PYC1512 notes

Foundations of sub-discipline of Psychology (University of South Africa)

Biological aspects of psychology

✱ Knowledge of the Human Nervous System

- Nervous system → composed of TWO parts:
  1.) CENTRAL NERVOUS SYSTEM (CNS)
  2.) PERIPHERAL NERVOUS SYSTEM (PNS)

→ Central Nervous System:
→ Consists of the brain and spinal cord.

→ Peripheral Nervous System:
→ consists of all the nerves that exit the brain & spinal cord, and carry sensory & motor messages to and from other parts of the body.

↳ Somatic nervous system →
→ consists of axons conveying messages from the sense organs to the CNS, and from the CNS to the muscles.

↳ Autonomic nervous system → (ANS)
→ controls the heart, intestines and other organs.
→ ANS has cell bodies within the brain and spinal cord and some in the clusters along the sides of the spinal cord.

→ Autonomic nervous system: (ANS)

↳ Sympathetic nervous system →
→ "fight or Flight" response.
→ Dilation of pupils to facilitate vision.
→ Constriction of peripheral arteries to supply more blood to arteries & br

→ Secretion of epinephrine to raise blood sugar levels & increase metabolism.
→ Reduction of stomache & intestinal activity so that energy can be redirected elsewhere.

↳ Parasympathetic nervous system →
→ Controls rest, enjoyment, eating, sleep, & sexual activity.
→ Stimulates the secretion of saliva & those responsible for digestion in the stomach, produces pupillary constriction, decreases the heart rate, & increases blood flow to the genitalia during sexual activity.

✱ Understanding the major structures of the brain

→ The peripheral nervous system: Cells of the nervous system

Nervous system = 2 cells → NEURONS
→ GLIA

↳ Neuron → Information processing & transmitting element of the CNS + PNS.
→ Receive information about environment & transmit to other cells.

↳ Glia → (Greek = "glue")
→ Support functions for neurons.

→ Adult brain = 86 million neurons
= 300 billion glial cells.

The Structure of a Neuron

- **SOMA:** Main mass of a neuron - contains the nucleus & organelles.
- **Dendrites:** / **Axons:** → Specialised branches that extend from the cell body & communicates with other cells.

↳ MOTOR NEURON → with it's soma in the spinal cord, receives excitation through dendrites & conducts impulses through it's body (soma) to a muscle.

↳ SENSORY NEURON → highly sensitive to particular kinds of stimuli such as light, sounds, or touch.

Dendrites

- Dendrites that become narrower near their ends, are lined with SYNAPTIC RECEPTORS. - enables them to receive information from other neurons.
- Most have short outgrowths → DENDRITIC SPINES - increase surface area for a synapses - heightening ability to receive information.

EXAMPLE → Taking Asprin for headache.
(SYNAPTIC ACTIVITY)

1.) Asprin reaches neuron's terminal buttons. (at the axon)
2.) Neuron button containing Asprin "talks" to dendritic membrane of receiving cell (to enable transmission of Asprin).
3.) Membranes of 2 neurons "talking" to each other.
4.) Synaptic cleft diffuses substance with cellular fluid containing neurochemicals.
5.) Synaptic activity between neurons cause Asprin to "travel" to the areas where it's needed is required.