

The Nervous System

Sense Receptors

Sensory Receptors

- Cells that monitor the conditions in the body or the environment
- When stimulated, sends the information to the CNS
- Information that arrives is the sensation
- Awareness of the sensation is perception
- General sensory receptors found throughout the body
 - General Senses: sensitivity to temperature, pain, touch, pressure, vibration, & proprioception

General Sensory Receptors

- Exteroceptors
 - external environment information
- Proprioceptors
 - skeletal muscle & joint position information
- Interoceptors
 - visceral organs & functions information
- Divided into four types of receptors based upon the stimulus

Nociceptors

- Pain receptors
- More common in superficial skin
- Sensitive to temperature, mechanical damage, & chemicals
- Fast Pain
 - pricking pain
- Slow Pain
 - burning/aching pain

Thermoreceptors

- Temperature receptors
- Found in skin, skeletal muscles, liver, & hypothalamus
- Quickly adapt to new, stable temperature
 - i.e. air conditioning
- Cold receptors > warm receptors

Mechanoreceptors

- Respond to physical distortion
- Tactile Receptors
 - fine touch, crude touch & pressure
- Baroreceptors
 - monitor pressure in organs
 - i.e. blood pressure
- Proprioceptors
 - monitor joint position & muscle contraction

Chemoreceptors

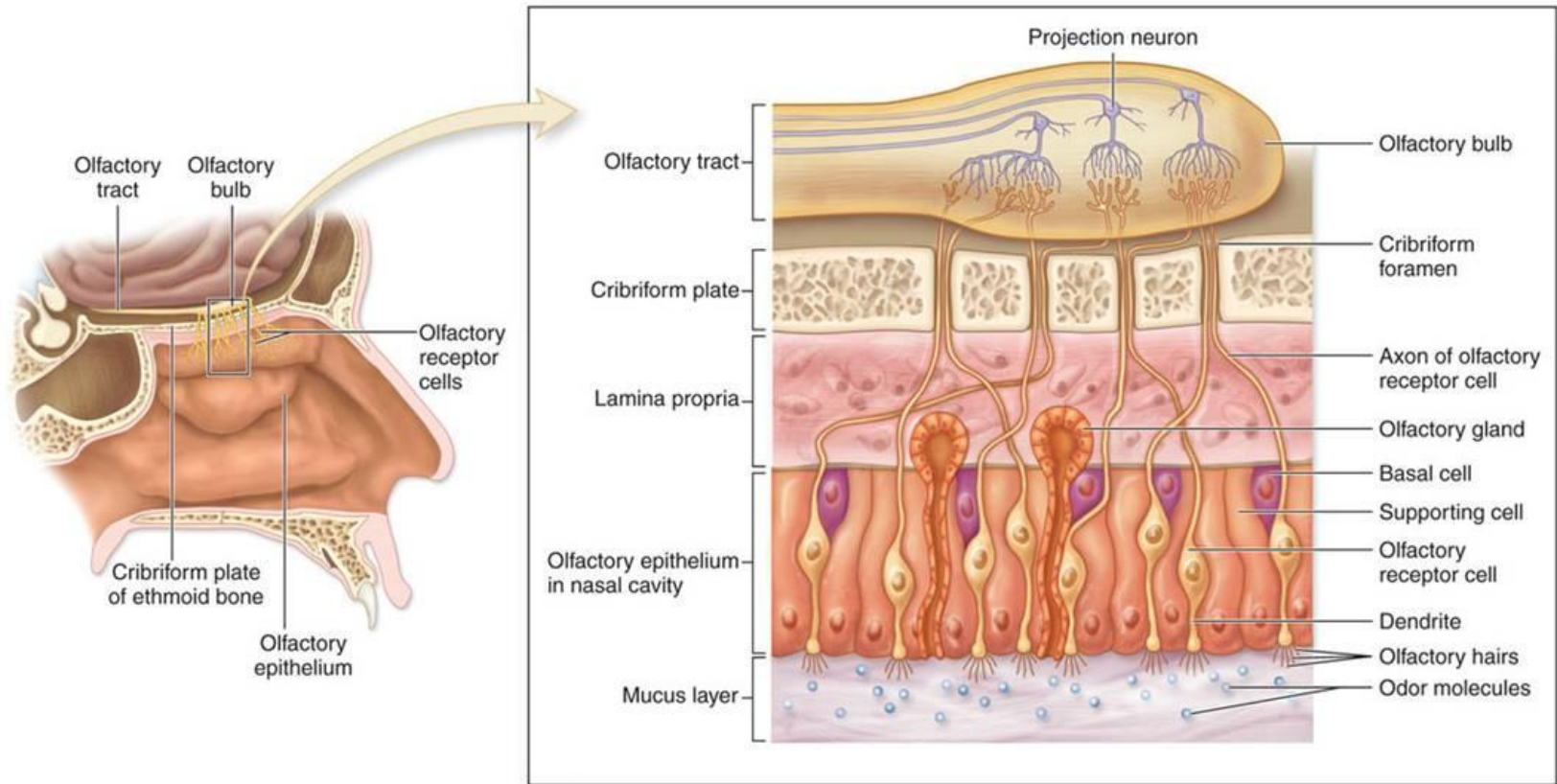
- Chemical Receptors
- Monitor pH, CO₂, and O₂ levels
- Not consciously aware of sensation

Special Senses

- Complex receptors located in sense organs provide sensations
- Olfaction, vision, gustation, equilibrium, & hearing

Olfaction

- Sense of smell
- Olfactory receptor cells within the olfactory epithelium found in the nasal cavity
- Odorants
 - chemicals that stimulate olfactory receptors
- Can distinguish 2000-4000 different chemical stimuli
- Receptors decline with age



(a) Olfactory receptor cells

Gustation

- Sense of taste
- Taste receptors located on the tongue
 - Taste buds
 - ~3000
 - Filiform papillae
 - front of tongue
 - Fungiform papillae
 - middle tongue
 - Circumvallate papillae
 - back of tongue

Taste Sensations

- Primary: sweet, salty, sour, & bitter
- In addition: umami & water
- Receptors are only receptive to ions/solutes in a solution
- Taste buds decline with age

