

# NERVOUS SYSTEM OVERVIEW

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## Nervous System Functions

- 1) Sensation
- 2) Interpretation
- 3) Response

## Central Nervous System (CNS)

- Brain and spinal cord

## Peripheral Nervous System (PNS)

- All nerves in the body
  - Cranial nerves: leave the CNS off the brain stem
  - Spinal nerves: leave the CNS off the spinal cord

All spinal nerves carry sensory and motor information. These are the two divisions of the PNS:

- **Sensory/Afferent Division of the PNS:** How we perceive/interpret our environment
  - Consists of neurons relaying sense of touch, taste, sight, sound, and smell from organs to the brain
  - Sensory neurons have receptors in the eyes, ears, nose, tongue and skin. Action potentials are fired from these places and travel up the neuron to the brain or spinal cord.
  - pain receptors (also called nociceptors)
  - proprioceptors are sensory receptors found in muscles and joints that send signals to the CNS so that the brain can know where limbs are in space, even when our eyes are closed.
- **Motor/Efferent Division of the PNS:**
  - **Somatic/Voluntary nervous system:** These include motor neurons that go to skeletal muscles (there are over 600 skeletal muscles!). Skeletal muscles are always attached to bones, thus causing bones to move when the muscle contracts (shortens).
  - **Autonomic/Involuntary nervous system:** This includes neurons that go to cardiac muscle, smooth muscle and glands
    - **Sympathetic nervous system:** ("Fight or Flight") Motor neurons that prepare our body to handle stressful events
    - **Parasympathetic nervous system:** (Rest and Digest) Motor neurons that stimulate digestion, relaxation and repair of body tissues

There is constant communication between the CNS and the PNS. The CNS is continually updated about the outside world through information relayed by PNS sensory nerves. The CNS commands are carried out by the motor nerves of the PNS.