

CORNELL NOTES

Directions: You must create a minimum of 5 questions in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be stamped after each assigned sections (if completed) and turned in to your teacher at the end of the Unit for scoring.

UNIT 6: PHYSIOLOGY

Chapter 29: Nervous and Endocrine Systems

I. How Organ Systems Communicate (29.1)

A. The body's communication system help maintain homeostasis

B. **Homeostasis** depends on ability of different systems in body to _____ with one another

1. _____ must be generated, delivered, interpreted, and acted upon by your body

2. Two systems serve as communication network

a. _____ **system**- connected network of cells, tissues, and organs

b. _____ **system**- collection of physically disconnected organs that help control growth, development, and response to environment

3. Both systems allow you to respond to _____ in your environment

a. **Stimulus**- something that causes a _____.

b. Changes can be chemical, cellular, or behavioral

C. The **nervous** and **endocrine** systems have different methods and rates of _____

1. **Nervous system**- _____ acting and "hard wired"

a. **Central Nervous System (CNS)**- _____ and _____ **cord**- interprets messages and stores some messages for later use

b. **Peripheral Nervous System (PNS)**- network of _____ that transmit messages to CNS and from CNS to other organs in body

2. **Endocrine system**- _____ acting chemical signals carried in your bloodstream throughout the body

a. Control process that occur over _____ periods of time (hair growth, aging, sleep patterns, etc.)

b. Helps _____ homeostatic functions (body temperature, blood chemistry, etc.)

II. Neurons (29.2)

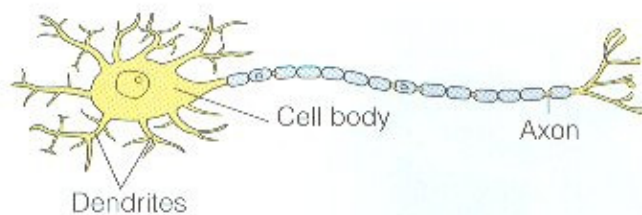
A. Neurons are highly specialized cells

1. _____ - specialized cell that stores information and carries messages (most have three parts)

a. **Cell** _____ - contains nucleus and organelles

b. _____ - branchlike extensions that receive messages

c. _____ - long extension that carries electrical messages away from cell body to other cells



2. _____ types of **neurons**

a. _____ **neurons**- detect stimuli and transmit signals to brain and spinal cord

b. _____ - make up brain and spinal cord and receive and process information

c. _____ **neurons**-pass messages from nervous system to organs and muscles

B. Neurons receive and transmit signals

1. Neurons transmit information in form of _____ and _____ impulses

a. When stimulated, produces **electrical impulse** that travels along neuron

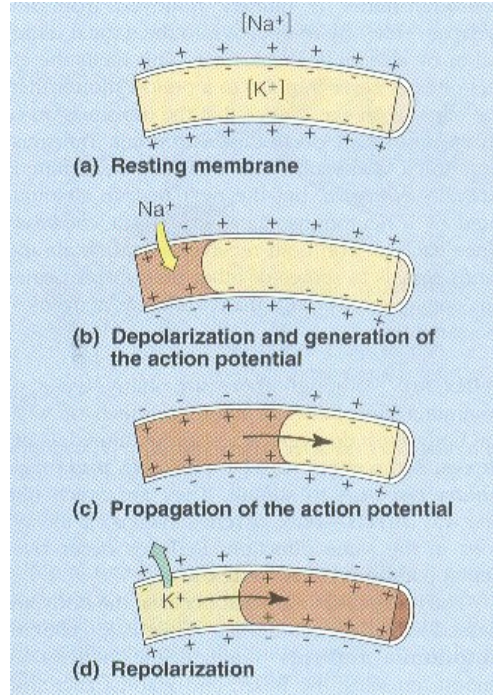
b. Moves to next cell as a _____ **signal**

2. _____ **Potential**- unequal concentrations of ions inside and outside neuron contains potential energy

a. Unequal diffusion of ions main reason for resting potential

b. **Sodium-potassium** _____ - keeps unequal concentration of ions and maintains resting potential

3. Transmission within a neuron



a. _____ **potential**- moving electrical impulse created by stimulus

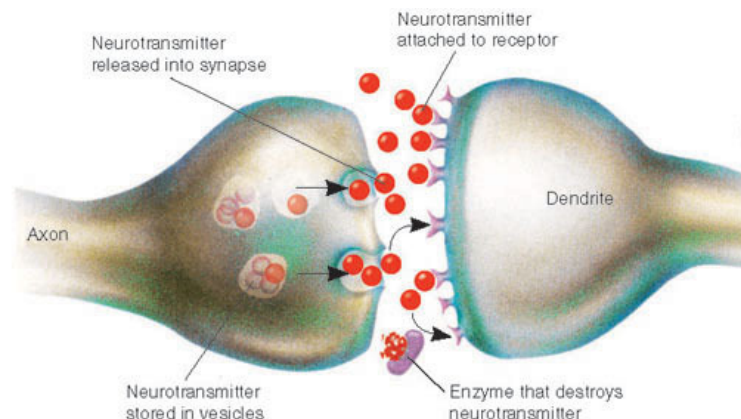
b. **Channels** for _____ open and close causing moving area of positively charged membrane to move down axon

4. Transmission between neurons

a. Signal must cross tiny gap between neurons called a _____

b. Chemical filled vesicles at end of axon (axon terminal) release _____ in synapse

c. _____ - chemical signals that travel across **synapse** and cause adjacent neuron to generate **action potential**



III. The Senses (29.3)

A. The **senses** help to maintain _____

1. **Sensory organs** collect information about the world around you and triggers _____ to maintain homeostasis

2. Also influence your _____ (protective mechanism to help maintain homeostasis)

B. The senses detect physical and chemical stimuli

1. Humans have highly specialized **sensory organs**

2. **Five main senses**: vision, hearing, touch, taste, smell

a. **Vision**- most important sense. Contains _____ (rods and cones)

b. **Hearing**- the ear collects vibrations (sound waves) with **mechanoreceptors** and converts them into nerve _____ and interpreted in brain

c. **Smell** and **taste**- contain **chemoreceptors** that _____ molecules that are dissolved in liquid.

d. **Touch, temperature, and pain**

1). **Touch**- uses two types of **mechanoreceptors** (light and heavy pressure)

2). **Temperature** and **pain** - sensed by **thermoreceptors** and **pain receptors**

IV. Central and Peripheral Nervous Systems (29.4)

A. The nervous system's two parts work together

1. **CNS** includes _____ and _____ cord composed of interneurons

2. **PNS** is collection of nerves that connects the _____ to all of your organ systems

B. The CNS _____ information

1. The interneurons of brain and spinal cord are arranged in a particular way

a. All **cell bodies** clustered together on outside (called _____ **matter**)

b. All **axons** clustered together on inside (_____ **matter**)

2. The _____ - contains over a 100 billion neurons

a. Protected by three layers of connective tissue (called _____)

b. _____ found between layers that help cushion brain

c. Brain has three main structures

1). _____ - part of brain that interprets signals from your body and forms responses

2). _____ - coordinates movements

3). _____ - connects brain to spinal cord and controls most basic activities required for life (breathing and heartbeat)

3. The Spinal Cord

a. **Spinal column** consists of **vertebrae**, **fluid**, **meninges**, and the **spinal cord**

b. Connects _____ to the nerves throughout your body

c. _____ - involuntary movements allowing you to react quickly

1). Important role in protecting your body from _____

2). Signal travels to spinal cord and back to create _____ response

C. The PNS links the CNS to muscles and other organs

VI. The Endocrine System and Hormones (29.6)

A. _____ influence a cell's activities by entering the cell or binding to its membrane

1. **Endocrine system** makes _____ **signals** that help body grow, develop, and maintain homeostasis

a. _____ - chemicals produced by endocrine glands

b. _____ - organs that release

hormones into bloodstream

B. Endocrine glands secrete hormones that act throughout the body

1. **hormones** travel in the **bloodstream** to all areas of body to find _____ **cells**

2. Endocrine system consists of 7 major glands

a. **Hypothalamus**- makes hormones to stimulate pituitary gland to release hormones

b. **Pituitary gland**- Can stimulate other endocrine glands. Produces _____ hormones

c. **Thyroid gland**- regulate _____, growth, and development

d. **Thymus**- causes _____ blood cells to mature and help fight infection

e. **Adrenal glands**- secrete hormone (_____ - epinephrine) that control "**fight or flight**" response

f. **Pancreas**- makes digestive enzymes and produces _____ to help regulate sugar levels in bloodstream

g. **gonads**- **ovaries** in women and **testes** in men

C. The _____ interacts with the **nervous** and **endocrine** systems

1. Nervous and endocrine systems _____ to each other at the base of the brain

2. The hypothalamus acts as part of _____ systems

D. Hormonal imbalances can cause severe illness

1. Too much or too little hormones can affect the entire body

2. _____ - pancreas not making proper amount of insulin and glucagons

3. Many hormonal imbalances can be treated with **surgery** or **medicines**