Endocrine System- Introduction

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Introduction

- Endocrine system maintains homeostasis
- Endocrine glands are ductless glands which secrete secretions, hormones directly into the blood stream
- Hormones are chemical substances that transfer information from one set of cells into the other.

Introduction

- The word hormone is derived from a Greek word “Hormaein” – to excite or set in motion
- The term “Hormone” was first used by E.H.Starling in 1905 to describe **Secretin**
- Target organs: express receptors that bind the specific hormones to initiate a cellular response

- In the dark ages, victors of battle used to eat the organs (brain, heart, gonads) as they considered them to have powers.

- Aristotle noted the behavioral and physical effects of castration of roosters

- Charles Brown Sequard, French physician gave the concept of endocrine replacement therapy
- Bayliss and Starling, first described hormone - Secretin

Functions of hormones

- Change in cell function
- Control of growth and development
- Alteration in body mass and its composition
- Reproductive functions
- Digestion, utilization and storage of nutrients
- Regulation of volume and composition of fluid compartments
- Behavioral changes
- Control of senescence

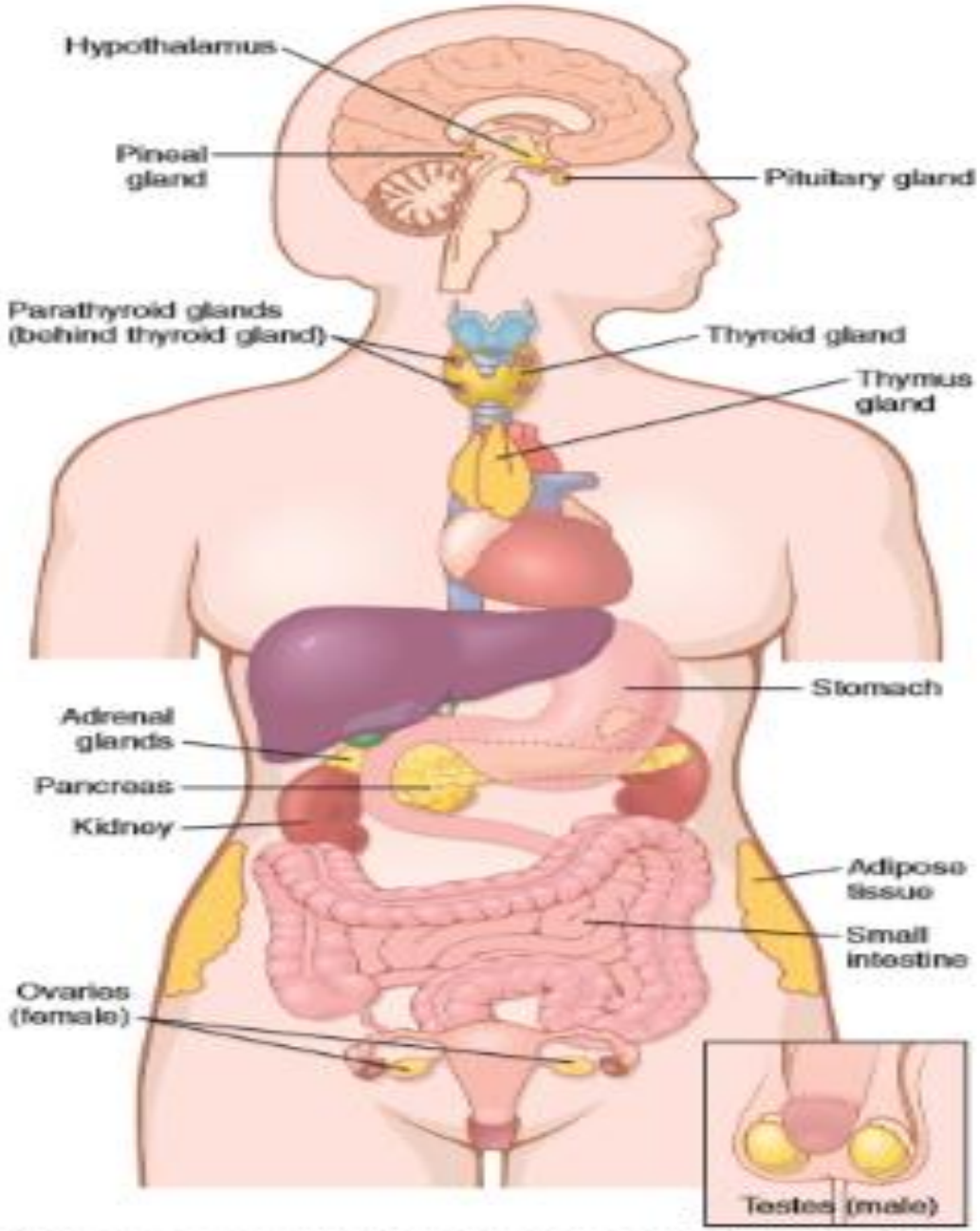


Figure 75-1. Anatomical loci of the principal endocrine glands and tissues of the body.

Ref: Guyton & Hall 13th Edition

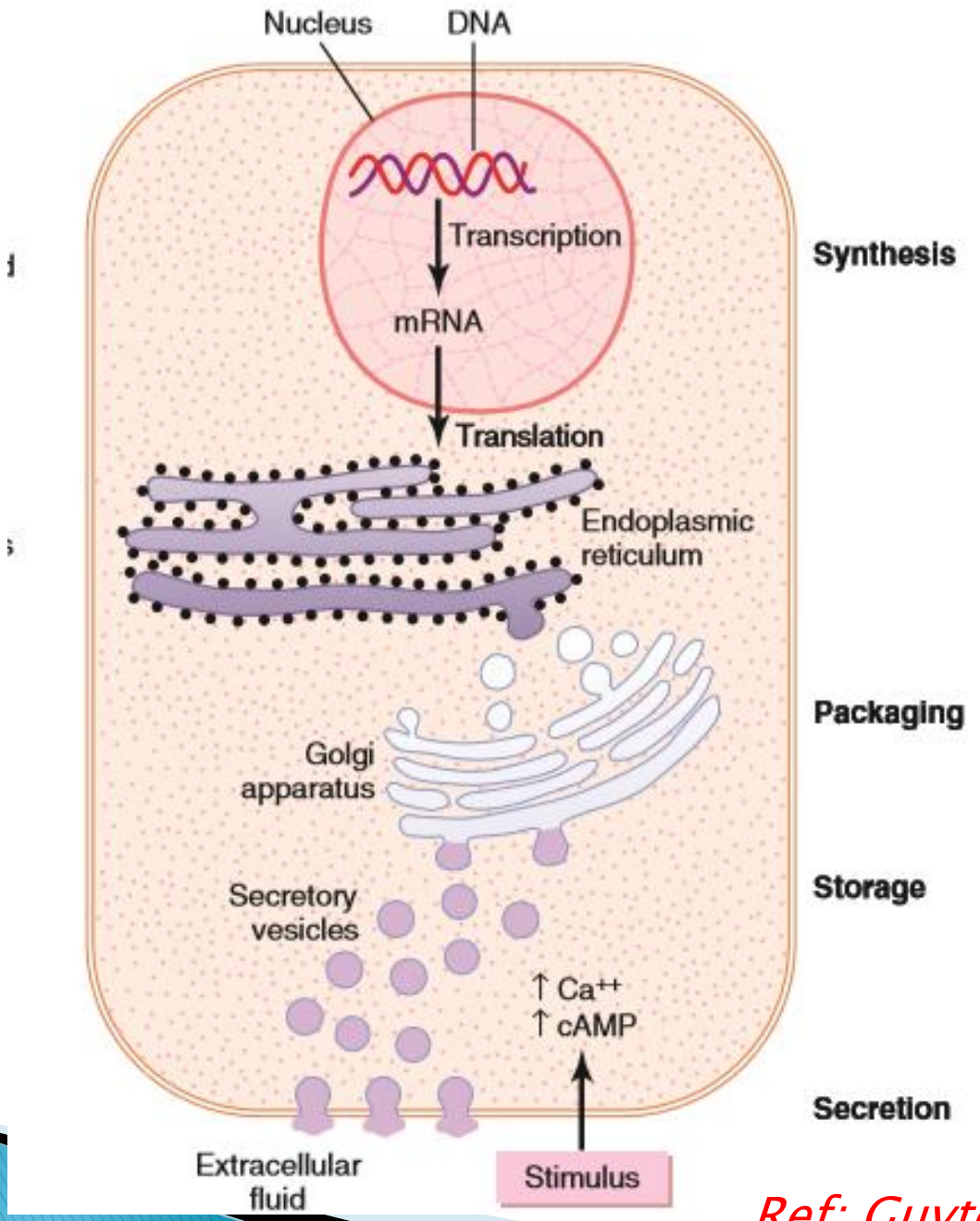
Types of hormones

- **Proteins or peptides:**

- Insulin
- IGF (Insulin like Growth Factors)
- LH
- FSH
- TSH
- HCG
- GH
- Prolactin
- HPL
- PTH
- Secretin
- Glucagon
- VIP
- GIP
- ANP
- Calcitonin
- CCK
- ADH
- Inhibin
- Somatostatin
- ACTH

Types of hormones

- **Amino Acid derivatives:**
  - Epinephrine
  - Norepinephrine
  - Dopamine
  - Serotonin
  - Thyroxine (T4)
  - Tri-iodothyronine (T3)
- **Steroid Hormones:**
  - Glucocorticoids
  - Mineralocorticoids
  - Estrogen
  - Progesterone
  - Testosterone
  - 1,25-Dihydroxycholecalciferol



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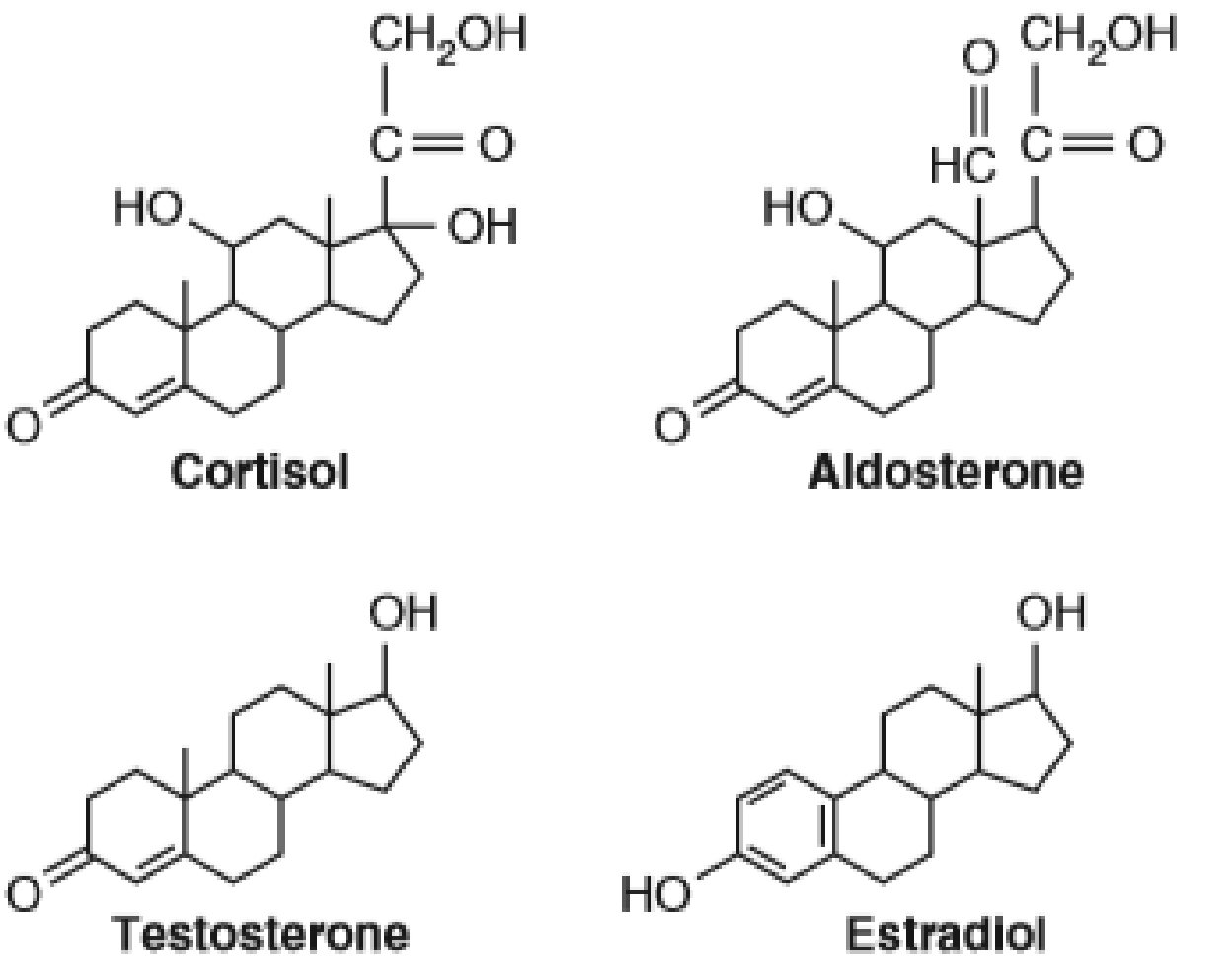

Figure 75-3. Chemical structures of several steroid hormones.

Ref: Guyton & Hall 13th Edition

Regulation of hormone secretion

- Feedback control
- Neural control
- Rhythmic or chronotropic control
- Humoral control