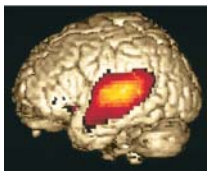
Slide 1

## Sensory System

- Introduction
  - Sensory information
  - Sent by receptors
  - Interpreted by the brain



Slide 2

## Sensory System

- 5 Types of receptors
  - Mechanoreceptors
  - Thermoreceptors
  - Pain receptors
  - Chemoreceptors
  - Photoreceptors

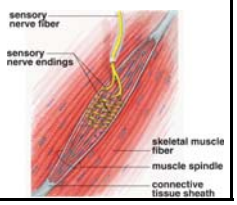
Slide 3

## Sensory System

- Mechanoreceptors = proprioceptors
  - Reflex actions
  - Muscle tone (body's equilibrium and posture)
  - Muscle regulations
    - Stretch
    - Length
    - Position

  All due to
  - Muscle Spindle!

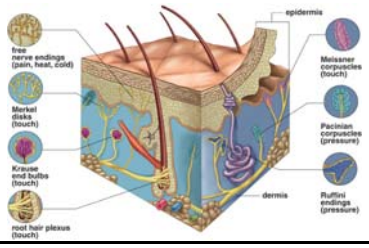
  - Resulting in the knee-jerk reflex



Slide 4

## Sensory System

– Cutaneous receptors = MANY TYPES!
- Be familiar with this figure (dermis v epidermis)

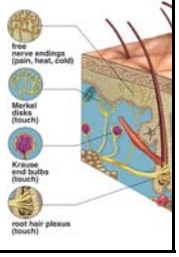



Slide 5

## Sensory System

– Cutaneous receptors = MANY TYPES!
- Be familiar with this figure

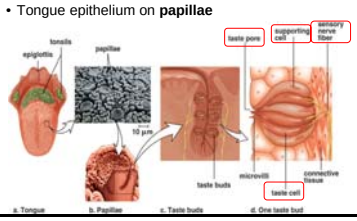
- Thermo-
- Pain receptors
  - – Found through out the body
  - – Test damaged tissues
    - » Chemical stimulation to these receptors
    - » Ibuprofen inhibits these chemical synthesis




Slide 6

## Sensory System

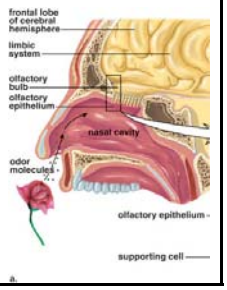
- Senses of Taste & Smell
  - – Chemoreceptors involved
  - – **Taste buds**
    - Tongue epithelium on **papillae**



Slide 7

## Sensory System

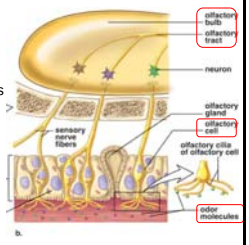
- Senses of Taste & Smell
  - Roof of nasal cavity
    - Olfactory epithelium contains olfactory cells
    - Specialized neurons
    - Specific molecules excite differently




Slide 8

## Sensory System

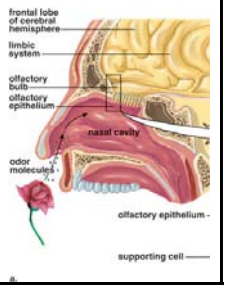
- Senses of Taste & Smell
  - Roof of nasal cavity
    - Olfactory epithelium contains olfactory cells
    - Specialized neurons
    - Specific molecules excite differently




Slide 9

## Sensory System

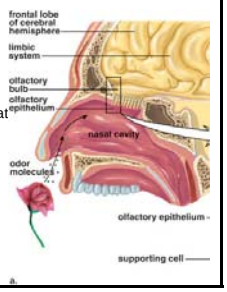
- Senses of Taste & Smell
  - Smell and memory!
  - Direct link to the limbic system
  - Triggers memory



Slide 10

## Sensory System

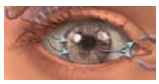
- Senses of Taste & Smell
  - Work together!!
  - Connection at back of throat
  - Colds
    - Effect the passage in the nasal cavity




Slide 11

## Sensory System

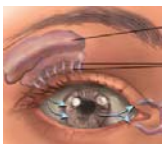
- Sense of Vision
  - Photorecptors
  - Eyes
    - Location: orbits
      - Frontal, lacrimal,ethmoid, zygomatic maxilla, sphenoid & palatine



Slide 12

## Sensory System

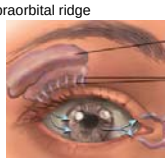
- Sense of Vision : Eyes : Accessory organs
  - Eyebrows, eyelids and eyelashes
  - Lacrimal apparatus
  - Extrinsic muscles



Slide 13

## Sensory System

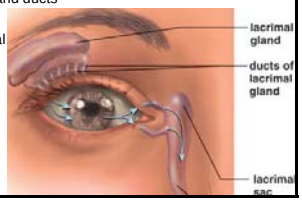
- Sense of Vision : Eyes : Accessory organs
  - Eyebrows
    - Thick hairs along supraorbital ridge
    - Protection
      - Sun
      - Perspiration
  - Eyelids
    - Continuous with skin
  - Eyelashes
    - Hairs of the lid
    - Protection and sebaceous lubrication
    - Clogged = sty



Slide 14

## Sensory System

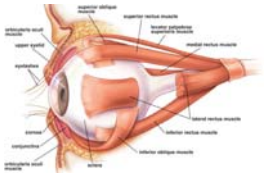
- Sense of Vision : Eyes : Accessory organs
  - Lacrimal apparatus
    - Tear production
    - Gland, sac and ducts
    - Medial flow
    - Nasolacrimal duct




Slide 15

## Sensory System

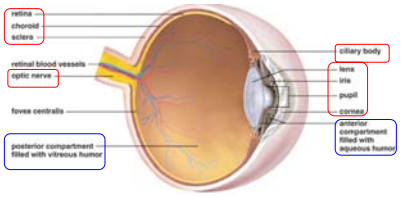
- Sense of Vision : Eyes : Accessory organs
  - Extrinsic muscles
    - Precise
    - Eye movement
    - Don't memorize



Slide 16

## Sensory System

- Sense of Vision : Eyes : Structure




Slide 17

## Sensory System

- Sense of Vision : Eyes : Structure

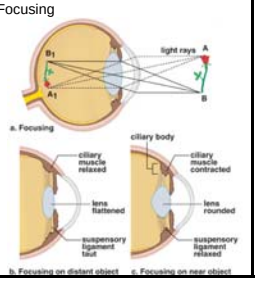
**Table 9.1 Functions of the Parts of the Eye**

| Part | Function |
|---|---|
| Sclera | Protects and supports eyeball |
| Cornea | Refracts light rays |
| Pupil | Admits light |
| Choroid | Absorbs stray light |
| Ciliary body | Holds lens in place, accommodation |
| Iris | Regulates light entrance |
| Retina | Contains sensory receptors for sight |
| Rods | Make black-and-white vision possible |
| Cones | Make color vision possible |
| Fovea centralis | Makes acute vision possible |
| Other | |
| Lens | Refracts and focuses light rays |
| Humors | Transmit light rays and support eyeball |
| Optic nerve | Transmits impulse to brain |

Slide 18

## Sensory System

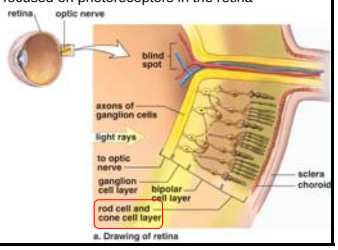
- Sense of Vision : Eyes : Focusing
  - Eyestrain
    - accommodation



Slide 19

## Sensory System

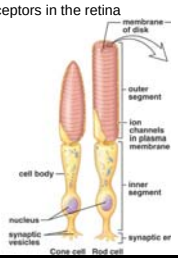
- Sense of Vision : Pathway
  - Light is focused on photoreceptors in the retina




Slide 20

## Sensory System

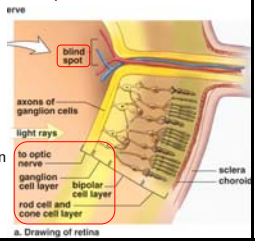
- Sense of Vision : Pathway
  - Light is focused on photoreceptors in the retina
  - Cones
    - Color vision
    - Contain pigments
    - Fine detail
  - Rods
    - Gray shades
    - Night vision
    - Peripheral vision
    - Perception of movement




Slide 21

## Sensory System

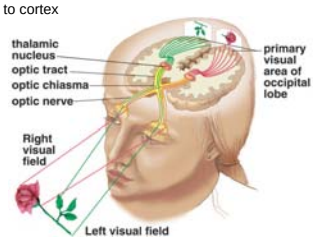
- Sense of Vision : Pathway
  - Light is focused on photoreceptors in the retina
  - Blind spot
    - NO cones or rods
  - Macular degeneration
    - Destroyed R or C
    - Blindness



Slide 22

## Sensory System

- Sense of Vision : Pathway
  - Retina to cortex




Slide 23

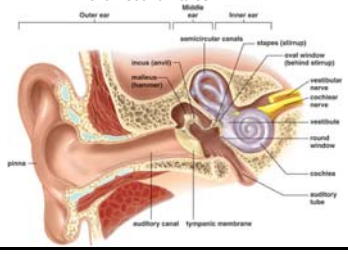
## Sensory System

- Sense of Hearing
  - Mechanoreceptors
    - Hair cells
      - Stereocilia
        - » Long microvilli


Slide 24

## Sensory System

- Sense of Hearing : Structures : Know this figure
  Follow sound waves



Slide 25

## Sensory System

- Sense of Hearing : Structures : Functions

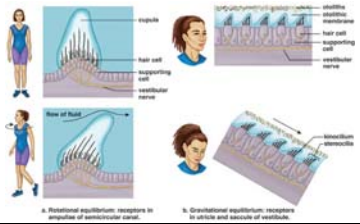
**Table 9.2 Functions of the Parts of the Ear**

| Part | Medium | Function | Mechanoreceptor |
|---|---|---|---|
| *Outer Ear* | Air | | |
| Pinna | | Collects sound waves | — |
| Auditory canal | | Filters air | — |
| *Middle Ear* | Air | | |
| Tympanic membrane and ossicles | | Amplify sound waves | — |
| Auditory tube | | Equalizes air pressure | — |
| *Inner Ear* | Fluid | | |
| Cochlea (contains spiral organ) | | Hearing | Stereocilia embedded in tectorial membrane |
| Semicircular canals | | Rotational equilibrium | Stereocilia embedded in cupula |
| Vestibule (contains utricle and saccule) | | Gravitational equilibrium | Stereocilia embedded in otolithic membrane |

Slide 26

## Sensory System

- Sense of Equilibrium
  - Vertigo
    - Dizziness and rotation sensation




Slide 27

## Sensory System

- Age
  - Hearing
    - Osteoclerosis
      - Over growth of inner ear bones
      - May affect balance
  - Vision
    - Macular degeneration
    - Glaucoma anterior portion changes shape
    - Cataracts
      - Lens = opaque and can not transmit light
      - Due to sun?

Slide 28

## Sensory System

- Sense of Equilibrium
  - Vertigo
    - Dizziness and rotation sensation