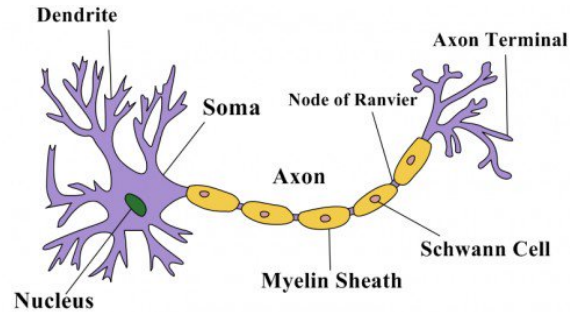


Neurons and the Nervous System

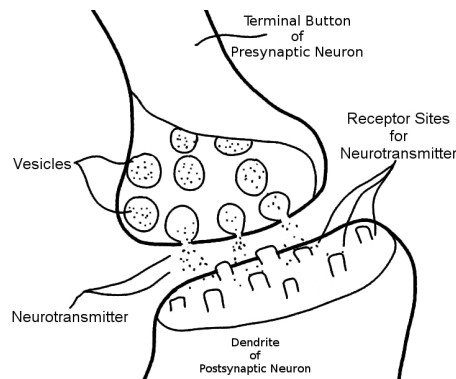
Neuron Structure



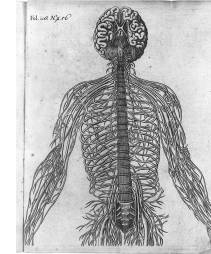
Dendrites	“Tree” receive / detect
Soma / Cell Body	Nucleus, axon hillock
Axon	Projects away from soma
Myelin	Improves speed & efficiency, <i>Schwann cells</i>
Nodes of Ranvier	Gaps in myelin sheath for <i>saltatory conduction</i>
Glial cells / Glia	“Glue” support, nutrients, waste, neurotransmission
Multiple Sclerosis	Immune disorder; demyelination
Axon Terminal	End leading to synapse
Ion channel	Allows passage of charged particles (<i>ions</i>)
Resting Potential	Negative charge -70mV
Action Potential	Electrical impulse; travels down axon +40mV
All-or-none Principle	Fire or not, no in-between
Refractory Period	Return to resting potential before firing again
Synapse	“conjunction” - gap btw neurons; neurotransmitters released (from <i>vesicles</i>)

Neurotransmitters & Associated Functions

Acetylcholine (ACh)	Learning, attention, memory, muscle activation
Alzheimer’s Disease	ACh neurons deteriorate; impairs learning & memory
Dopamine (DA)	Reward & motor control
Parkinson’s Disease	DA neurons in mid-brain (<i>substantia nigra</i>), tremors; treatment with L-DOPA
Nucleus Accumbens – Reward Area	Hypothalamus; pleasure, reward, & motivation
GABA <i>gamma-Aminobutyric acid</i>	Inhibitory NT; muscle tone regulation
Serotonin (5-HT)	Mood, sleep & dreaming
Selective Serotonin Reuptake Inhibitor - SSRI	Antidepressant medication; blocks reuptake of 5-HT
Reuptake	Neurotransmitter taken back by <i>presynaptic</i> neuron
Autoreception	Presynaptic neuron regulates NT release
Agonist vs. Antagonist	+ or – effects of NT
Endorphins	“ <i>endogenous morphine</i> ” euphoria, inhibit pain



Structure of the Nervous System



Central Nervous System	Brain & spinal cord
Peripheral Nervous System	All nerves outside CNS
Somatic Nervous System	Voluntary; sensory & somatosensory nerves
Autonomic Nerv. System	Involuntary functions
Sympathetic Nervous System	“Fight or Flight” activates stress response
Parasympathetic Nervous System	“Rest and Digest” relaxation response
Hormone	Chemical signal released into bloodstream by glands
Endocrine system	System of glands & hormones
Adrenal glands	Release stress hormones
Pituitary gland	“master gland” signals other glands
Sensory / Afferent neuron	Carries sense information
Motor / Efferent neuron	Connects to muscles/organs
Interneuron	Connects other neurons; information processing
Reflex	Stimulus → auto response