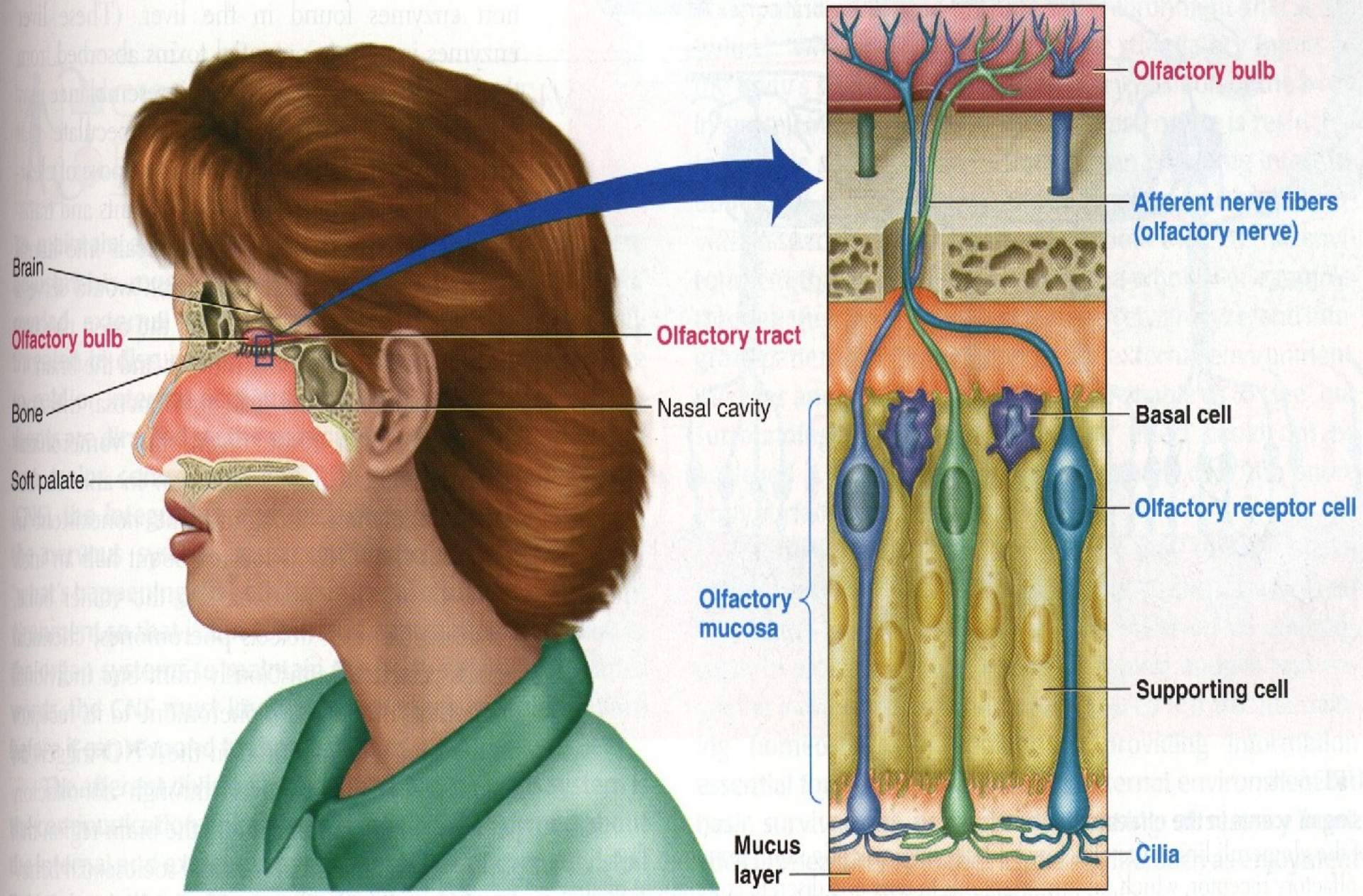
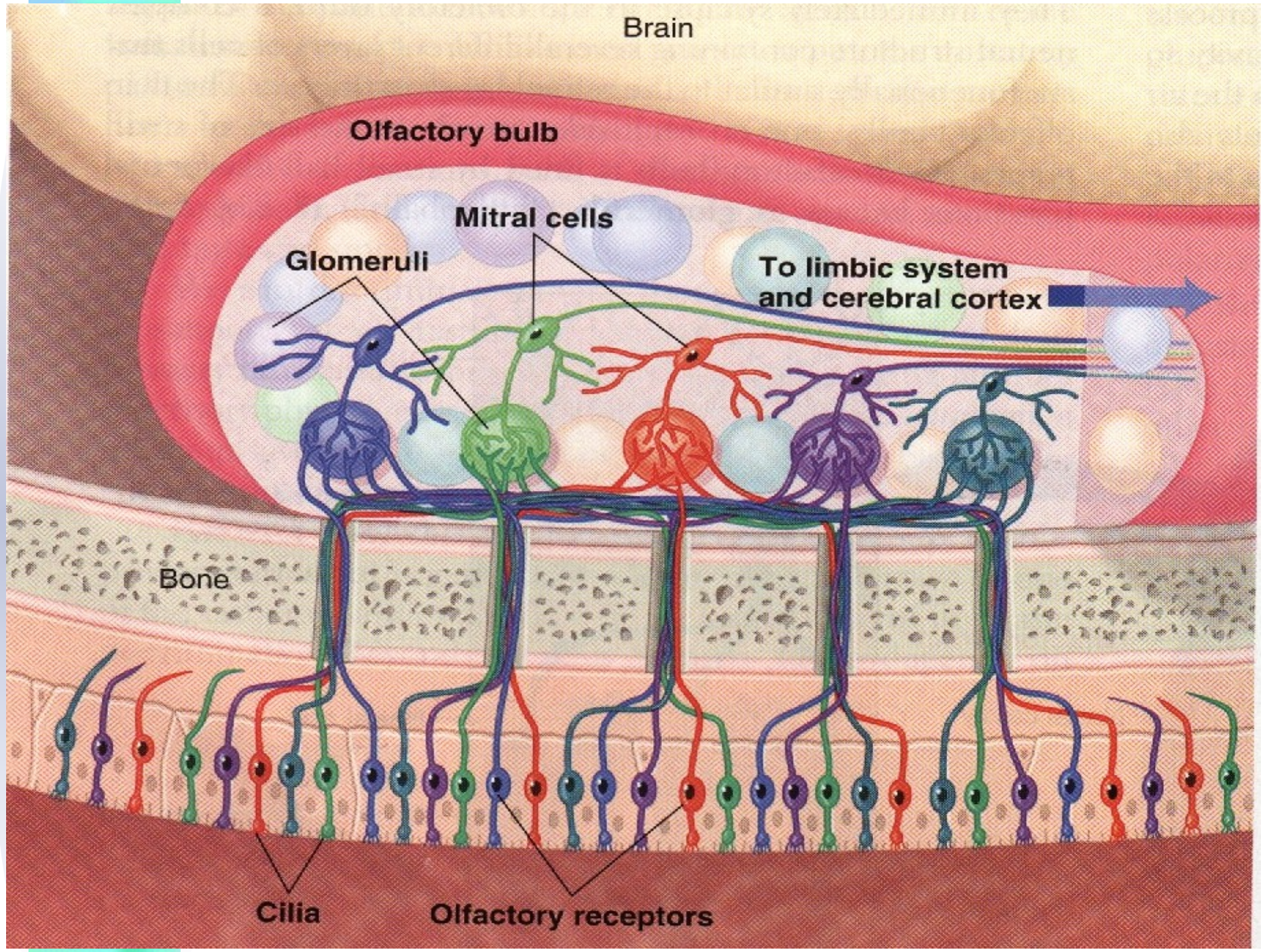
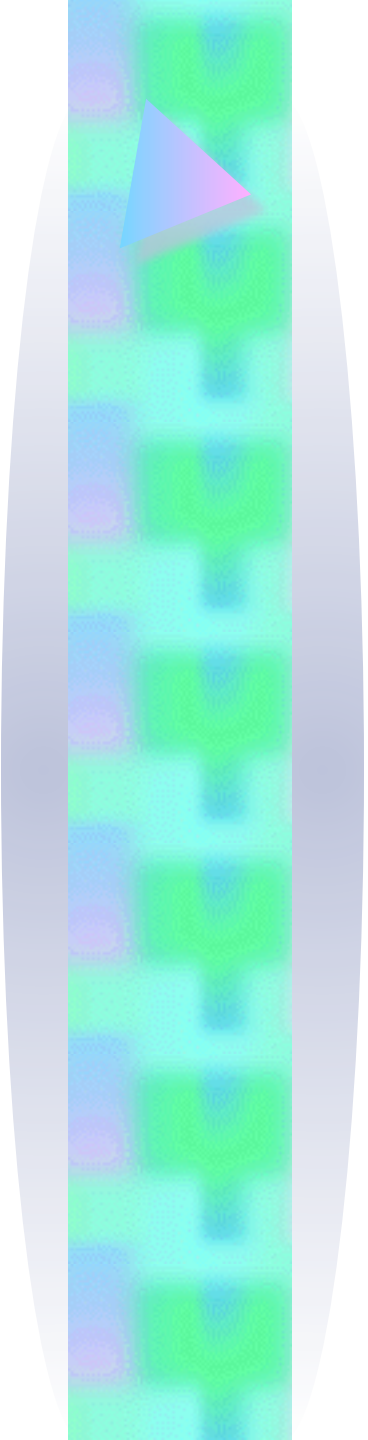


FIGURE 6-47

Location and structure of the olfactory receptors


Brain
Olfactory bulb
Mitral cells
Glomeruli
To limbic system
and cerebral cortex
Bone
Cilia
Olfactory receptors

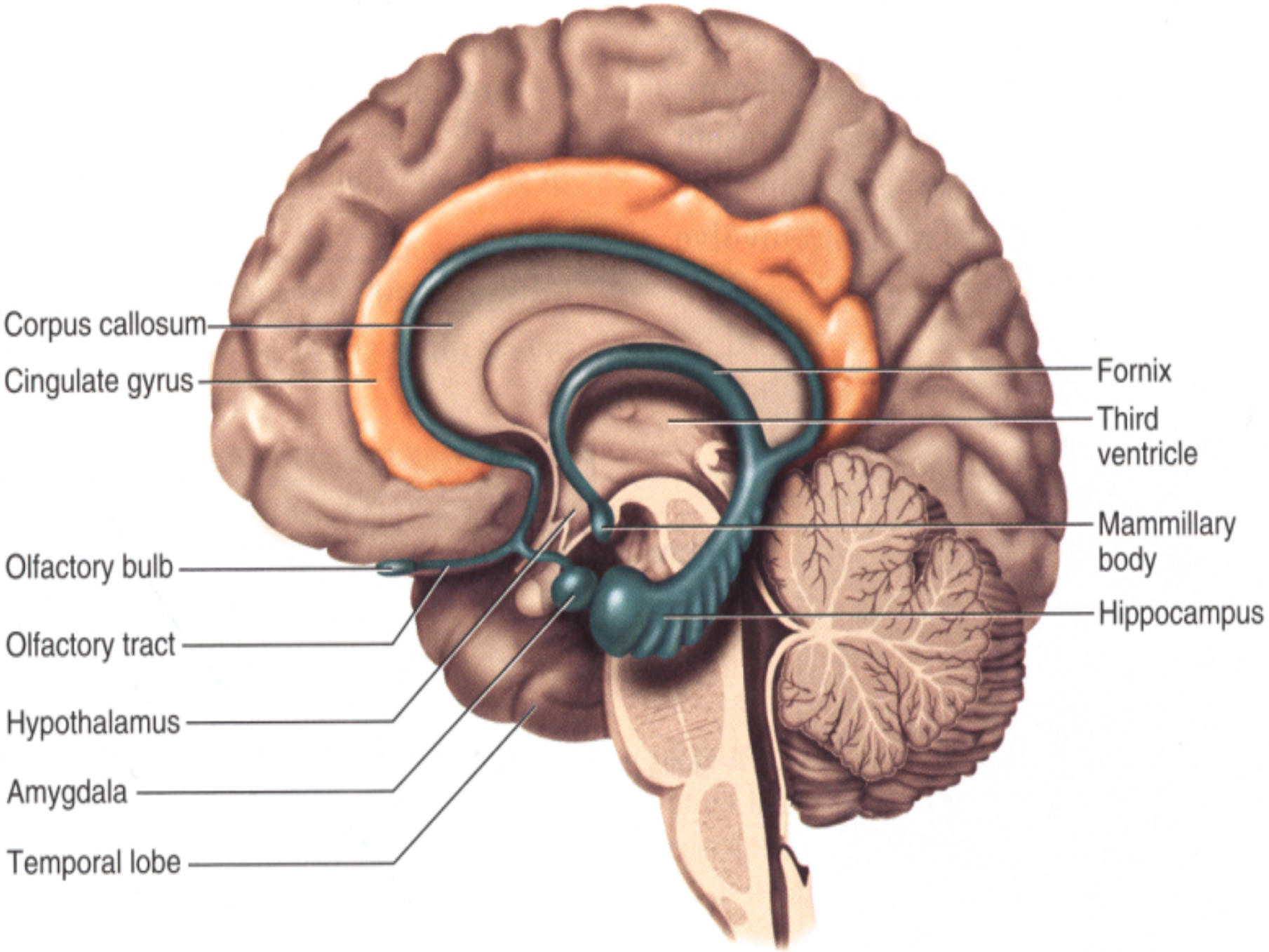


Olfactory pathway

- **Fila olfactoria inter olfactory bulb »»»» synapse with mitral and tufted cells :**

- »»»» from mitral cells lateral and intermediate stria start »»»» end on ipsilateral cortex

- »»»» from tufted cells medial strai start then cross the midline & end on granular cells in opposite side (contralateral)


Corpus callosum
Cingulate gyrus
Olfactory bulb
Olfactory tract
Hypothalamus
Amygdala
Temporal lobe
Fornix
Third ventricle
Mammillary body
Hippocampus

- Impulses travel along the olfactory tracts to the limbic system
  - (also involved in emotions and memory
- Impulses are interpreted in olfactory cortex
  - Deep in temporal lobe and base of frontal lobe

Physiology of olfaction

- **Molecules dissolve in mucus layer »»»» combine with receptors on cilia**
- **»»»» stimulate adenylat cyclase »»»» increase intracellular cAMP**
- **»»»» opening of Na channels »»»» receptors potential »»»» AP in olfactory pathway**

Physiology of olfaction

- **Human can differentiate between 2000-4000 odours**
- **Adaptation can occur to pleasant and nasty smells due to changes both in receptors and central connections**

Pathophysiology

- **Anosmia: loss of smell sensation**
- **Due to damage to olfactory epithelium**

Pathophysiology

- **Parosmia (dysosmia)**
- **Alteration in smell sensation**

Pathophysiology

- **Hyperosmia (increase in smell sensation)**
- **Adrenal insufficiency**

Pathophysiology

- **Hyposomia (decreased smell sensation)**
- **Vitamin A deficiency**