



GENITOURINARY SYSTEM

SUBJECT : Anatomy lab

LEC NO. : 2

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GUS

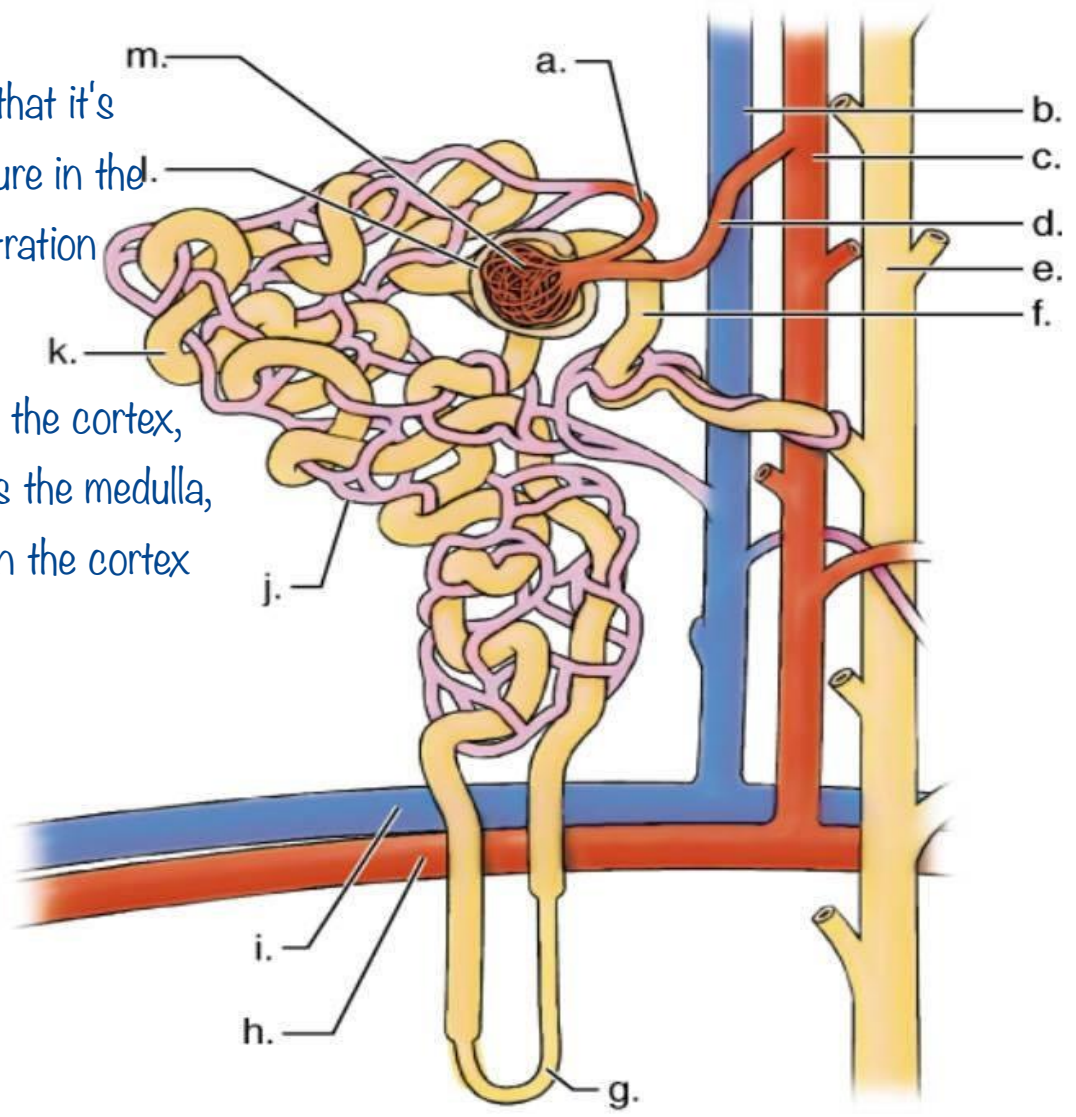
Lab (2)

Histology of Urinary System

* Ratio of nephrons and collecting ducts isn't 1 : 1, each group of nephrons are related to the same collecting ducts

* Each kidney has from 1.3 - 1.5 million nephrons
* Nephron is functional and anatomical unit in kidney

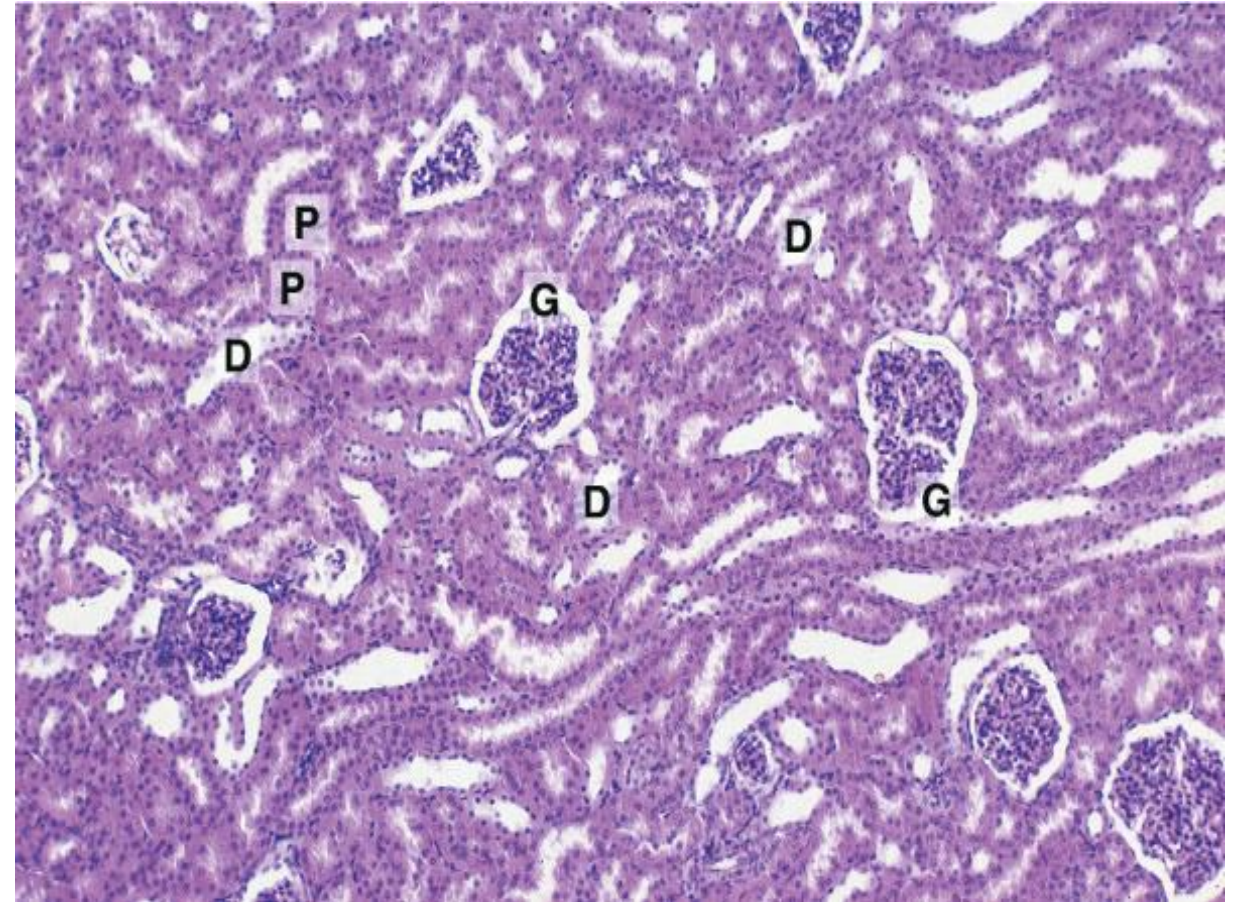
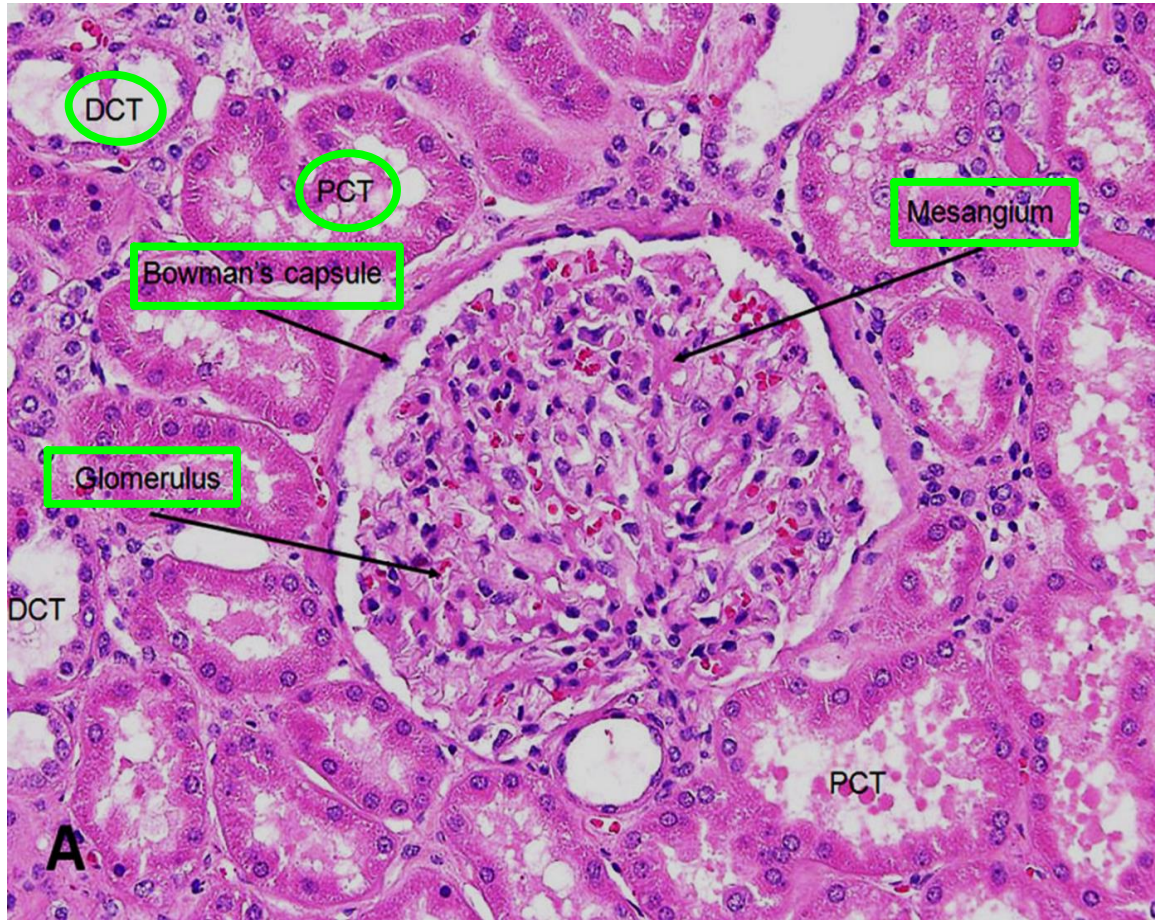
- a- Efferent arteriole.** There's muscles in its wall so that it's closure will increase the pressure in the glomerulus and improve the filtration
- b- Interlobular vein.**
- c- Interlobular artery.** Most of the nephron is in the cortex, only loop of henle reaches the medulla, collecting duct part of it in the cortex the other in the medulla
- d- Afferent arteriole.**
- e- Collecting duct.**
- f- Distal convoluted tubule.**
- g- Loop of Henle.**



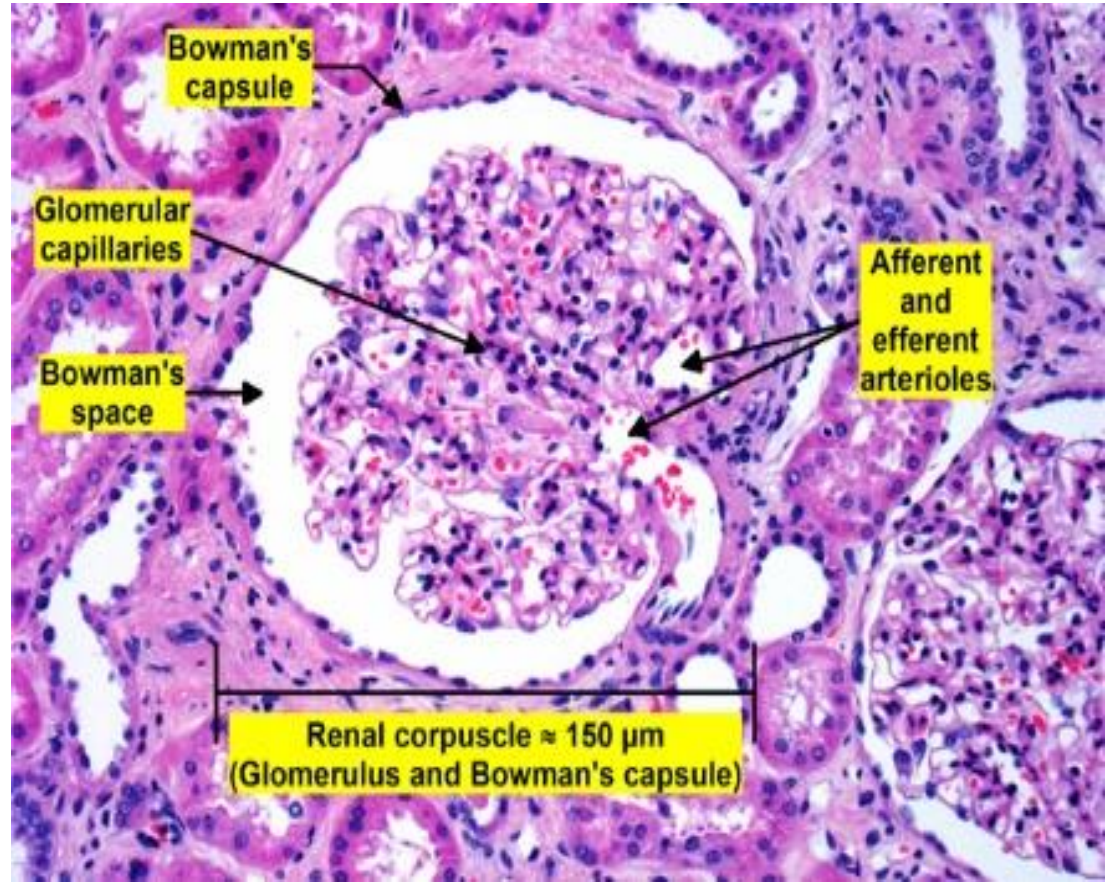
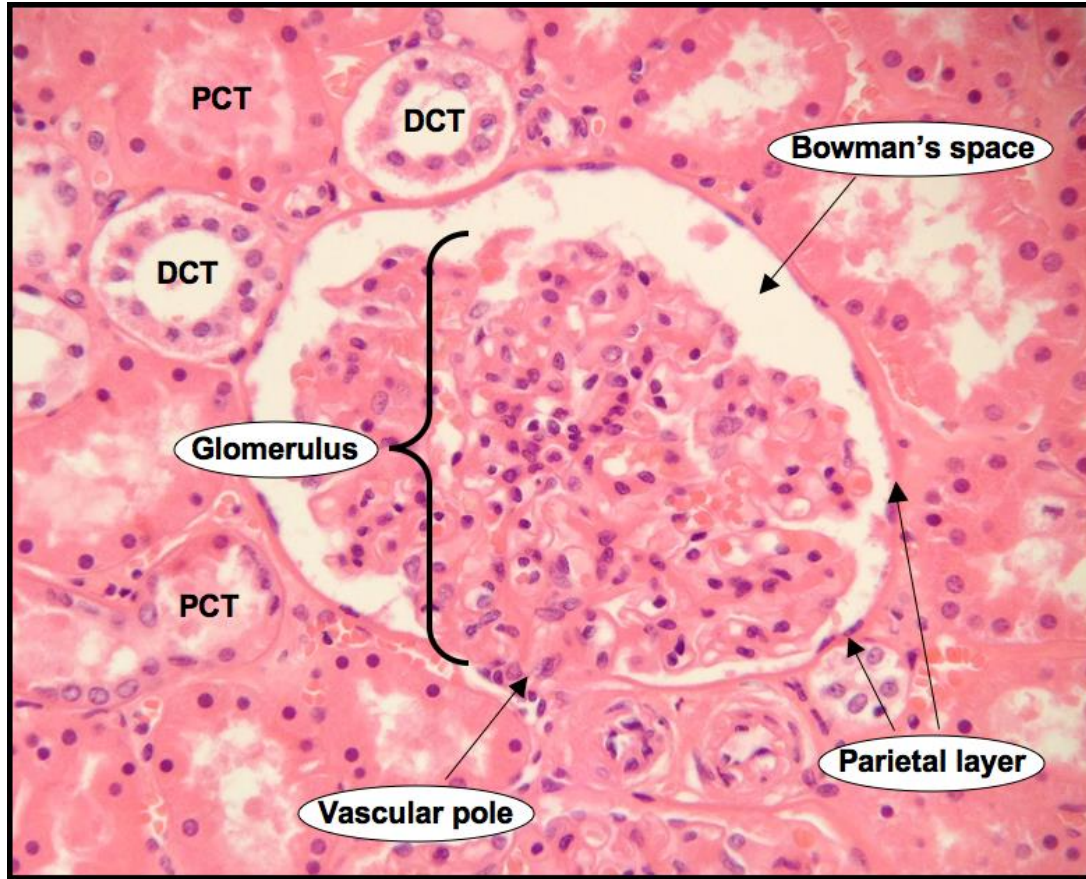
* Efferent and afferent arterioles exist and enter from the same pole

Renal Cortex

✿ How to differentiate between proximal and distal tubules? Look at the lumen the distal tubules have wide open lumen, proximal tubules have brush border unlike the distal



Light micrograph of **Renal Cortex**, which is composed mainly of proximal (P) and distal (D) convoluted tubules and renal glomeruli (G).



- ✿ Bowman's capsule from the outside formed from epithelial cells
- ✿ Visceral layer formed of podocytes
- ✿ Bowman's space contains interstitial fluid
- ✿ Podocytes have processes called pedicles they could be primary or secondary

Photomicrograph shows histologic features of a renal corpuscle.

A- Parietal layer of Bowman's capsule.

B- Bowman's space.

C- Proximal convoluted tubule.

E- Podocytes.

F- Afferent arteriole.

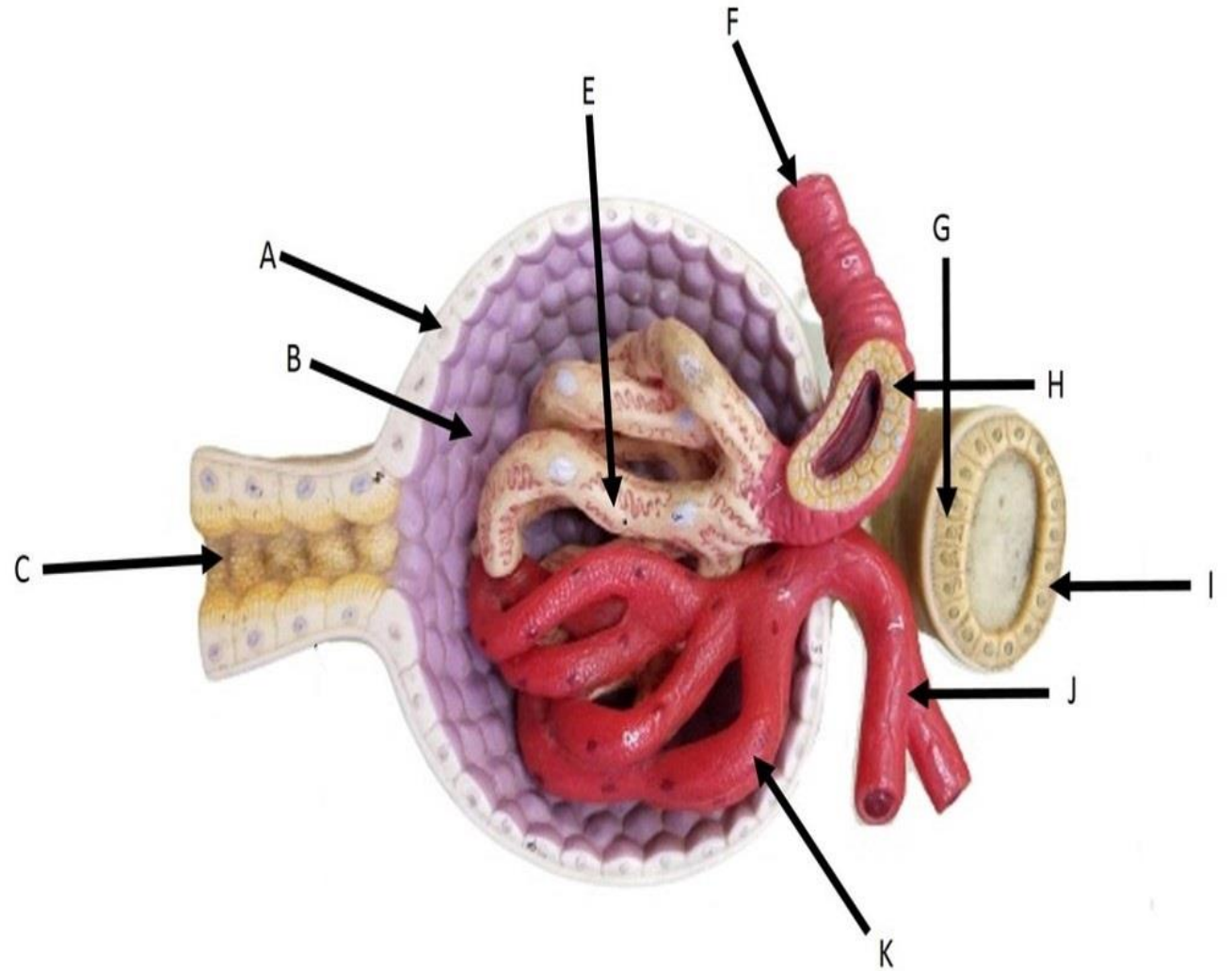
G- Macula densa.

H- Juxtaglomerular Cells. → *Secrete angiotensin*

I- Distal convoluted tubule.

J- Efferent Arteriole.

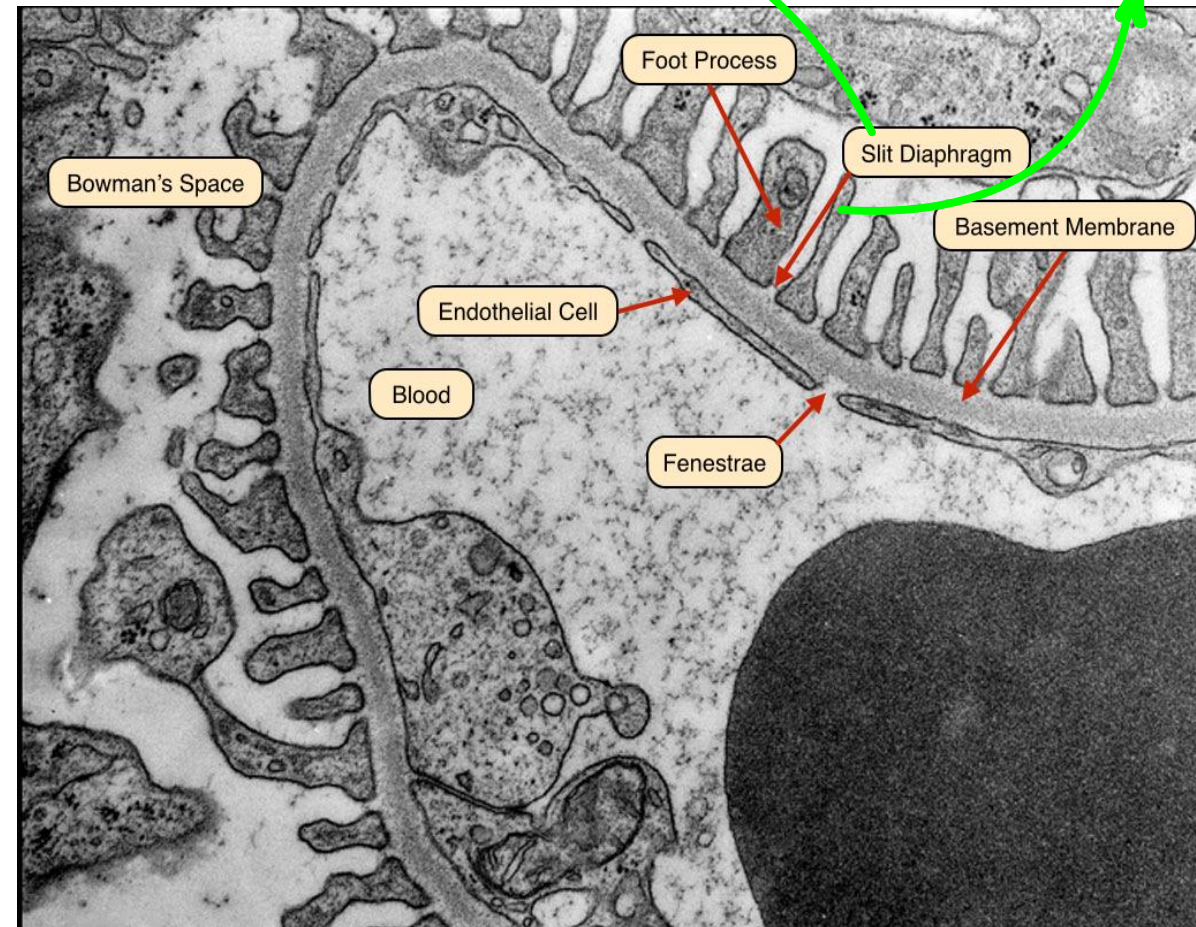
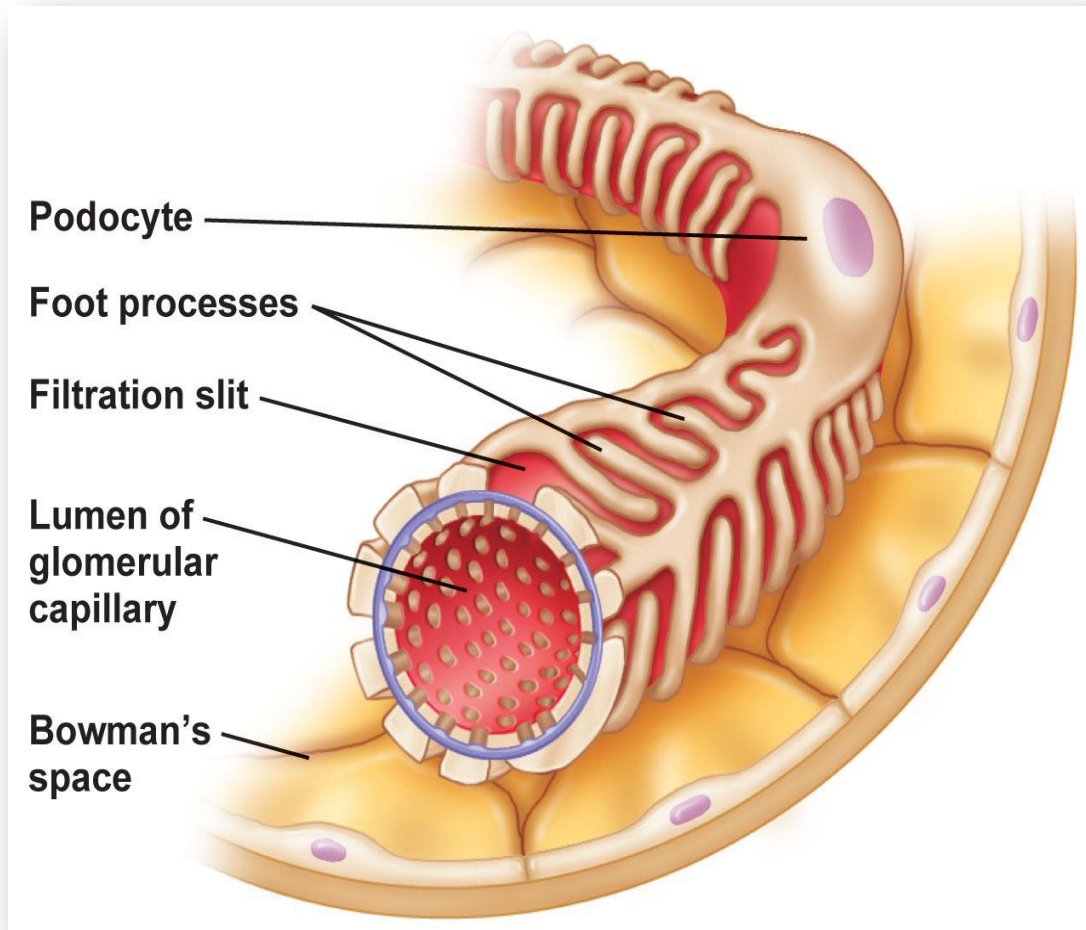
K- Glomerular Capillaries (Glomerulus).



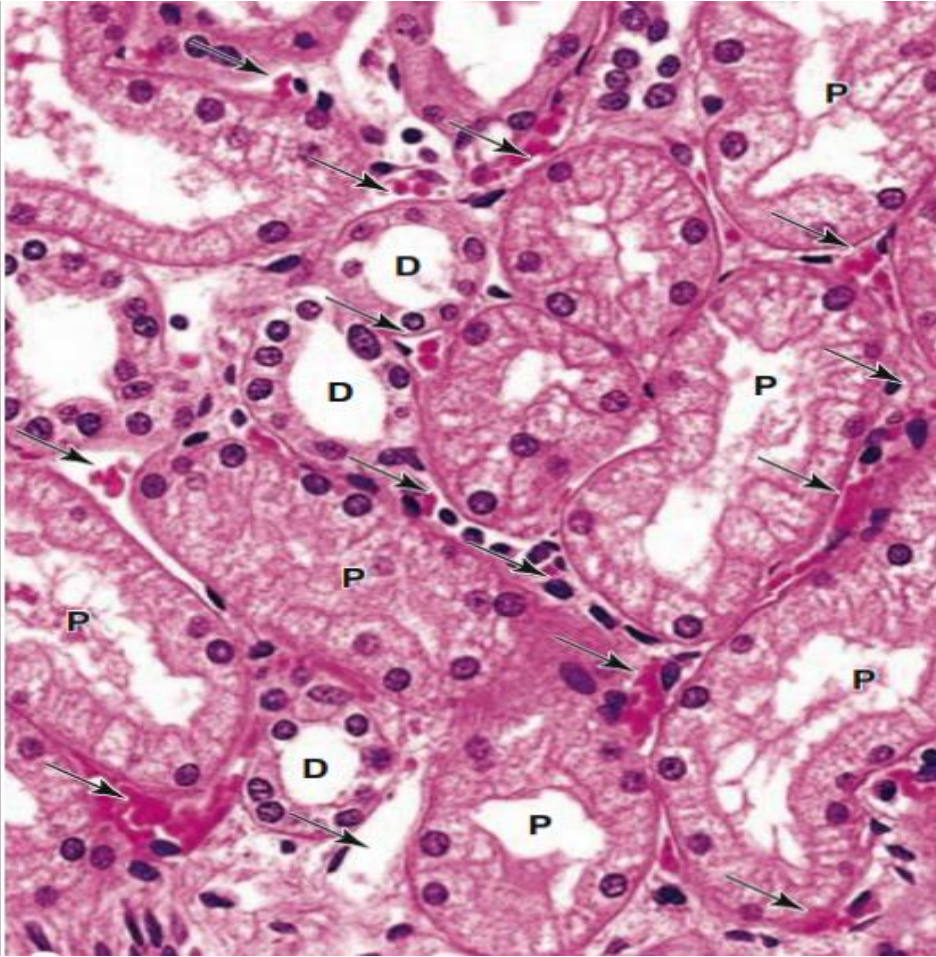
Blood Renal Barrier

✱ Between parietal and visceral layers of bowman's capsule

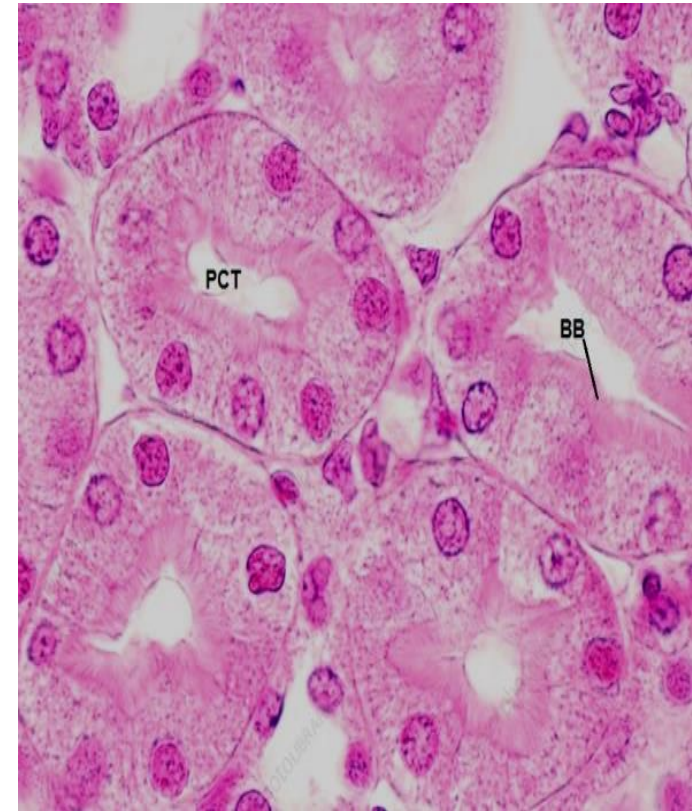
Secondary process



Electron micrograph of the filtration barrier in a renal corpuscle

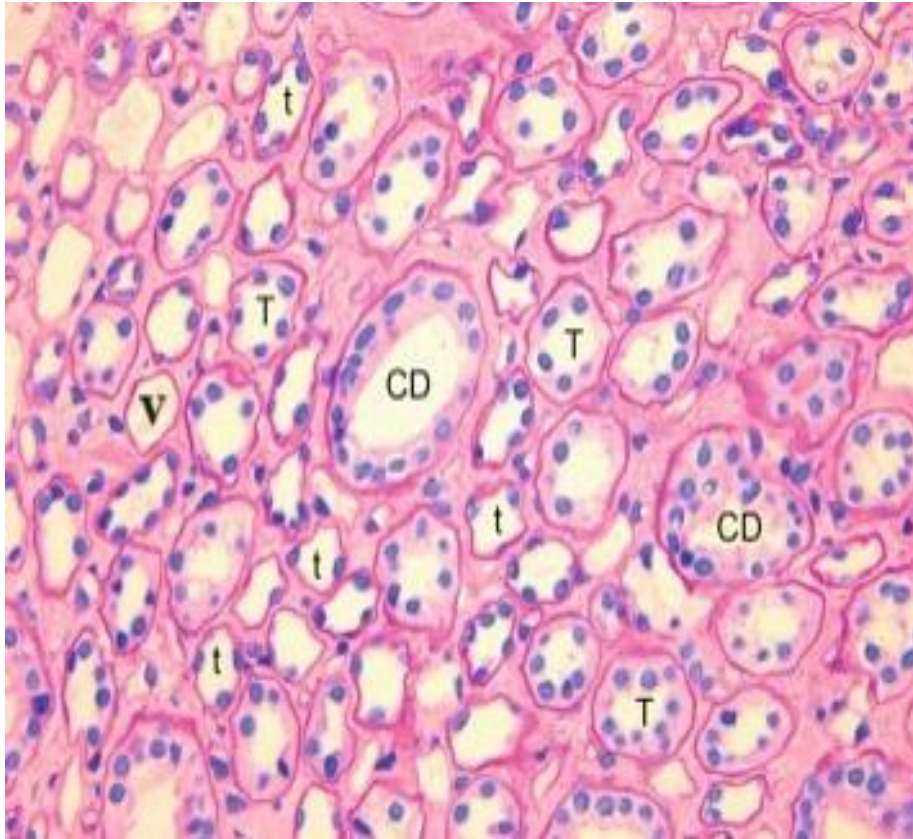


Light micrograph, Renal cortex section showing a proximal convoluted tubule (P), its cells presenting a brush border. Distal convoluted tubules (D). Peritubular capillaries and draining venules (arrows)

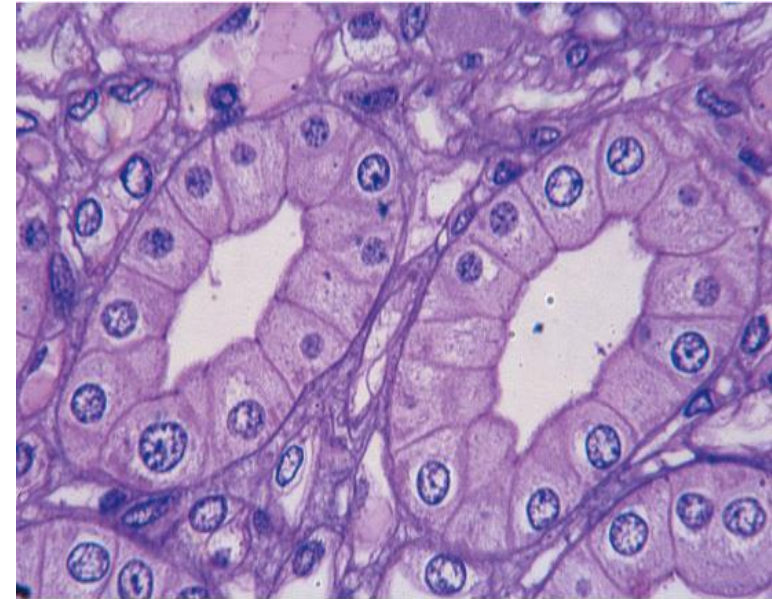


Renal cortex section, **PCT**; Proximal convoluted tubule. **BB**; Brush border.

Renal Medulla

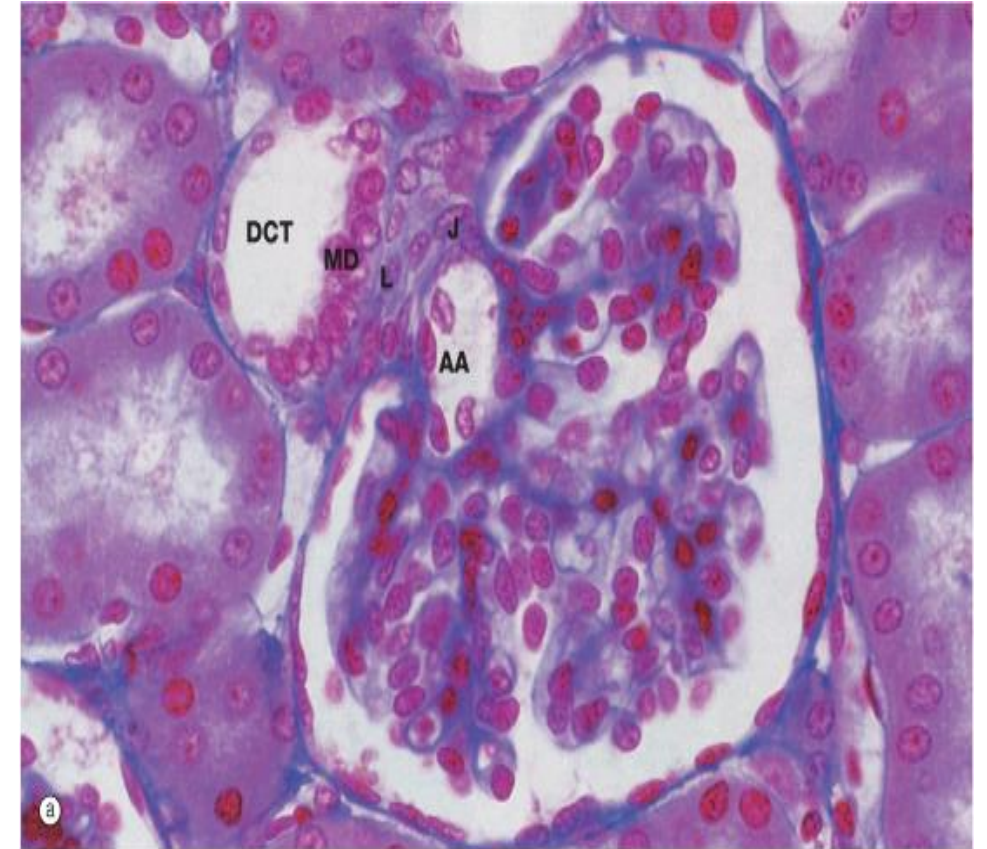
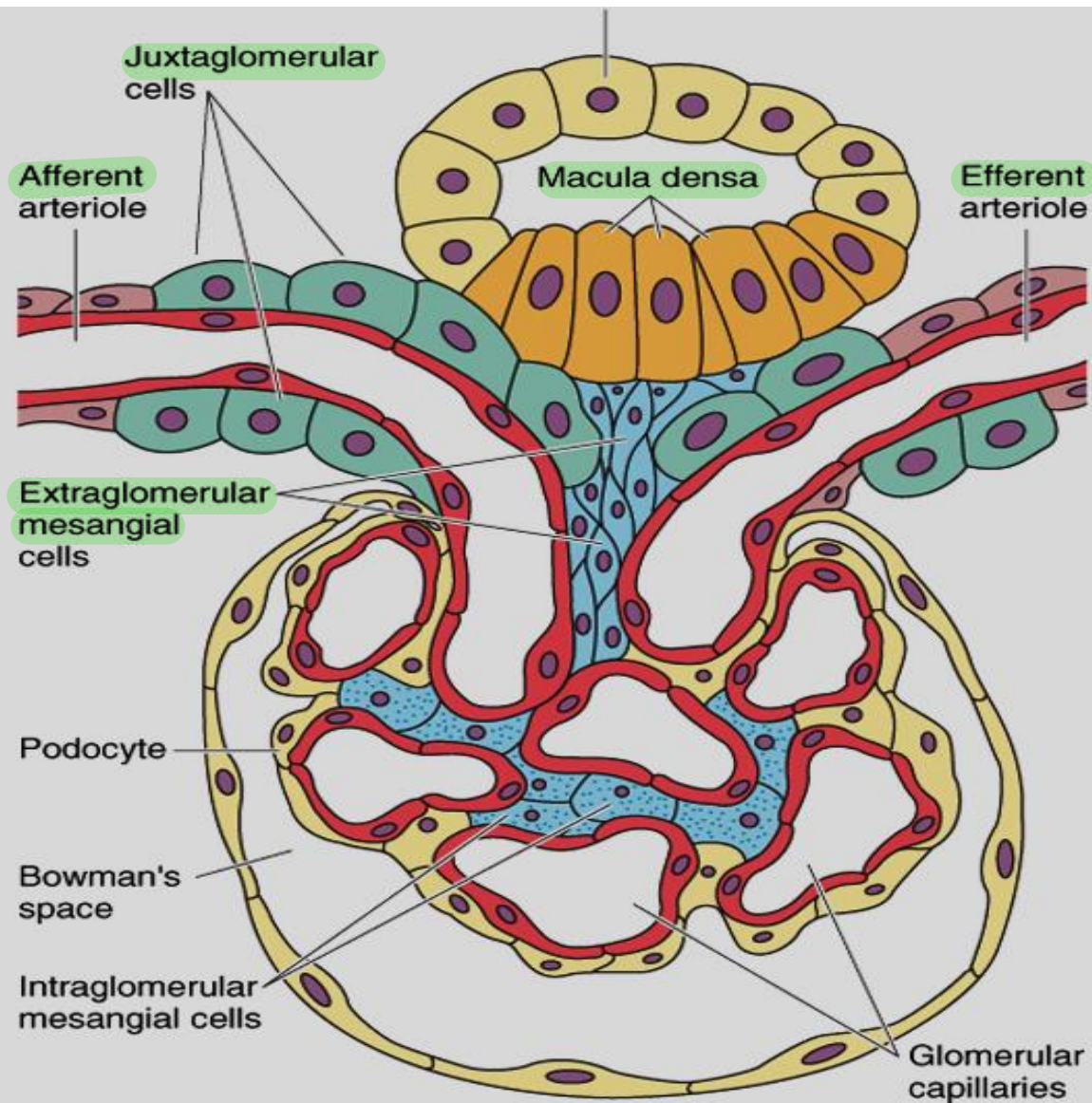


Light micrograph of Cross section of **Renal Medulla**; shows closely packed cross sections of the many Henle's loop, thin descending and ascending limbs (t) and thick ascending limbs (T), intermingled with parallel vasa recta capillaries containing blood (v) and collecting ducts (CD).

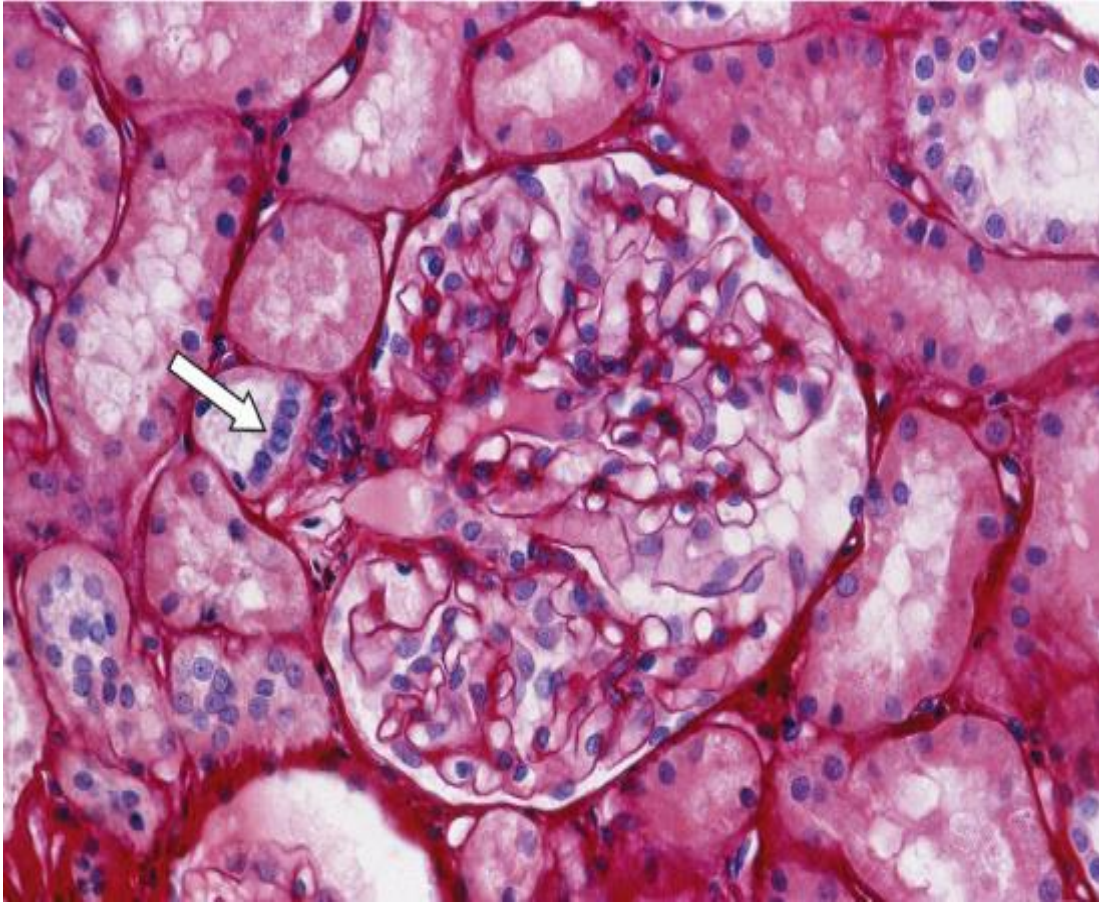


Photomicrograph of renal medulla showing two collecting ducts consisting of cuboidal cells resting on a basement membrane.

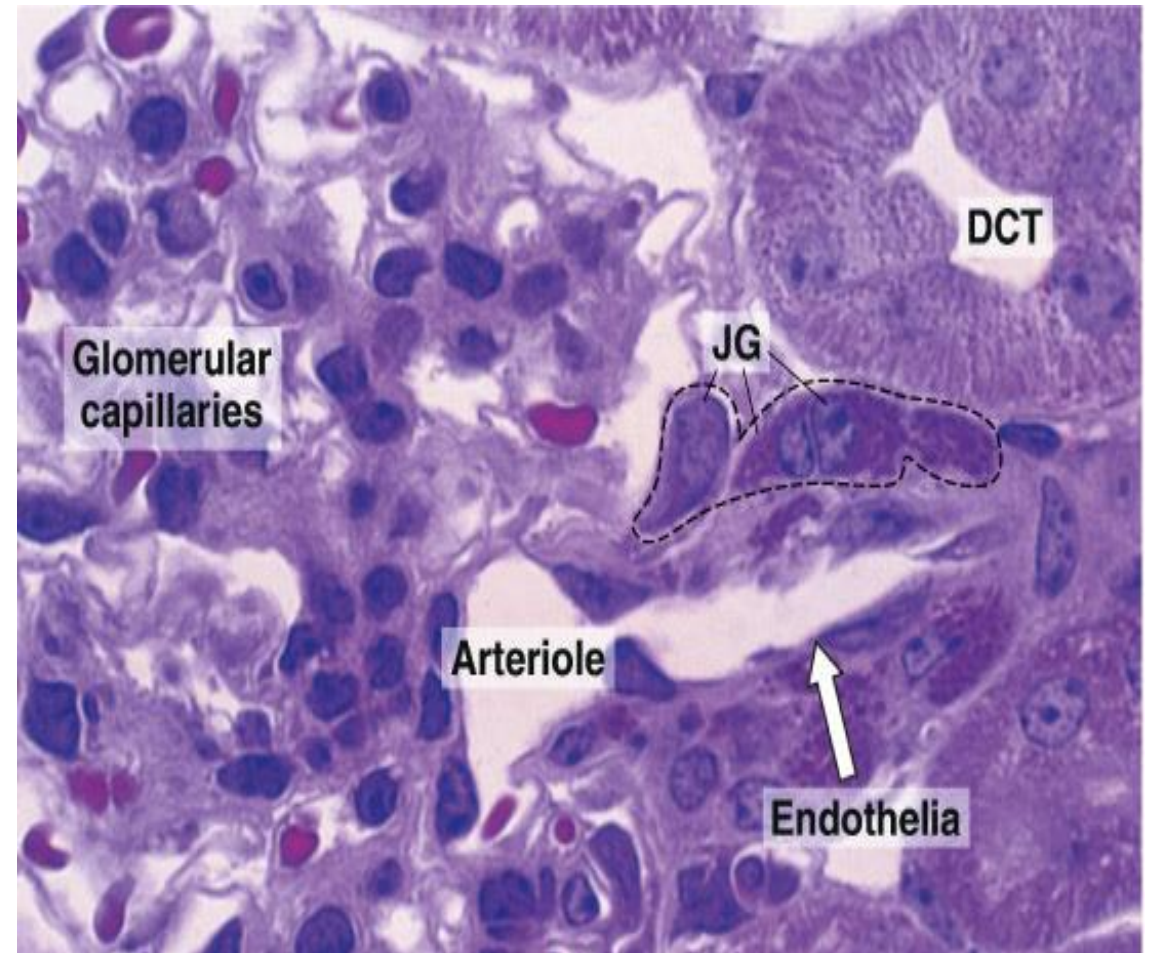
Juxtaglomerular Complex



L- Lacis cell (Extra glomerular mesangial cells)
MD- Macula densa.
DCT- Distal convoluted tubule.
J- Juxtaglomerular cells.
AA- Afferent arteriole.



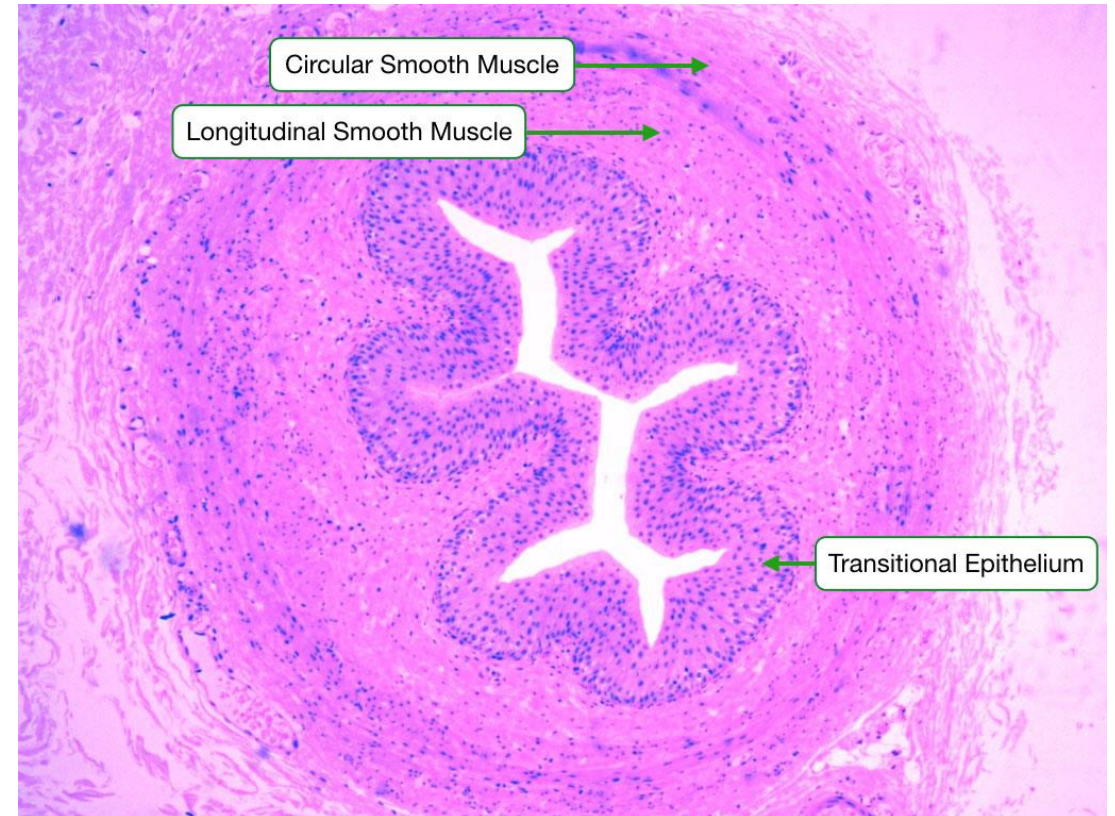
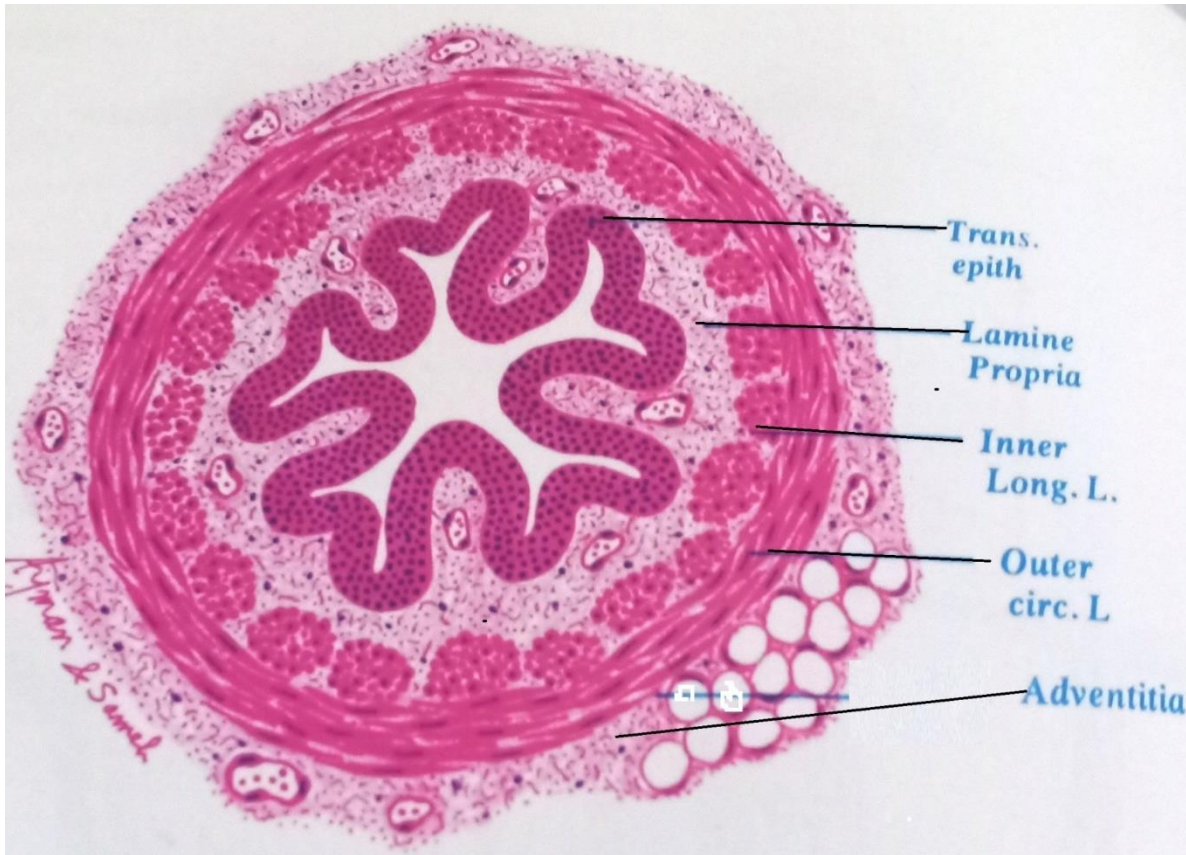
A **macula densa** (arrow) is seen at the vascular pole of a renal corpuscle.



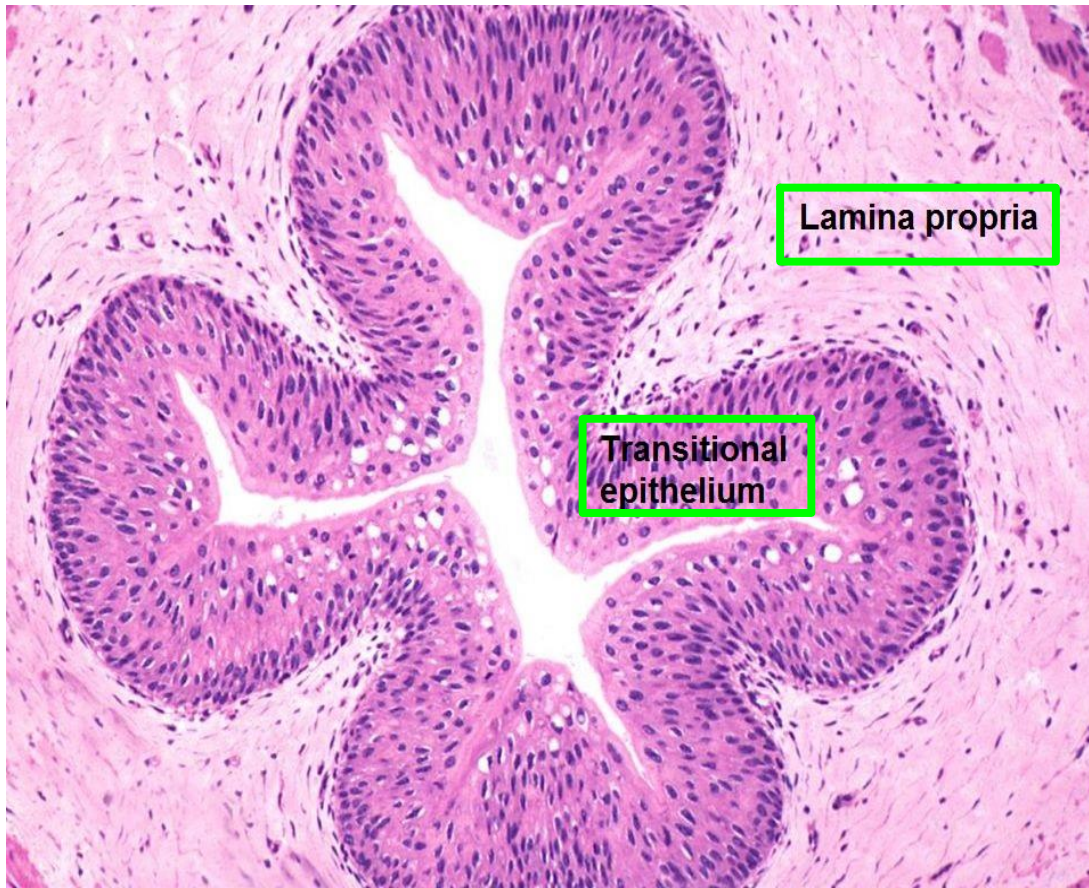
Photomicrograph of an **afferent arteriole** entering a renal corpuscle. The wall of this arteriole shows the **juxtaglomerular (JG) cells** (broken line). A **distal convoluted tubule (DCT)**.

Microscopic Appearance of Ureter

* Urethral stones cause pain from distention, visceral pain is transmitted through sympathetic nerves, patient is pale with dilated pupils, sweating, tachycardia, diffused sensation of pain

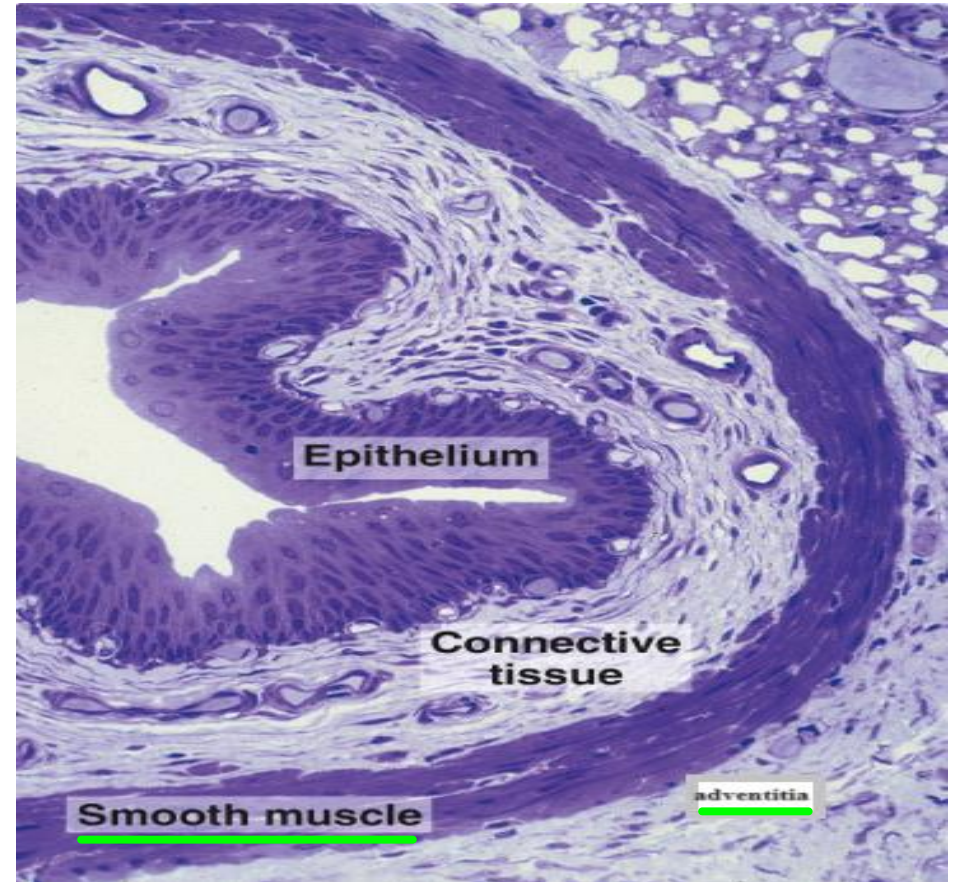


Microscopic Appearance of Ureter



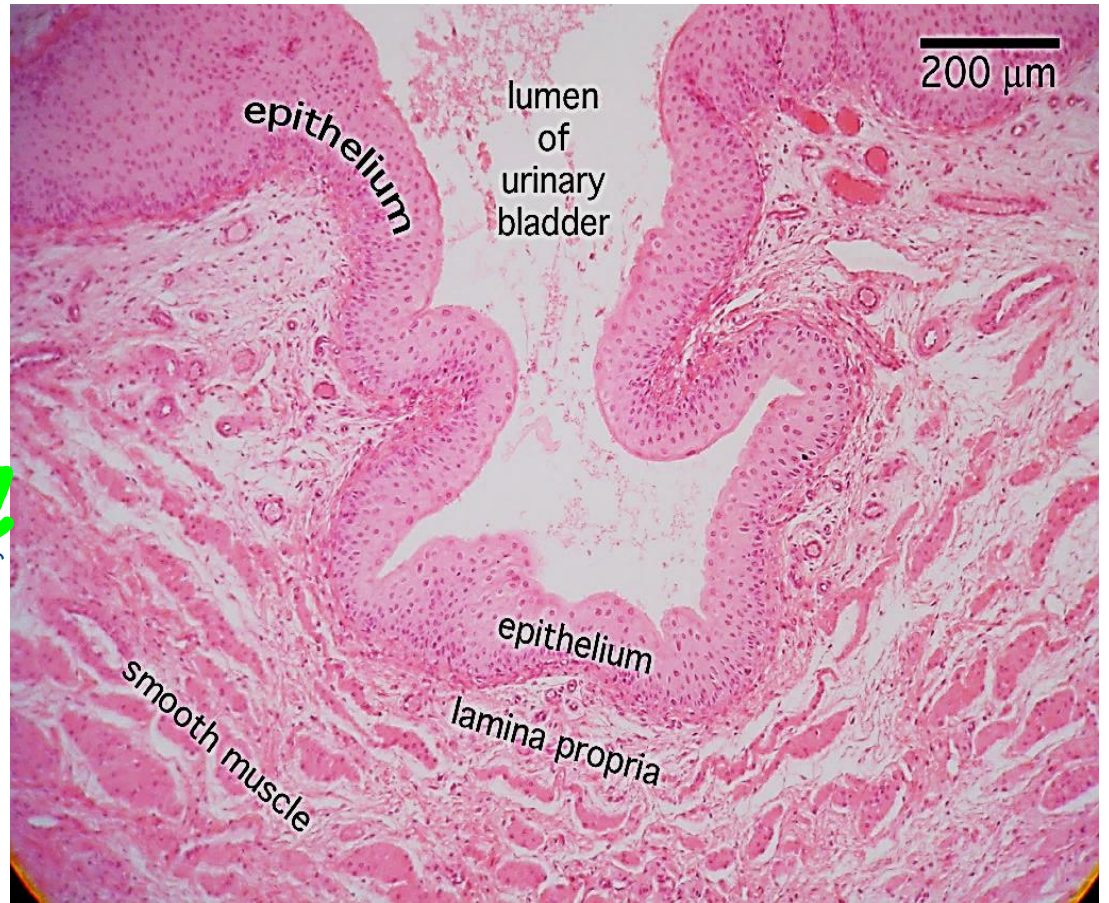
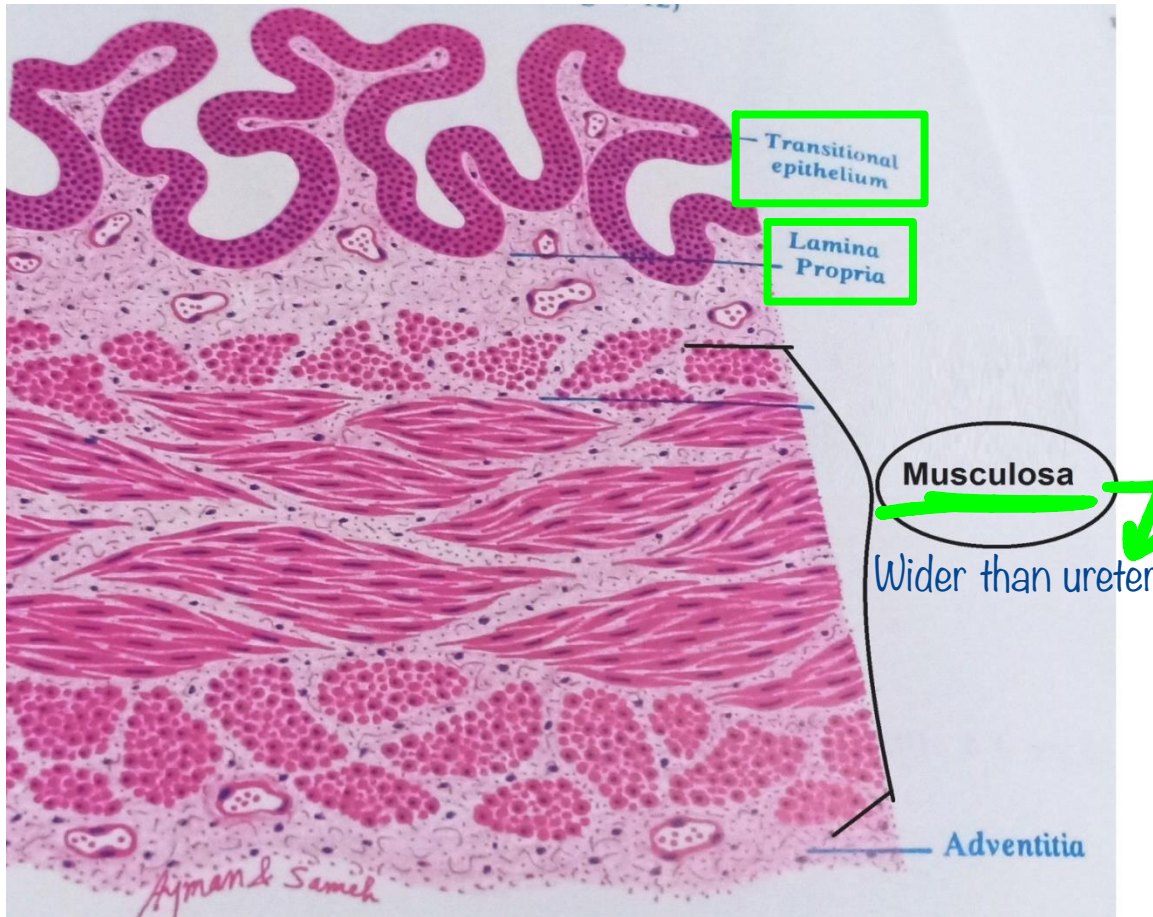
Light micrograph showing stellate-shaped lumen of ureter.

Mucosa of ureter; Transitional Epithelium & Lamina propria.

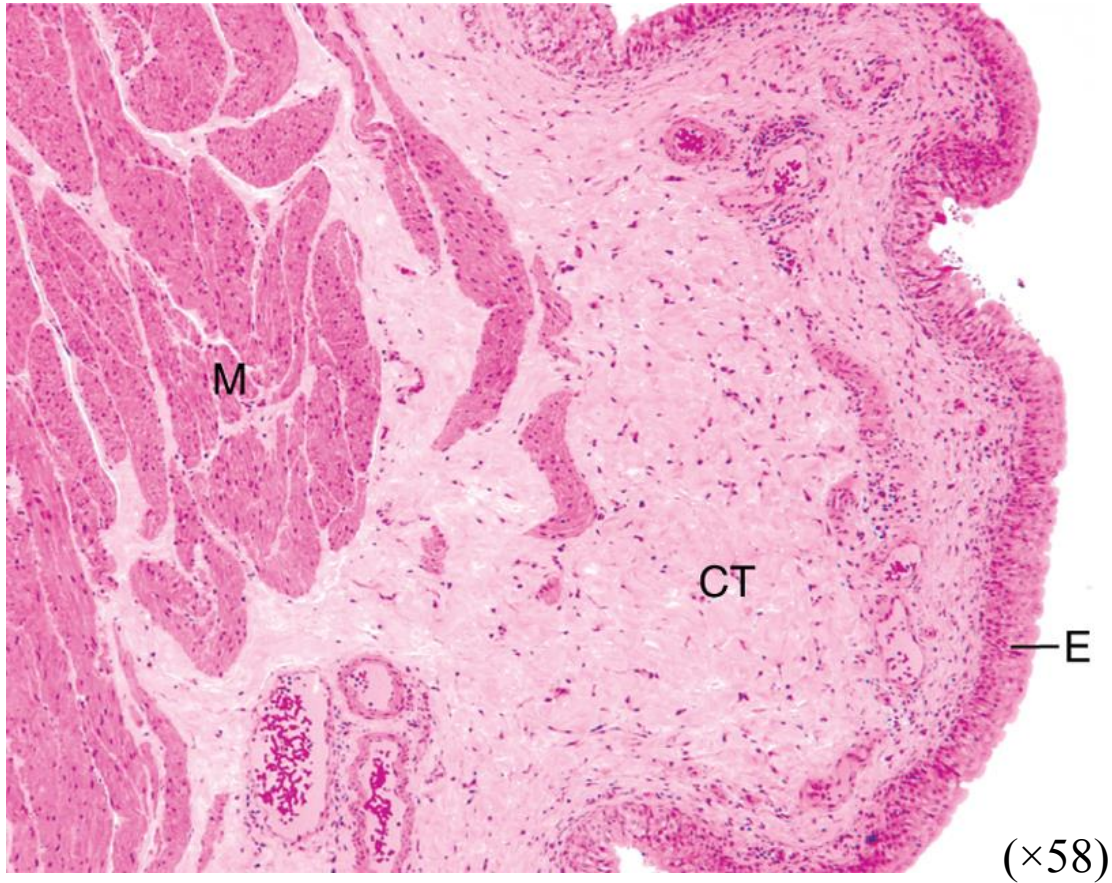


Light micrograph showing structure of the ureter, which consists of an inner layer of transitional epithelium, a highly vascularized connective tissue (lamina propria), a smooth muscle layer, and an outer layer of connective tissue (adventitia).

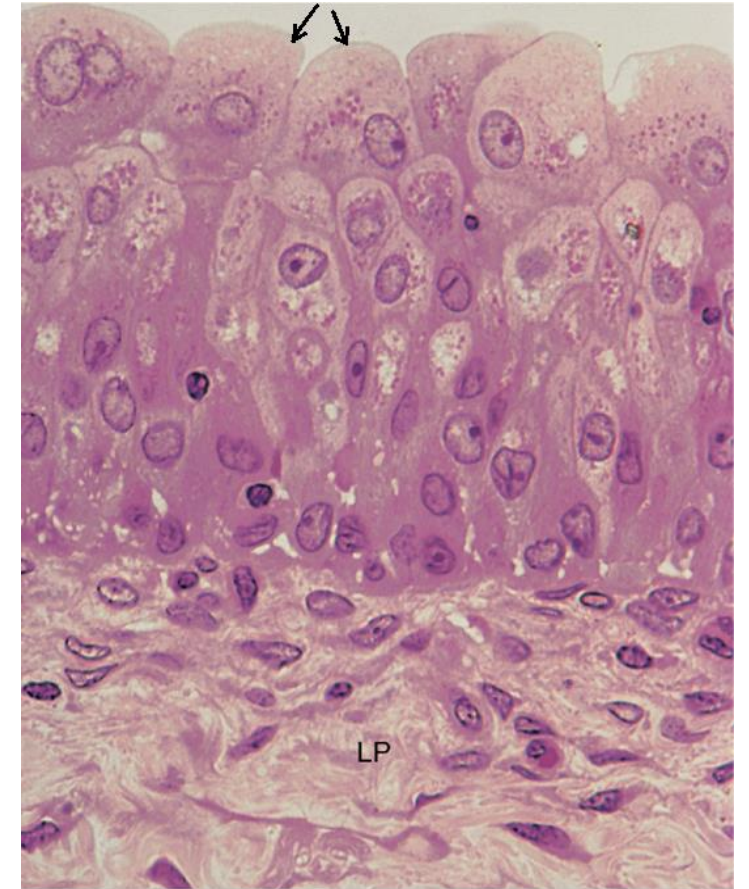
Microscopic Appearance of Urinary Bladder



Microscopic Appearance of Urinary Bladder

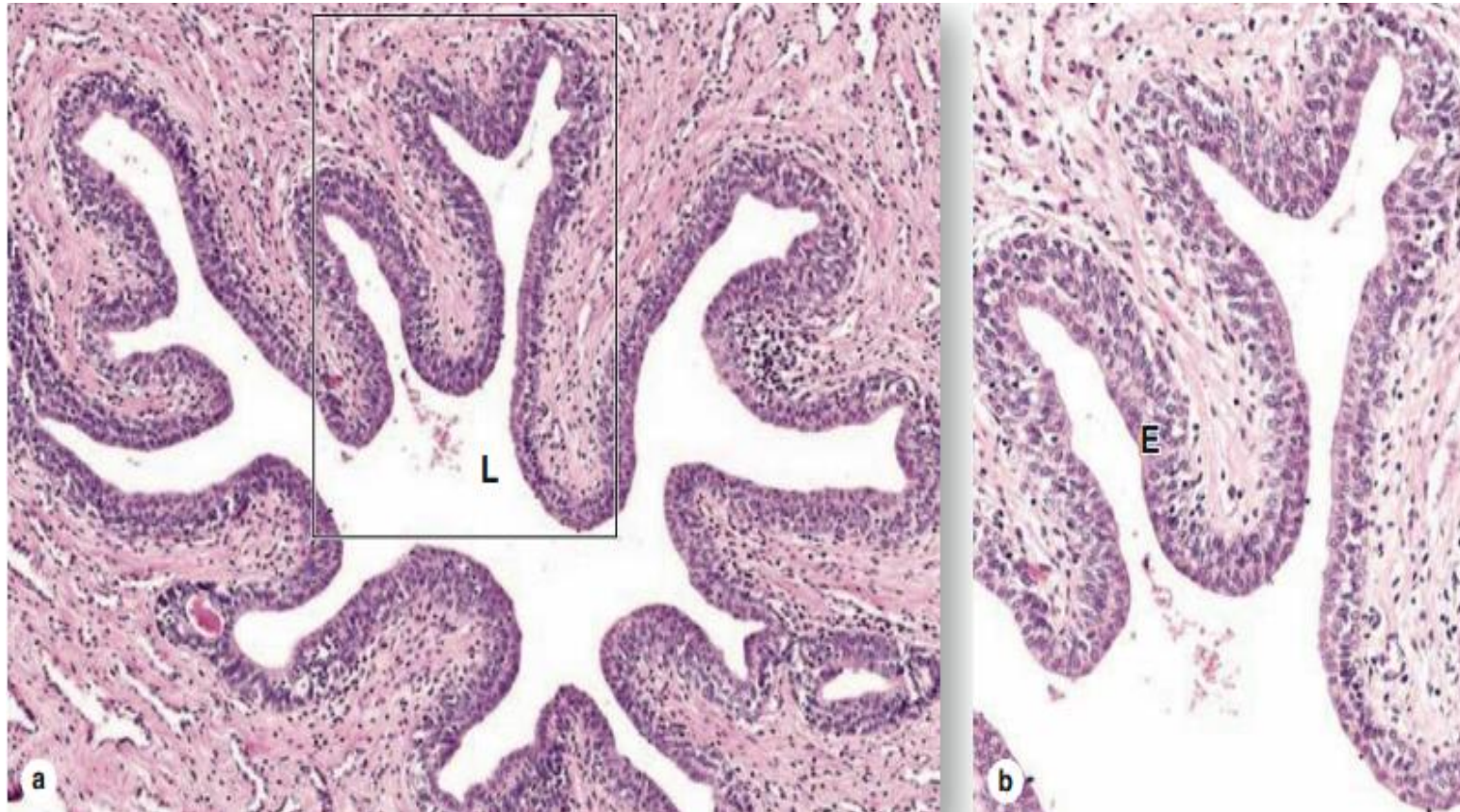


Light micrograph of the urinary bladder. Observe the transitional epithelium (E), the lamina propria connective tissue (CT), and the muscular coat (M) of the bladder.



Light micrograph of transitional epithelium from the bladder. Observe the very large, dome-shaped cells (arrows). LP; lamina propria.

Microscopic Appearance of Urethra



✦ عدد تفرعات كثيرة

✦ Lesser thickness

(a) A transverse section through urethra shows that the mucosa has large longitudinal folds around the lumen (L).

(b) A higher magnification shows the epithelial lining (stratified columnar epithelium (E)).

**Thank
you**