

The Nervous System - 1

Organization, Function &
Communication

Agenda

- Communication & Control in the body
- Organization of the Nervous System
- Nervous Tissue
- Neuron Function
- Neural Communication

Communication & Control in the Body

Two organ systems control all of the other organ systems

1. Nervous system characteristics

- Rapid response
- Brief duration

2. Endocrine system characteristics

- Slower response
- Long duration

Organization of the Nervous System

Two Anatomical Divisions

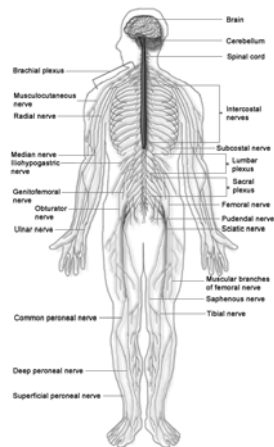
1. **Central nervous system (CNS)**
 - Brain
 - Spinal cord
2. **Peripheral nervous system (PNS)**

Consists of all the neural tissue outside CNS

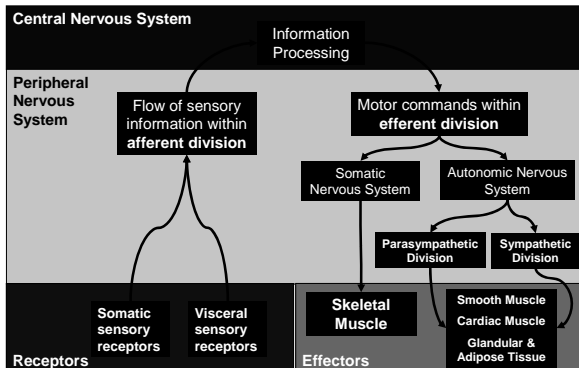
 - *Afferent* division (sensory input)
 - *Efferent* division (motor output)
 - Somatic nervous system
 - Autonomic nervous system

Organization of the Nervous System

Structural Organization



Functional Organization of the Nervous System



Nervous Tissue

Composition:

Two groups of cells

1. Neurons
the functional cell of the nervous system
2. Neuroglia
the supporting cells of the nervous system

Nervous Tissue

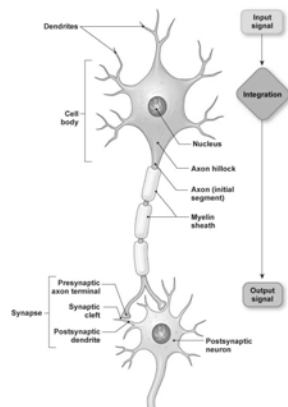
Neuron Anatomy

Soma

- dendrites & cell body
- nucleus
- organelles

Axon

- axon hillock
- axon
- axon terminal
- synaptic bulbs (terminal button)



Nervous Tissue

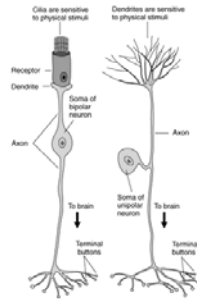
- Structural Classification of Neurons
 - Classified based on processes off of soma
 - Many = multipolar
 - Two = bipolar
 - One = unipolar/pseudounipolar

Nervous Tissue

- Functional Classification of Neurons

- Sensory

- 10 million neurons receive information from sensory receptors
 - Divided into
 - Somatic Sensory Receptors
 - » External receptors (exteroceptors)
 - » Proprioceptors
 - Visceral Sensory Receptors
 - » Internal receptors (interoceptors)



Nervous Tissue

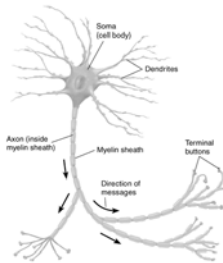
- Functional Classification of Neurons

- Interneurons

20 billion neurons involved in integrative brain function
May be commissural, associative or projection neurons

- Motor

- 500,000 motor neurons
 - Divided into somatic and visceral



Nervous Tissue

- Neuroglia – next time!
