# Endocrine System

# Objective

- Differentiate endocrine and exocrine gland.
- Explain the effect of steroid and non steroid hormone towards body cells.
- Discuss about relationship between hormone control and nervous system.
- Describe the function of hormone that been secreted by endocrine glands.

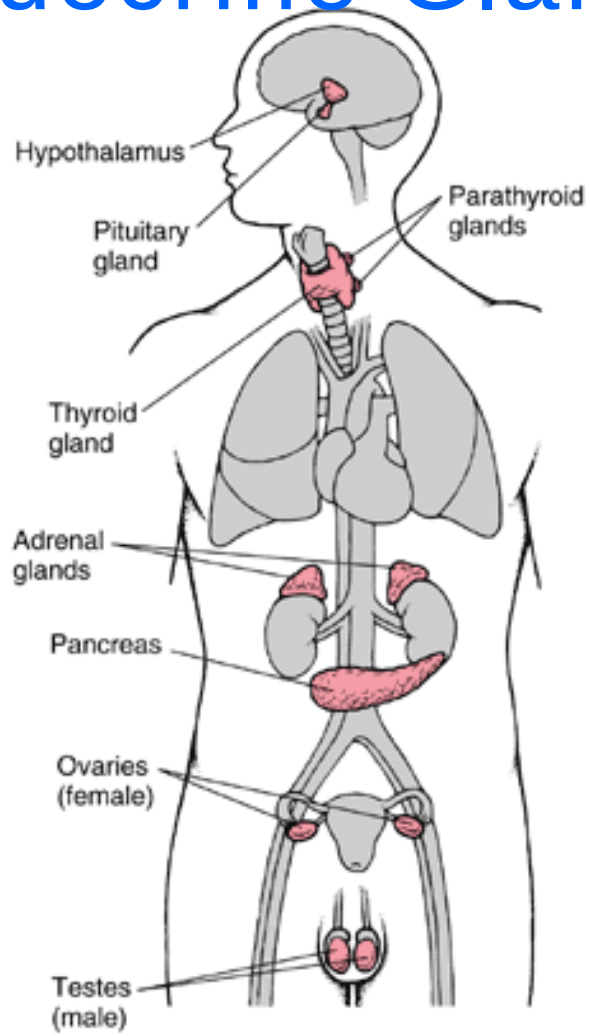


2

# Introduction

- Endocrine glands release hormone into bloodstream.
- Hormones classified on their chemical structure into 3 groups:
  - Peptide hormones (chain of amino acid)
  - Steroid hormones (lipid derived from cholesterol)
  - Biogenic amines (small molecule from altering amino acid).

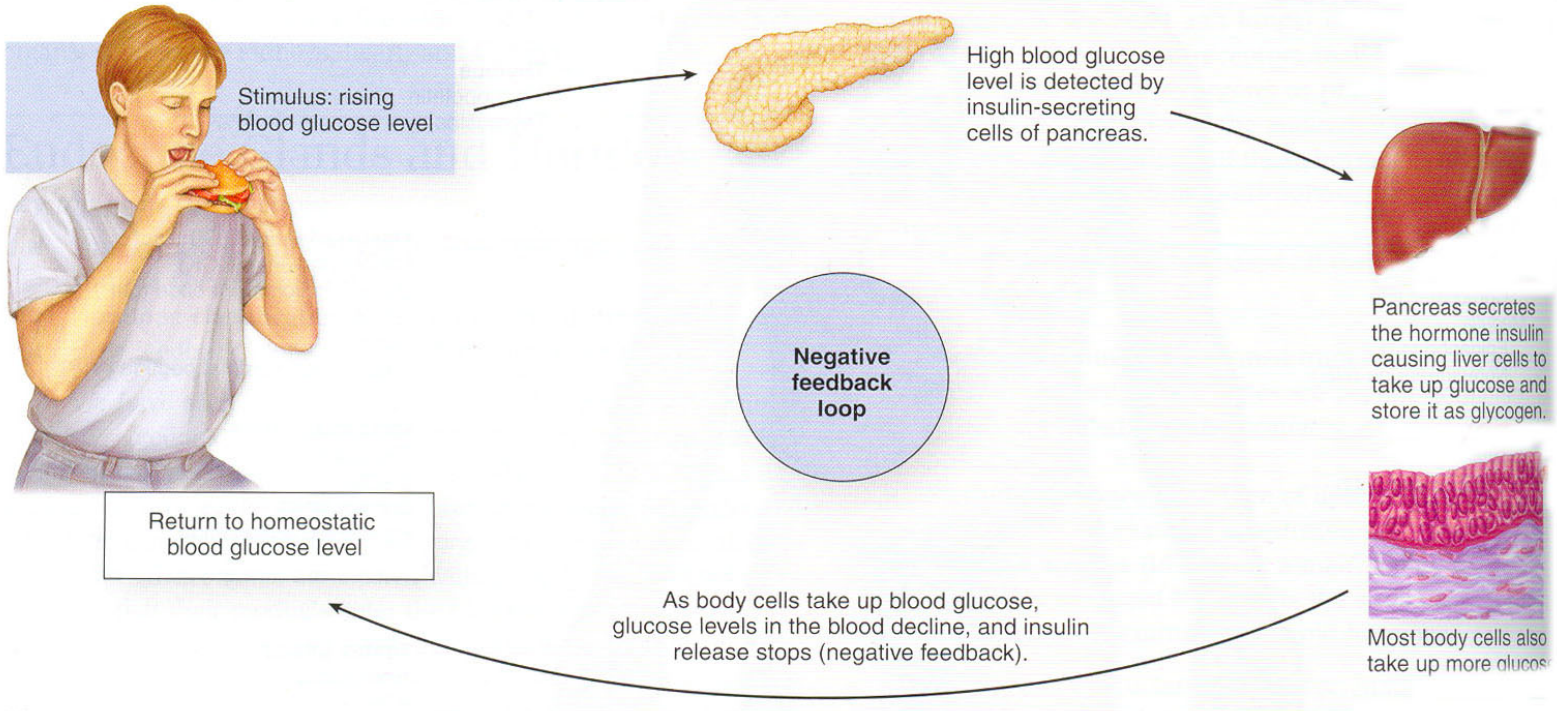
# Endocrine Glands






4

# Negative feedback Loops

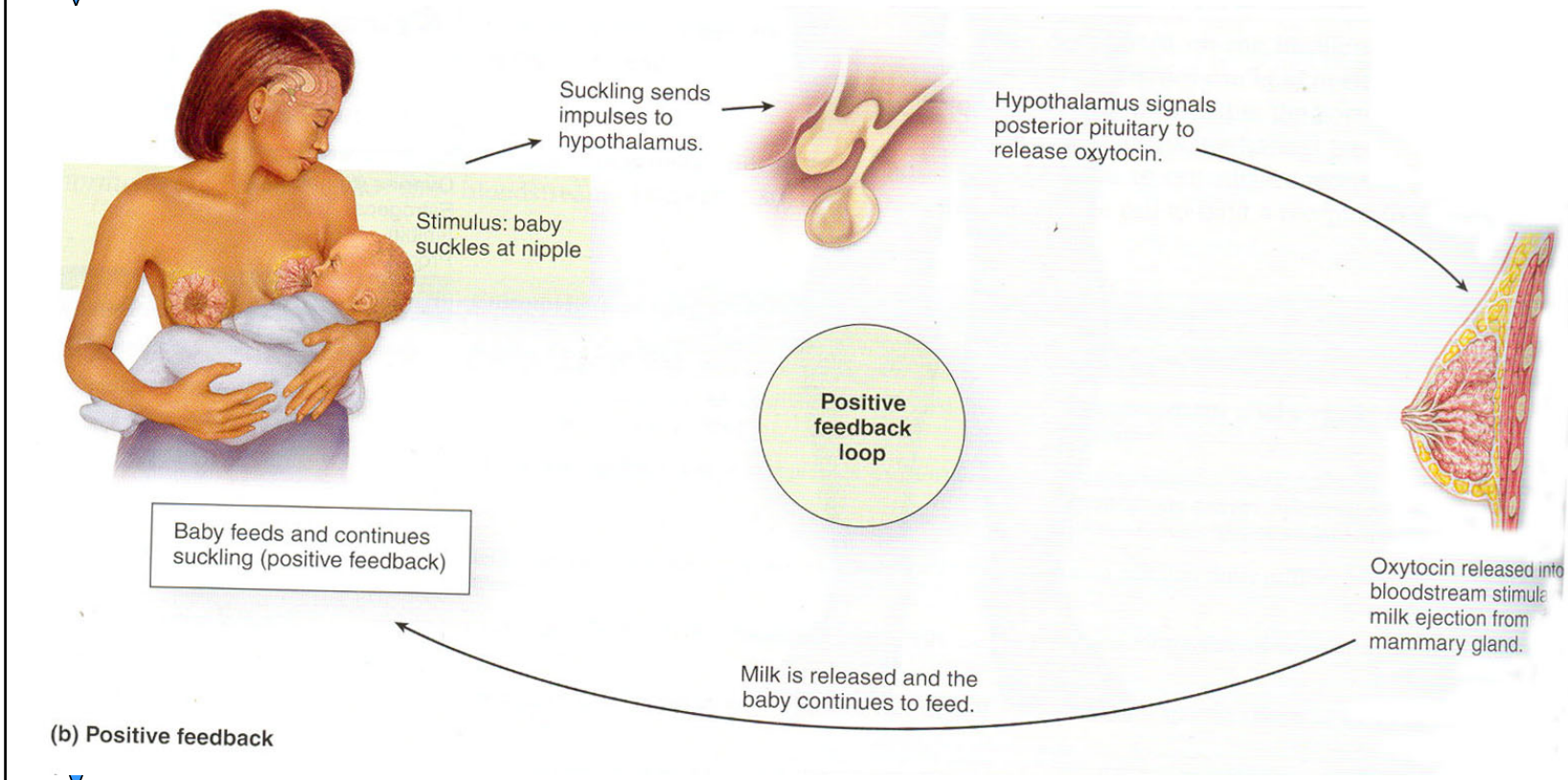



(a) Negative feedback



5

# Positive Feedback Loop

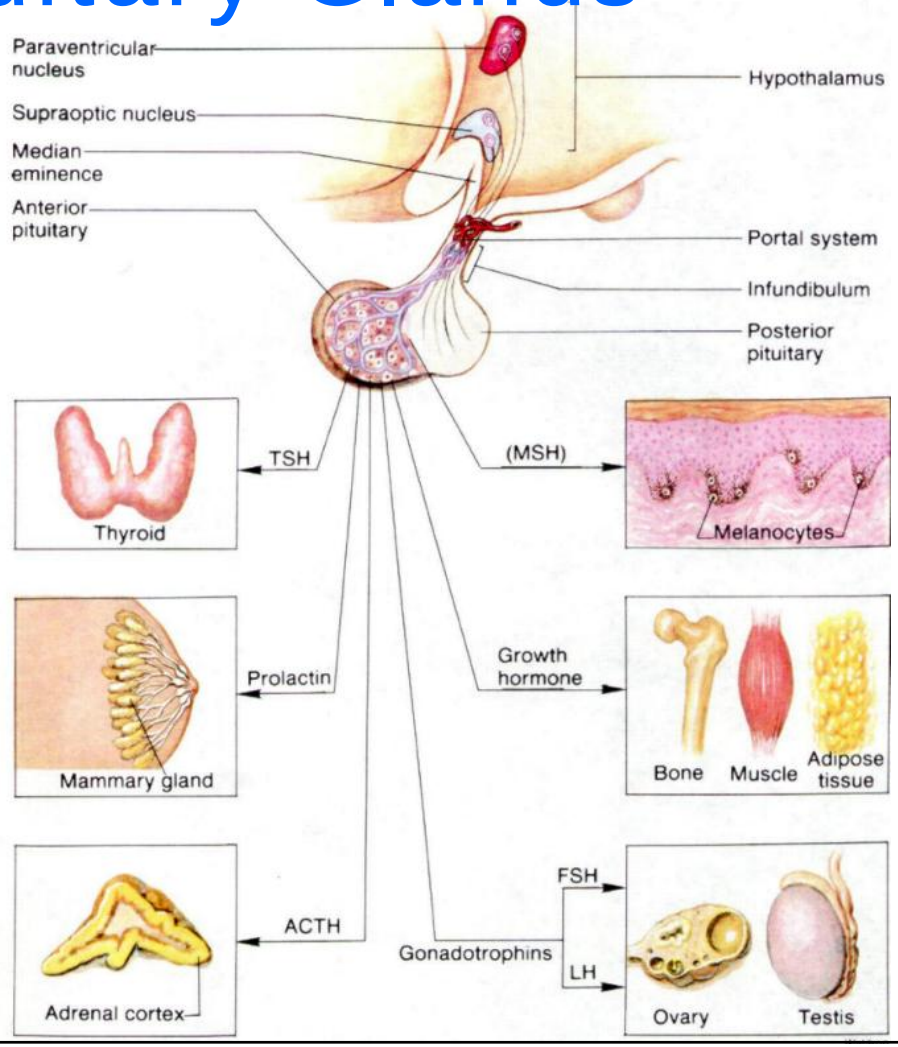





6

# Pituitary Glands

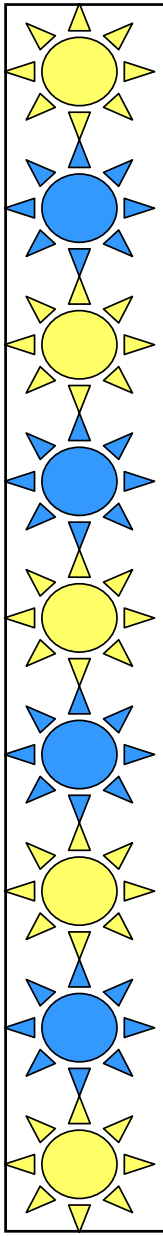
- Stimulate other endocrine
- glands / tissue to secrete
- other hormones



# Functions of Hormones

| Hormones | Functions |
|---|---|
| Thyroid-stimulating hormone (TSH) | Stimulate thyroid gland to release thyroid hormone due to low temperatures, stress & pregnancy. |
| Prolactin | Regulates mammary gland growth & breast milk production. |
| Adrenocorticotropic (ACTH) | Stimulates adrenal cortex |
| Growth hormone (GH) | Stimulate cell growth, cell division (skeletal & muscular systems). Stimulate liver to produce somatomedin (growth epiphyseal plates) |
| Gonadotropic | Secrete follicle-stimulating hormone (FSH) & luteinizing hormone (LH) – influence reproductive system activities. |

# Endocrine System



Hypothalamus

↓

Secretes hormones
That stimulate

↓

Anterior pituitary

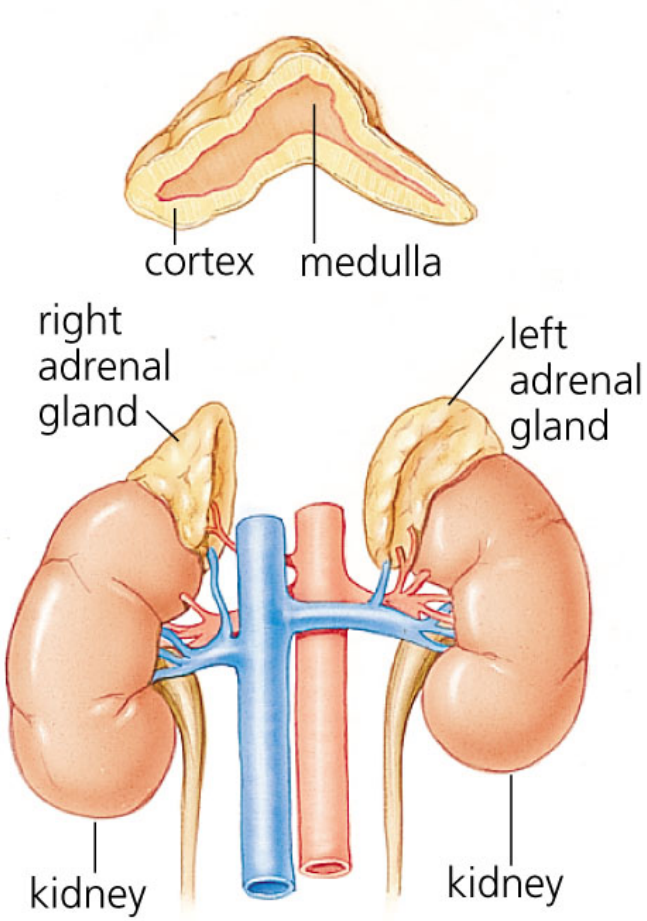
↓

Secretes different
hormones that stimulate

↓

Target organs
(thyroid, adrenal cortex,
gonads)

# Adrenal Gland






10

# Adrenal Gland Function

Glucocorticoids
(Glucose level – fasting, injury, anxiety)

Glucose

Mineralcorticoids
(mineral balance)

$K^+$

$Na^+$

Gonadocorticoids
(secrete adrogen)

Adrenal glands secrete hormones which help regulate chemical balance, regulate metabolism and supplement other glands

A.D.A.M.

# Organs with Endocrine Functions

| Gland/ Endocrine cells | Hormone | Hormonal Effects |
|---|---|---|
| Kidney | Calcitriol<br>Erythropoietin (EPO) | Calcium absorption in small intestine<br>Stimulates erythrocyte production |
| Heart | Atriopeptin | |
| GI tract | Various hormones related to digestion | |
| Ovaries | Estrogen<br>Inhibin<br>Progesterone | |
| Testes | Inhibin<br>Androgens | Inhibit FSH secretion<br>Stimulates male reproductive organ development, production of sperm |