



Histology of kidney

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Objectives:

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

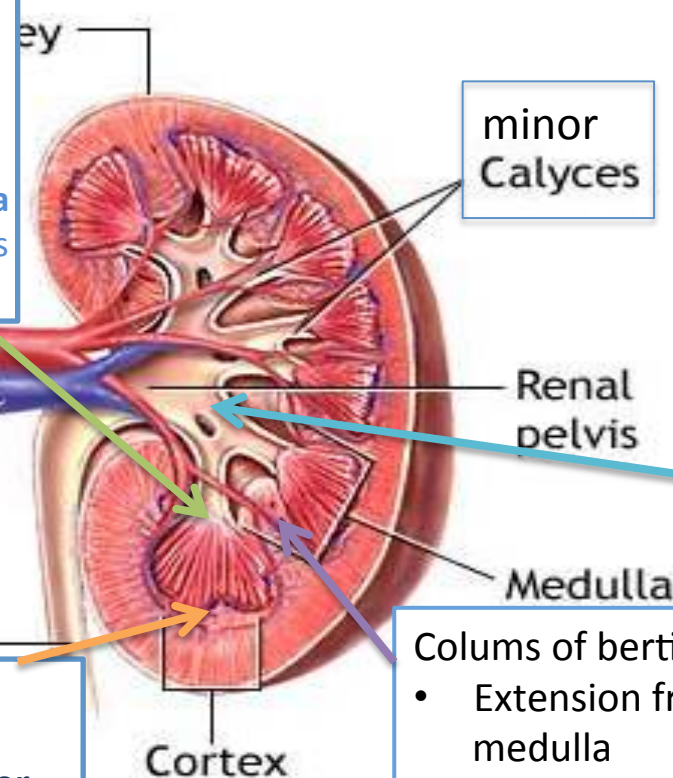
- 1. The microscopic structure of the renal cortex and medulla.**
- 2. The histology of renal corpuscle, proximal and distal tubules, loop of Henle, and collecting tubules & ducts.**
- 3. The histological structure of juxtaglomerular apparatus.**
- 4. The functional structures of the different parts of the kidney.**

- Renal papilla: (the apex)**
- Toward the hilum
 - Perforated by 12 openings Called **Ducts Of Bellini** in region named **Area Cribrosa**
 - surrounded by minor calyces

Renal artery

Renal vein

Ureter

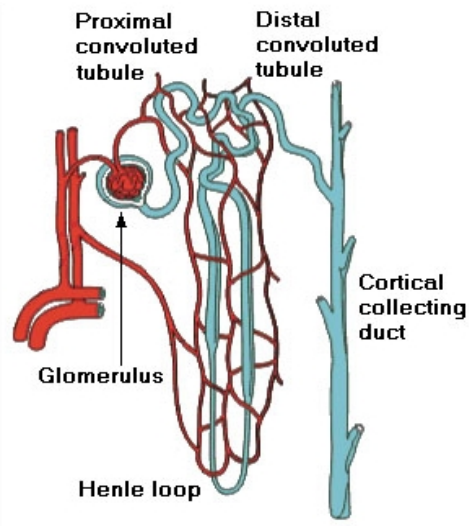


- Major calyces :**
- Formed by joining of 3-4 **minor** calyces
 - 3-4 **major** calyces forms the renal pelvis

- The base:**
- **Toward the cortex**
 - **Cortico-medullary border**

- Columns of bertin:**
- Extension from the cortex found in medulla
 - No glomerulus , between pyramids

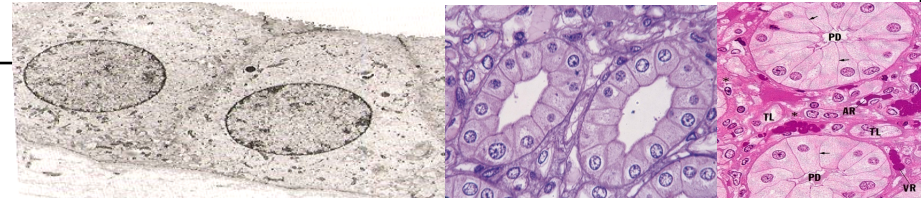
Cortex	medulla
<p>Gross: Dark brown and granular</p> <p>Structures:</p> <ul style="list-style-type: none"> • Glomerulus • Proximal tubules • Distal tubules • Cortical collecting tubule 	<p>Gross : 6-12 pyramids-shaped region (renal pyramids) (picture above)</p> <p>structures:</p> <ul style="list-style-type: none"> • Medullary collecting tubules • Loop of henle



Urineriferous tubules

functional unit of the kidney

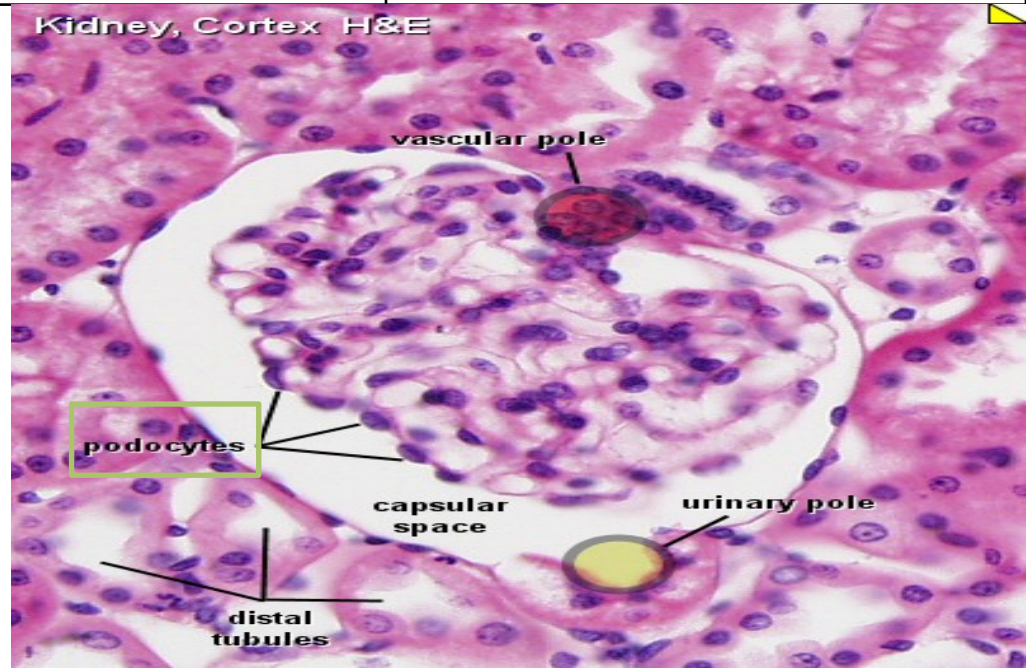
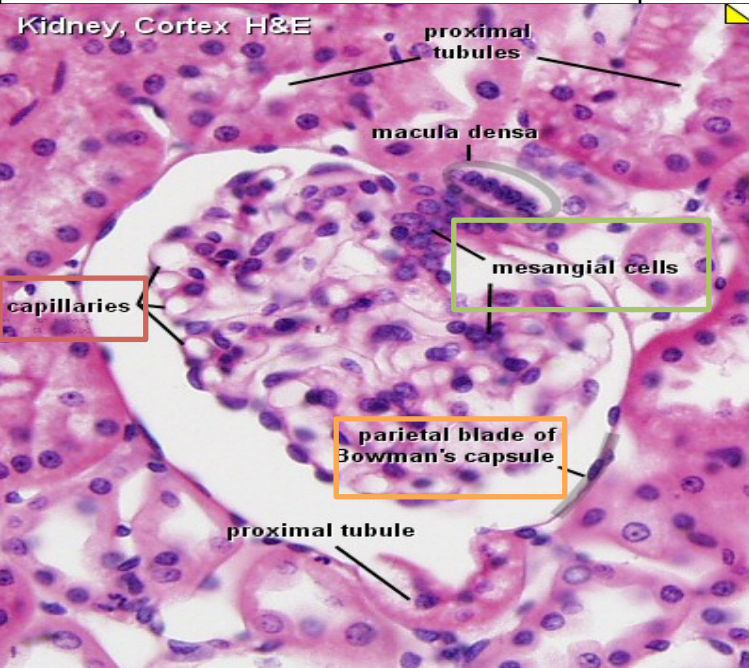
nephron	Collecting tubules
<p>Formed of :</p> <ul style="list-style-type: none"> • Renal corpuscles: <ul style="list-style-type: none"> *glomerulus *bowman's capsule *mesangial cells • Proximal convoluted tubule • Thin limbs of Henle's loop • Distal convoluted tubule 	<ul style="list-style-type: none"> • Simple cuboidal epithelium • They Are not parts of nephron • 3 regions : <ul style="list-style-type: none"> a. Cortical region: simple cuboidal epithelium b. Medullary region: simple cuboidal epithelium c. Palpillary region: simple columnar epithelium, they open in area cribrosa • Impermeable to water except in the presence of ADH



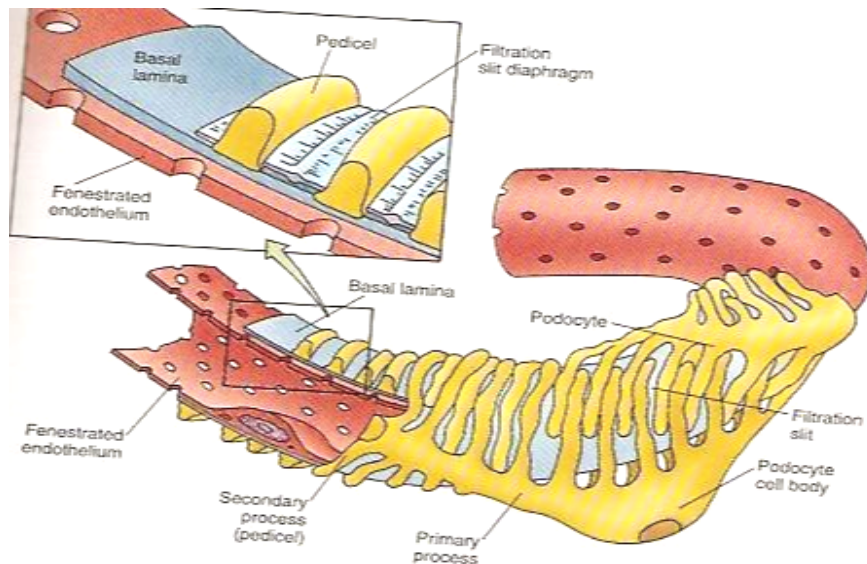
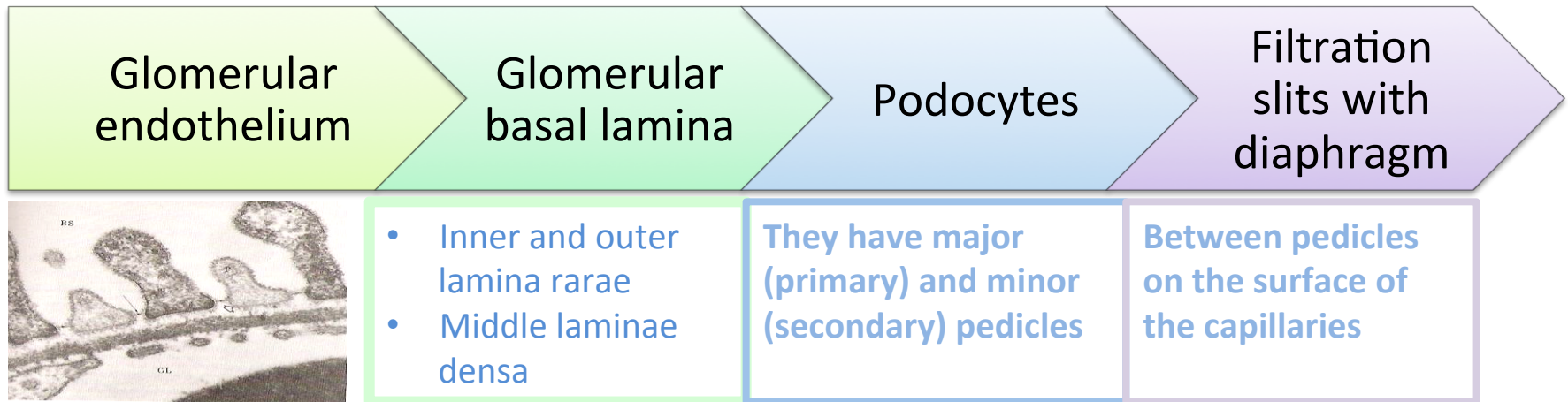
*tubules are densely packed and separated by thin stroma and lamina

Renal corpuscles

glomerulus	Bowman's capsule	Mesangial cells
<p>Tuft of fenestrated capillaries without diaphragm</p> <p>*it's special because its located between to arterioles "Afferent & Efferent" not arteriole and venule.</p>	<ul style="list-style-type: none"> • Parietal layer • Urinary space • Visceral layer or Podocytes 	<p>Intra-gloerular cells (between glomerulus)</p> <p>*mesangial cells and matrix together form the mesangium which supports the capillaries</p>



Glomerular filtration barrier



Renal tubules

Proximal convoluted tubules

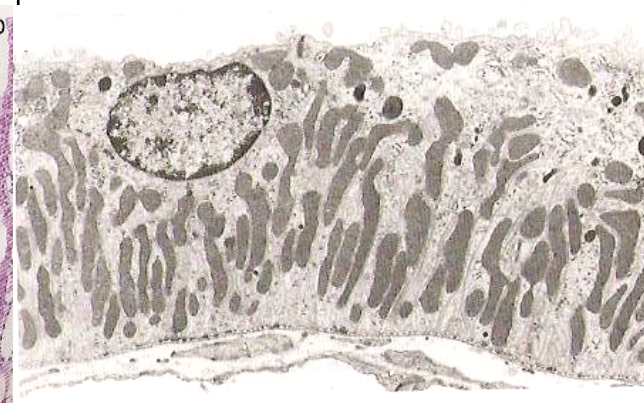
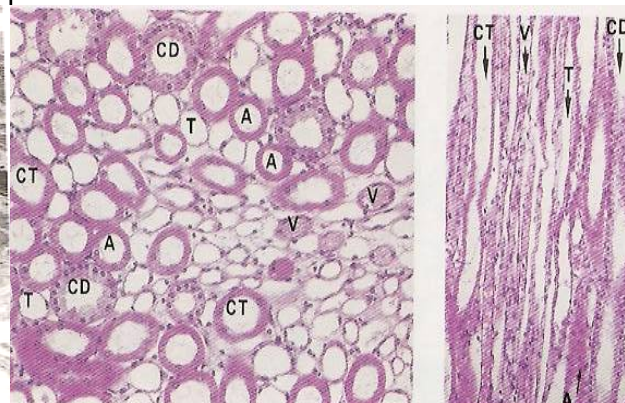
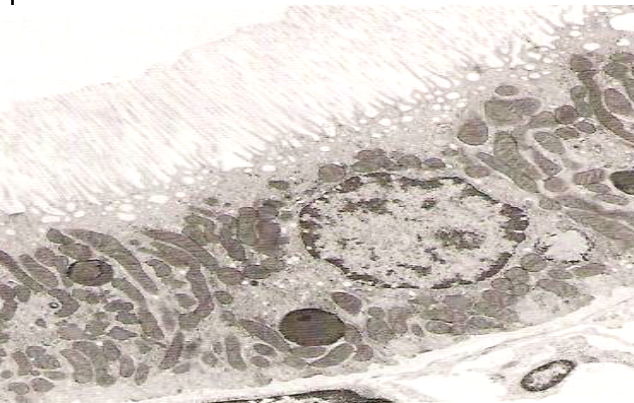
- Simple cuboidal epithelium
- Acidophilic cytoplasm (pink)
- Striated or brush borders
formed of microvilli to increase surface area
- Lateral inter-digitations
the cell walls are irregular and fit together making it hard to see the cell borders
- Well defined basal lamina
- In cortex

Thin limbs of henle's loop

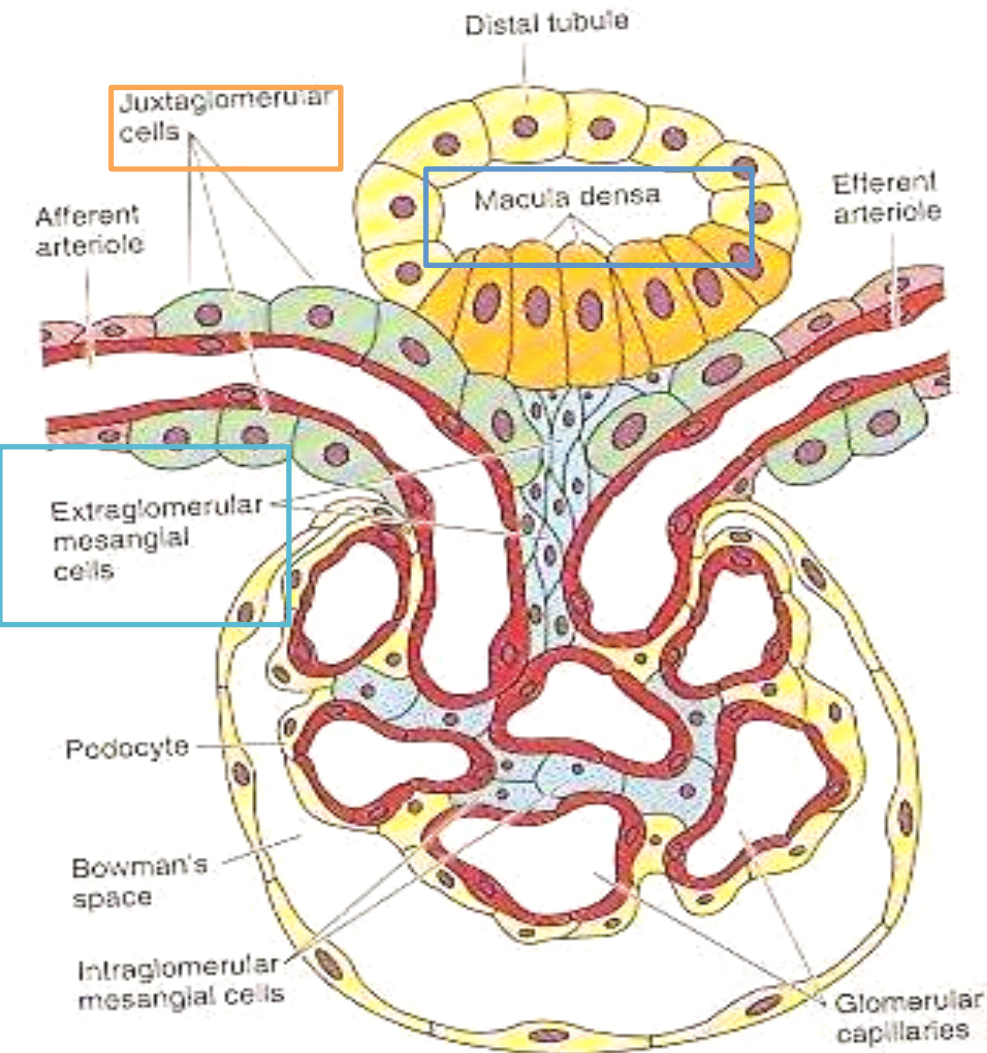
- 1-Descending thin limb.
 - 2-Crest of Henle's loop.
 - 3-Ascending thin limb.
- NB. It is longer in juxta-medullary nephron than in cortical nephron.
* It is composed of simple squamous epith.

Distal convoluted tubules

- Starts with macula densa (tall columnar and narrow cells)
- Formed of low cuboidal epithelium
- Shorter than proximal tubules , that's why in any section of renal cortex we find less distal tubules than proximal
- Drains into collecting tubules



Juxtaglomerular apparatus :



Renal Interstetium:

- It is a very flimsy, scant amount of loose CT that contains:
- **1-Fibroblasts.**
- **2-Macrophages.**
- **3-Interstitial cells:** They secrete medullipin I, which is converted in the liver into medullipin II, that lowers blood pressure.

Done by :

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Good luck 😊