we will examine the structures of the brain and what each one does. With this general overview of the brain, you will be able to understand concepts such as

- **motor control**
- **visual processing**
- **auditory processing**
- **sensation**
- **learning**
- **memory and**
- **emotions**

How Your Brain Works

- Every animal you can think of -- mammals, birds, reptiles, fish, amphibians -- has a brain. But the human brain is unique. It gives us the power to think, plan, speak, imagine... It is truly an amazing organ.
- The brain performs an incredible number of tasks:

- It controls body temperature, blood pressure, heart rate and breathing.
- It accepts a flood of information about the world around you from your various senses (seeing, hearing,smelling, tasting, touching, etc).
- It handles physical motion when walking, talking, standing or sitting.
- It lets you think, dream, reason and experience emotions.

Major Divisions of the Brain

- **Spinal cord**
- **Brain stem**
- **Forebrain**

Diencephalon- thalamus, hypothalamus

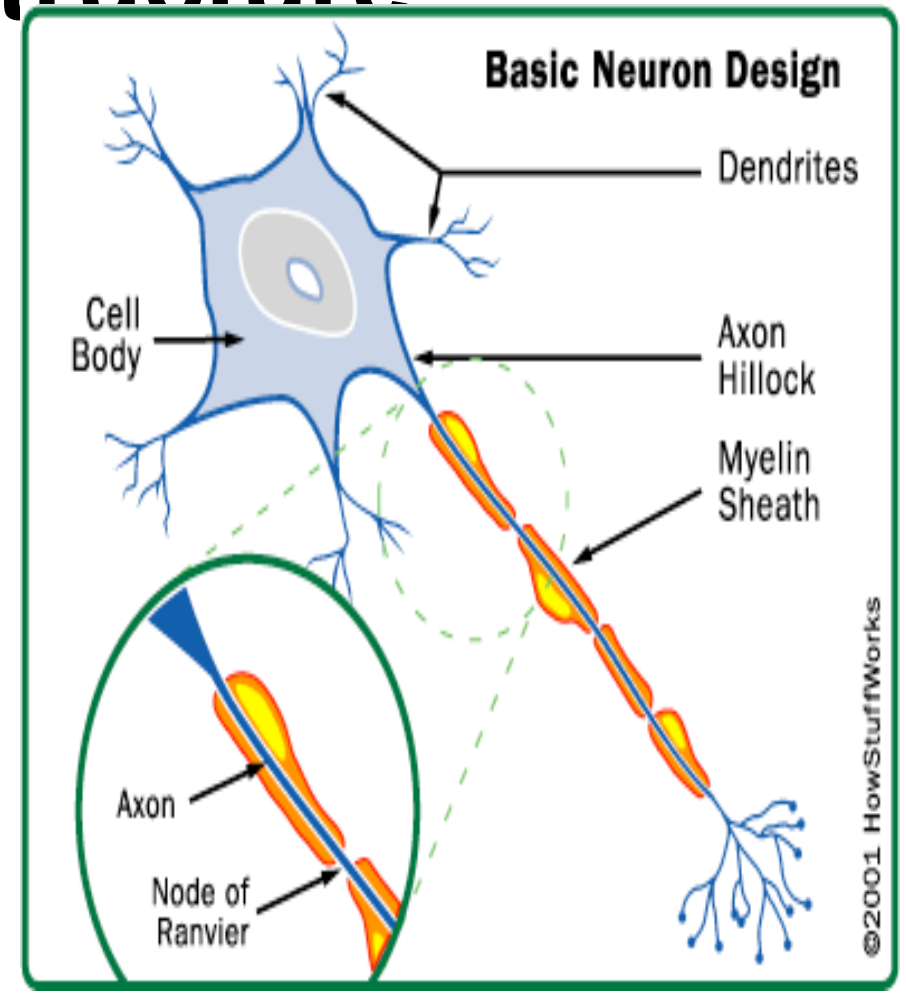
Cerebral cortex

Brain Parts

- **Brain stem** - The brain stem consists of the medulla (an enlarged portion of the upper spinal cord), pons and midbrain (lower animals have only a medulla). The brain stem controls the reflexes and automatic functions (heart rate, blood pressure), limb movements and visceral functions (digestion, urination).
- **Cerebellum** - The cerebellum integrates information from the vestibular system that indicates position and movement and uses this information to coordinate limb movements.
- **Hypothalamus and pituitary gland** - These control visceral functions, body temperature and behavioral responses such as feeding, drinking, sexual response, aggression and pleasure.
- **Cerebrum (also called the cerebral cortex or just the cortex)** - The cerebrum consists of the cortex, large fiber tracts (corpus callosum) and some deeper structures (basal ganglia, amygdala, hippocampus). It integrates information from all of the sense organs, initiates motor functions, controls emotions and holds memory and thought processes (emotional expression and thinking are more prevalent in higher mammals).

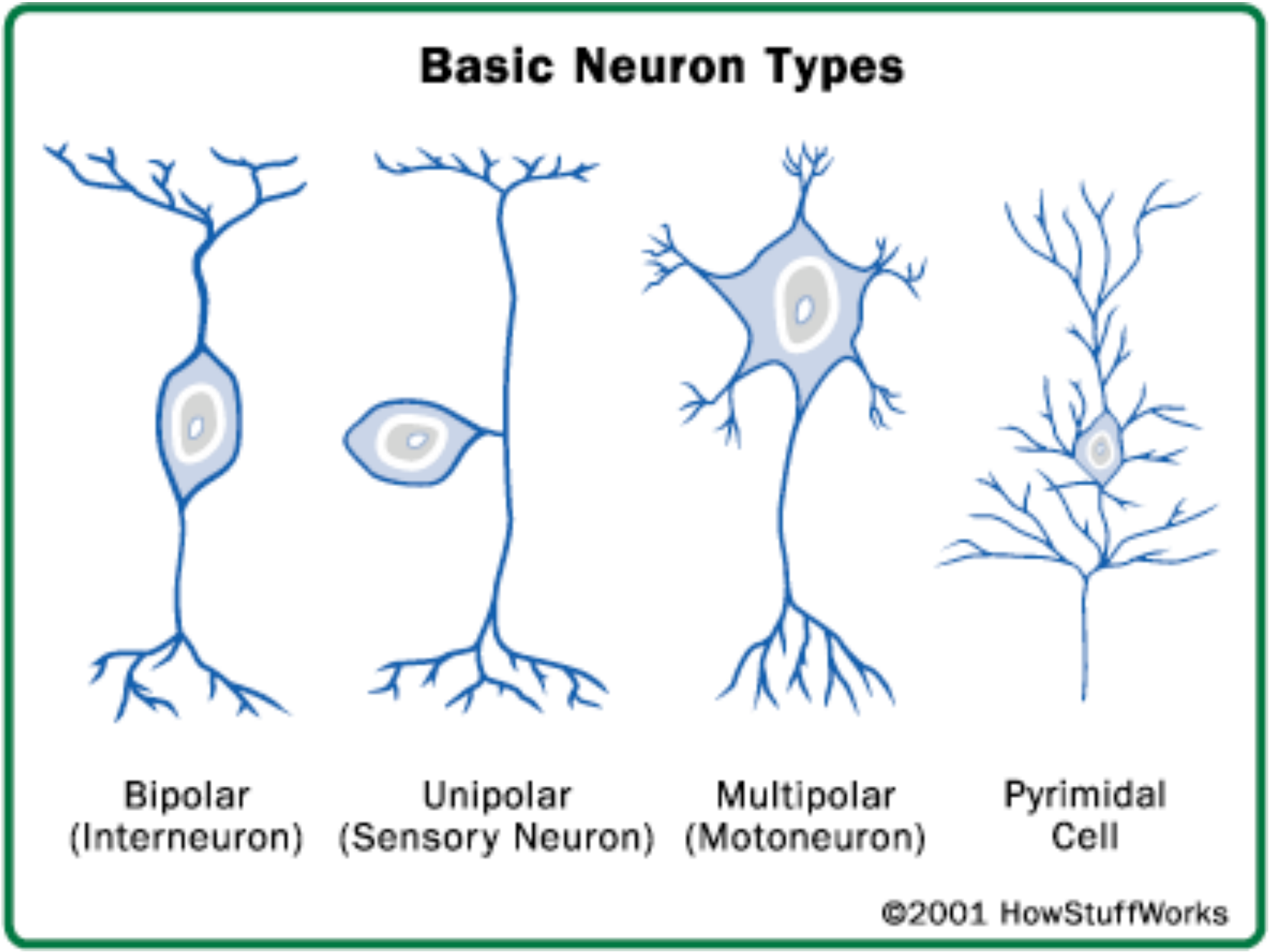
Neuron Structure

- Your brain is made of approximately 100 billion nerve cells, called **neurons**. Neurons have the amazing ability to gather and transmit electrochemical signals -- they are something like the gates and wires in a computer. Neurons share the same characteristics and have the same parts as other cells, but the electrochemical aspect lets them transmit signals over long distances (up to several feet or a few meters) and pass messages to each other.
- Neurons have three basic parts
- **Cell body**
- **Axon**
- **Dendrites** or **nerve endings**



Basic Neuron Types

- **Sensory neurons** carry signals from the outer parts of your body (periphery) into the central nervous system.
- **Motor neurons** (motoneurons) carry signals from the central nervous system to the outer parts (muscles, skin, glands) of your body.
- **Receptors** sense the environment (chemicals, light, sound, touch) and encode this information into electrochemical messages that are transmitted by sensory neurons.
- **Interneurons** connect various neurons within the brain and spinal cord.


Basic Neuron Types
Bipolar
(Interneuron)
Unipolar
(Sensory Neuron)
Multipolar
(Motoneuron)
Pyrimidal
Cell
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