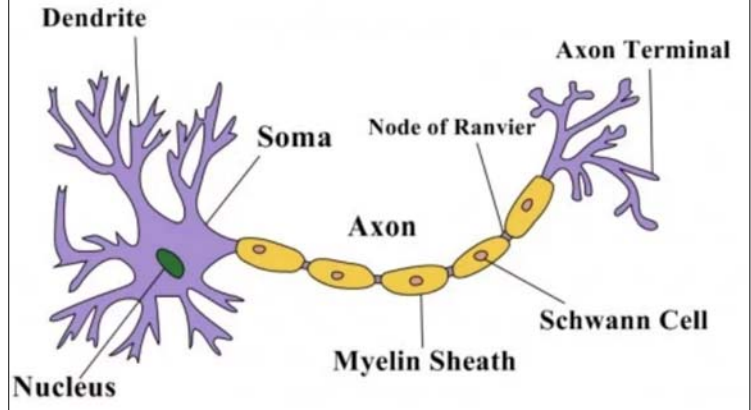
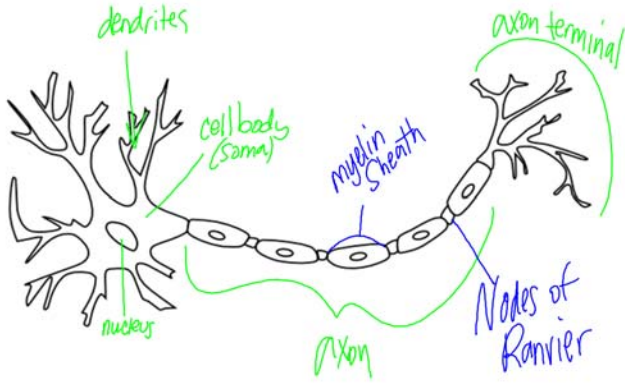
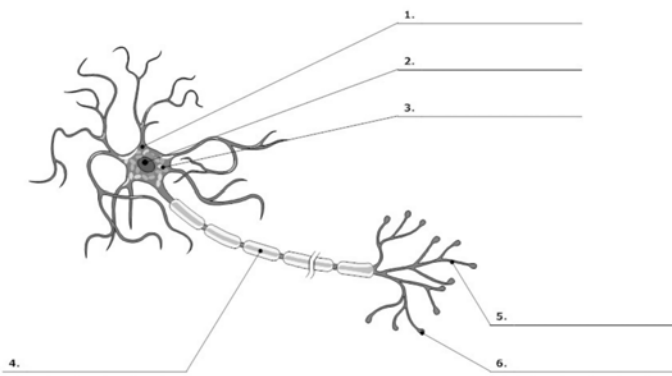


# The Neuron

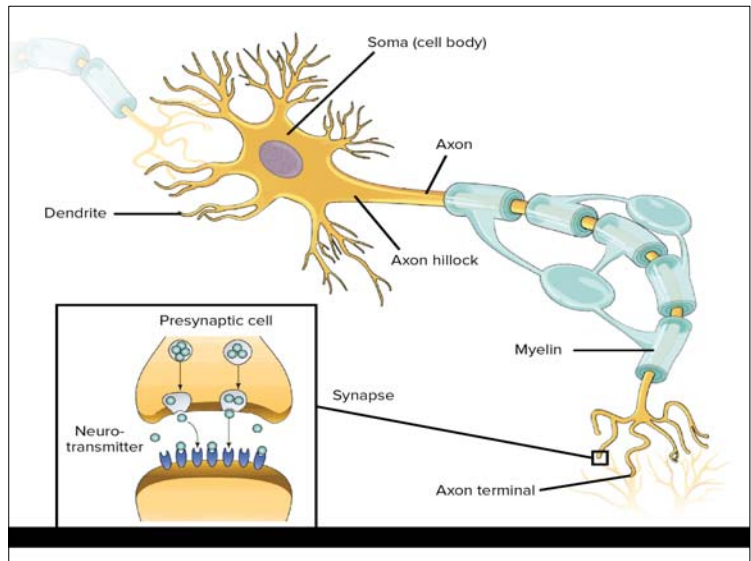


# Cell Structure and Major Cell Types

Neuron



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### Basic Neuron Types

**MOTOR NEURONS**

Originates in the **motor region of the cerebral cortex** or the **brain stem**.

**Cell body is located in the spinal cord** and whose fiber (**axon**) projects **outside the spinal cord to directly or indirectly control muscles**.

**Motor neurons** are efferent nerves (also called **effector neurons**), that carry signals from the spinal cord to the muscles to produce (effect) movement

### Basic Neuron Types

**SENSORY NEURONS**

- **Transmit sensory information (sight, sound, feeling)**
- They are activated by sensory input, and send projections to other elements of the nervous system, ultimately conveying sensory information to the brain or spinal cord.
- In complex organisms, **when stimulation of a peripheral sensory neuron (a first-order sensory neuron) receptor exceeds a set level of intensity, an electrical impulse travels down the nerve fiber to the central nervous system, where it may activate a motor neuron or another sensory neuron (a second- or third-order neuron), or both.**
- In less complex organisms, such as the hydra, sensory neurons transmit data to motor neurons or ganglia. Different types of receptor respond to different kinds of stimulus.

### Basic Neuron Types

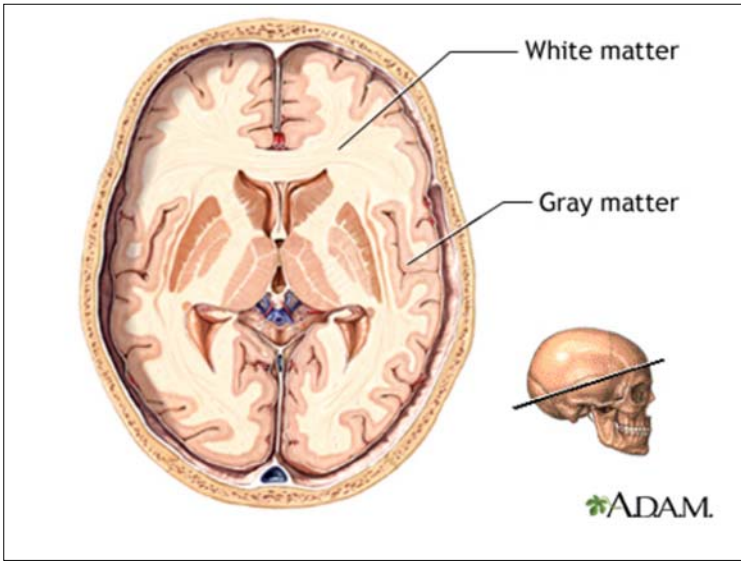
**INTERNEURONS**

Also called **relay neuron, association neuron**, connector neuron or local circuit neuron

**Neuron that forms a connection between other neurons.**

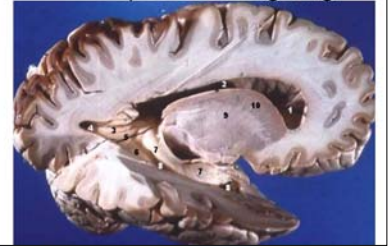
Interneurons are neither motor nor sensory.

**Types of Neurons**



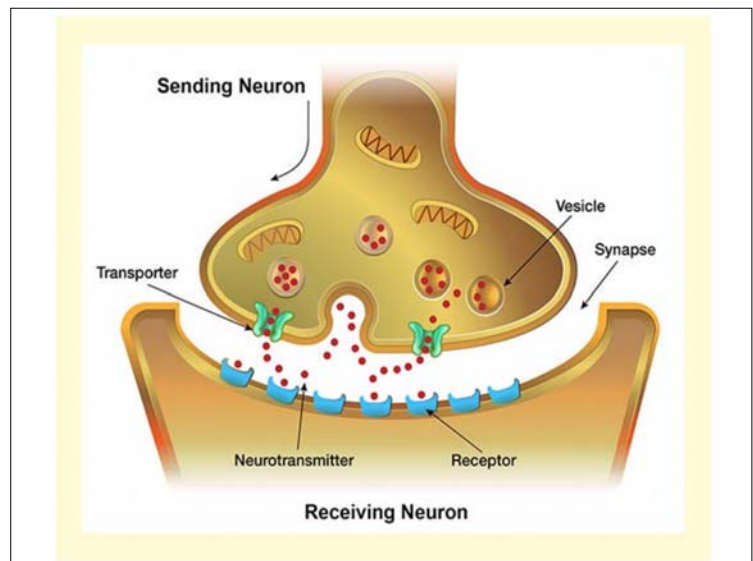
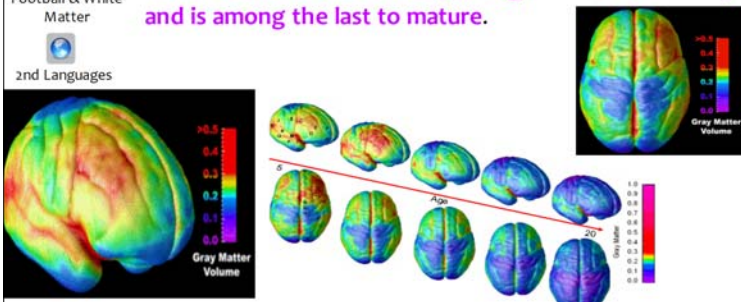
## Gray matter vs. **White matter**

- Contains most of the brain's cell bodies
- Contains nerve fibers (many surrounded by fat called myelin)
- Includes regions involved in muscle control & sensory perception
  - seeing and hearing
  - memory
  - emotions
  - speech
  - decision making
  - self-control
- Myelin gives white matter its color
  - acts as an insulator
  - plays an important role in the speed of nerve signaling.
- 20% of O<sub>2</sub> taken in by the body; 95% goes to grey matter



### Red indicates more gray matter, blue less gray matter.

- Gray matter wanes in a back to front wave as the brain matures and neural connections are pruned.
- Areas performing more basic functions mature earlier; areas for higher-order functions (emotion, self-control) mature later.
- The pre-frontal cortex, which handles reasoning and other "executive" functions, emerged late in evolution, and is among the last to mature.



# Neurotransmitters

