



**AL-Mustaqbal University College**

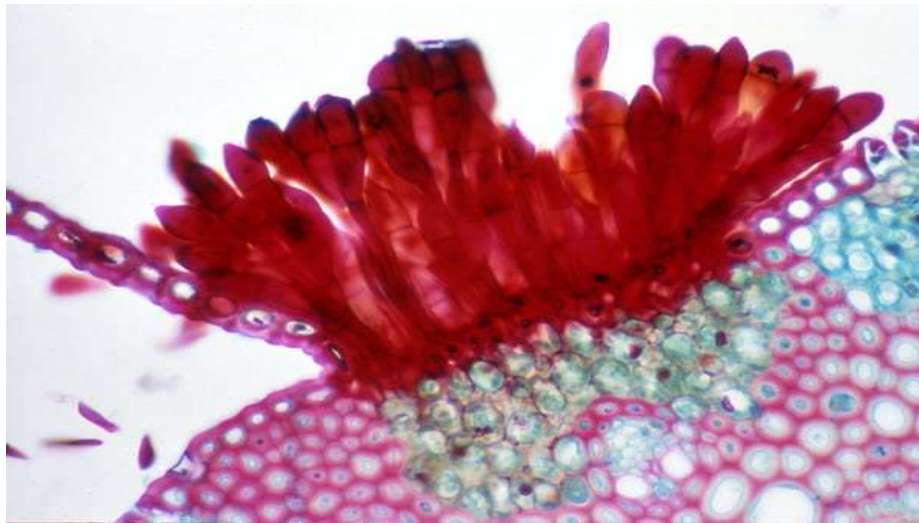
**Pharmacy Department**

**First stage**

**Practical Histology**

**(Endocrine system)**

**Lab 7**



**Lecturer: M.Sc. Noor Muhsen AL-Ammary**

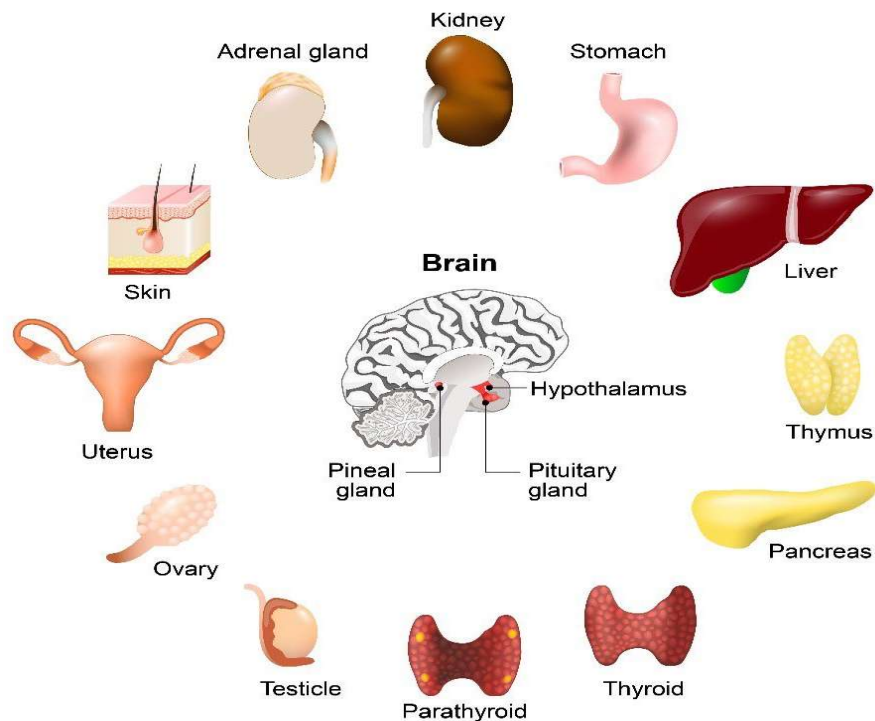
# Endocrine system

**The endocrine system** is a series of glands that produce and secrete hormones that the body uses for a wide range of functions. hormones that regulate metabolism, growth and development, tissue function, sexual function, reproduction, sleep, and mood, among other things.

**Hormones** are produced by glands and sent into the bloodstream to the various tissues in the body. They send signals to those tissues to tell them what they are supposed to do. When the glands do not produce the right amount of hormones, diseases develop that can affect many aspects of life.

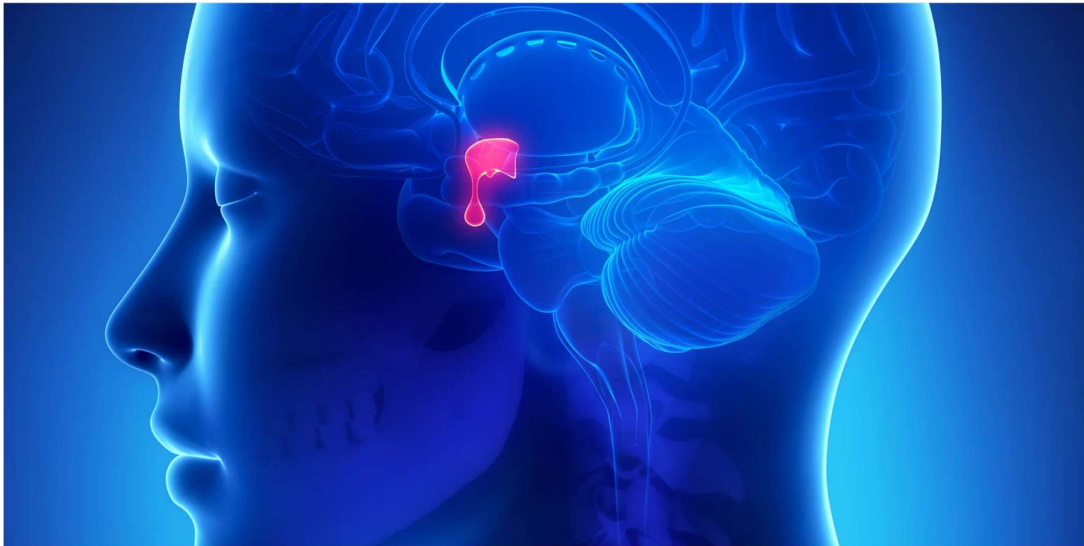
The **endocrine system** is made up of the **pituitary gland**, **thyroid gland**, **parathyroid glands**, **adrenal glands**, **pancreas**, **ovaries** (in females) and **testicles** (in males).

## ENDOCRINE SYSTEM



# Pituitary gland

The pituitary gland is located at the base of the brain beneath the hypothalamus small pea-sized gland that plays a major role in regulating vital body functions and general wellbeing. It is referred to as the body's 'master gland' because it controls the activity of most other hormone-secreting glands.



The pituitary gland can be divided into two different parts: the anterior and posterior lobes.

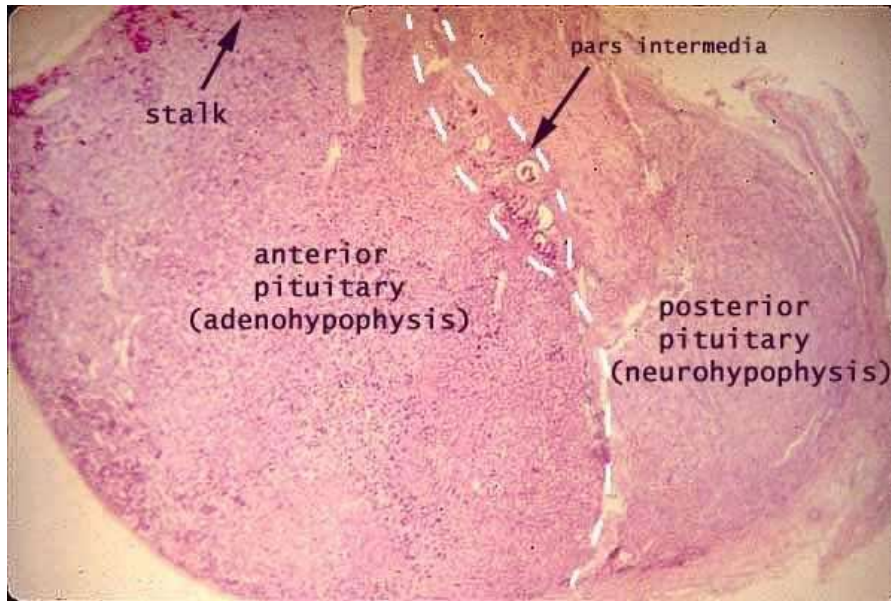
It is composed of two anatomically and functionally distinct parts:

- The adenohypophysis (anterior pituitary).
- The neurohypophysis (posterior pituitary).

The adenohypophysis is of endodermal origin. It has three regions, the pars distalis or anterior lobe, the pars intermedia or intermediate lobe, and the pars tuberalis.

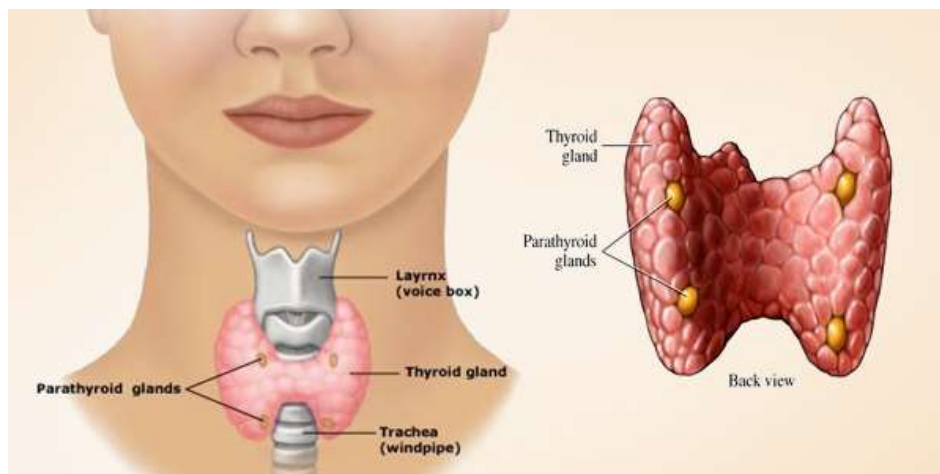
The adenohypophysis contains three major cell types: Acidophils, Basophils and Chromophobes.

The pars distalis secretes Growth hormone (GH), Thyroid-stimulating hormone (TSH), Adrenocorticotrophic hormone (ACTH), follicle-stimulating hormone (FSH), Luteinizing hormone (LH), and Prolactin. The pars intermedia secretes Melanocyte-stimulating hormone (MSH).

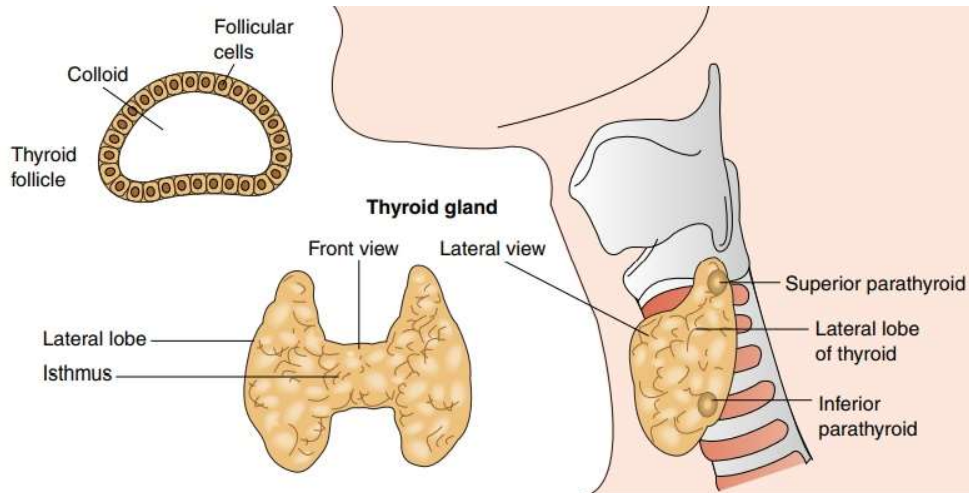


## Thyroid gland

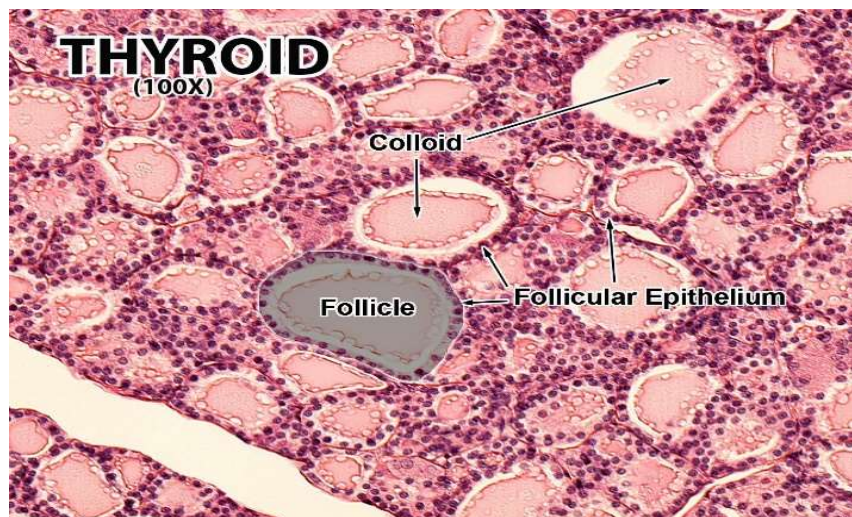
The **thyroid** is a butterfly-shaped gland that sits low on the front of the neck. The thyroid has two side lobes, connected by a bridge (isthmus) in the middle. Brownish-red in color, the thyroid is rich with blood vessels. Nerves important for voice quality also pass through the thyroid.



The **thyroid** secretes several hormones, collectively called **thyroid hormones**. The main hormone is thyroxine, also called **T4**. Thyroid hormones act throughout the body, influencing metabolism, growth and development, and body temperature. During infancy and childhood, adequate thyroid hormone is crucial for brain development.



The thyroid gland is composed of many spherical hollow sacs called **thyroid follicles**. Each follicle appears as an irregular circle of cells. The principal cells, which surround the follicle are simple cuboidal epithelium. These follicles are filled with a colloid, which usually stains pink. The principal cells use the thyroglobulin and iodide stored in the colloid to produce the primary thyroid hormones- including thyroxin. Between these follicles are the parafollicular cells which produce calcitonin.

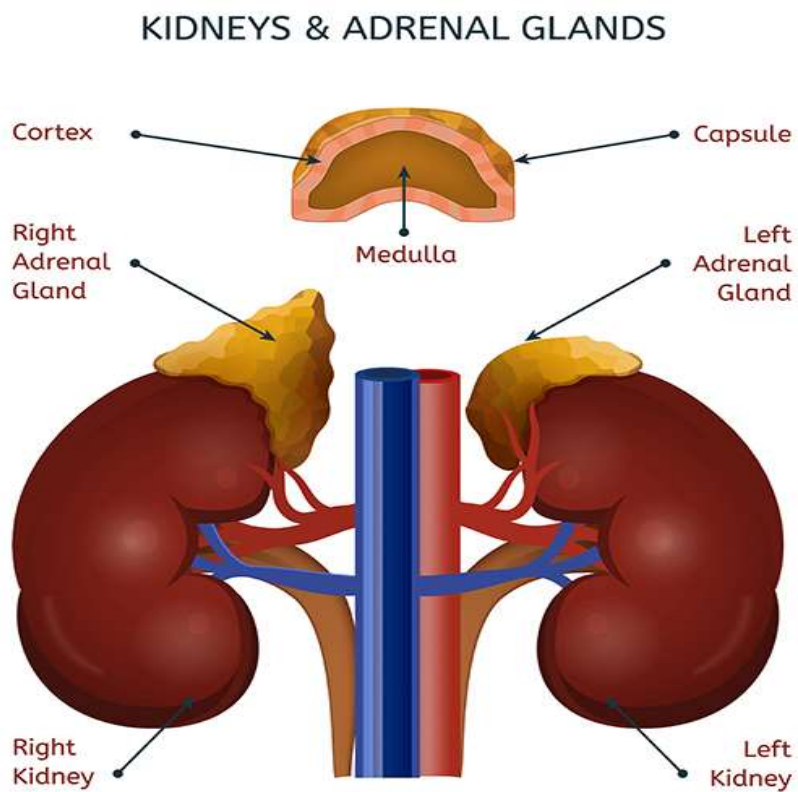


# Adrenal gland

**Adrenal glands:** the body has two triangular adrenal glands, one on top of each kidney.

Adrenal glands produce hormones that help regulate your metabolism, immune system, blood pressure, response to stress and other essential functions.

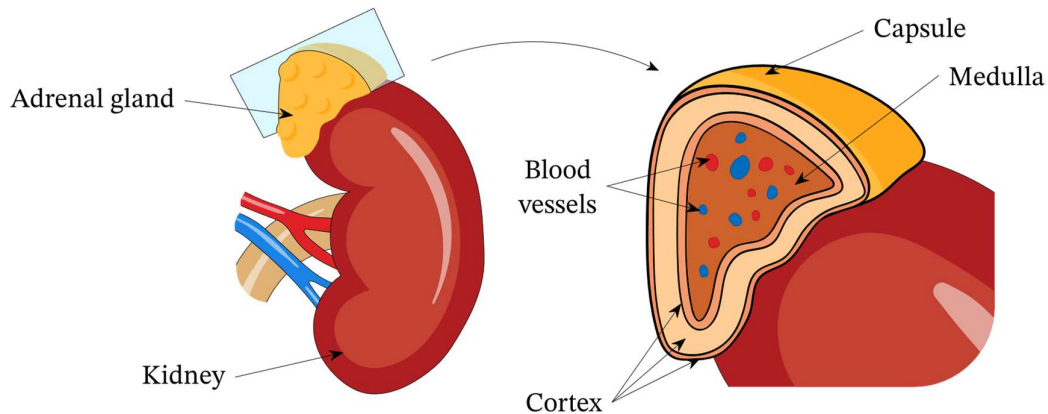
- ✚ When adrenal glands don't produce enough hormones, this can lead to adrenal insufficiency (Addison's disease).
- ✚ Adrenal glands may develop nodules that can be benign or malignant, which can potentially produce excessive amounts of certain hormones leading to various health issues.



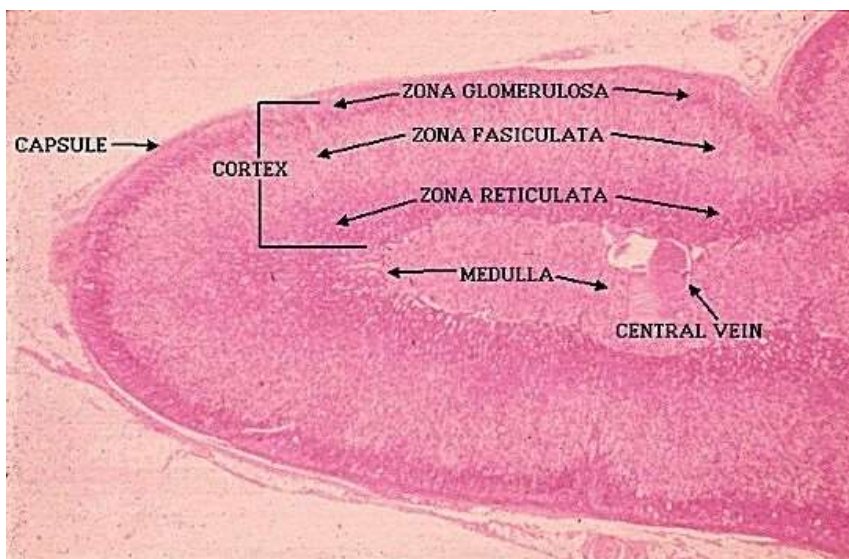
## Anatomy of the Adrenal Glands

An adrenal gland is made of two main parts:

- ✚ The **adrenal cortex** is the outer region and also the largest part of an adrenal gland. It is divided into three separate zones: zona glomerulosa, zona fasciculata and zona reticularis. Each zone is responsible for producing specific hormones.
- ✚ The **adrenal medulla** is located inside the adrenal cortex in the center of an adrenal gland. It produces “stress hormones,” including adrenaline.



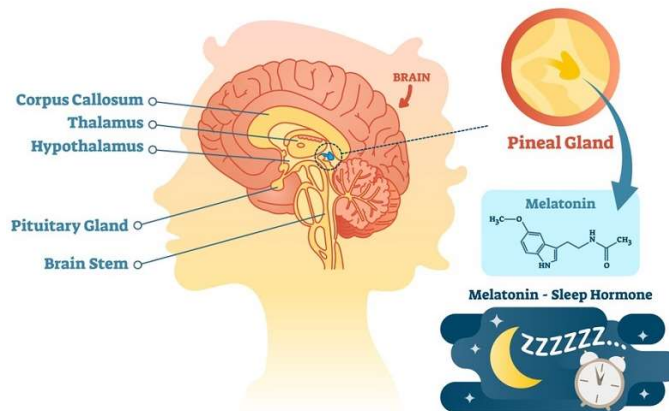
The adrenal cortex and adrenal medulla are enveloped in an **adipose capsule** that forms a protective layer around an adrenal gland.



# Pineal gland

The pineal gland is a small endocrine gland located within the brain (looks like ink spots). Its main secretion is **melatonin**, best known for the role it plays in regulating sleep patterns. Sleep patterns are also called circadian rhythms. It is also thought to produce hormones that inhibit the action of other endocrine glands in the body.

## PINEAL GLAND



There are two types of cells present within the gland:

- **Pinealocytes** – hormone secreting cells (produce melatonin)
- **Glial cells** – supporting cells (support neurons)

The pineal gland is encased by pia mater and lobulated by its connective tissue septae that projects into the gland.

