• Reminder: Exam 3 on 10/24
• Endocrine System
The Endocrine System

- Utilizes chemical signals called hormones that are secreted by endocrine glands
- Slower response than nervous system
Hormone “Partnerships”

- Opposing interaction: effect of one hormone opposes the effect of another
- Synergistic interaction: two or more hormones cooperate to trigger an effect
- Permissive interaction: one hormone must “prime” target cell before another hormone can have an effect
Types of Hormones

- Steroid Hormones: Made from lipids; produced by adrenal glands and ovaries / testes
• Nonsteroid Hormones: Made from amino acids; produced by gland or organ other than adrenal gland or gonads
Hypothalamus & Pituitary Gland

- Hypothalamus integrates nervous and endocrine systems
- Pituitary cooperates with hypothalamus
Posterior Lobe of Pituitary Gland

- Stores and secretes ADH and oxytocin which are produced in the hypothalamus.
Anterior Lobe of Pituitary Gland

- Produces six hormones, including Growth Hormone (GH)
Growth Hormone (GH)

- Stimulates growth of cartilage and bone, increases muscle mass (banned in athletics)

Gigantism: Too much GH during childhood

Acromegaly: Too much GH during adulthood
• Pituitary Dwarfism: Too little GH or receptors not responding normally
Thyroid Gland

- Secretes Thyroid Hormone (TH) which affects metabolic rate, growth, & development
Thyroid Disorders

Goiter caused by lack of iodine

Hypothyroidism (before & after treatment)

Hyperthyroidism (Graves’ disease)
Parathyroid Glands

- Secrete ParaThyroid Hormone (PTH) which regulates calcium levels in blood
Adrenal Glands

• One found on top of each kidney
• 2 parts: adrenal cortex, adrenal medulla
Adrenal Medulla

- Releases epinephrine and norepinephrine which trigger “Fight or Flight” response
- Stimulated by sympathetic division of autonomic nervous system
Adrenal Cortex

- Responds to signals from hypothalamus instead of nervous system
- Aids in metabolism of glucose and in maintaining salt & water balance
Pancreas

• Clusters of endocrine cells called “islets”

• Produce glucagon and insulin to regulate blood sugar
Hypoglycemia

- Too much insulin leads to too little sugar in the blood – can lead to “insulin shock”
Gonads: Testes & Ovaries

- Produce Androgens (mostly testes) – development & maintenance of male reproductive system
- Produce Estrogens, Progestins (mostly ovaries) – development & maintenance of female reproductive system
Pineal Gland

• Produces & secretes melatonin
• Regulates biological rhythms to light/dark, seasonal cycles