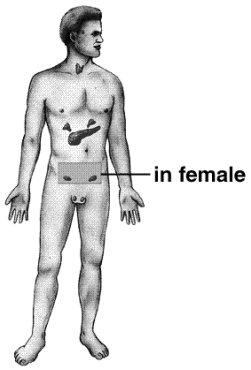
Endocrine System



Endocrine Functions

- Maintains homeostasis by releasing chemicals called hormones
- Controls long-term processes e.g
  - Growth & development
  - Reproduction
  - Metabolism

Types of Glands

- Exocrine Glands
  - Formed from epithelial tissue.
  - Release their products at the body's surface or into body cavities through ducts.
- Endocrine Glands
  - Formed from epithelial tissue.
  - Release their products - hormones -into the blood or lymph - ductless glands

Hormones

- Chemical messengers secreted by endocrine glands.
- Responsible for specific regulatory effects on certain parts or organs.

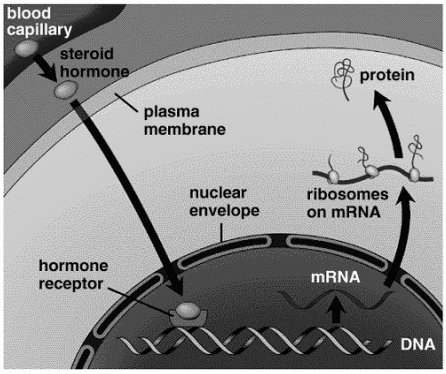
Mechanisms of Hormone Action

- Hormones affect only certain tissue cells or organs - target cells or target organs.
  - Change plasma membrane permeability or electrical state.
  - Stimulate synthesis of proteins or certain regulatory molecules in cell.
  - Activate or inactivate enzymes.
  - Stimulate mitosis

Classification of Hormones

- Steroid hormones
  - Made from cholesterol
- Nonsteroid hormones
  - Made from proteins, peptides, and amines

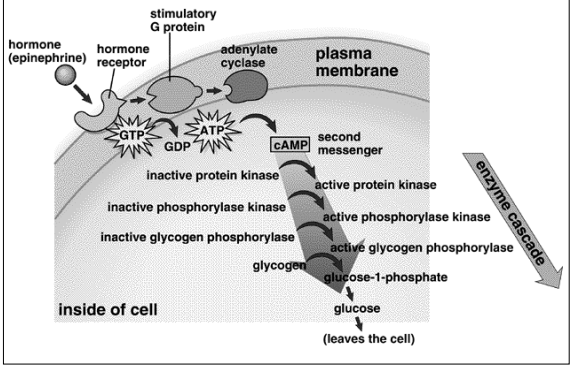
Steroid Hormone Activity



Steroid Hormone Activity

1. Hormone diffuses through plasma membrane of the target cell.
2. Hormone enters the nucleus.
3. Hormone binds to specific receptor protein in nucleus.
4. Hormone-receptor complex binds to specific area on cell's DNA
5. Activates certain genes to transcribe mRNA
6. mRNA aids in synthesis of new protein.

Peptide Hormone Activity



Nonsteroid Hormone Activity

Hormone unable to enter target cell.

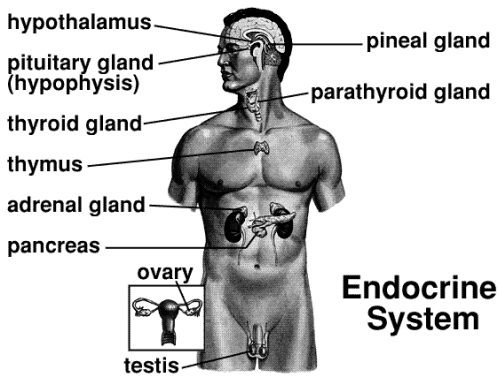
1. Hormone binds to plasma membrane receptor.
2. Series of reactions are set off that activates an enzyme.
3. Activated enzyme causes a reaction that produces a second messenger molecule.
4. Second messenger promotes typical target cell response.

Control of Hormone Release

- Negative feedback mechanism
  1. Hormone secretion triggered by some stimulus.
  2. Rising hormone levels inhibit further hormone release.
  3. Hormones vary only within a very narrow range.

Endocrine Gland Stimuli

- Hormonal
  - Endocrine gland prodded into action by other hormones.
- Humoral
  - Changing blood levels of certain ions and nutrients may stimulate hormone release.
- Neural
  - Nerve fibers stimulate hormone release.

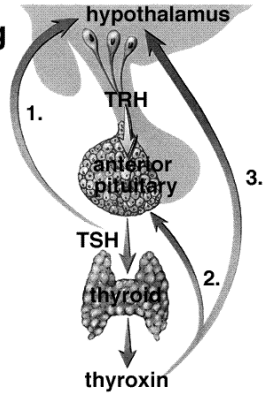


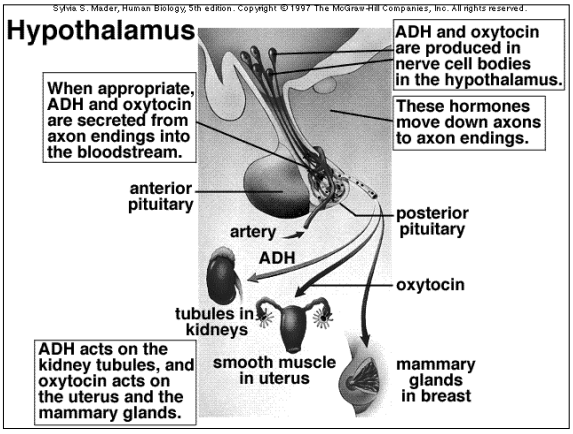
Endocrine System

Major Endocrine Organs

- Hypothalamus
- Pituitary Gland
- Thyroid Gland
- Parathyroid Glands
- Adrenal Glands
- Pancreatic islets
- Pineal Gland
- Thymus
- Ovaries
- Testes

Controlling Hormone Levels





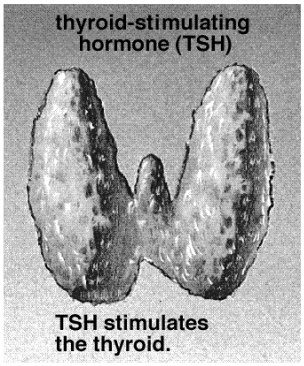
Posterior Pituitary Hormones

- Oxytocin
- ADH - antidiuretic hormone

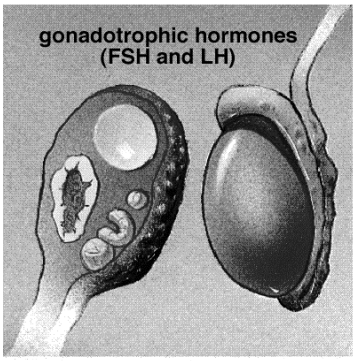
Anterior Pituitary Hormones

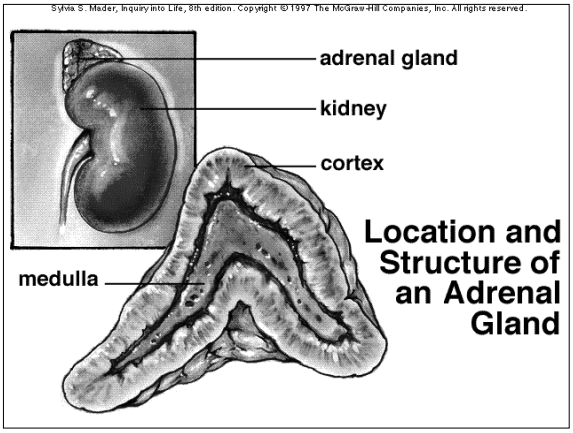
- TSH - thyroid stimulating hormone
- FSH & LH - follicle stimulating hormone & luteinizing hormone
- ACTH - adrenocorticotropic hormone
- MSH - melanocyte stimulating hormone
- PRL - prolactin stimulating hormone
- GH - growth hormone

Action of TSH

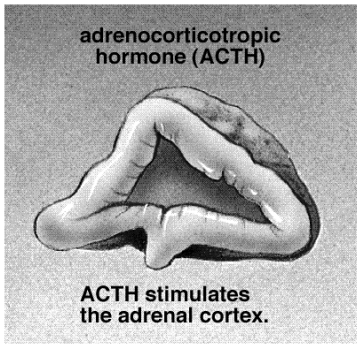


Action of FSH and LH

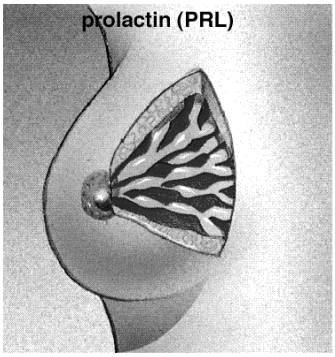




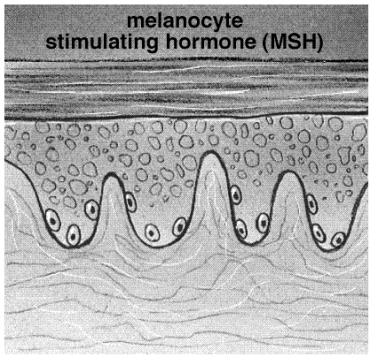
Action of ACTH



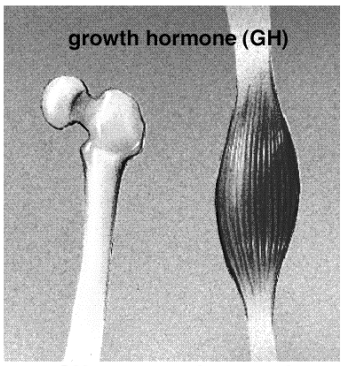
Action of PRL



Action of MSH

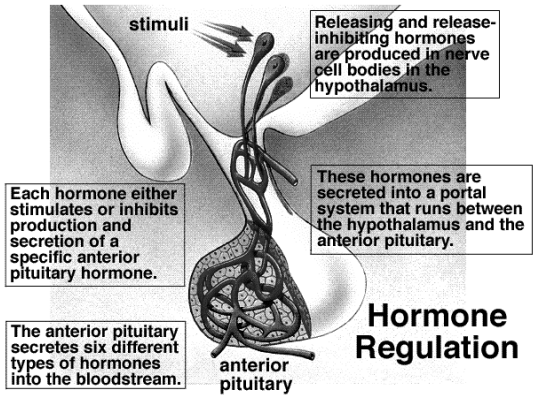


Action of GH

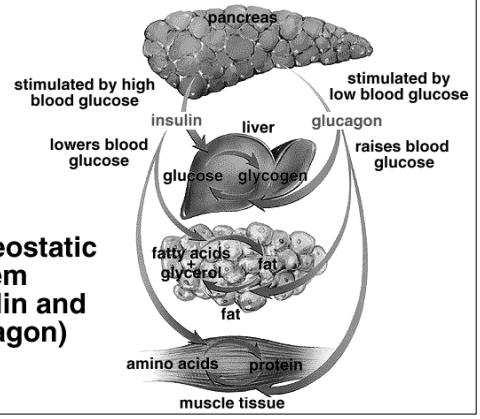


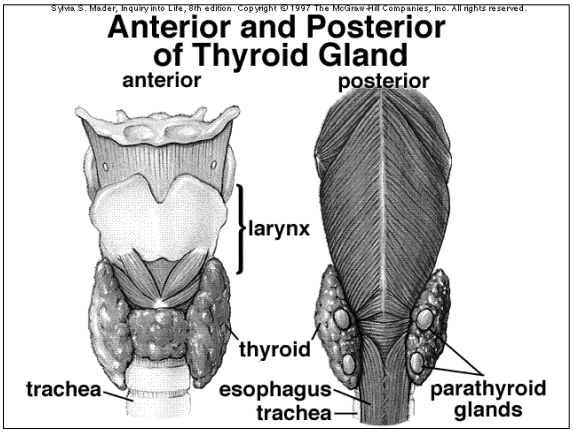
GH promotes bone and muscle growth.

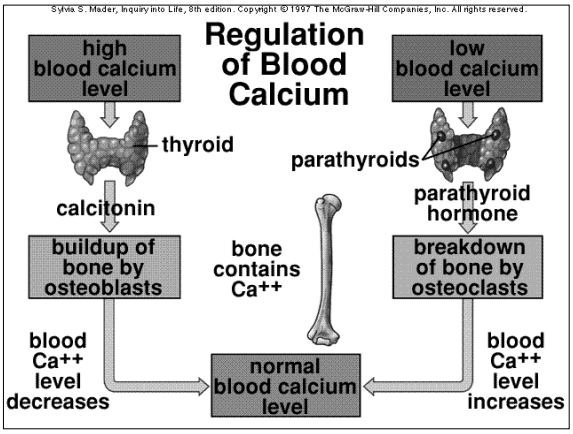
Hormone Regulation

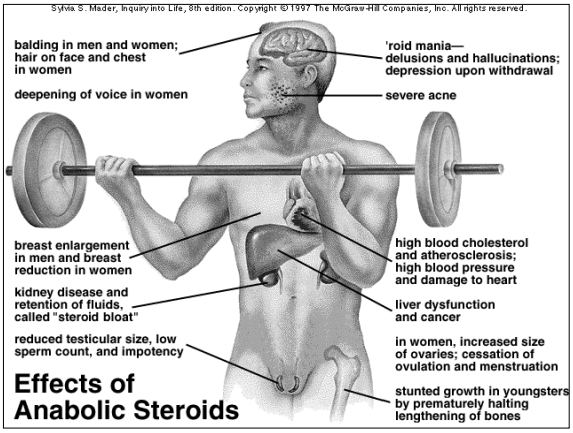


Homeostatic System (Insulin and Glucagon)









The End