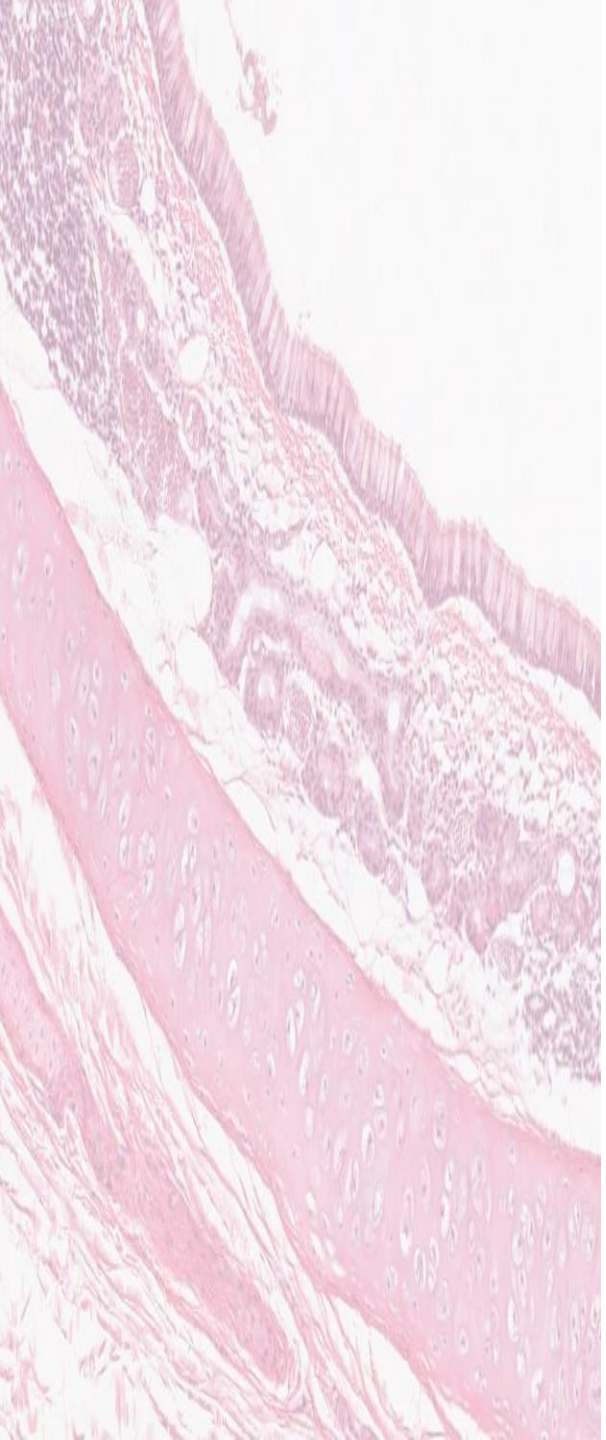


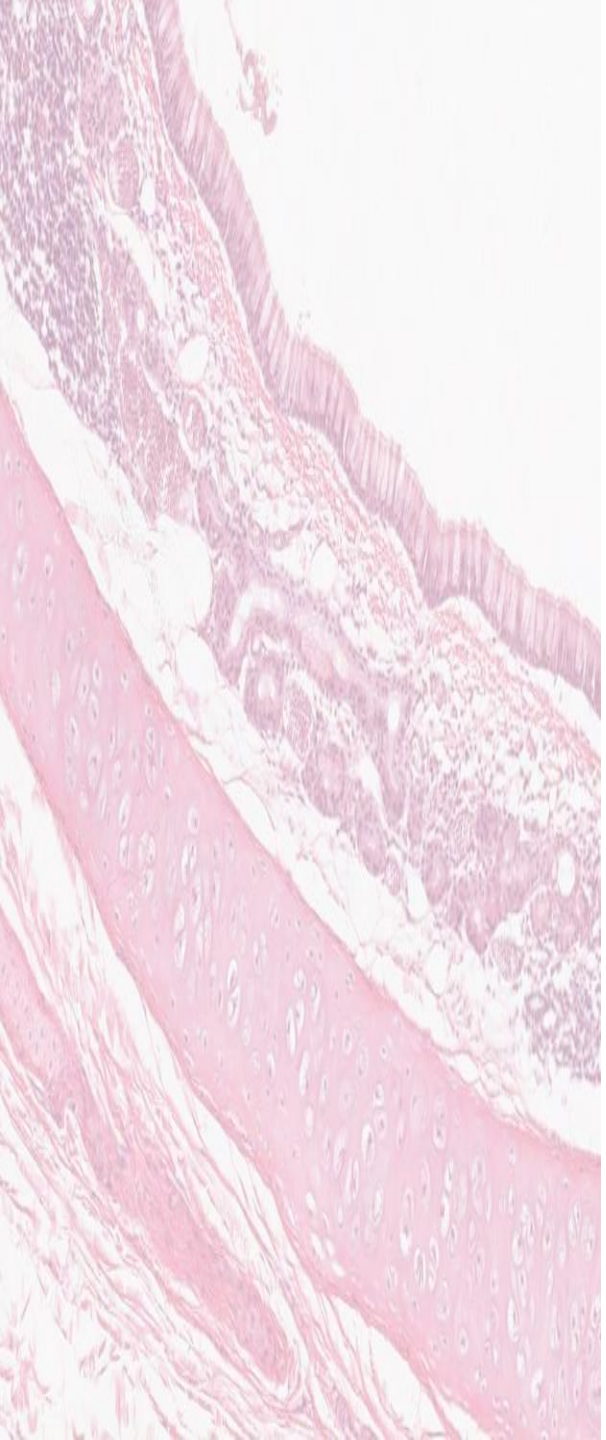
جامعة الملك سعود
King Saud University

436
MEDICINE
KING SAUD UNIVERSITY

Adrenal Gland

تمت المراجعة
شوق الأحمري & عبدالعزيز العنقري

Color index:
Slides.. Important ..Notes ..Extra..



وَمَن يَتَوَكَّلْ عَلَى ٱللَّهِ فَهُوَ حَسْبُهُۥٓ

Objectives :

By the end of this lecture, the student should be able to describe:

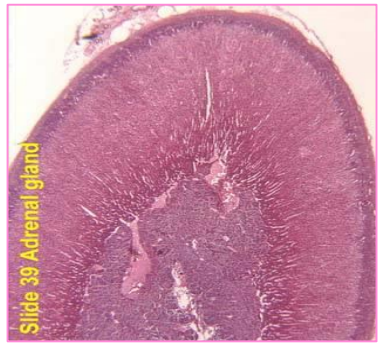
1. Differentiate between adrenal cortex and medulla.
2. Identify the histological features of each cortical zone and its cells.
3. Identify the histological features of the medullary cells

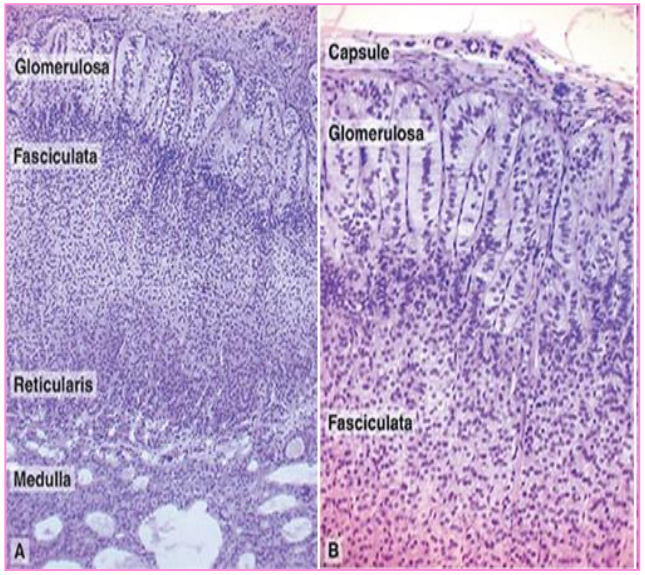
All adrenal gland hormones are steroids in origin.

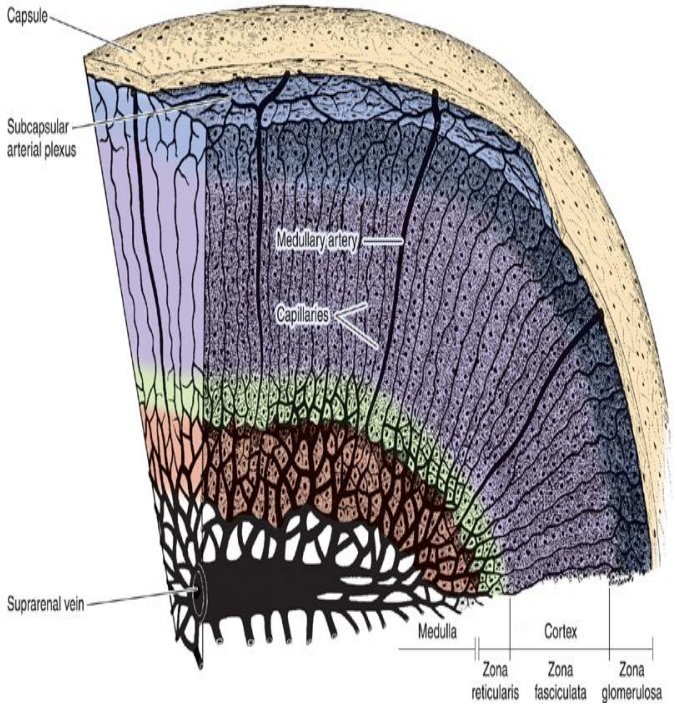
Adrenal gland is formed of

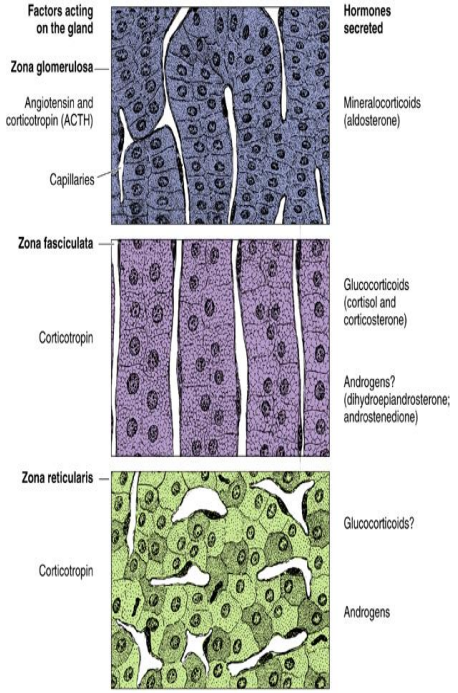
- **Stroma**
- **Parenchyma** that is divided into:
  - **I. Cortex** that is composed of:
    - A-Zona glomerulosa.
    - B-Zona fasciculata.
    - C-Zona reticularis.
  - **II. Medulla**

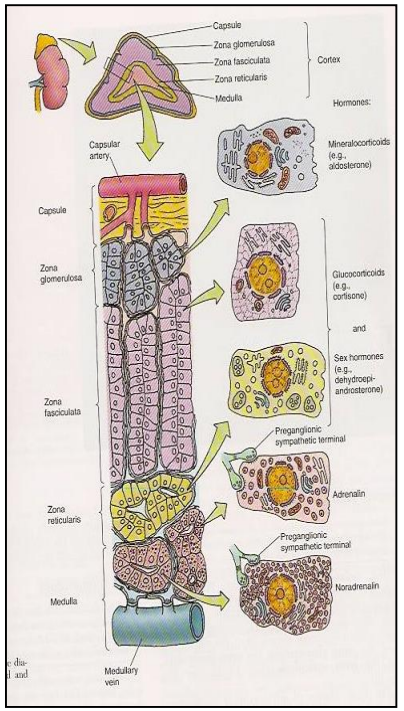
Mnemonic: GFR which is the flow rate of filtered fluid through the kidney.







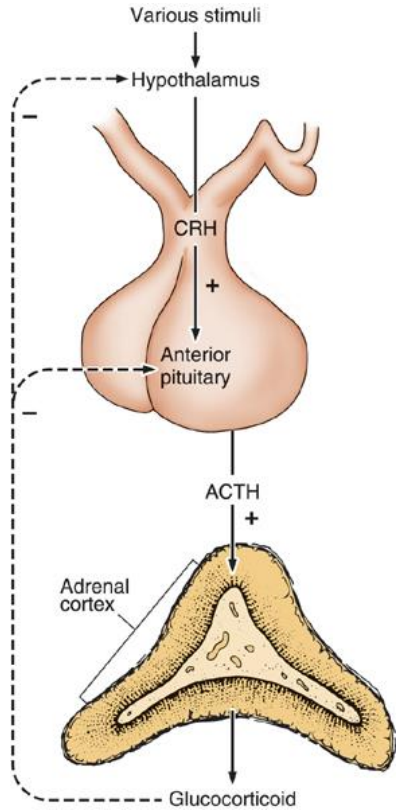




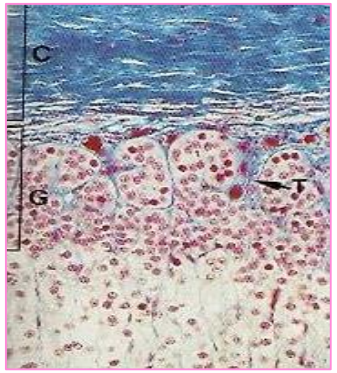
*We can differentiate between the layers by the cell arrangement.

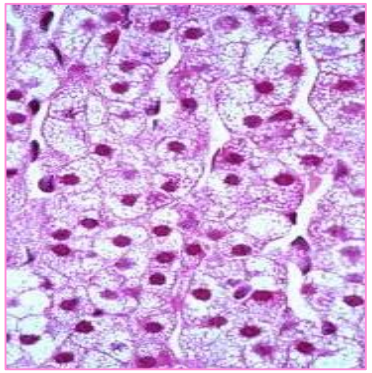
Adrenal cortex

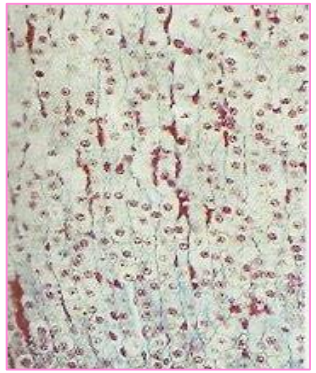
1. Zona Glomerulosa:	2. Zona Fasciculata (Spongiocytes):	3. Zona Reticularis:
▪ Is formed of clusters of small columnar cells that are rich in **SER** and mitochondria for steroid synthesis. ▪ Produces Mineralocorticoids e.g. Aldosterone Hormone; {Reabsorb all the remaining **sodium**, and **passively** 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).	▪ It is the intermediate and the largest layer of the cortex. ▪ Formed of columns of large polyhedral cells that are separated by longitudinal sinusoidal capillaries. ▪ **Its cells are rich in:** 1. **Lipids** so they appear empty in sections (spongiocytes). 2. Mitochondria (**with tubular cristae**), 3. SER and **lipofuscin pigments**. ▪ Its cells secrete Glucocorticoids. ▪ It is regulated by **ACTH** of pituitary. Fasciculata = column They look like air bubbles with spaces for blood capillaries.	▪ It is the innermost layer of adrenal cortex. • It is formed of anastomosing cords of deep acidophilic cells. With no specific arrangement. acidophilic compared to fasiculata ▪ Its cells contains **few lipofuscin** and **lipid droplets**. ▪ The cells secrete Androgens. Androgens are higher in males because they're secreted by testes as well.



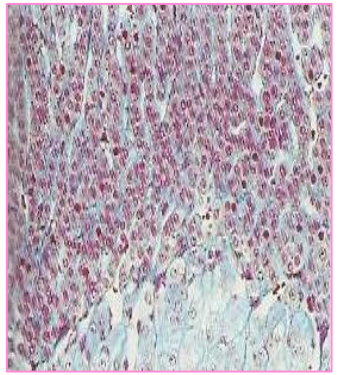
Spongiocytes



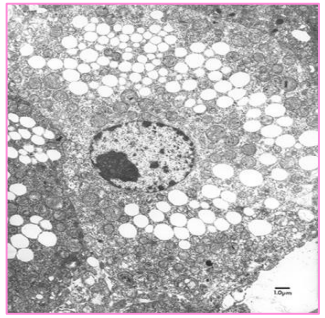


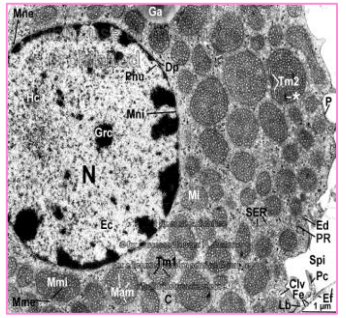


Zona Reticularis:



E/M of spongiocytes.



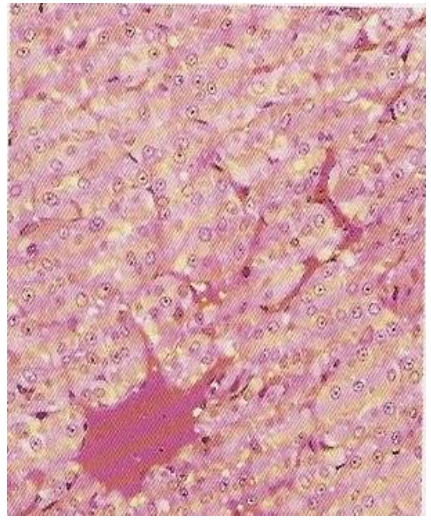


Adrenal Medulla

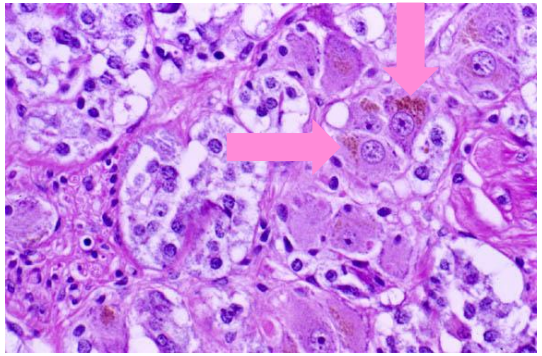
- It is the central portion of the adrenal gland.
- It is completely invested with adrenal cortex

(there is **no** CT. septa between cortex and medulla)

When sympathetic activity increases > cortisol level increases



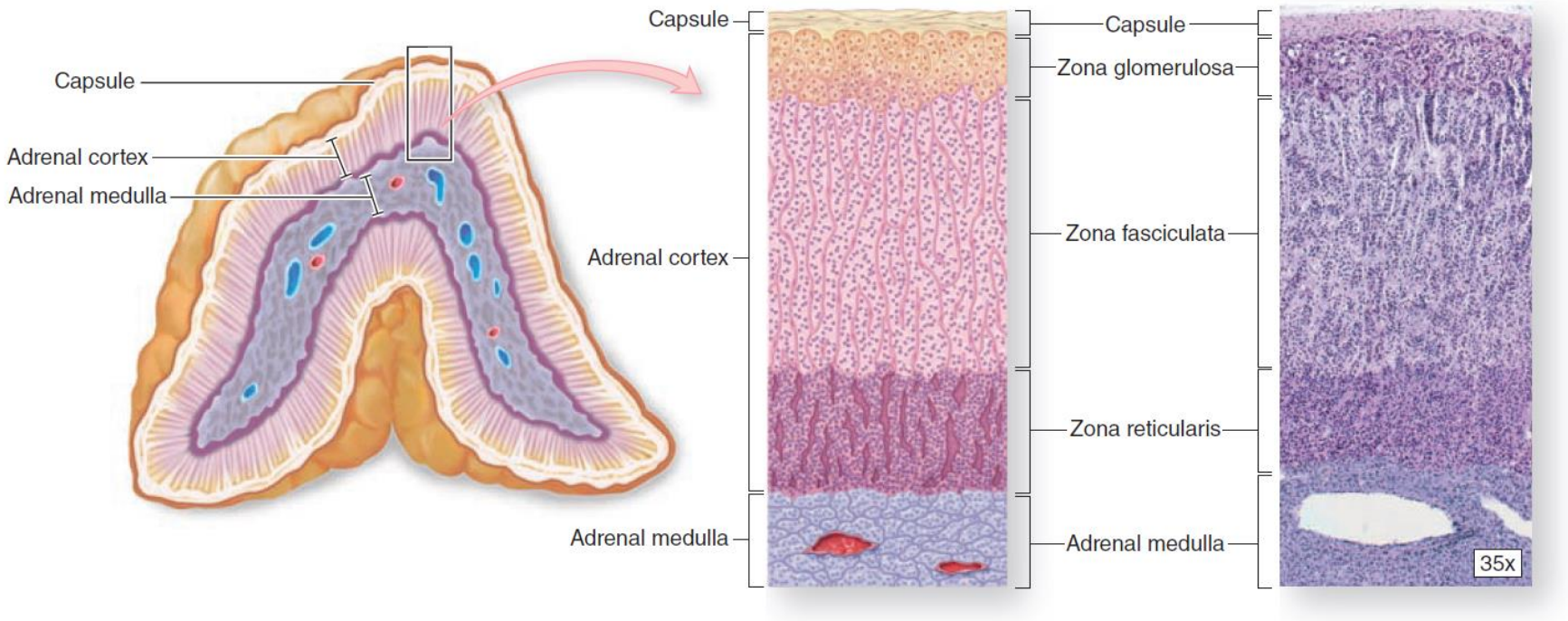
It contains:	
1.Chromaffin cells (Pheochromocytes):	2. Sympathetic ganglion cells:
▪ Contains granules of catecholamine as that of sympathetic nervous system. ▪ They **produce** epinephrine and norepinephrine. ▪ They <u>stain</u> deep brown with <u>chromic salts.</u> Basophilic High amount of RER for synthesis of tyrosine to make catecholeamine	▪ Relay on chromaffin cells.



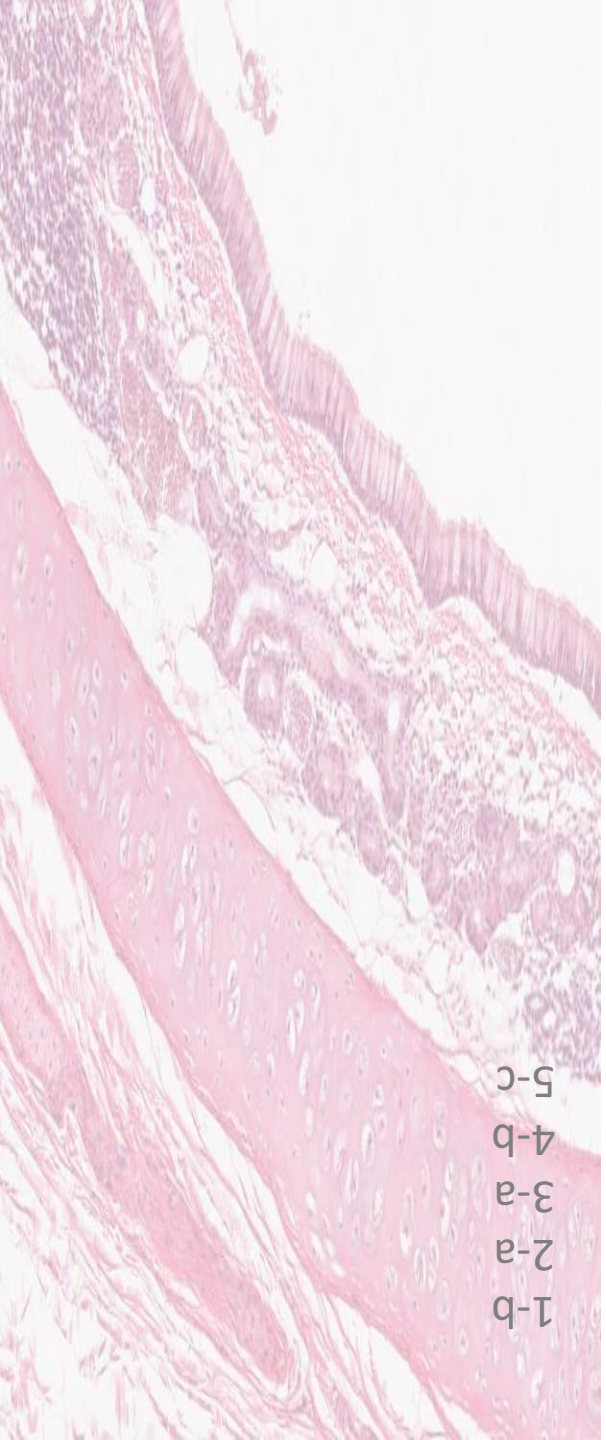
NEURONS IN ADRENAL MEDULLA

EXTRA

FIGURE 20–14 Adrenal gland.



Inside the capsule of each adrenal gland is an adrenal cortex, formed from embryonic mesodermal cells, which completely surrounds an innermost adrenal medulla derived embryologically from neural crest cells. Both regions are very well vascularized with fenestrated sinusoidal capillaries. Cortical cells are arranged as three layers: the zona glomerulosa near the capsule, the zona fasciculata (the thickest layer), and the zona reticularis.



MCQs

1\Which one of following layers Produce mineralocorticoids:
A-Zona reticularis.
B-Zona glomerulosa.
C-Zona Fasciculata.

2\the largest layer of the cortex:
A-Zona Fasciculata.
B-Zona glomerulosa.
C-Zona reticularis.

3\The cells secrete androgen in which of following layers:
A-Zona reticularis.
B-Zona glomerulosa.
C-Zona Fasciculata.

4\Chromaffin cells produce:
A-glucocorticoids.
B-epinephrine.
c-acetylcholine.

5\Medulla of adrenal gland is:
A-the peripheral portion of the adrenal gland.
B-the outermost portion of the adrenal gland.
C-the central portion of the adrenal gland.

1-b
2-a
3-a
4-b
5-c

HISTOLOGY TEAM 436

Thank you & good luck

- Histology team

Done by:

- ✓ Amal AlGarni
- ✓ Duaa Walid
- ✓ Heba AlNasser
- ✓ Shahad AlAnzan
- ✓ We'am Babaier

Team leaders:

- ✓ Rana Barasain
- ✓ Faisal Alrabaii

References:

- ✓ Females' and Males' slides.
- ✓ Doctors' notes