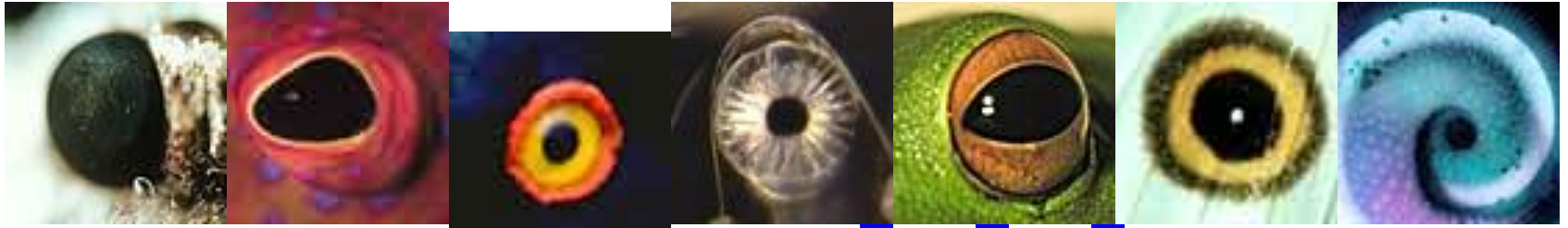


Special Senses: The Eye



MMHS Advanced Biomed
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Normal vs. Special

- **Normal Sense**: receptors in the skin, muscles and joints.
 - Touch = tactition (tactile)
 - Temperature, pressure, pain receptors in skin.
 - Proprioceptors (stretch) in muscles and joints.
- **Special Senses**: smell, taste, sight, hearing, and equilibrium.

Special Senses

- **Sight** = Vision (Visual)
- **Hearing** = Audition (Auditory)
- **Taste** = Gustation (Gustatory)
- **Smell** = Olfaction (Olfactory)



Sensation vs. Projection

- A **sensation** is a feeling that occurs when the brain interprets sensory impulses
- The cerebral cortex causes the sensation to seem to come from the stimulated receptors. This is called **Projection**, because the brain projects the sensation to its apparent source. This allows a person to pinpoint the region of stimulation.

Sensory Adaptation

Do you notice that you perceive certain sounds when entering a room but soon that same sound becomes faint background noise after time?

→ This can happen with smells, and sight too.

This experience is known as...

- ***Sensory Adaptation*** is the ability to ignore unimportant stimuli.
 - Prevents nervous system from becoming overwhelmed.

5 Types of Sensory Receptors

- **Chemoreceptors:** Stimulated by changes in the chemical concentration of substances
- **Painreceptors:** Stimulated by tissue damage
- **Thermoreceptors:** Stimulated by changes in temperature
- **Mechanoreceptors:** Stimulated by changes in pressure or movement
- **Photoreceptors:** Stimulated by light energy.

Sensory Receptors



Eye Statistics



- 70% of all sensory receptors are in the eye.
- Optic tracts are massive nerve bundles with over a million nerve fibers.
- The Vision sense requires the highest learning curve.
- Microscopic creatures lurk in your eyelashes.
- At birth, your eyes are 70% of their maximum size. Ears and nose never stop growing.
- Average person blinks 12x per minute or 10,000x per day or 30 minutes each day.
- The older we are, the less tears we produce.

Somatic Afferent Perception

- **Special somatic afferent (SSA)** refers to afferent nerves that carry information from the special senses of vision, hearing and balance.
- The cranial nerves containing SSA fibers are the
 - optic nerve
 - vestibulocochlear nerve

Visceral Afferent Perception

- **Special visceral afferent (SVA)** refers to afferent nerves that develop in association with the gastrointestinal tract.^[1] They carry the special senses of smell (olfaction) and taste (gustation).
- The cranial nerves containing SVA fibers are the
 - olfactory nerve
 - facial nerve
 - glossopharyngeal nerve
 - vagus nerve