**KSS Psych 11 Structure of the Brain Notes**

Genes

– chains of chemicals that are arranged like rungs on a twisting ladder

– there are about 25,000 genes that contain chemical instructions that equal about 1,000,000 pages of written instructions

– genes program the development of individual parts into a complex brain & body

**STRUCTURE OF THE BRAIN (CONT.)**

3 Functions of glial cells

– guide the growth of developing neurons

– wrap around neurons and form an insulation to prevent interference from other electrical signals

– release chemicals that influence a neuron’s growth and function

**3 PARTS OF THE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**– large egg-shaped structure that provides fuel, manufactures chemicals, and maintains the entire neuron in working order**

**• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**– branchlike extensions that arise from the cell body**

**- receive signals from other neurons, muscles, or sense organs**

**– pass these signals onto the cell body**

**• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**– a single threadlike structure that extends from and carries signals away from the cell body to neighboring neurons, organs, or muscles**

**ALZHEIMER’S DISEASE**

Alzheimer’s Disease

– results from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which destroy neurons

**PERIPHERAL & CENTRAL NERVOUS SYSTEM**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Nervous System

– made up of nerves that are located throughout the body, except in the brain & spinal cord

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ System

– made up of neurons located in the brain & spinal cord

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

– stringlike bundles of axons and dendrites that come from the spinal cord and are held together by connective tissue

– carry information from the senses, skin, muscles, and the body’s organs to and from the spinal cord

– nerves in the peripheral nervous system have the ability to grow or reattach if severed or damaged

**SENDING INFORMATION: ACTION POTENTIAL SEQUENCE**

– axon membrane has chemical gates that can open to allow electrically charged particles to enter or can close to keep out these particles

– ions are chemical particles that have electrical charges

– opposite charges attract and like charges repel

**SENDING INFORMATION: NERVE IMPULSE**

Sending Information

– the nerve impulse refers to the series of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that take place segment by segment as they move down the length of the axon

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

– if an action potential starts at the beginning of the axon, the action potential will continue at the same speed segment to segment to the very end of the axon

Sending information

– ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** is a tiny electrical current that is generated when the positive sodium ions rush inside the axon

– the enormous increase of Na ions inside the axon causes the inside to reverse its charge

– the inside becomes positive & the outside becomes negative

**NEUROTRANSMITTER**

– dozens of different chemicals that are made by neurons and then used for communication between neurons during the performance of mental or physical activities

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_transmitters

– \_\_\_\_\_\_\_\_\_\_\_\_\_\_ receptor locks and turn on neurons

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transmitters

– \_\_\_\_\_\_\_\_locks and turn off neurons

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ branch out and end near dendrites of neighboring cells

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are the tips of the axon’s branches

• A gap separates the axon terminals from dendrites - called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or synaptic gap

• Presynaptic neuron – message-sending neuron

• Postsynaptic neuron – message-receiving neuron

**WHAT DOES ALCOHOL DO?**

GABA Neurons

– \_\_\_\_\_\_\_\_\_\_ neurons have chemical locks that can be opened by chemical keys in the form of the neurotransmitter GABA

• GABA Keys

– alcohol molecules so closely resemble those of the GABA neurotransmitter that alcohol can function like GABA keys and open GABA receptors

– when GABA neurons are excited, they decrease neural activity

**REFLEX**

Reflex

– unlearned, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reaction to some stimulus

– neural connections underlying a reflex are prewired by genetic instructions

• Reflex sequence

– sensors

• sensors trigger neurons that start the withdrawal effect

– \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ neurons

• carry information from the senses to the spinal cord

**REFLEX (CONT.)**

Interneuron

– relatively short neuron whose primary task is making connections between other neurons

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_neuron

– carry information awayfrom the spinal cord to produce responses in various muscles and organs throughout the body

**PARKINSON’S DISEASE**

Parkinson’s Disease

– includes symptoms of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the limbs, a slowing of voluntary movements, and feelings of depression

– as the disease progresses, patients develop a shuffling walk and may suddenly freeze in space for minute or hours at a time

– It is caused \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_

– \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a medication that boosts the levels of dopamine in the brain

– eventually the drug causes involuntary jerky movements

– after prolonged use, L-dopa’s beneficial effect may be replaced by unwanted jerky movements

**FETAL TISSUE TRANSPLANTS**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ procedure

– fixing a patient’s head in a holder and drilling a small hole through the skull

– the holder has a syringe that can be precisely guided into a predetermined location in the brain

• To date, about 150 Parkinson’s patients have been treated with fetal tissue transplants

– about 30 to 60% showed substantial improvement, but none have been completely cured

– patients under 60 showed most improvement, while those over 60 reported little or no improvement in symptoms