

# Pituitary

EQ: Why is it important to have both the anterior and posterior portions of the pituitary gland?

- I. Endocrine Histology
  - a. Simple cuboidal
    - i. Single layer of cube-like cells
    - ii. Common in glands and their ducts
    - iii. Forms walls of kidney tubules
  - b. Adipose tissue
    - i. Matrix is an areolar tissue in which fat globules predominate
    - ii. Many cells contain large lipid deposits
    - iii. Functions
      1. Insulates the body
      2. Protects some organs
      3. Serves as a site of fuel storage
- II. What is the Endocrine system?
  - a. Made up of glands that produce and secrete hormones (chemical messengers)
  - b. Regulation of growth, metabolism, sexual development
  - c. Responses to stress and injury
  - d. Internal balance of body systems (homeostasis)
  - e. BIG IDEA
    - i. HORMONES are chemical messengers that act on target cells (or organs)
      1. Endocrine – secretions inside the body
      2. Exocrine – secretions outside the body (sweat)
- III. Hormone Chemistry – 3 Types
  - a. Steroids
    - i. made from cholesterol
    - ii. EX: Testosterone, estrogen, adrenal cortex hormones
  - b. Non steroid hormones
    - i. amino acid based molecules
    - ii. EX: all the rest
  - c. Prostaglandins
    - i. lipid based
    - ii. act locally, on nearby organs
- IV. Hormone Control
  - a. The pituitary is often called the “master gland”
  - b. Its actions are controlled by the hypothalamus in the brain.
  - c. Negative feedback system
    - i. Increase of hormone in blood tells pituitary to increase cascade production
    - ii. Decreased hormone in blood tells hypothalamus to initiate pituitary production.
- V. Anterior Pituitary Hormones
  - a. **Prolactin or PRL**
    - i. stimulates milk production
    - ii. can affect sex hormone
  - b. **Growth hormone or GH**
    - i. stimulates growth in childhood
    - ii. important for maintaining a healthy body composition
    - iii. can affect fat distribution in the body.
    - iv. Problems with the pituitary gland can result in Dwarfism

- v. Over secretion of growth hormone in adulthood leads to the condition called Acromegaly
  - c. **Adrenocorticotropin or ACTH**
    - i. stimulates production of cortisol by the adrenal glands.
  - d. **Thyroid-stimulating hormone or TSH**
    - i. stimulates the thyroid gland to make thyroid hormones
  - e. **Luteinizing hormone or LH**
    - i. regulates testosterone in men and estrogen in women
  - f. **Follicle-stimulating hormone or FSH**
    - i. promotes sperm production in men
    - ii. stimulates the ovaries to release eggs in women.
    - iii. LH and FSH work together to allow normal function of the ovaries or testes.
- VI. **Posterior Pituitary Hormones**
  - a. **Oxytocin**
    - i. causes milk letdown in nursing mothers and contractions during childbirth.
  - b. **Antidiuretic hormone or ADH**
    - i. also called vasopressin
    - ii. stored in the back part of the pituitary gland
    - iii. regulates water balance
    - iv. Diuretics
      - 1. Increase urine production