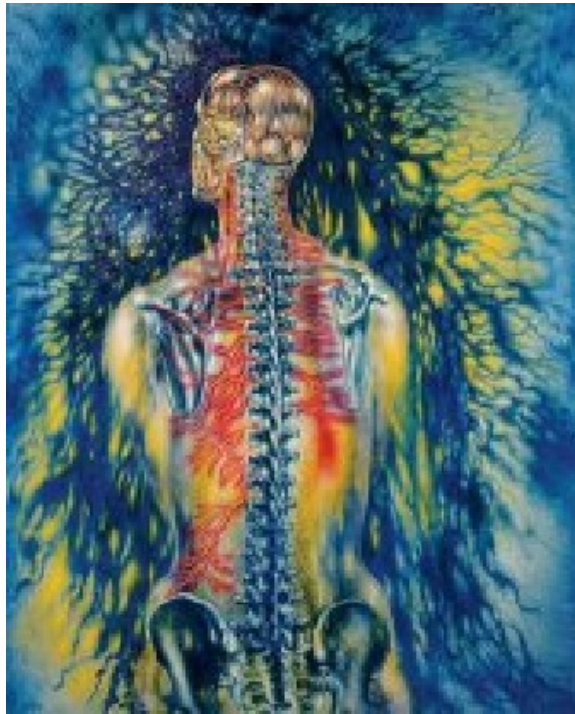
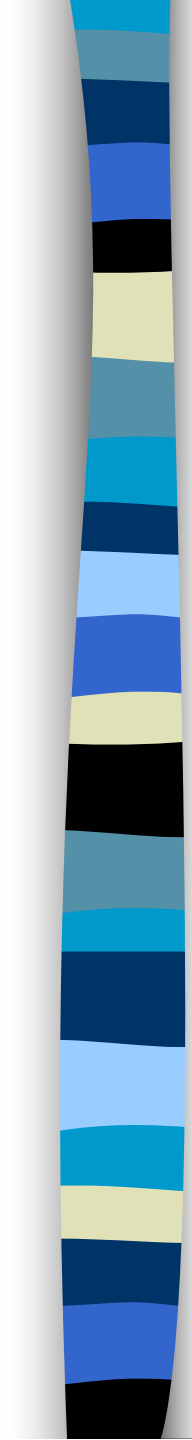


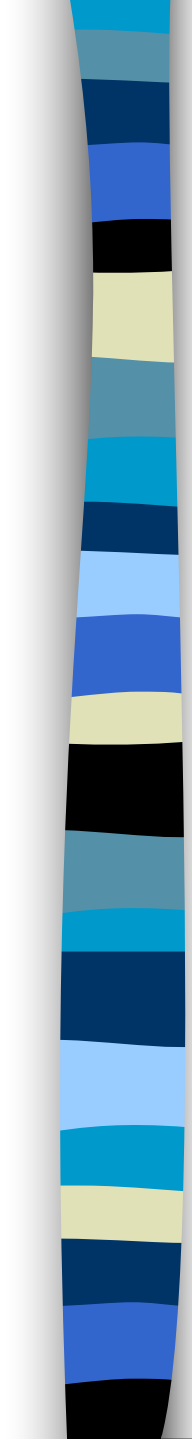
51a A&P: Nervous System - Autonomic Nervous System and Sensory Receptors





51a A&P: Nervous System - Autonomic Nervous System and Sensory Receptors Class Outline

5 minutes	Attendance, Breath of Arrival, and Reminders
10 minutes	Lecture:
25 minutes	Lecture:
15 minutes	Active study skills:
60 minutes	Total



51a A&P: Nervous System - Autonomic Nervous System and Sensory Receptors

Class Reminders

ABMP Exam Coach

- “Access your ABMP account” using instructions on page A-74
- Familiarize yourself with the ABMP Exam Coach “Study Subjects” section
- Preview the preparation assignments for MBLEx Prep classes (74a, 75a, 80a, 81a, 84a, 86a, 87a)

Assignments:

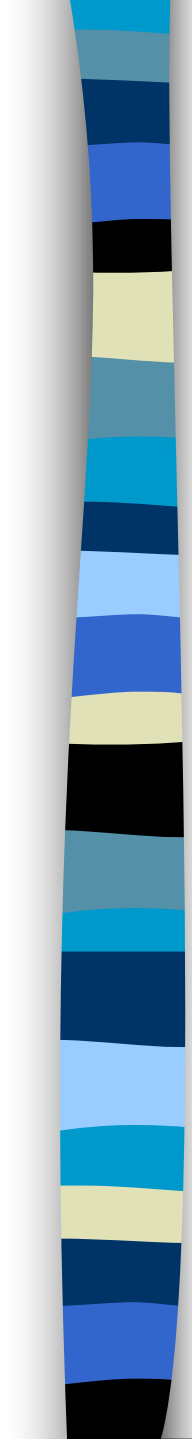
- 53a Internship Review Questions (due before class starts) – *turn in hard copy for Tammie to grade – not done on Classmarker*
- 55a Review Questions – due before class starts

Quizzes and Exams:

- 52a Kinesiology Quiz
(brachialis, brachioradialis, flexor digitorum superficialis, and extensor digitorum)

Preparation for upcoming classes:

- 52a Pathology: Nervous System
Werner: Chapter 4
Packet E: 117-122.
RQ - Packet A: 179-180.
RQ - Packet A: 190-191.
- 52b Integration Massage: Deep Swedish
Packet D: 1-4.
- 56a/b Internship: This class cannot be made up in the make-up room. To schedule a sit-in, please contact the Student Administrator.



Classroom Rules

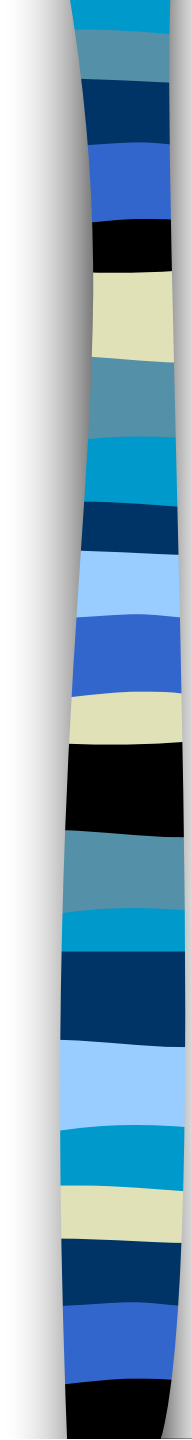
Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

The following are not allowed:

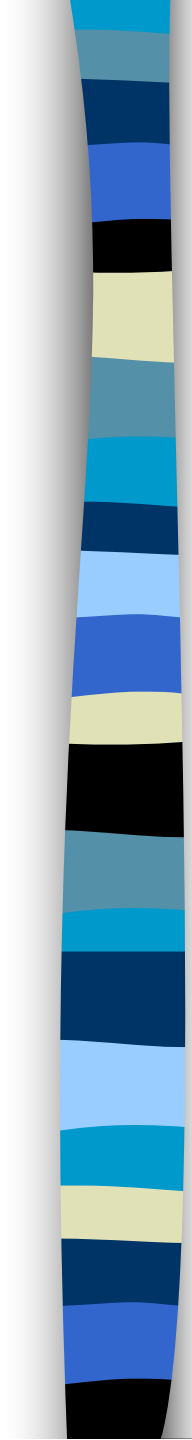
- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

You will receive one verbal warning, then you'll have to leave the room.



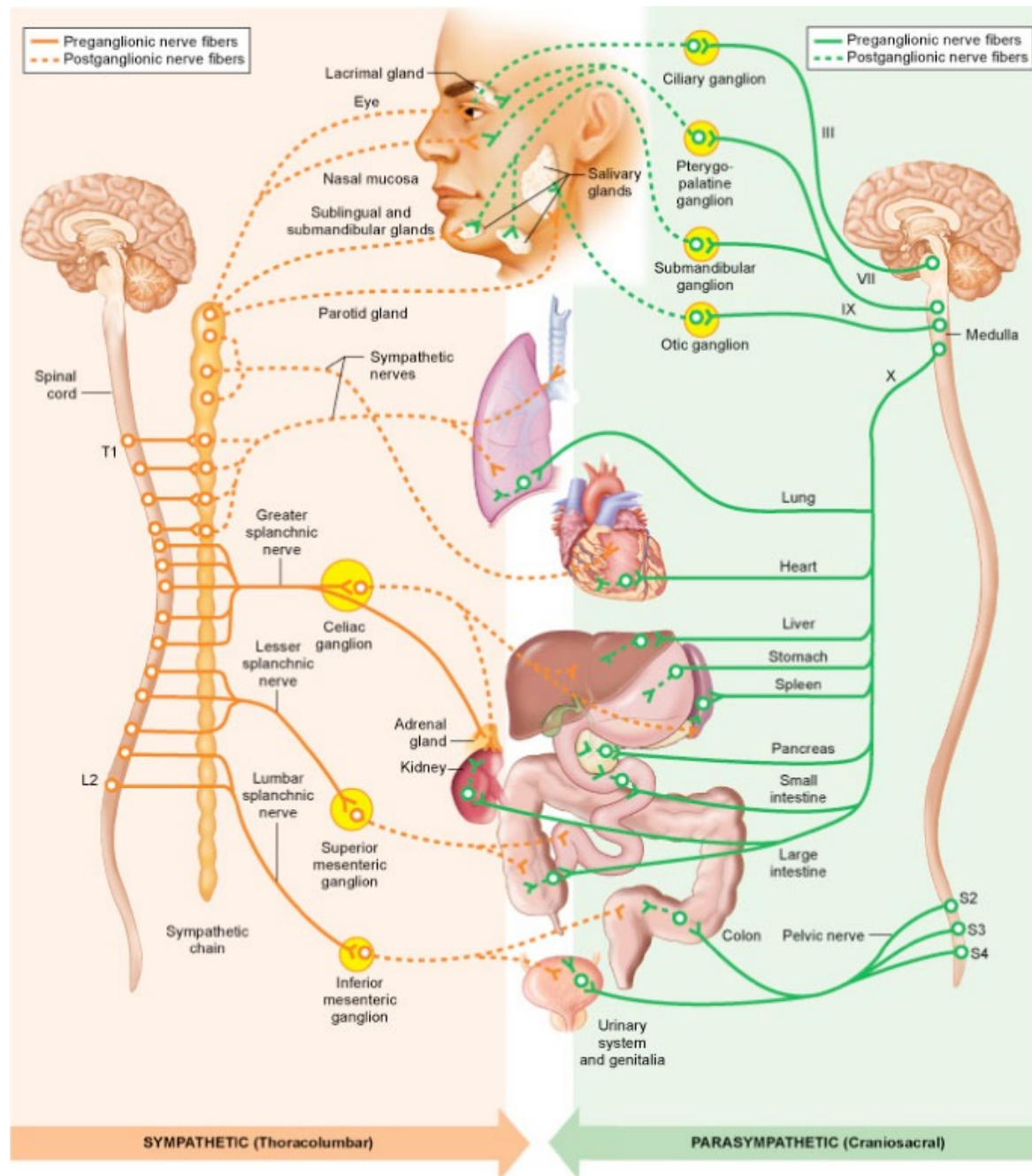
51a A&P: Nervous System - Autonomic Nervous System and Sensory Receptors

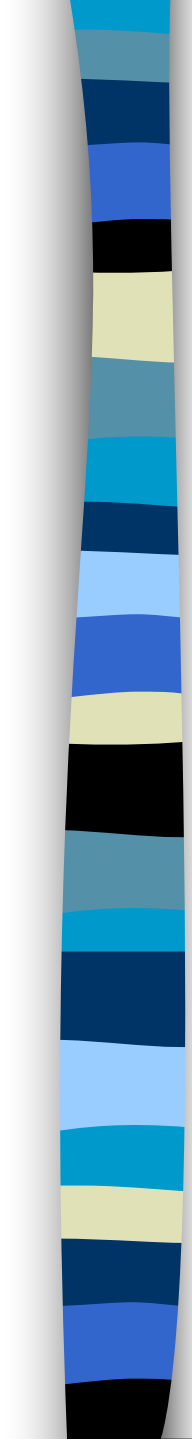
Packet E - 113



Autonomic Nervous System

Autonomic nervous system Division of the PNS that supplies impulses to smooth muscle, cardiac muscle, and glands. Has two divisions: sympathetic and parasympathetic.

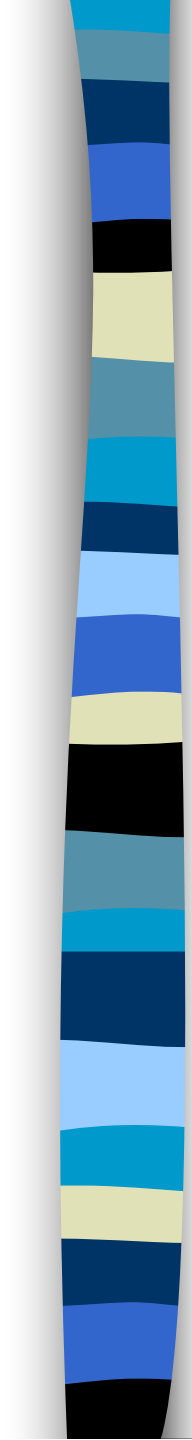




Autonomic Nervous System

Parasympathetic division (AKA: craniosacral outflow) Part of the ANS that conserves the body's energy resources.

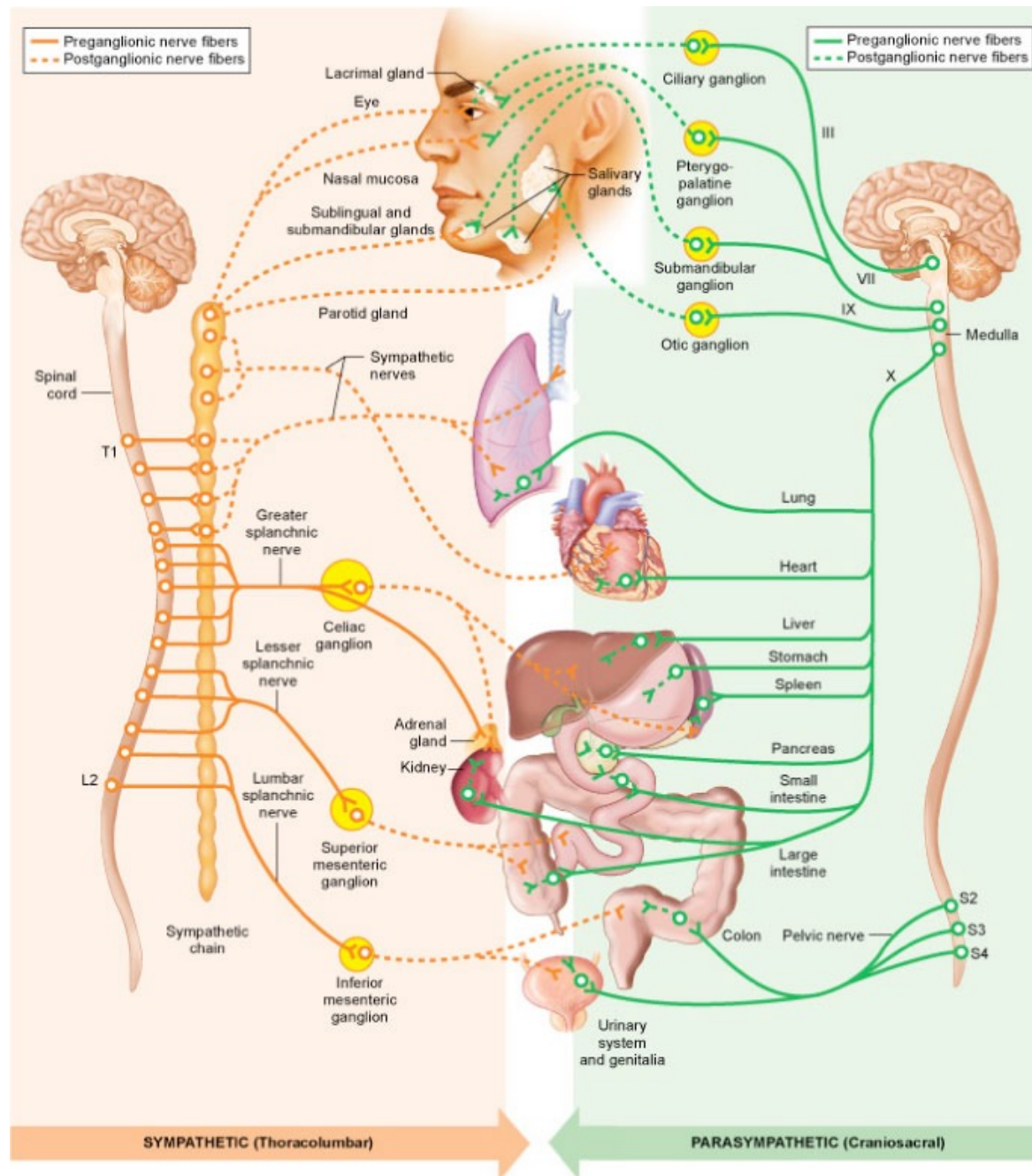
Rest and Digest!

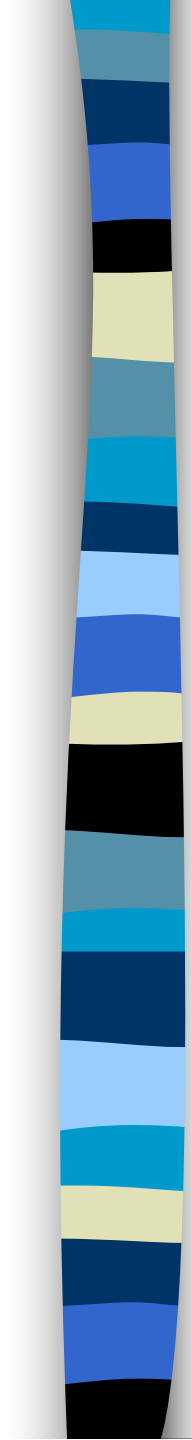


Autonomic Nervous System

Sympathetic division (AKA: thoracolumbar outflow) Part of the ANS that spends the body's energy resources during physical exertion or emotional stress.

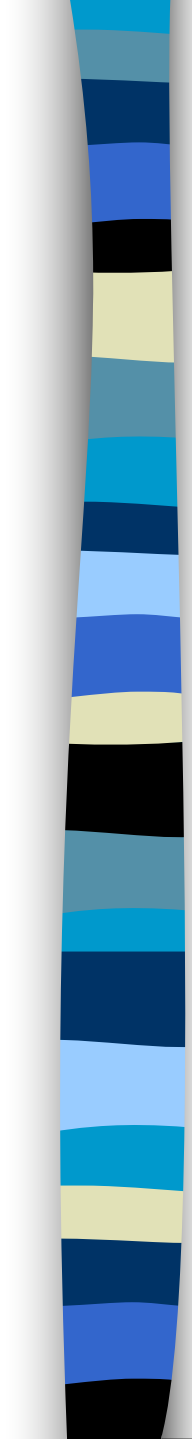
Fight, Flight, Freeze!





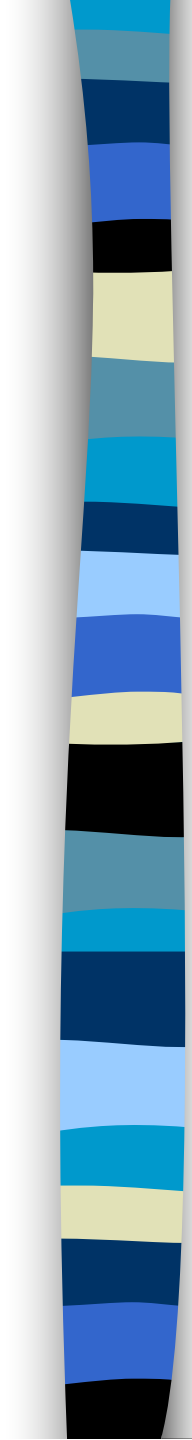
Autonomic Nervous System

<u>Sympathetic</u>	<u>Body Activity</u>	<u>Parasympathetic</u>
Increased	Heart rate	Decreased
Stronger	Heart contraction	Weaker
Increased	Respiratory rate	Maintained
Dilation	Bronchi	Constriction
Released from the liver	Glucose	N/A
Increased	Blood sugar	N/A
Blood vessel constriction	Skin and viscera	Blood vessel dilation
Increased	Blood pressure	N/A



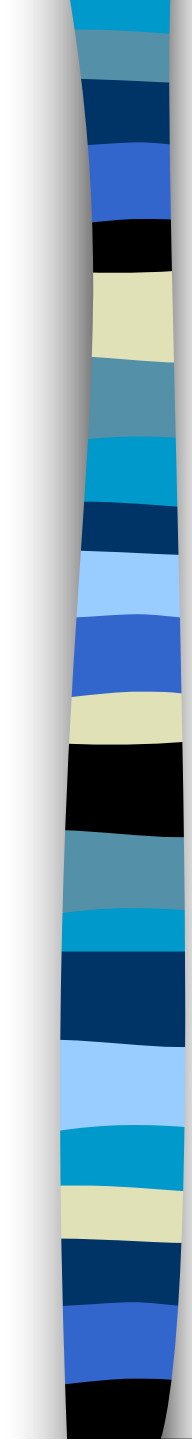
Autonomic Nervous System

<u>Sympathetic</u>	<u>Body Activity</u>	<u>Parasympathetic</u>
Pallor	Skin color	N/ A
Blood vessel dilation	Skeletal muscle	N/ A
Blood vessel dilation	Heart muscle	Blood vessel dilation
Blood vessel dilation	External genitalia	Blood vessels constriction
Dilation	Pupils	Constriction
Far-sightedness	Vision	Near-sightedness
Increased	Perspiration	N/ A
N/ A	Tears	Stimulated



Autonomic Nervous System

<u>Sympathetic</u>	<u>Body Activity</u>	<u>Parasympathetic</u>
Inhibited	Salivation	Stimulated
Inhibited	Pancreatic secretions	Stimulated
N/A	Insulin secretions	Stimulated
Decreased	Peristalsis/motility	Increased
Constriction	G.I. sphincters	Relaxation
Inhibited	Urination	Stimulated
Released by adrenals	Epinephrine	N/A
Released by adrenals	Norepinephrine	N/A



Types of Receptors

Classified by location of the stimulus

Exteroceptor

Proprioceptor

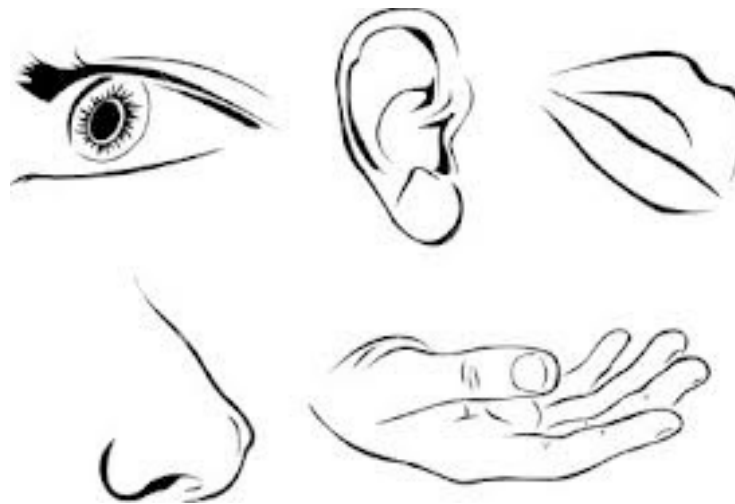
Interoceptor

Adaptation

Types of Receptors

Classified by location of the stimulus

Exteroceptor Receptor located in the skin, mucous membranes, and sense organs. Responds to stimuli originating from outside of the body.

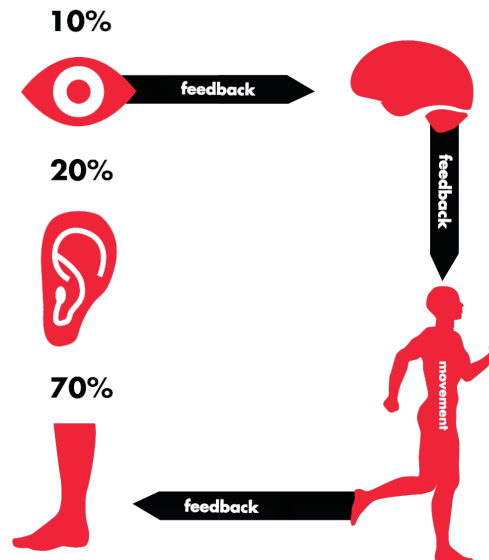


Types of Receptors

Classified by location of the stimulus

Proprioceptor Receptor located in the skin, ears, muscles, tendons, joints, and fascia. Responds to movement and body position.

Proprioception



Types of Receptors

Classified by location of the stimulus

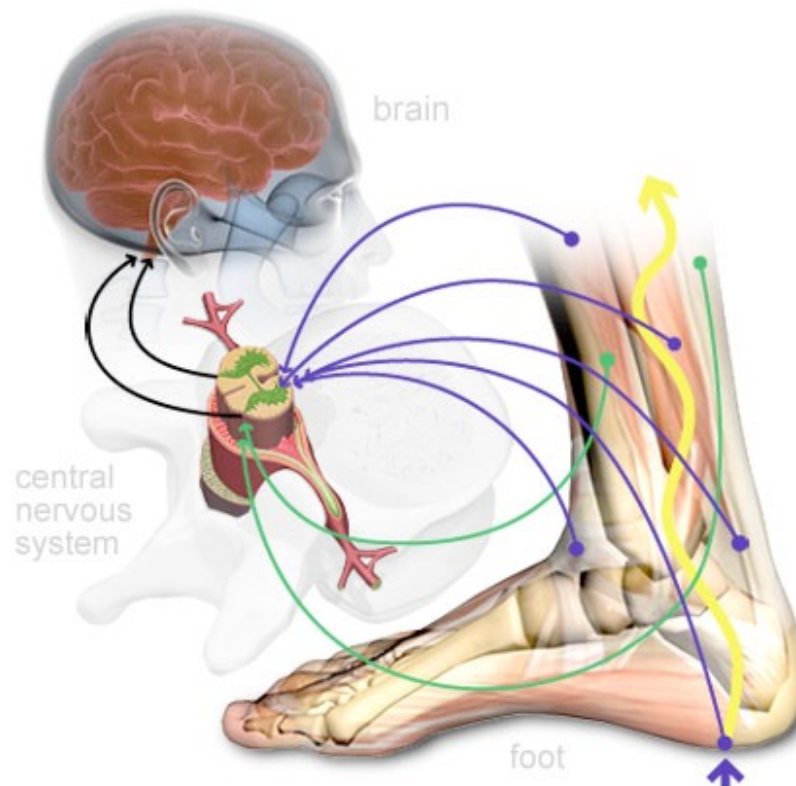
Proprioceptor Receptor located in the skin, ears, muscles, tendons, joints, and fascia. Responds to movement and body position.



Types of Receptors

Classified by location of the stimulus

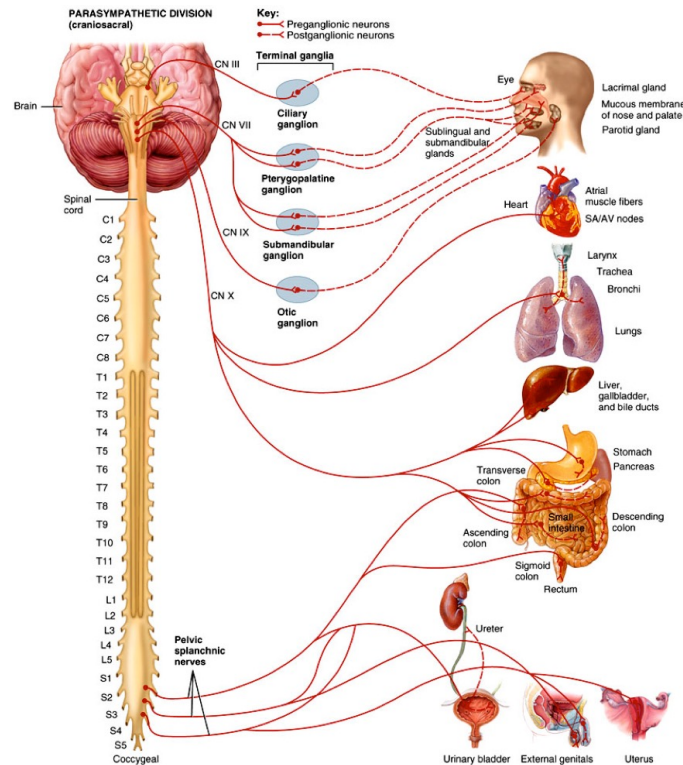
Proprioceptor Receptor located in the skin, ears, muscles, tendons, joints, and fascia. Responds to movement and body position.

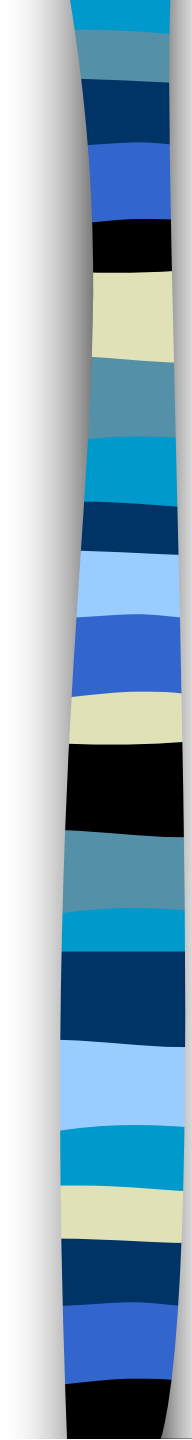


Types of Receptors

Classified by location of the stimulus

Interoceptor Receptor located in the viscera. Responds to stimuli such as digestion, excretion, and blood pressure originating within the body.

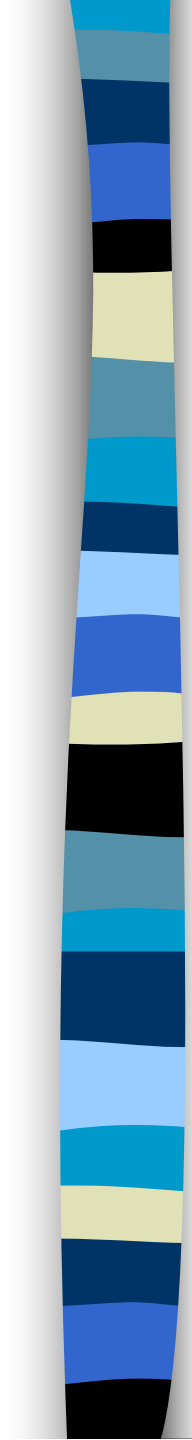




Types of Receptors

Classified by location of the stimulus

Adaptation decrease in sensitivity to prolonged stimulus.



Types of Receptors

Classified by the types of stimuli they detect

Chemoreceptor

Mechanoreceptor

Stretch receptor

Photoreceptor

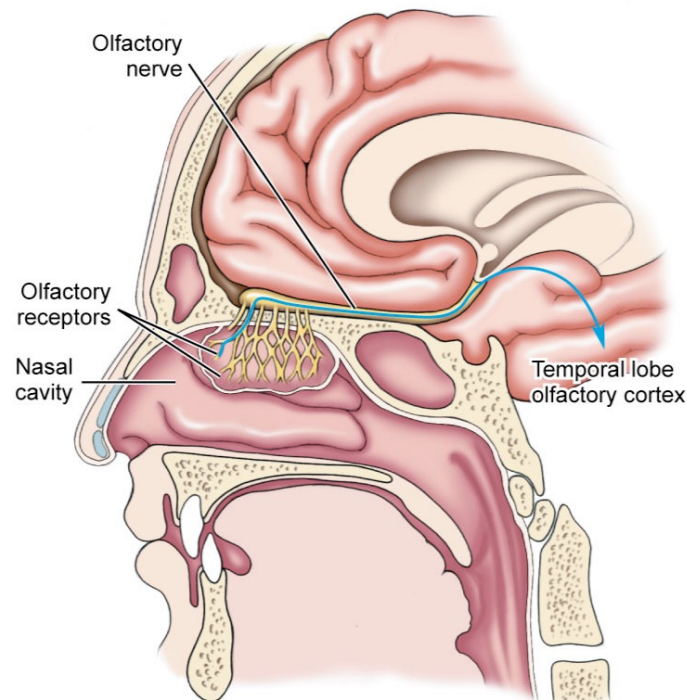
Nociceptor

Thermoreceptor

Types of Receptors

Classified by the types of stimuli they detect

Chemoreceptor Activated by chemical stimuli. Detects smells, tastes, and changes in blood chemistry.



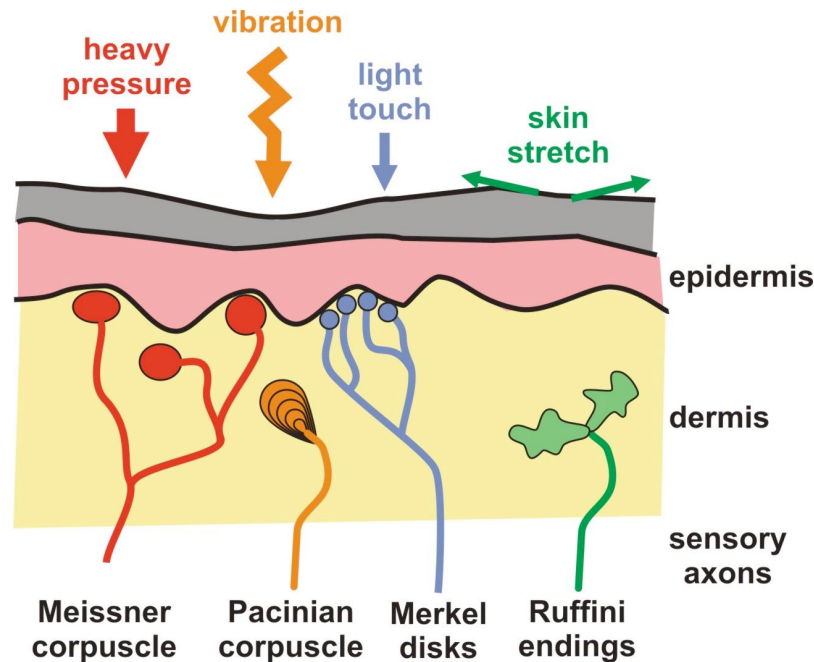
Types of Receptors

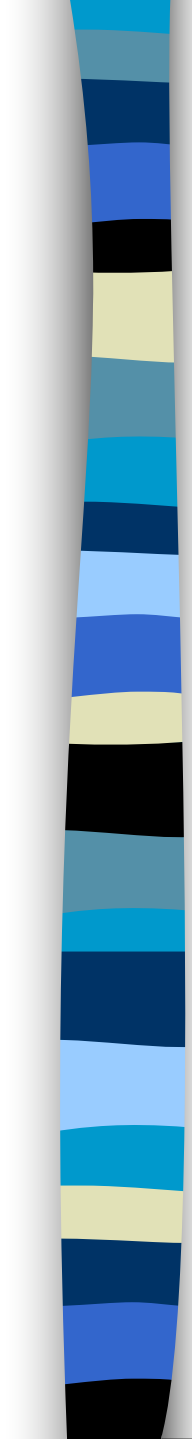
Classified by the types of stimuli they detect

Mechanoreceptor Receptor that detects pressure and movement.

Found in the skin, blood vessels, ears, muscles, tendons, joints, and fascia.

Detects pressure, blood pressure, vibration, stretching, muscular contraction, proprioception, sound, and equilibrium.





Types of Receptors

Classified by the types of stimuli they detect

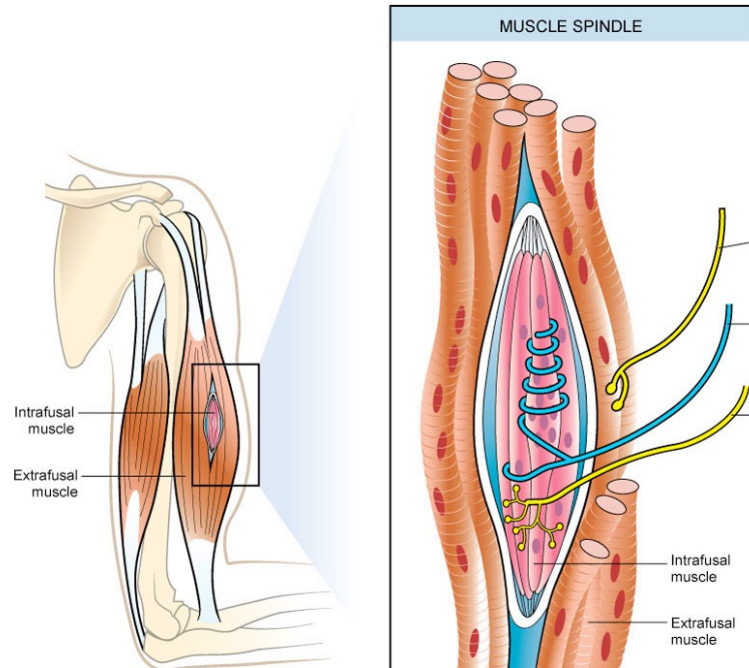
Stretch receptor Receptors that detect stretch in muscle fibers, tendons, and arteries. Examples:

- Muscle spindle
- Golgi tendon organ
- Baroreceptor

Stretch Receptors

Muscle spindle Stretch receptor located within the muscle belly.

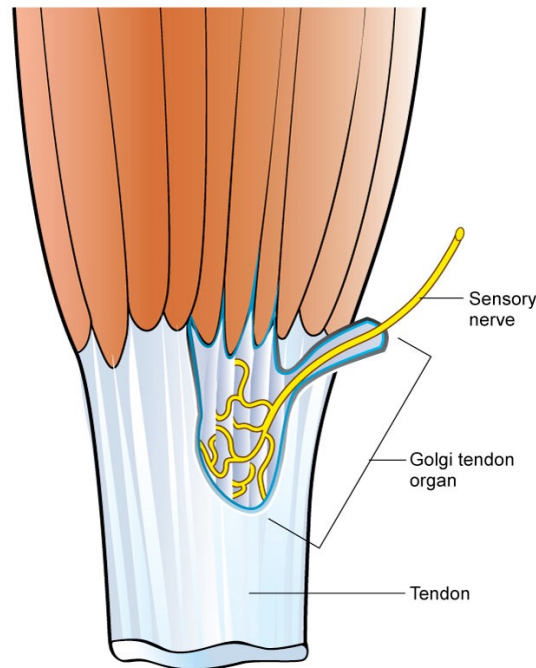
Detects sudden stretching, causing the nervous system to respond by reflexively contracting the muscle.



Stretch Receptors

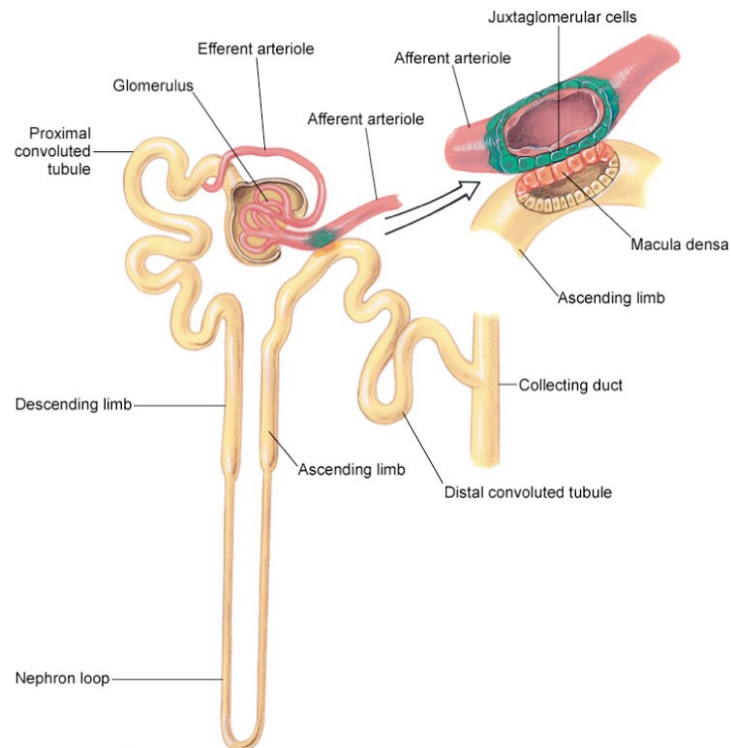
Golgi tendon organ Receptor located at the musculotendinous junction.

Detects movement and excessive stretch, causing the nervous system to respond by inhibiting contraction.



Stretch Receptors

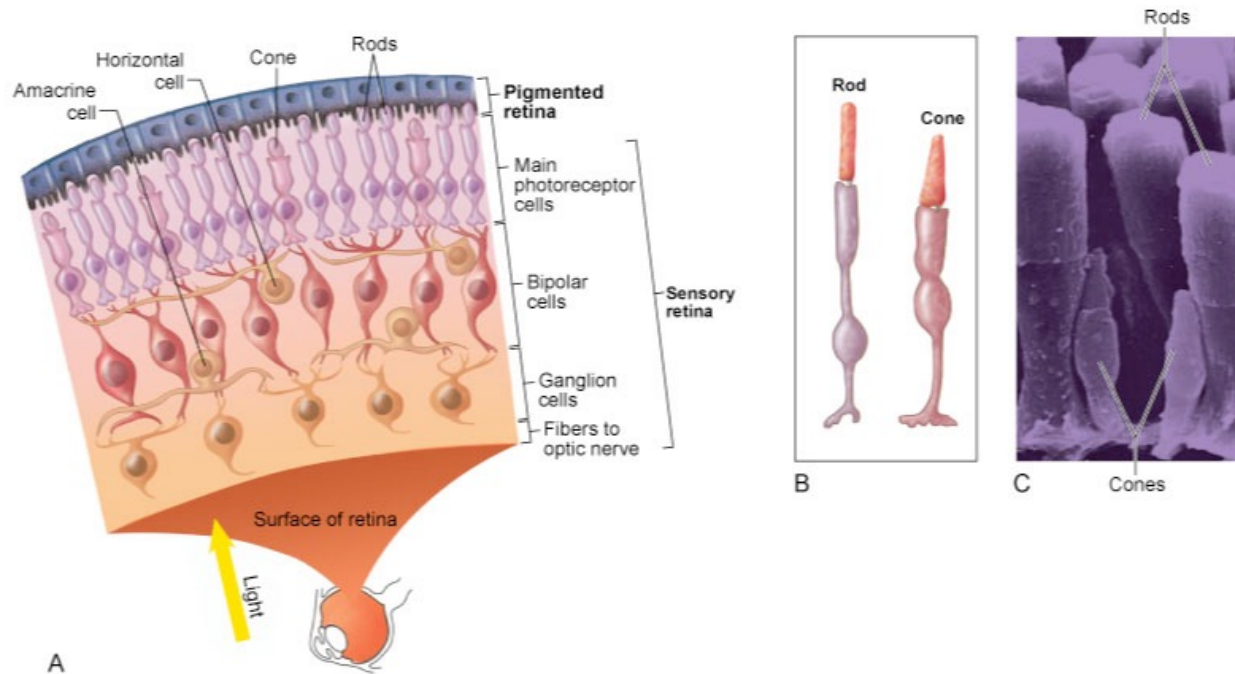
Baroreceptor Detects blood pressure by monitoring the amount of stretch exerted on certain arterial walls, namely carotid arteries and the aortic arch.

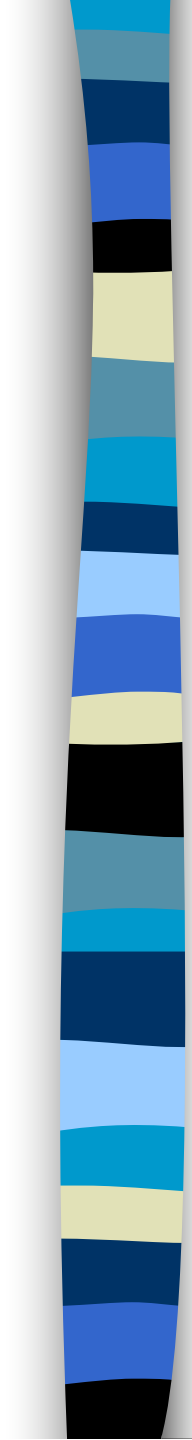


Types of Receptors

Classified by the types of stimuli they detect

Photoreceptor Receptor that is sensitive to light. Examples: rods and cones in the eyes.





Types of Receptors

Classified by the types of stimuli they detect

Photoreceptor Receptor that is sensitive to light. Examples: rods and cones in the eyes.

Fun Facts!

Rods:

- Black and white vision
- Low light situations such as night vision
- 120 million rod cells per retina

Cones:

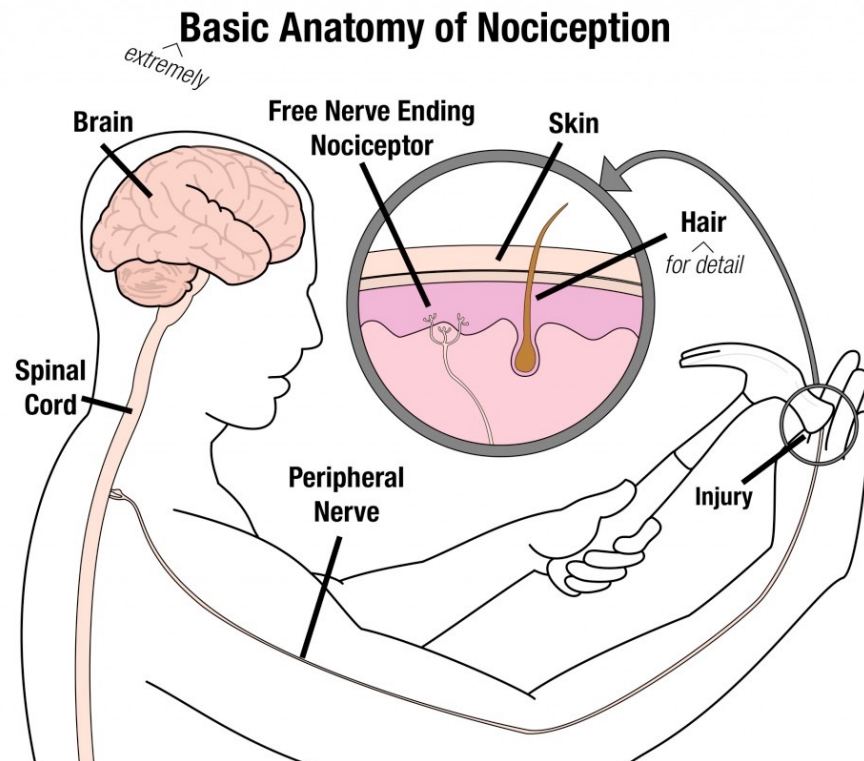
- Colors
- Bright light

6 million cone cells per retina

Types of Receptors

Classified by the types of stimuli they detect

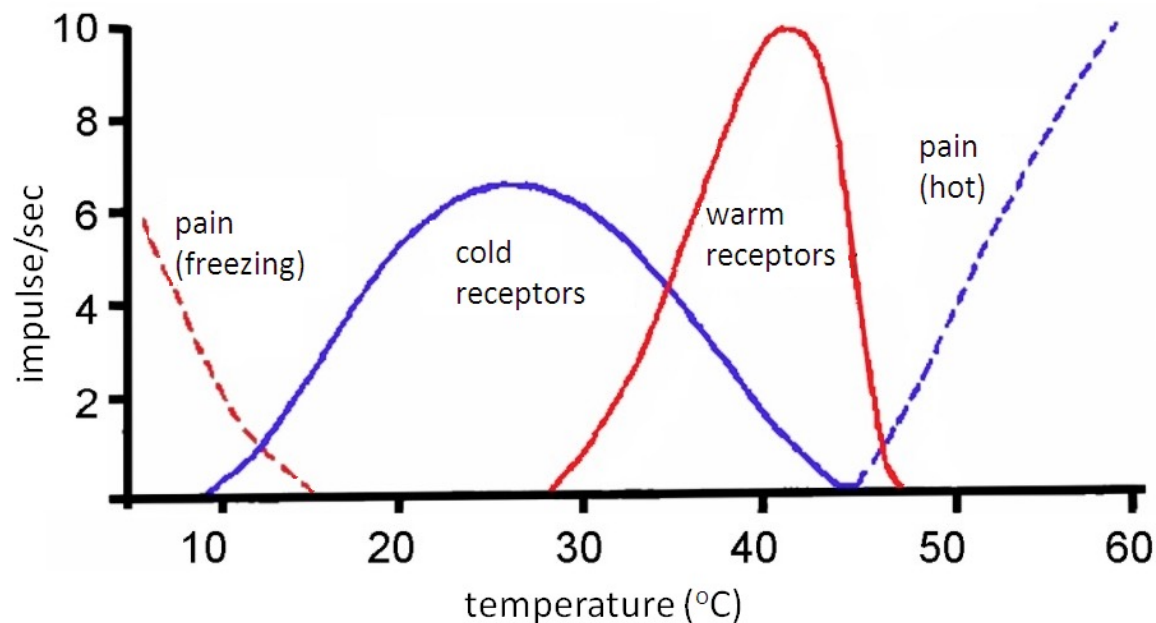
Nociceptor (AKA: free nerve ending) Receptor that detects pain.



Types of Receptors

Classified by the types of stimuli they detect

Thermoreceptor Receptor that detects temperature changes.



50° F 68° F 86° F 104° F 122° F
140° F

51a A&P: Nervous System - Autonomic Nervous System and Sensory Receptors

