


Endocrine System – Introduction

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
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- ▶ 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**
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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

Types of hormones

▶ **Proteins or peptides:**

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

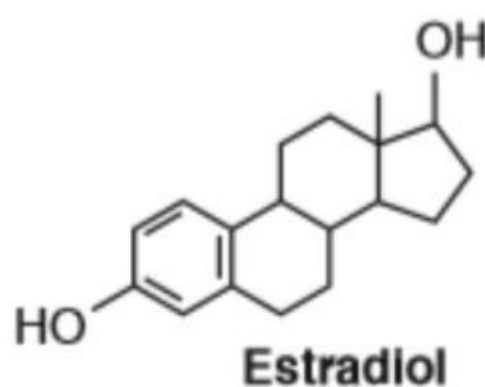
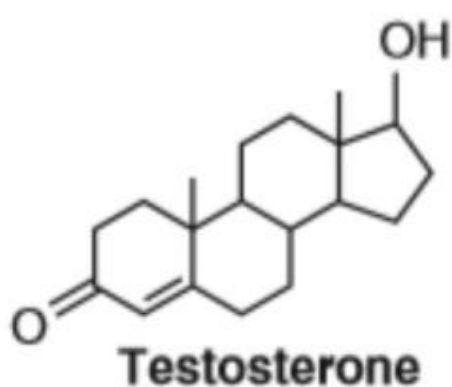
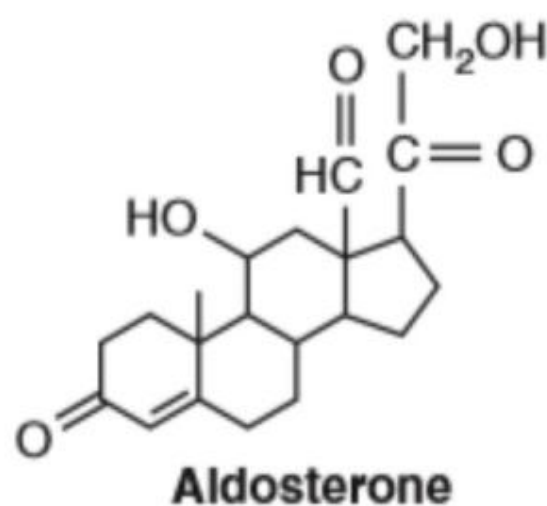
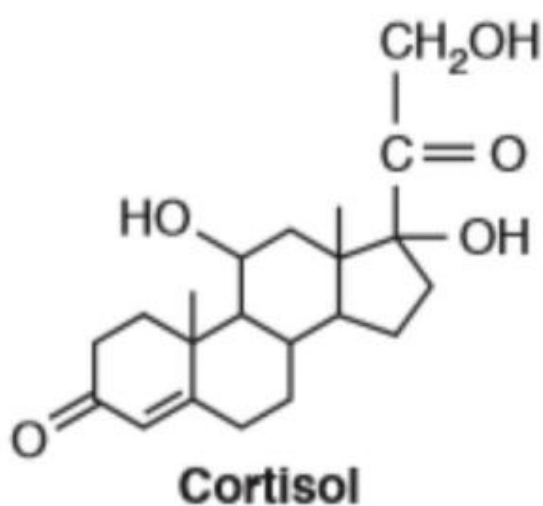
Types of hormones

▶ Amino Acid derivatives:

- Epinephrine
- Norepinephrine
- Dopamine
- Serotonin
- Thyroxine (T4)
- Tri-iodothyronine (T3)

▶ Steroid Hormones:

- Glucocorticoids
- Mineralocorticoids
- Estrogen
- Progesterone
- Testosterone
- 1,25-Dihydroxycholecalciferol



Regulation of hormone secretion

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

