**Exam 5 Study Guide**

Chapter 37

**Purpose of endocrine system**

**Hormones**

Lipid-derived

 Cholesterol derivatives

Not water soluble

 Can diffuse across the plasma membrane of target cells

 Directly controls the transcription of proteins

 Small, long-lived

Amino acid-derived

 Water soluble

 Cannot cross plasma membrane of target cells

 Target cells have receptors

 Hormone binding to receptor triggers cascade reaction in cytoplasm of target cell

 Small, short-lived

Peptide

 Water soluble

 Cannot cross plasma membrane of target cells

 Target cells have receptors

 Hormone binding to receptor triggers cascade reaction in cytoplasm of target cell

 Large, short-lived

**How do lipid-derived hormones function at target cell?**

Hormone diffuses into plasma membrane, binds to intracellular receptor then then diffuses into nucleus

In nucleus, hormone is transcription factor that increases or decreases transcription of mRNA

 Controls production of proteins in the target cell

**How to amino acid-derived hormones and peptide hormones function at target cell?**

Hormone binds to receptor on outside of cell, triggers activation of G protein which activates adenylyl cyclase

Adenylyl activates cAMP which activates kinases which triggers cellular product

Phosphodiesterase deactivates cAMP

**Function of hypothalamus**

**Pituitary Gland**

Location

Structure

Hormones produced

What does it control in the body?

**Thyroid and Parathyroid Glands**

Location

Structure

Hormones produced

What does it control in the body?

**Adrenal Glands**

Location

Structure

Hormones produced

What does it control in the body?

**Pancreas**

Location

Structure

Hormones produced

What does it control in the body?

**Pineal Gland**

Location

Structure

Hormones produced

What does it control in the body?

**Gonads**

Location

Structure

Hormones produced

What does it control in the body?

**How is the excretory system regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

**How is the reproductive system regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

**How is metabolism regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

**How is blood calcium regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

**How is growth regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

**How is stress regulated by hormones?**

Glands involved

Hormones involved

What process(es) are being regulated

Chapter 38

**What are the different skeletal designs?**

Names, function, example organisms

**How does the human axial skeleton differ from the human appendicular skeleton?**

**Skull**

Location

Purpose

Facial bones

Cranial bones

**Vertebral column**

Location

Purpose

Three different types of vertebrae

**Thoracic cage**

Location

Purpose

Structure

**Human Pectoral Girdle**

Location

Purpose

Structure

Bones

**Human Pelvic Girdle**

Location

Purpose

Structure

Bones

**Long Bone structure**

**Bone Tissue (Location, Structure, Purpose)**

Compact tissue

Spongy tissue

**Bone Cell Types**

Names

Purpose

**Bone Development and Growth**

Ossification

Growth

Bone remodeling

**Joints**

What is the structure and function of the three different joint types?

**Muscle Tissue**

What is the structure and function of the three different muscle cells?

What are the difference between the three different muscle cells?

**Muscle Fiber**

Structure

Actin and Myosin bands

Structure of myofibril

**Muscle Contraction**

Sliding Filament Theory

Crossbridges

Steps of muscle stimulation and contraction

Chapter 39

**General purpose of respiratory system**

**Different types respiratory systems**

Diffusion

Skin

Gills

 How do they function?

 In what animals?

 Water flow vs blood flow

 How does oxygen diffuse into blood

Tracheal organs

 How do they function?

 In what animals?

 How does oxygen diffuse into blood

Pulmonary system

 How does it function?

 In what animals?

 How does oxygen diffuse into blood

 Lung structure

 Gas exchange in lungs

**Oxygen Transportation in Blood**

Chapter 40

**General purpose of circulatory system**

**Different types of circulatory systems**

Simple diffusion

 Function

 Organisms

Open circulatory system

 Function

 Organisms

Closed circulatory system

 Function

 Organisms

**Vertebrate Circulatory Systems (# of heart chambers, blood flow pattern)**

Fish

Amphibians

Reptiles

Mammals

**Blood**

Types of cells

 Red Blood Cells (function, structure)

 White Blood Cells (types, function, structure)

 Granulocytes versus agranulocytes

 Differences between them (structure and function)

 Names of individual types of cells (No need to know the function of each individual type of granulocyte and agranulocyte)

Platelets

 Structure and purpose

**Human Heart**

Structure

Blood flow pattern

Cardiac cycle

Chapter 41

**General purpose of excretory system**

**Tonicity**

**Osmoregulators versus osmoconformers**

**Nitrogenous waste**

What causes it

Why does it need to be removed

How is it excreted in fish versus mammals versus birds/reptiles/invertebrates

**Kidneys**

Location

Function

Structure

 Outer cortex

 Medulla

 Renal pelvis

**Nephrons**

Function

Structure

 Renal Corpuscle

 Renal Tubule

 Associated Capillaries

How is blood filtered through nephrons

Path of filtrate

 What is extracted and where? (the last two slides)

Chapter 43

**Asexual reproduction**

Offspring compared to parent

Advantages

Disadvantages

Types of asexual reproduction (how they work)

 Binary fission

 Budding

 Fragmentation

 Parthenogenesis

**Sexual reproduction**

Offspring compared to parent

Advantages

Disadvantages

Types of sexual reproduction (how they work)

 Hermaphroditism

 External fertilization

 Internal fertilization

**Human Reproduction**

Anatomy

Spermatogenesis

 Know how sperm are produced

Oogenesis

 Know how eggs are produced