



438
HISTOLOGY TEAM
KING SAUD UNIVERSITY



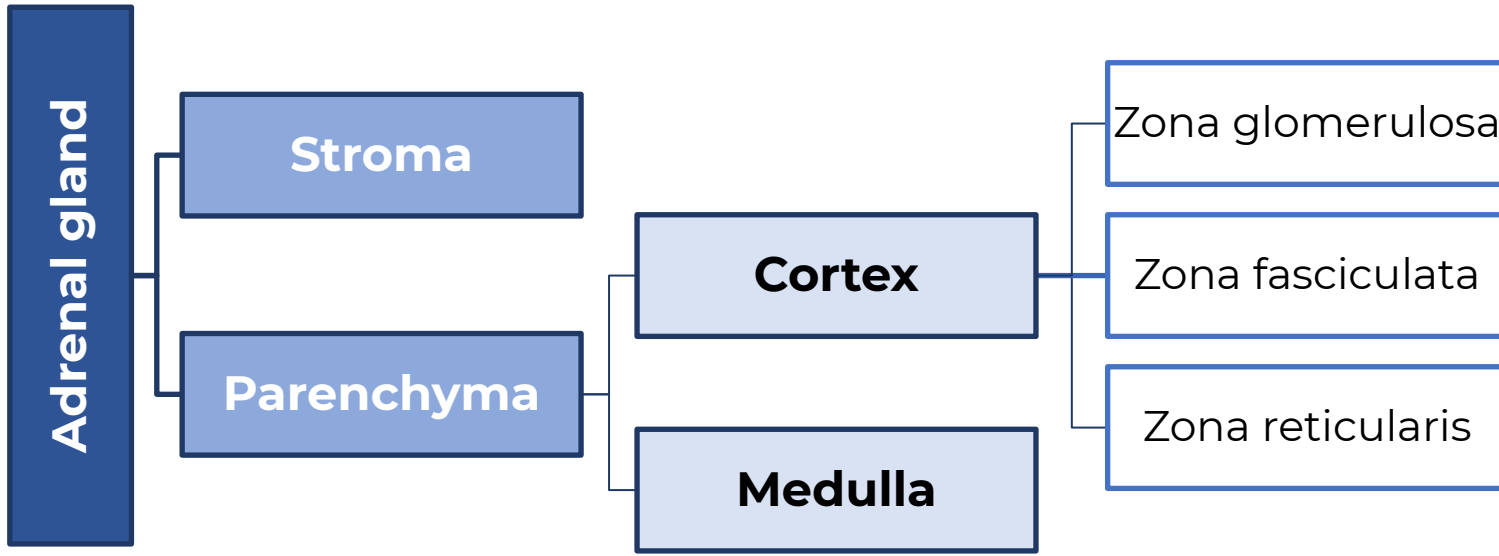
ADRENAL GLAND

Objectives:

- Differentiate between adrenal cortex and medulla.
- Identify the histological features of each cortical zone and its cells.
- Identify the histological features of the medullary cells.

- ▣ **Editing file**
- ▣ **Important**
- ▣ **Doctor notes / Extra**



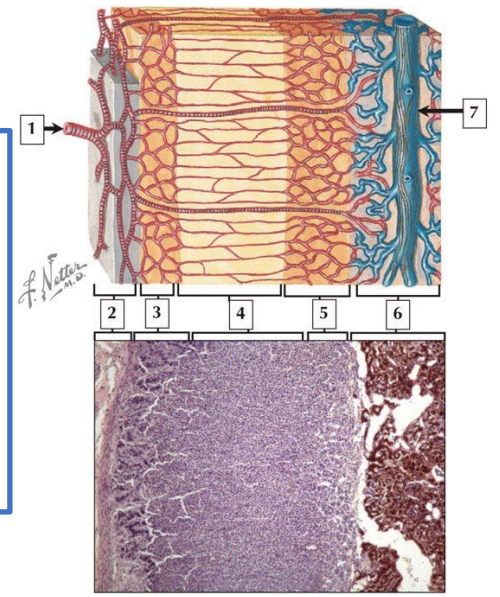


Factors acting on the gland	Hormones secreted
Zona glomerulosa Angiotensin and corticotropin (ACTH) Capillaries	Mineralocorticoids (aldosterone)
Zona fasciculata Corticotropin	Glucocorticoids (cortisol and corticosterone) Androgens? (dihydroepiandrosterone; androstenedione)
Zona reticularis Corticotropin	Glucocorticoids? Androgens

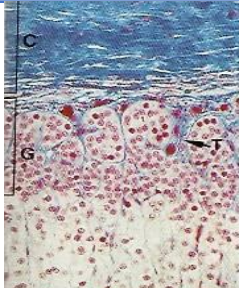
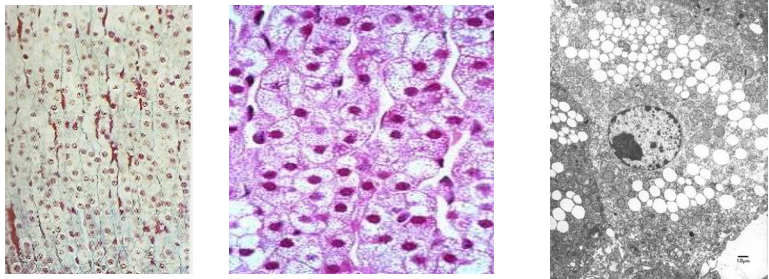
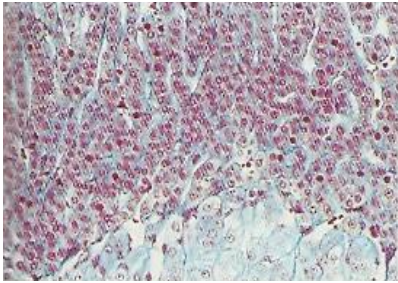
The adrenal cortex layers have 5 features in common: extra but important

- 1- Acidophilic cytoplasm
- 2- Abundant SER
- 3- Numerous mitochondria
- 4- Mitochondrial cristae is tubular
- 5- few Droplet of lipids (expect Zona fasciculata rich in lipids)

1. Suprarenal artery
2. Capsule
3. Zona glomerulosa
4. Zona fasciculata
5. Zona reticularis
6. Medulla
7. Central vein of medulla



Adrenal Cortex

Zona glomerulosa	Zona fasciculata (spongiocytes)	Zona reticularis
<ul style="list-style-type: none"> formed of <u>clusters of small columnar cells</u> that are rich in SER and mitochondria. Produces mineralocorticoids e.g. aldosterone hormone (Reabsorb all the remaining sodium, and passively the chloride, from the lumen of the distal renal tubules into the renal interstitium. In addition, potassium and hydrogen ions are actively secreted into the lumen). 	<ul style="list-style-type: none"> It is the intermediate and the largest layer of the cortex. It is formed of columns of large polyhedral cells that are separated by longitudinal sinusoidal capillaries. Its cells are rich in lipids, so they appear empty in sections (spongiocytes). Its cells are rich in mitochondria (with tubular cristae),SER and lipofuscin pigments. Its cells secrete glucocorticoids. It is regulated by ACTH of pituitary. 	<ul style="list-style-type: none"> It is the innermost layer of adrenal cortex. It is formed of anastomosing cords of deep acidophilic cells. Its cells contains few lipofuscin and lipid droplets. The cells secrete androgens.
		

Medulla of adrenal gland

- it is the central portion of the adrenal gland.
- It is completely invested with adrenal cortex (not separated from it by CT. septa)

It contains:

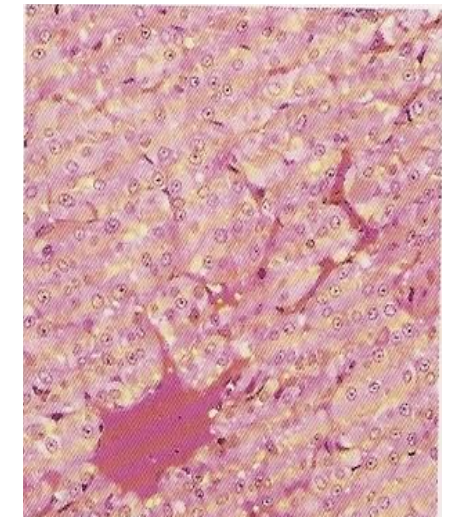
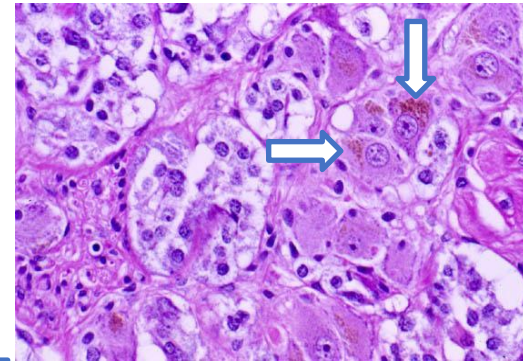
1- Chromaffin cells (Pheochromocytos):

1. Contains granules of catecholamine as that of sympathetic nervous system.
2. **They produce epinephrine and norepinephrine.**
3. **They stain deep brown with chromic salt**

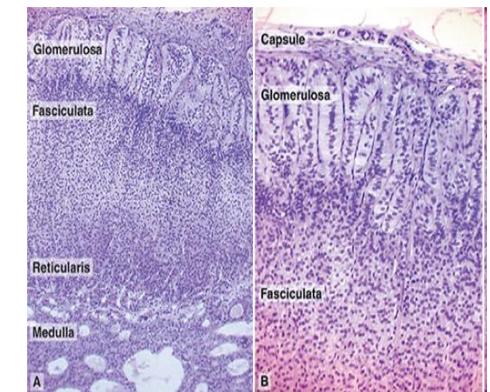
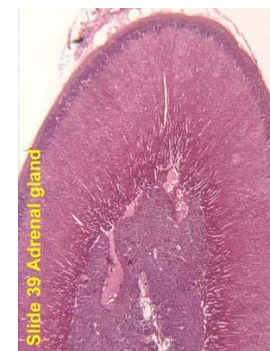
2- Sympathetic ganglion cells :

Relay on chromaffin cells.

Neurons in adrenal medulla



ANATOMY	HISTOLOGY	1° REGULATION BY	HORMONE CLASS	1° HORMONE PRODUCED
Adrenal gland Capsule Superior surface of kidney	Zona Glomerulosa	Angiotensin II	Mineralocorticoids	Aldosterone
	Zona Fasciculata	ACTH, CRH	Glucocorticoids	Cortisol
	Zona Reticularis	ACTH, CRH	Androgens	DHEA
MEDULLA	Chromaffin cells	Preganglionic sympathetic fibers	Catecholamines	Epi, NE



Quiz

Q1: Which of the following feature is true about Zona glomerulosa ?

- A. Formed of Small cuboidal cells
- B. Secrete glucocorticoids
- C. Formed of polyhedral column
- D. Has acidophilic cytoplasm

Q2: Which one of the following zone is rich in lipids ?

- A. Zona glomerulosa
- B. Zona fasciculata
- C. Zona reticularis
- D. Zona medullaris

Q3: Sex hormones are secreted by

- A. all endocrine tissues of the body
- B. zona glomerulosa
- C. the gonads
- D. zona reticularis and the gonads

Q4: Which one of the following cells secrete epinephrine ?

- A. Pheochromocyte
- B. Zona glomerulosa
- C. Zona reticularis
- D. Spongiocytes

Q5: all the following are true about the medulla expect

- A. it is the central portion of the adrenal gland.
- B. its produce epinephrine
- C. it separated from the cortex by CT. septa
- D. it is contain Pheochromocytes

Q6: Which one of the following Feature is common in the adrenal cortex layers ?

- A. Acidophilic nucleus
- B. Abundant RER
- C. few mitochondria
- D. Mitochondrial cristae is tubular



Team Leaders

- ▣ Abdullah shadid
- ▣ Sarah alflaij

Good luck :)