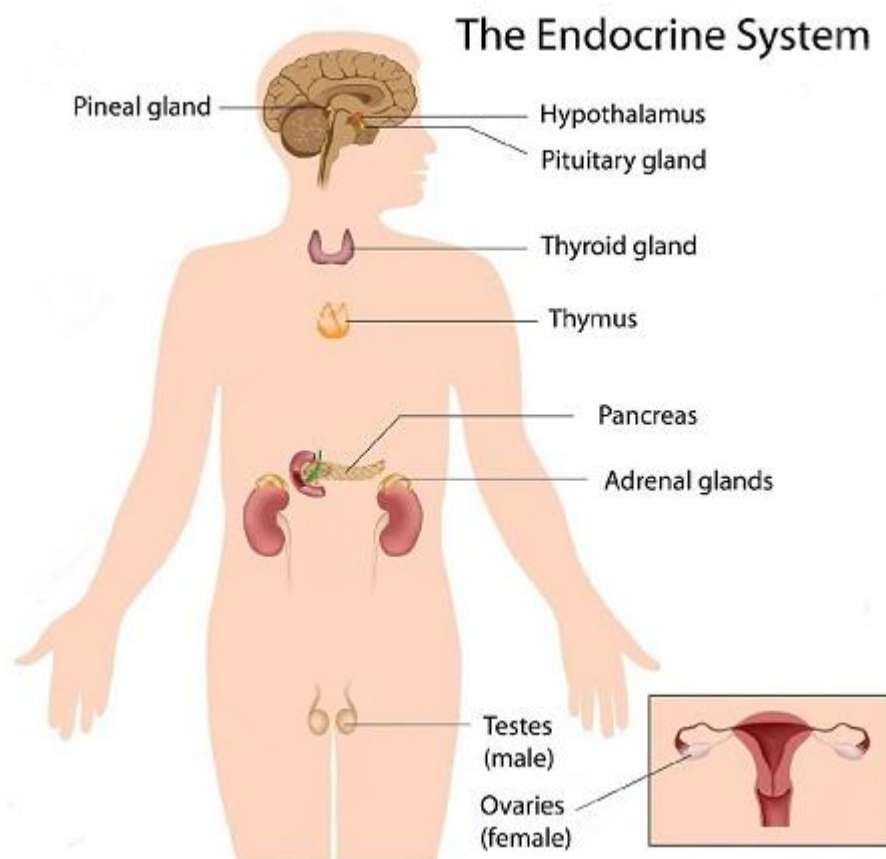


# Endocrine System

## Introduction

- The endocrine system is study of the glands of an organism that secrete hormones directly into the circulatory system.
- The organs through which the life running hormones are secreted are known as endocrine glands or simply ductless glands.
- The hormone secreting glands are located in different parts of a human body (see the image given below).



- The scientific study of the endocrine system and its disorders is known as **endocrinology**.

## Hormone

- The hormone is a complex but very important chemical substance released by the different glands in the body.
- The hormone is mainly made up of amino acid, catecholemines, and steroids.

- It is the hormone which is responsible for the overall growth and development; safety and security; behavior, sexual characteristics, and reproductive activities of a human body.

## Types of Endocrine System

- Following are the major types of endocrine system –
  - Hypothalamus
  - Pineal Gland
  - Pituitary Gland
  - Thyroid Gland
  - Parathyroid Gland
  - Adrenal Gland
  - Pancreas Gland
  - Reproductive Gland (Ovaries & Testes Glands)
- Let's discuss these glands in brief –

### Hypothalamus

- It is located at the base of the brain.
- It releases Growth hormone-releasing hormone, Somatostatin hormone, etc., important for the growth.

### Pineal Gland

- It is located at the base of the brain.
- It releases melatonin hormone helpful in lowering the core body temperature.

### Pituitary Gland

- With the size of a pea, the pituitary gland is found at the base of the human brain.
- The average weight of pituitary gland is about 0.5 grams.
- It is also known as hypophysis.
- Following are the hormones secreted by the pituitary gland –
  - **Growth hormone** (somatotropin) – It is abbreviated as GH and it stimulates growth and cell reproduction.
  - **Thyroid-stimulating hormone** (thyrotropin) – It is abbreviated as THS and it stimulates iodine absorption by thyroid gland.
  - **Adrenocorticotrophic hormone** (corticotropin) – It is abbreviated as ACTH and it stimulates corticosteroid and androgen.
  - **Beta-endorphin** – it inhibits perception of pain.

- **Prolactin** – it stimulates milk synthesis and release from mammary glands.

## Thyroid Gland

- Thyroid gland is located just below the larynx in the throat (pharynx).
- The hormone secreted by the thyroid gland is known as thyroxine.
- Following are the important hormones secreted by the thyroid gland –
  - **Triiodothyronine(T3)** – It stimulates body oxygen and energy consumption. It also promotes protein synthesis.
  - **Thyroxine** – It increases the basal metabolic rate.
  - **Calcitonin** – It stimulates osteoblasts and bone construction.

## Parathyroid Gland

- It is located in the neck of a human body.
- It releases parathyroid hormone that helps in regulating the amount of calcium in the blood as well as within the bones.

## Adrenal Gland

- Adrenal gland is found above the kidneys.
- It releases the following major hormones –
  - **Glucocorticoids** – It stimulates gluconeogenesis and fat-breakdown in adipose tissue.
  - **Mineralocorticoids** – It stimulates active sodium reabsorption in kidneys.
  - **Adrenaline** – It increases the supply of oxygen and glucose to the brain and muscles.
  - **Dopamine** – It increases heart rate and blood pressure.
  - **Enkephalin** – It regulates pain.

## Pancreas Gland

- Pancreas gland is located in the abdominal cavity (behind the stomach).
- Pancreas is a mixocrine gland, as it releases both enzymes and hormones.
- It releases the following major hormones –
  - **Insulin** – It regulates the metabolism of carbohydrates, proteins, and fats.
  - **Glucagon** – It raises the concentration of glucose in the bloodstream.
  - **Somatostatin** – It inhibits release of insulin and glucagon.

## Reproductive Gland

- The reproductive gland is classified as Testes in Male and Ovary in Female.

- Testes releases androgens (hormone) that help in strengthening muscle, increasing bone density, maturation of sex organs.
- Ovary releases progesterone hormone that helps during pregnancy period.