HORMONES

HORMONES DEFINITION

"Hormones are chemicals synthesized and produced by the specialized glands to control and regulate the activity of certain cells and organs. These specialized glands are known as endocrine glands."

WHAT ARE HORMONES?

As stated above, hormones are chemicals that essentially function as messengers of the body. These chemicals are secreted by special glands known as the endocrine glands. These endocrine glands are distributed throughout the body. These messengers control many physiological functions as well as psychological health. They are also quite important in maintaining homeostasis in the body.

TYPES OF HORMONES

To regulate various functions, different types of hormones are produced in the body. They are classified as follows:

- **PEPTIDE HORMONES**
- **STEROID HORMONES**

PEPTIDE HORMONES

Peptide hormones are composed of **amino acids** and are soluble in water. Peptide hormones are unable to pass through the cell membrane as it contains a phospholipid bilayer that stops any fat-insoluble molecules from diffusing into the cell. Insulin is an important peptide hormone produced by the pancreas.

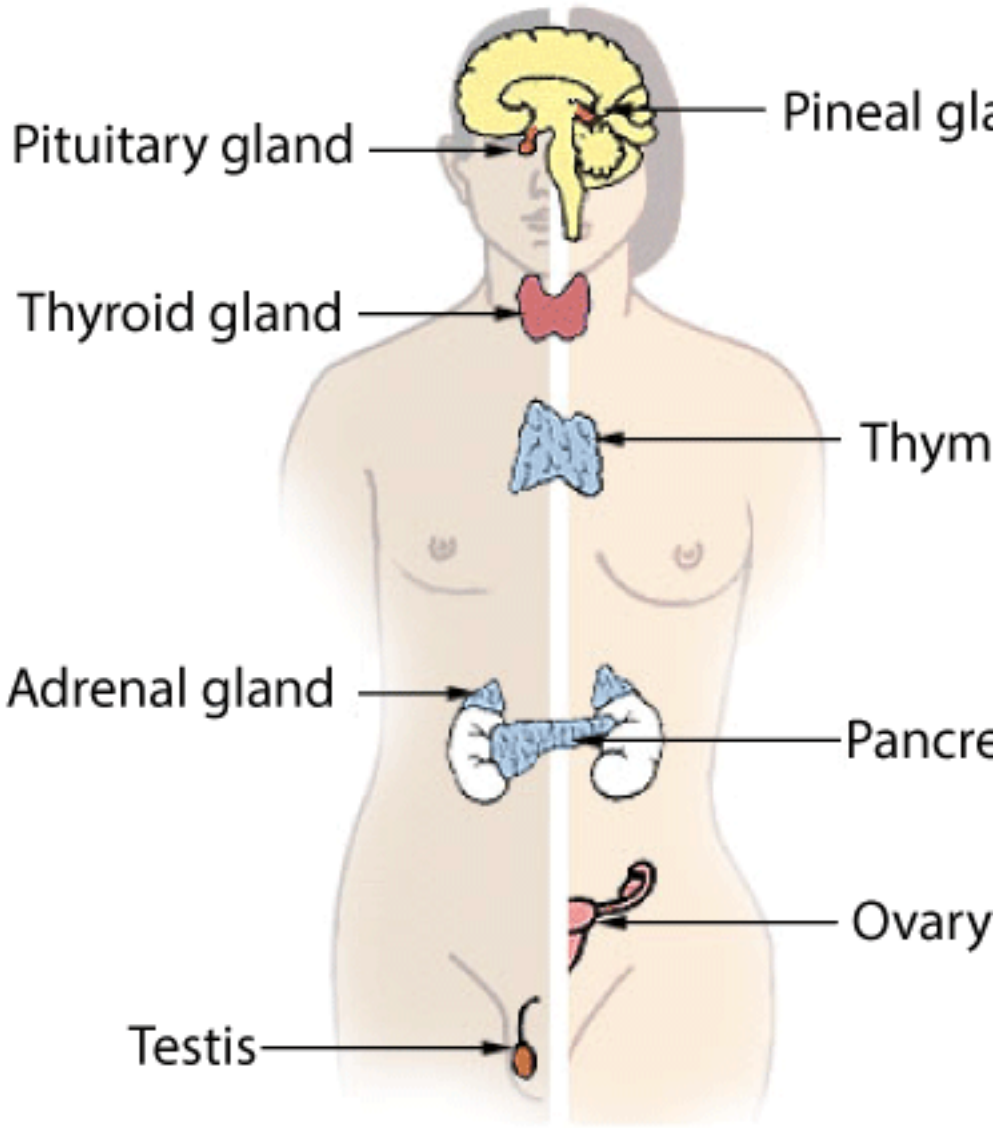
STEROID HORMONES

Unlike peptide hormones, steroid hormones are fat-soluble and are able to pass through a cell membrane. Sex hormones such as testosterone, estrogen and progesterone are examples of steroid hormones.

Endocrine Glands and the Hormones Secreted

As stated before, hormones are released by the endocrine glands. These are different from other glands of the human body as they are ductless.

THE ENDOCRINE SYSTEM



- **Hypothalamus:** It controls the body temperature, regulates emotions, hunger, thirst, sleep, moods and allow the production of hormones.
- **Pineal**: Pineal is also known as the thalamus. It produces serotonin derivatives of melatonin, which affects sleep patterns.
- **Parathyroid**: This gland helps in controlling the amount of calcium present in the body.

- **Thymus**: It helps in the production of T-cells, functioning of the adaptive immune system and maturity of the thymus.
- **Thyroid:** It produces hormones that affect the heart rate and how calories are burnt.
- **Adrenal**: This gland produces the hormones that control the sex drive, cortisol and stress hormone.
- **Pituitary**: It is also termed as the “master control gland,”. This is because the pituitary gland helps in controlling other glands. Moreover, it develops the hormones that trigger growth and development.
- **Pancreas**: This gland is involved in the production of insulin hormones, which plays a crucial role in maintaining blood sugar levels.
- **Testes:** In men, the testes secrete the male sex hormone, testosterone. It also produces sperm.
- **Ovaries**: In the female reproductive system, the ovaries release estrogen, progesterone, testosterone and other female sex hormones.

All these glands work together to produce and manage the hormones of the body.

LIST OF IMPORTANT HORMONES

1. **Cortisol** – It has been named as the “stress hormone” as it helps the body in responding to stress. This is done by increasing the heart rate, elevating blood sugar levels etc.
2. **Estrogen**-This is the main sex hormone present in women which bring about puberty, prepares the uterus and body for pregnancy and even regulates the menstrual cycle. Estrogen level changes during menopause because of which women experience many uncomfortable symptoms.
3. **Melatonin** – It primarily controls the circadian rhythm or sleep cycles.
4. **Progesterone** – It is a female sex hormone also responsible for menstrual cycle, pregnancy and embryogenesis.
5. **Testosterone** – This is the most important sex hormone synthesized in men, which cause puberty, muscle mass growth, and strengthen the bones and muscles, increase bone density and controls facial hair growth.

FUNCTIONS OF HORMONES

Following are some important functions of hormones:

- Food metabolism.
- Growth and development.
- Controlling thirst and hunger.
- Maintaining body temperature.
- Regulating mood and cognitive functions.
- Initiating and maintaining sexual development and reproduction.

HORMONAL DISEASES

Several hormonal diseases occur when there is a malfunctioning of the endocrine glands. Common hormonal issues are associated with hypothalamus, adrenal and **pituitary glands.** An increase or decrease in the secretion of these hormones can severely affect growth, metabolism and development.

Diseases such as hyperthyroidism, osteoporosis, and diabetes are caused due to hormonal imbalance. The factors responsible for hormonal diseases can be genetic, environmental, or related to diet.