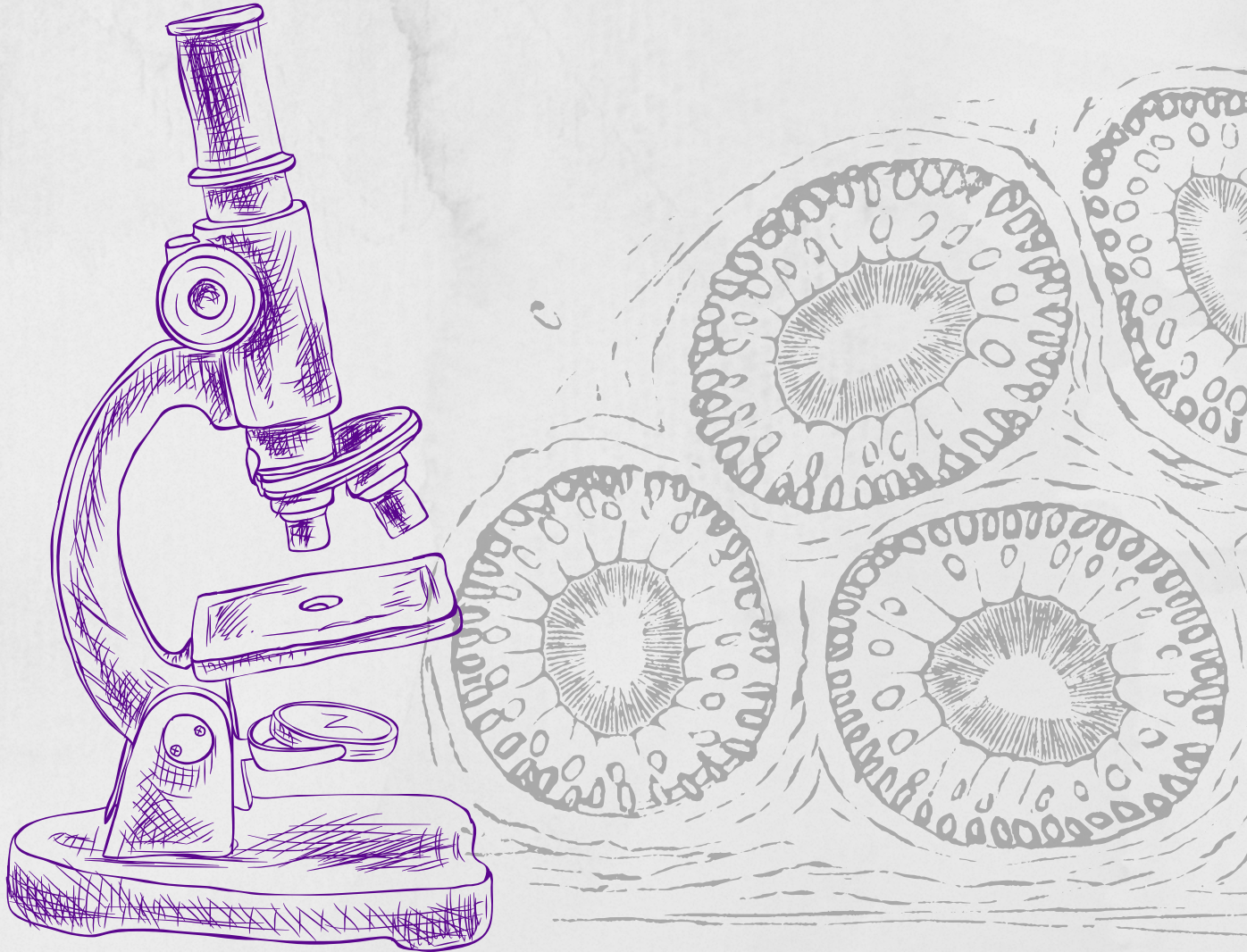
Urogenital System

Histology Lab

Done by:

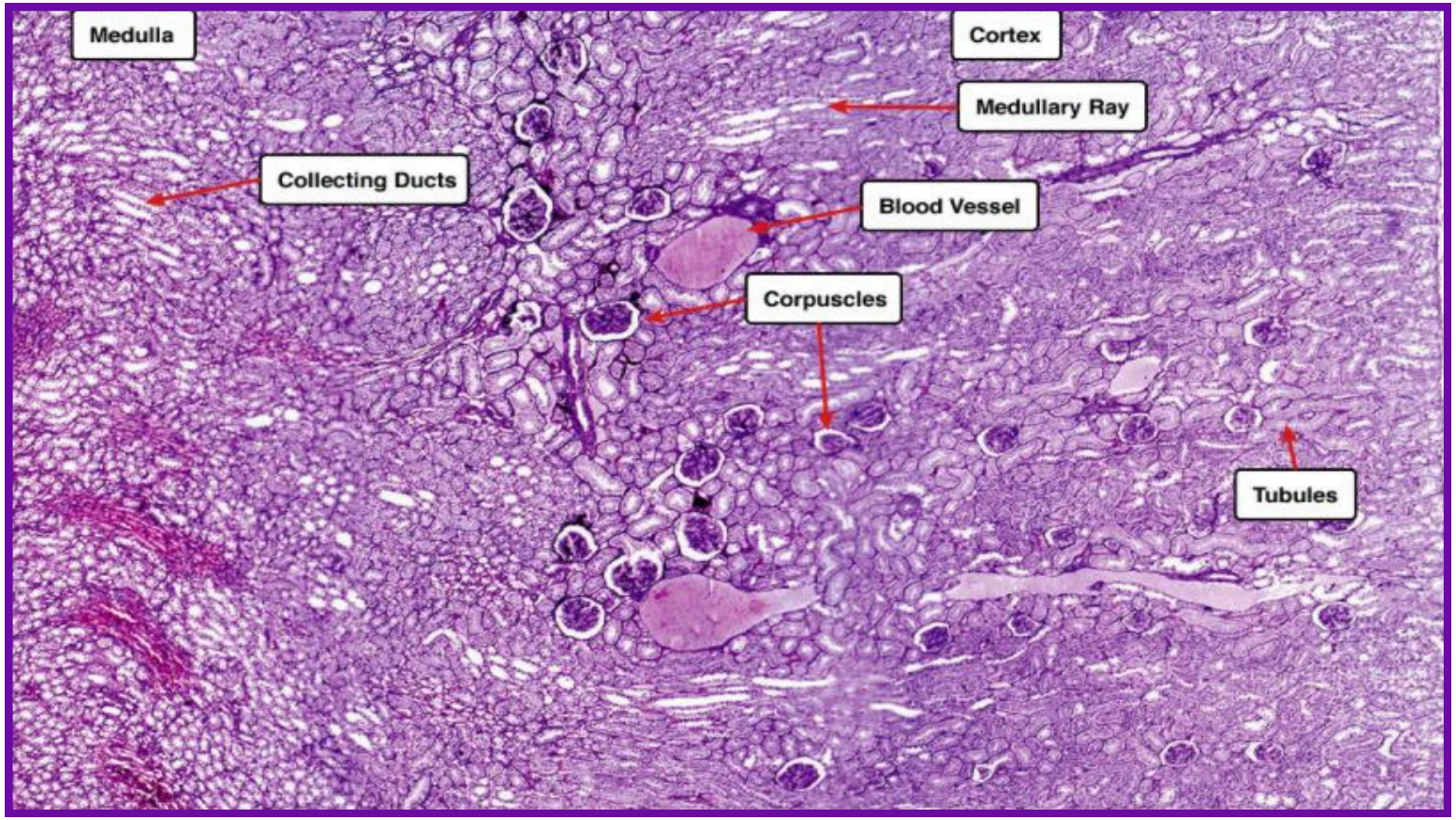
Layan Lafi



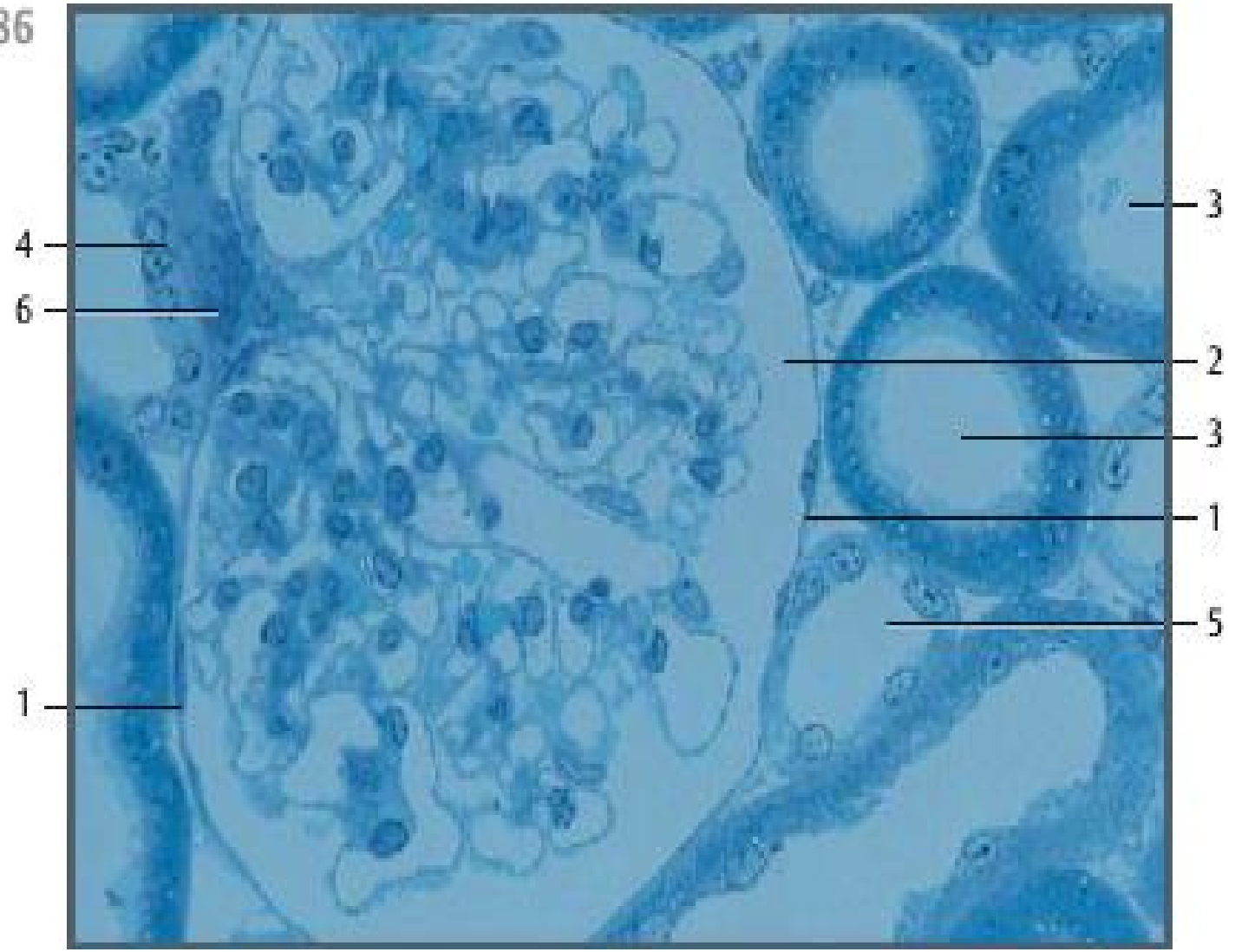
Urinary System

Kidney

- Composed of **medulla** and **cortex.**
- **Medullary ray:** extention from the medulla into the cortex.
- The kideny consists of:
  1. Part of nephron in the cortex
  2. **Collecting ducts** in the medulla
- **Renal corpuscle** consists of glomerulus and Bowman's capsule. Around it, we find afferent and efferent **blood vessels.**
- **Tubules:** proximal and distal tubules.



1. **Parietal layer of Bowman's capsule** which lined by simple squamous epithelium.
2. **Bowman's space** which contains the filtrated urine.
3. **Proximal tubule** has brush border in the lumen.
4. **Macula densa** in the wall of distal tubule.
5. **Distal tubule** (distal's lumen is wider than the proximal with not clear brush border).
6. **Extraglomerular mesangium Cells** are found between the distal tubule, glomerulus and afferent arteriole.
   *There function: supporting the system.

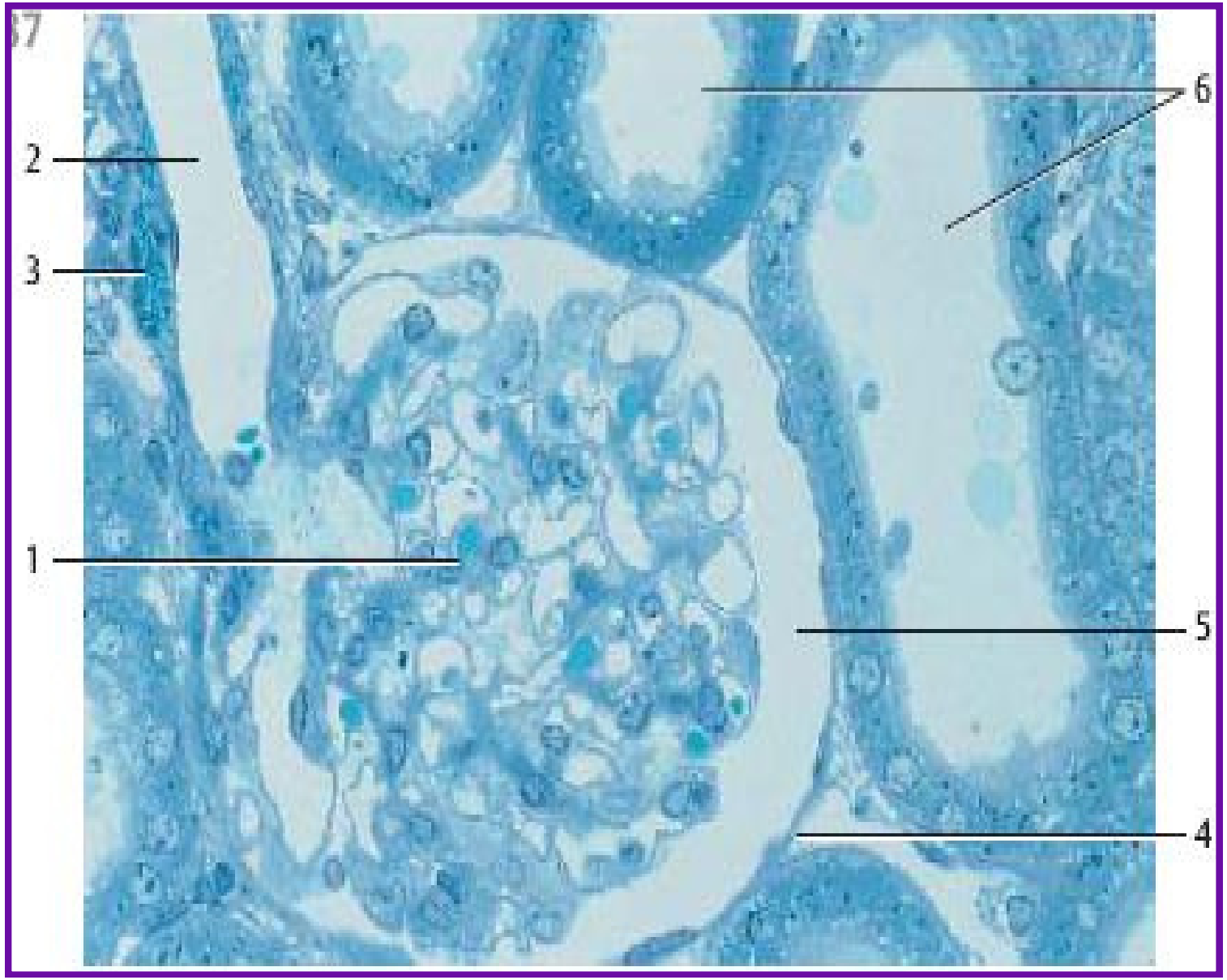


1. **Glomerulus is coiled capillaries** inside Bowman's capsule.
2. **Afferent glomerular arteriole**
3. **Juxta-glomerular (JG) cells** (Renin secreting cells)in the wall of afferent arteriole.
4. **Parietal layer of Bowman's capsule.**
5. **Bowman's space**
6. **Proximal tubule**

Recall from the midterm material:

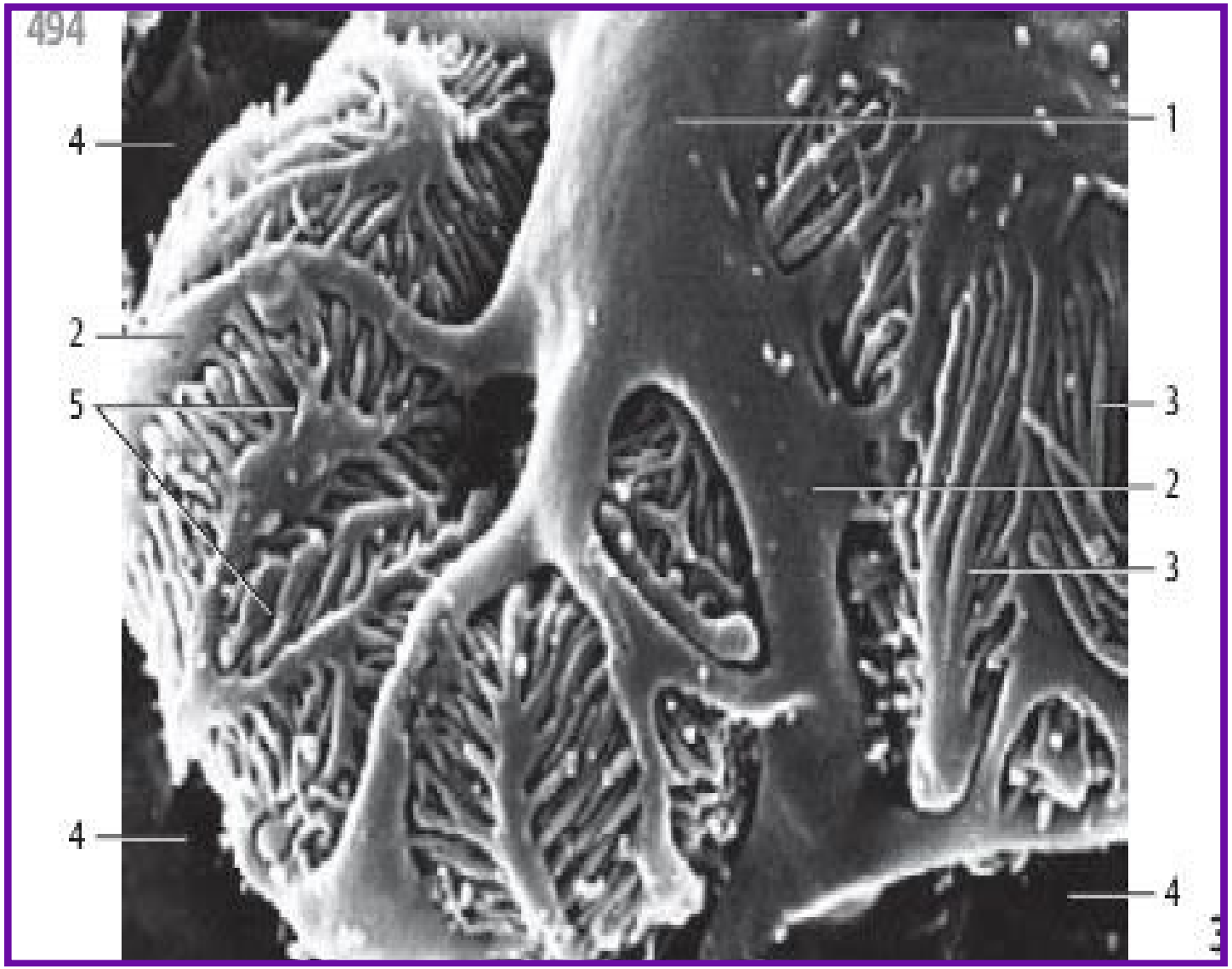
Juxta-glomerular apparatus components:

1. Maculla densa.
2. Mesengial cells.
3. Renin secreting cells (Juxta-glomerular cells).



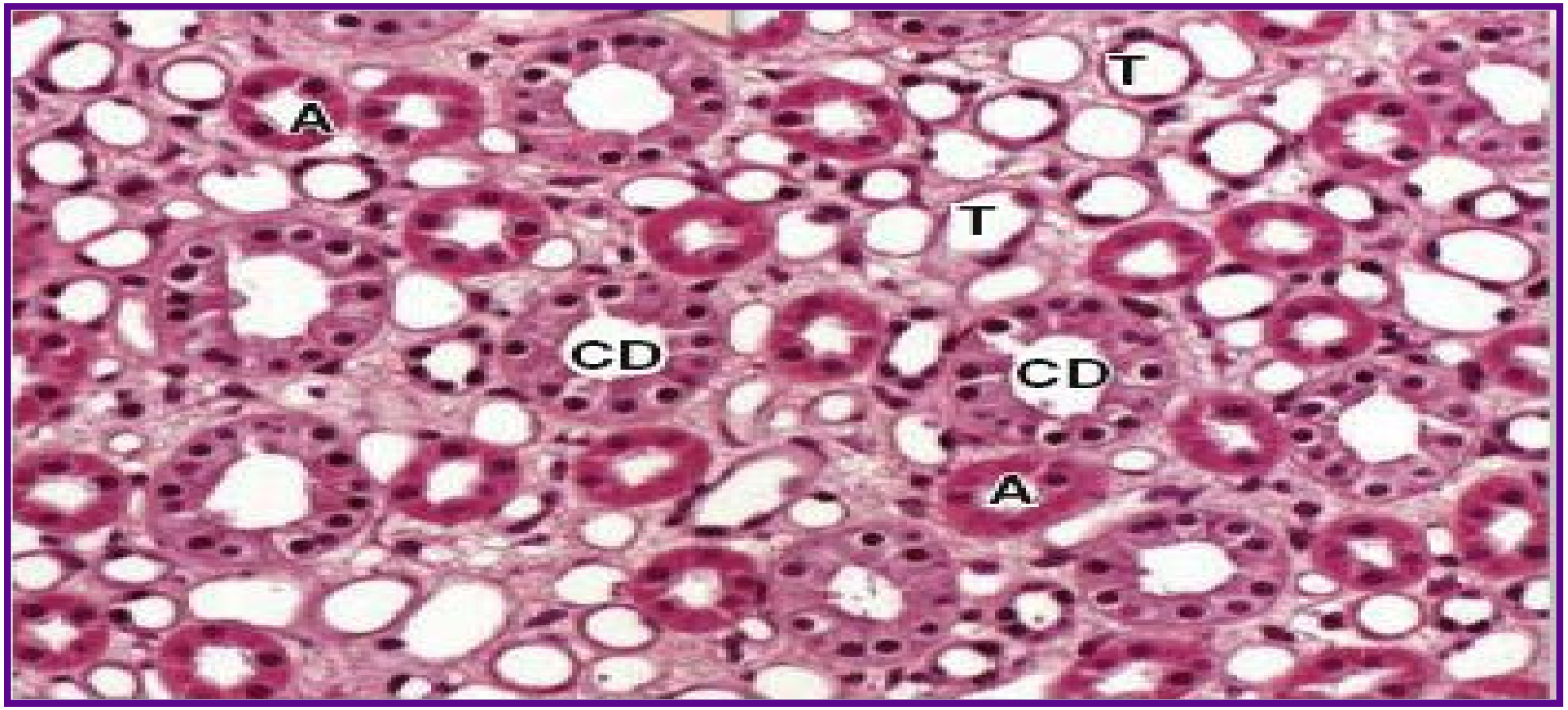
Visceral layer of Bowman's capsule lined by podocytes

Scanning electron microscopy of podocytes; magnification: ×7850



1. **Cell body of podocyte**
2. **Primary pedicles** (larger)
3. **Secondary pedicles (foot processes,** smaller)
4. **Bowman's space**
5. **Filtration slits** covered by diaphragm slit

1. Proximal tubules
2. Distal tubules
4. Interstitial connective tissue



A cross section through a medullary renal pyramid shows the simple squamous epithelium of the thin descending and ascending limbs of loops of Henle (T) and its thick ascending limbs (A) lined by cuboidal epithelium, as well as of collecting ducts (CD) lined by cuboidal to columnar epithelium with pale cytoplasm.

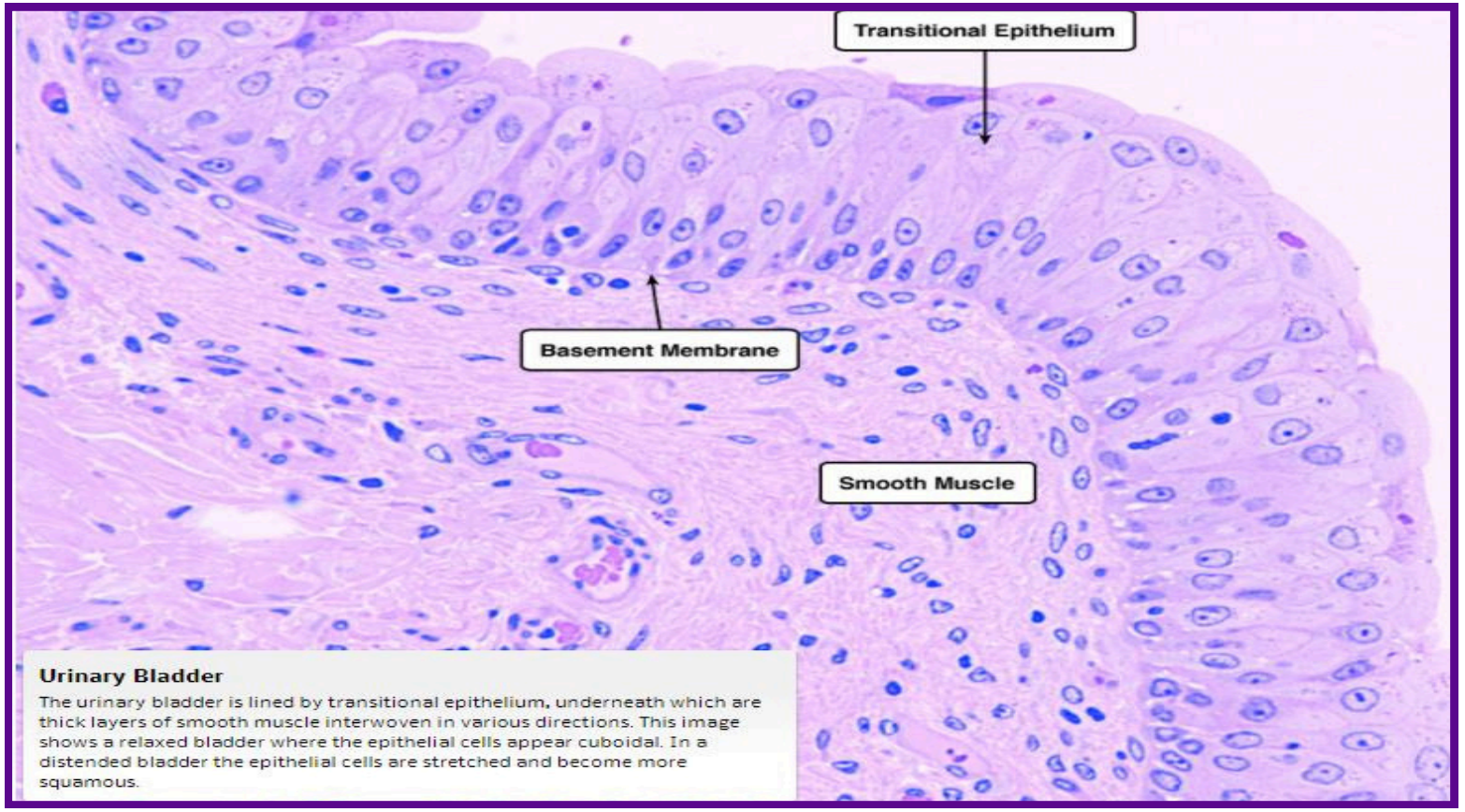
Ureter

Consists of 3 layers:

1. **Mucosa lined by multilayer of transitional epithelium.**
2. **Muscular layer:**
   - **A. Inner longitudinal.**
   - **B. Outer circular.**
3. **Adventitia**

Urinary bladder

1. Transitional epithelium.
2. Basement membrane.
3. Smooth muscle layer:
   - A. Inner longitudinal.
   - B. Middle circular.
   - C. Outer longitudinal



Recall from the midterm material:

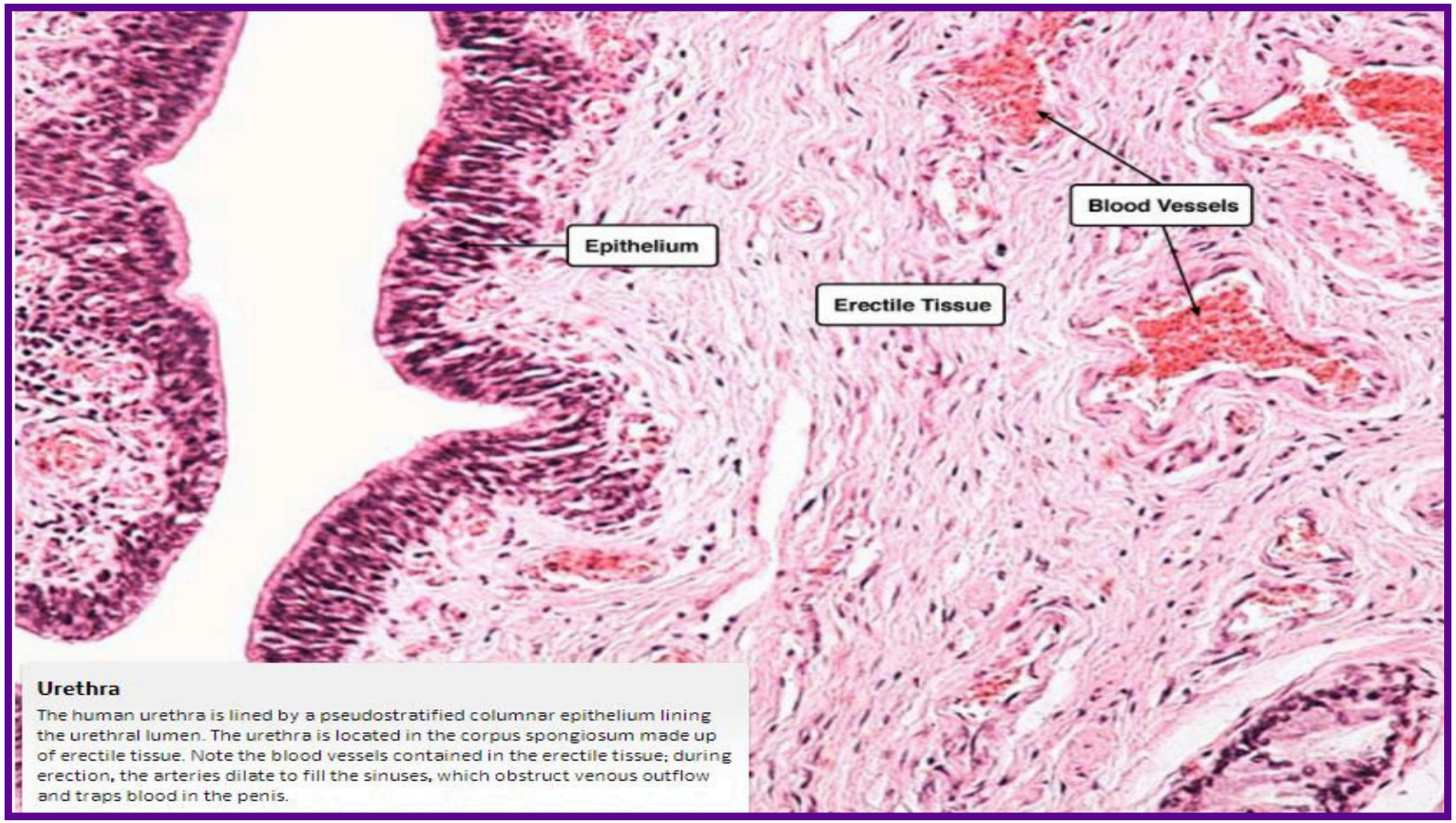
If the transitional epithelium:

Cuboidal epithelium —> Empty bladder

Squamous epithelium —> Full bladder

Urethra

- **Lining epithelium: Psudostratified columnar epithelium.**
- **This is spongy or penile urethra because it contains erectile tissue and blood vessels.**



Male Genital System

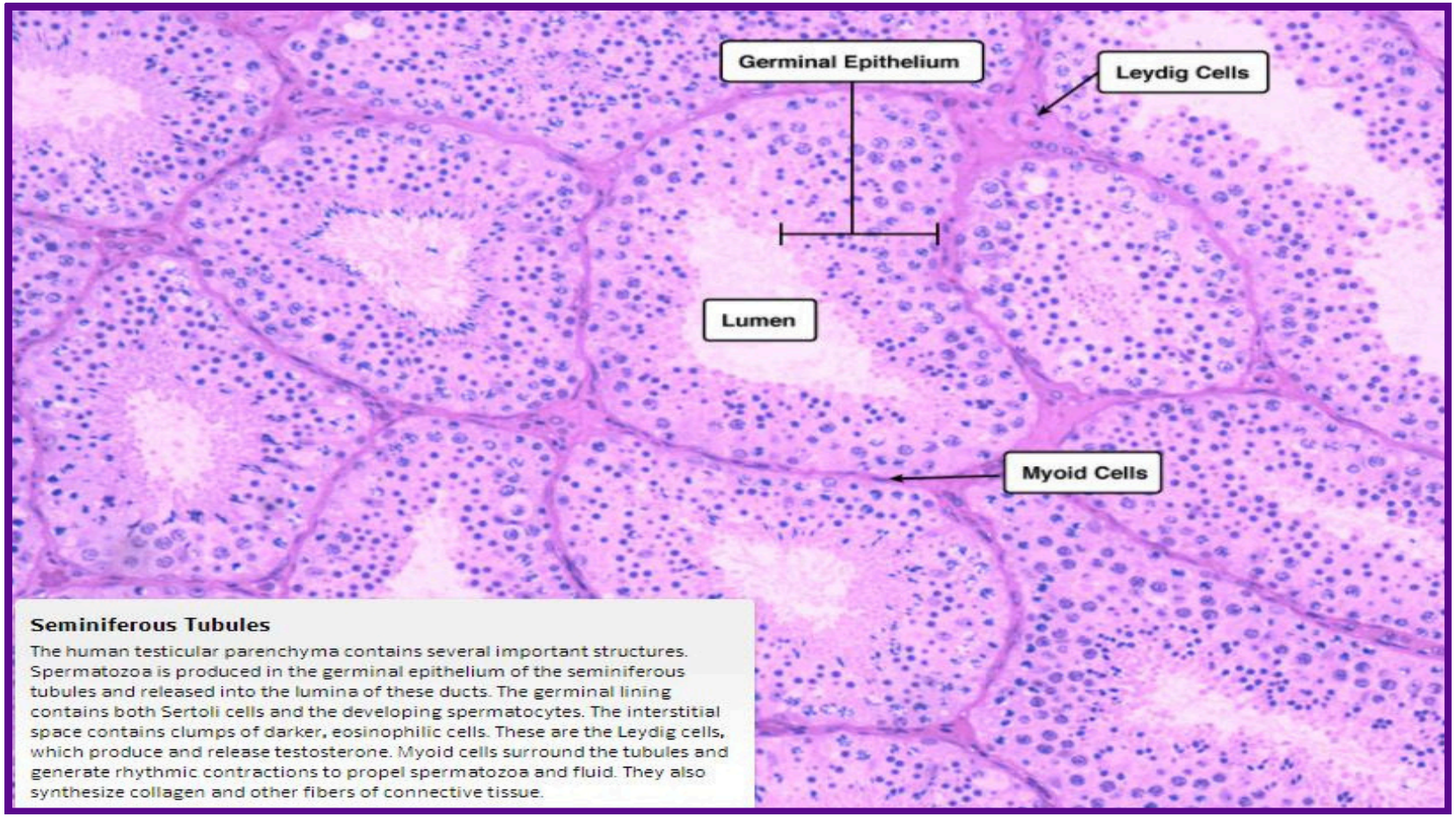
Testis

- Lined by tunica albuginea fibrous capsule.
- This fibrous capsule sends septa to divide the testis into lobules.
- Epididymis located posteriolateral to the testis.

Seminiferous tubules

- Lined by germinal epithelium (consists of spermatogenic cells and sertoli cells).
- Between the seminiferous tubules you will find:

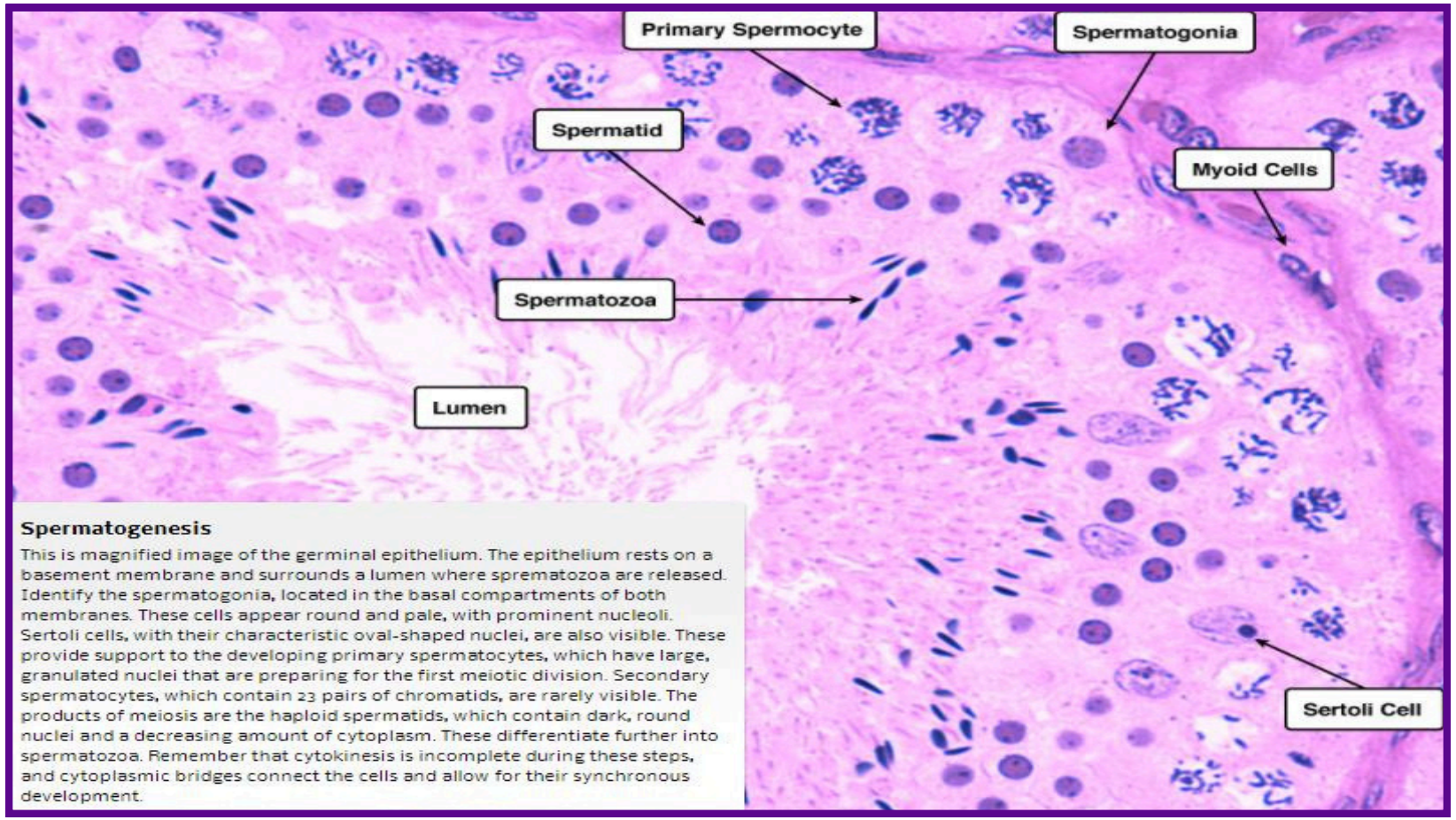
1. Interstitial leydig cells that secrete testosterone.
2. Myoid cells: smooth muscle-like cells that contarct to eject the sperms outside.



Spermatogenesis

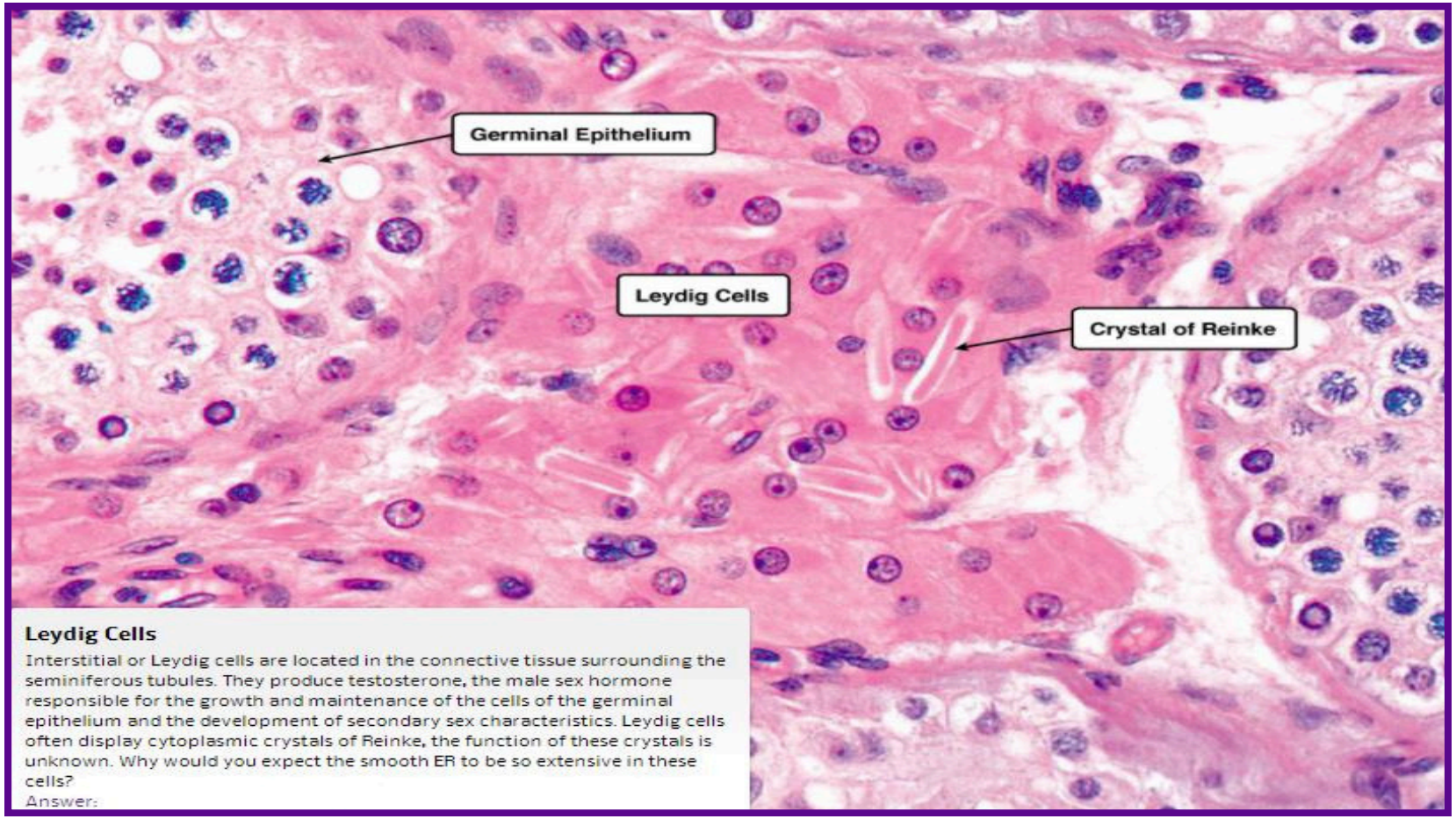
1. **Spermatogonia:** pale large cell with rounded nucleus.
2. **Primary spermatocyte:** granulated cell.
3. **Secondary spermatocyte:** you can't see it in this histological section
4. **Spermatid:** small cell.
5. **Spermatoza:** oval cell.

- **Sertoili cell:** pale cell with oval nucleus.



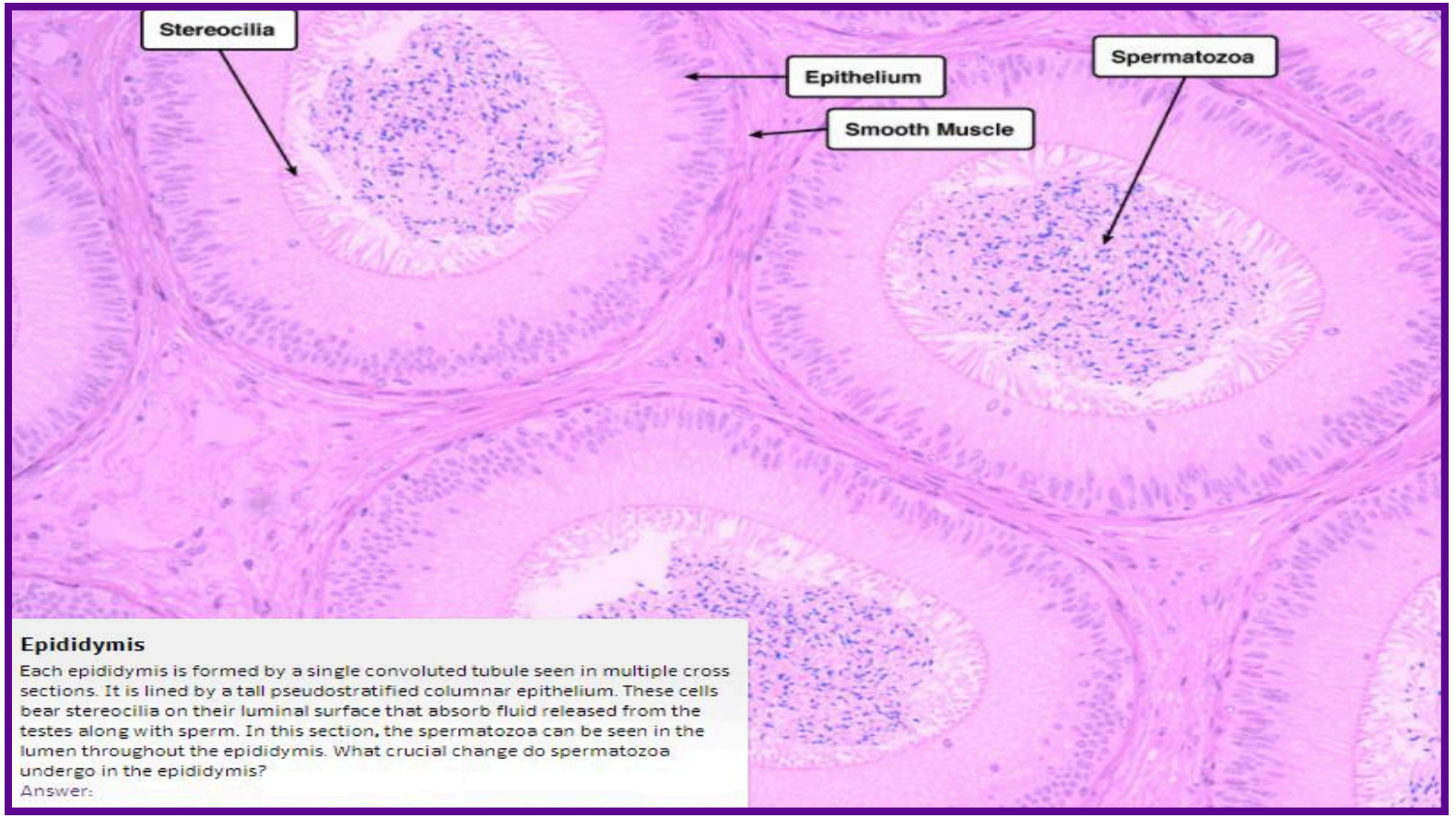
Seminiferous tubules

- Between the seminiferous tubules you will find interstitial leydig cells.



Epididymis

1. **Lining epithelium: pseudostratified columnar epithelium with long sterocilia.**
2. **Single muscular layer.**
3. **Spermatozoa inside the lumen.**

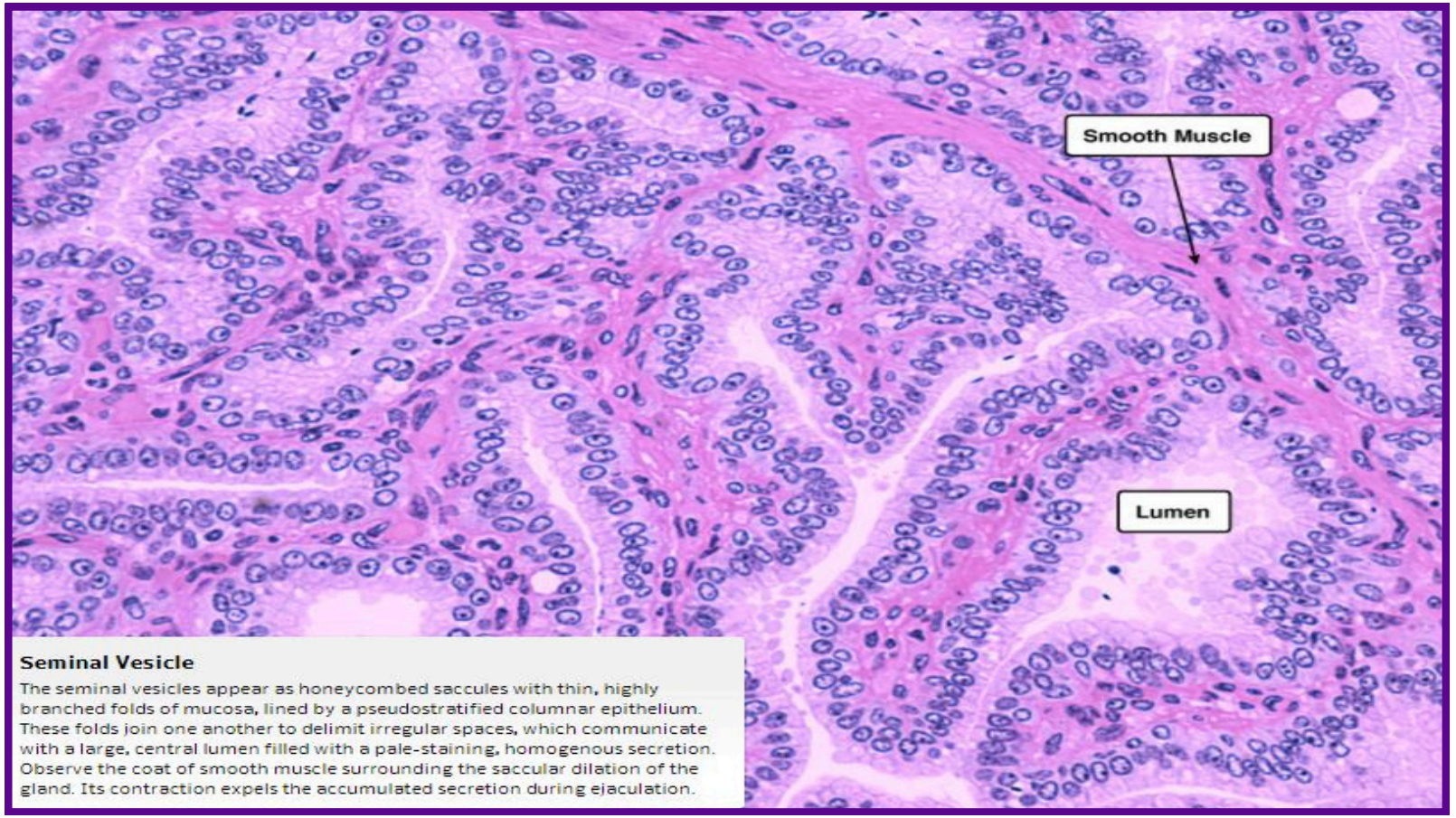


Vas deferens

1. **Lining epithelium:** **pseudostratified columnar epithelium with no or very short cilia.**
2. **Thick muscular layer:**
   - **A. Inner longitudinal**
   - **B. Middle circular**
   - **C. Outer longitudinal**
3. **Adventitia**

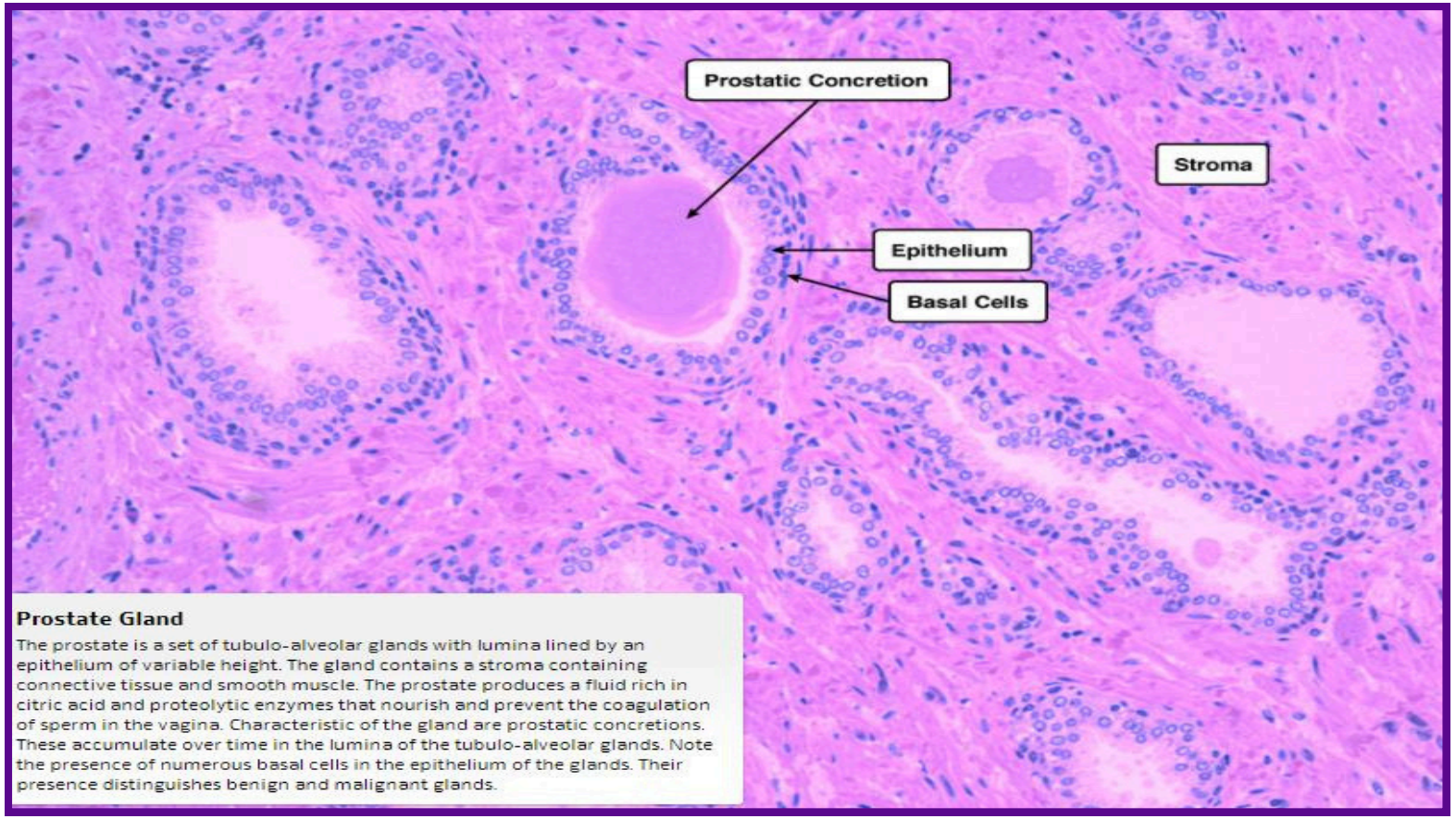
Seminal vesicle

- **Lining epithelium: pseudostratified columnar epithelium.**
- **Lumen full of secretions.**
- **Single muscular layer to eject the secretions to the ejaculatory duct.**



Prostate gland

- Full of alveolar glands with CT in between.
- Characteristic feature: Corpora amylacea that is concentrated prostatic secretions.

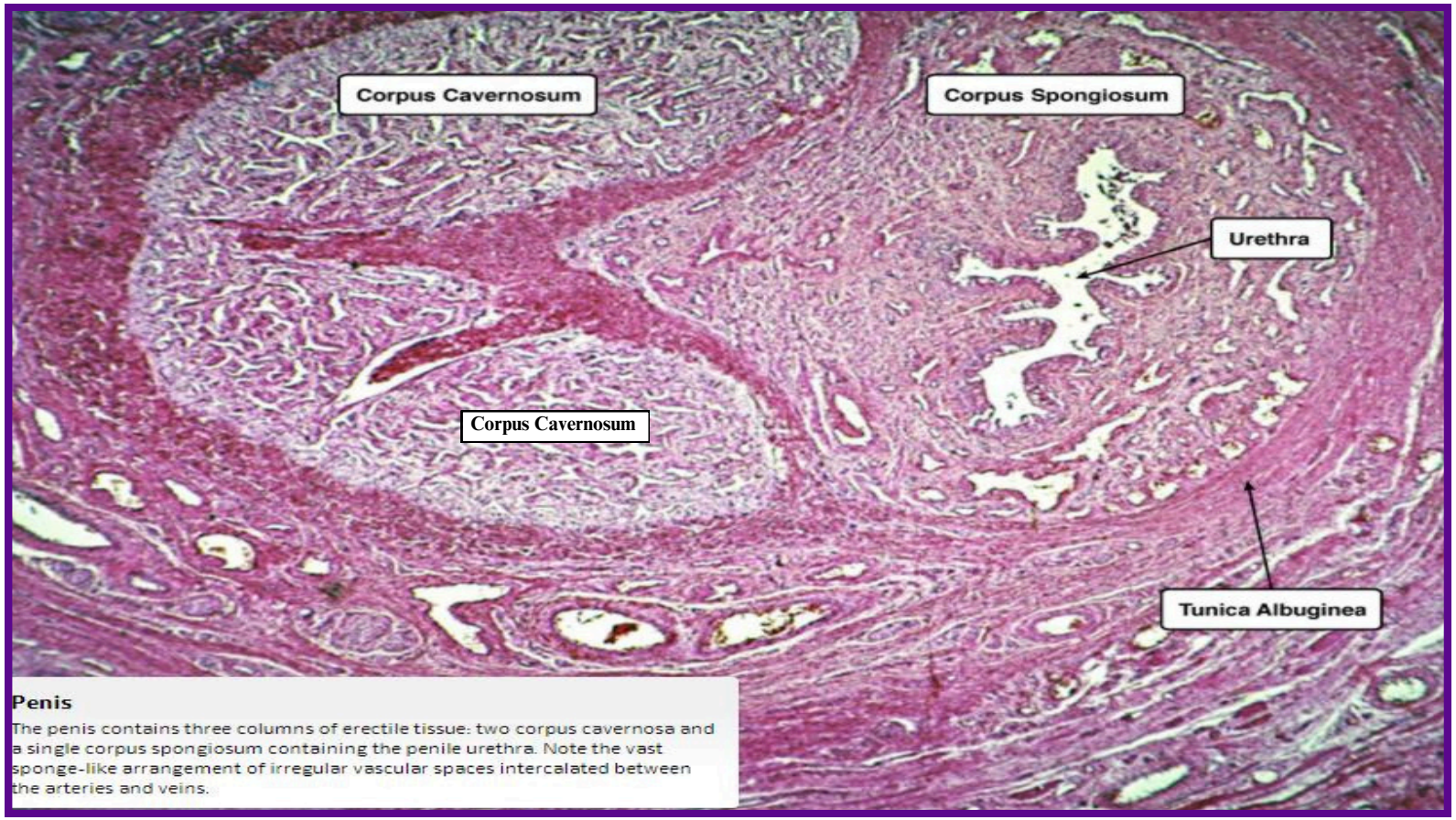


Penis

- Surrounded by tunica albuginea that sends septa to divide the penis into three compartments:

1- Two corpus cavernosa

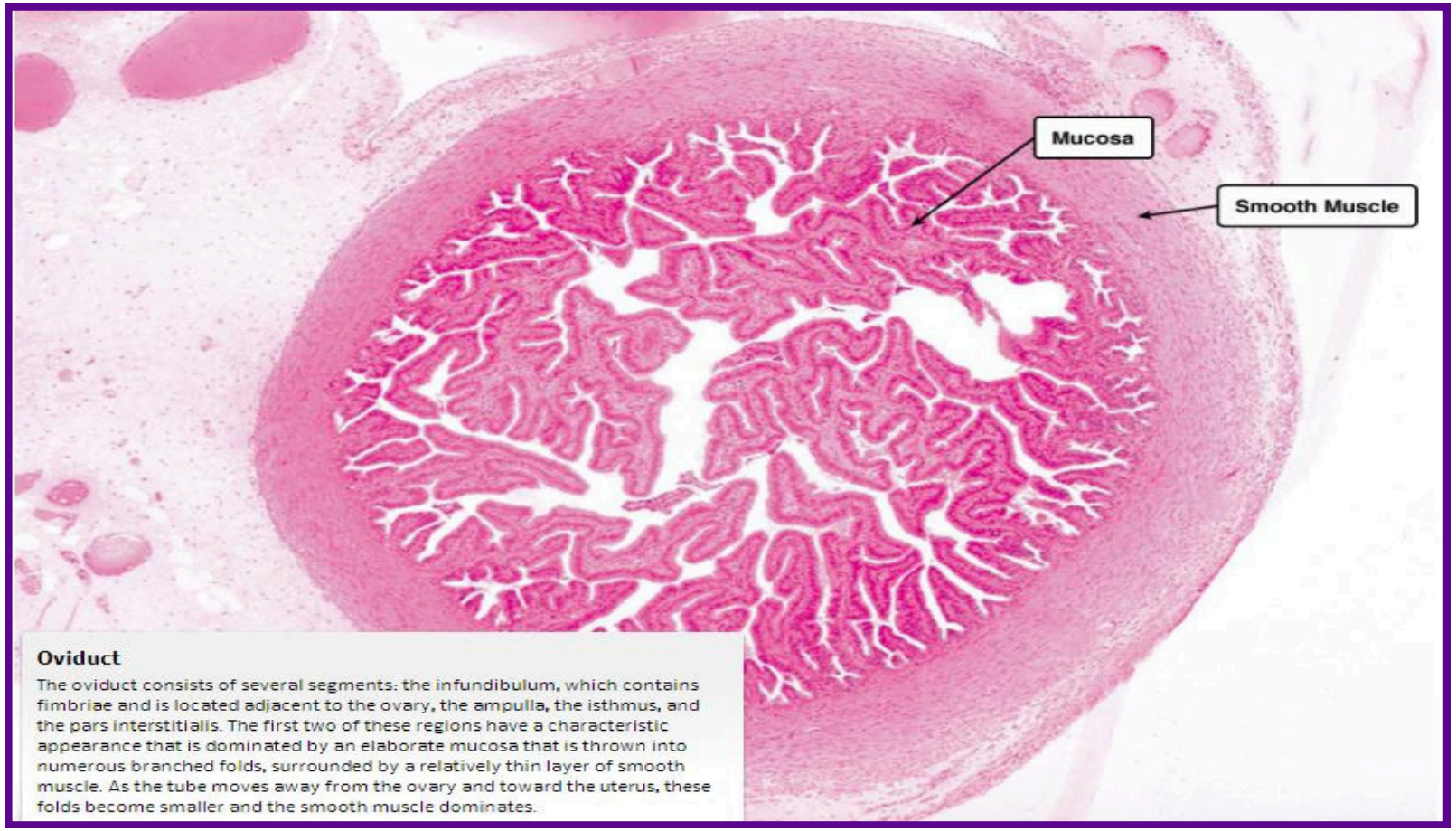
2- Corpus spongiosum



Female Genital System

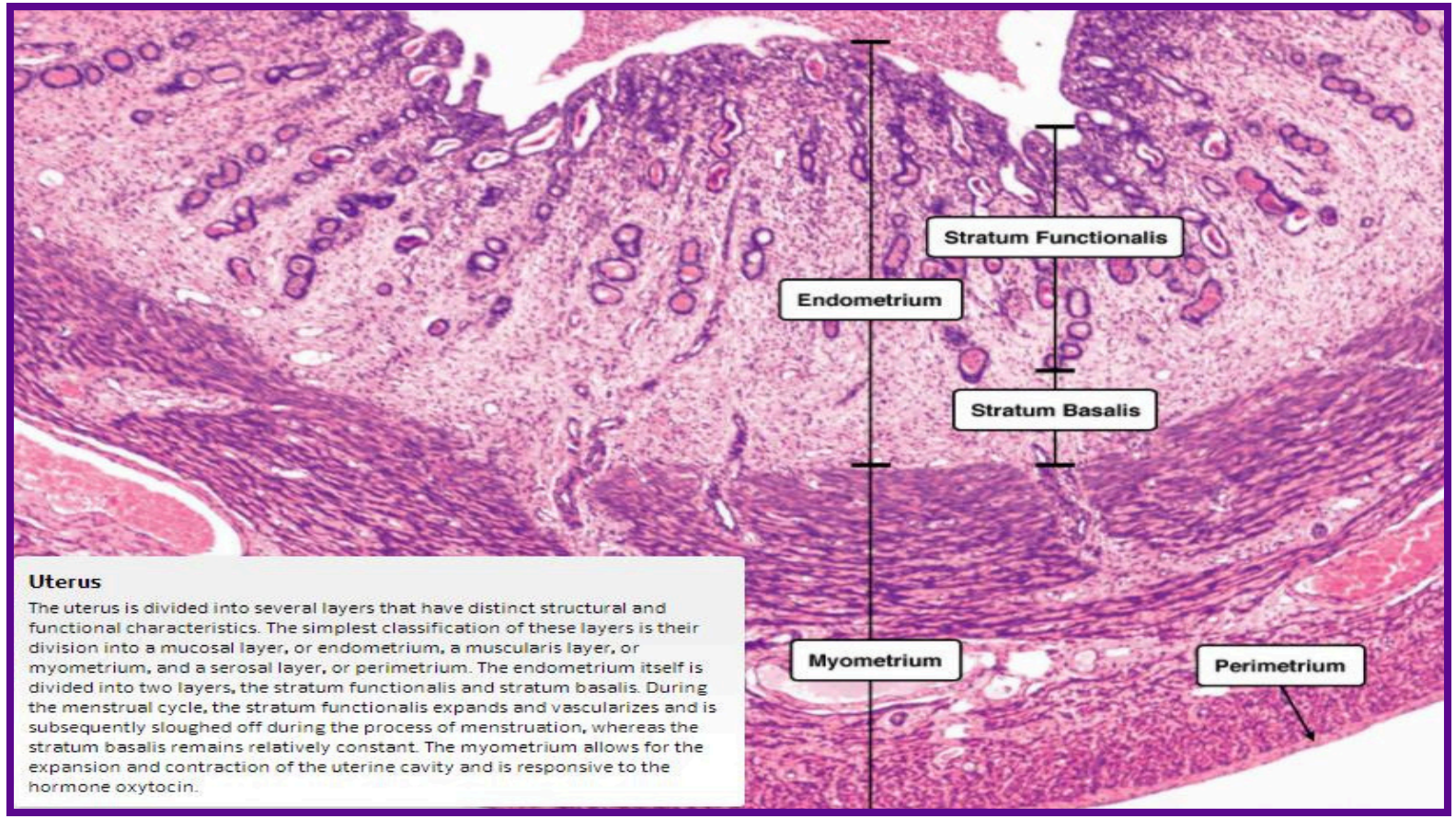
Uterine tube

- **Lining epithelium: simple columnar epithelium.**
- **The Mucosa consists of many folds.**
- **Muscular layer:**
  A. Inner circular
  B. Outer longitudinal



Uterus

- Consists of 3 layers:
  1- Outer layer: perimetrium.
  2- Middle layer: myometrium.
  3- Inner layer: endometrium.
- The endometrium composed of 2 layers:
  1- Stratum Basalis.
  2- Stratum Functionalis.



Uterus

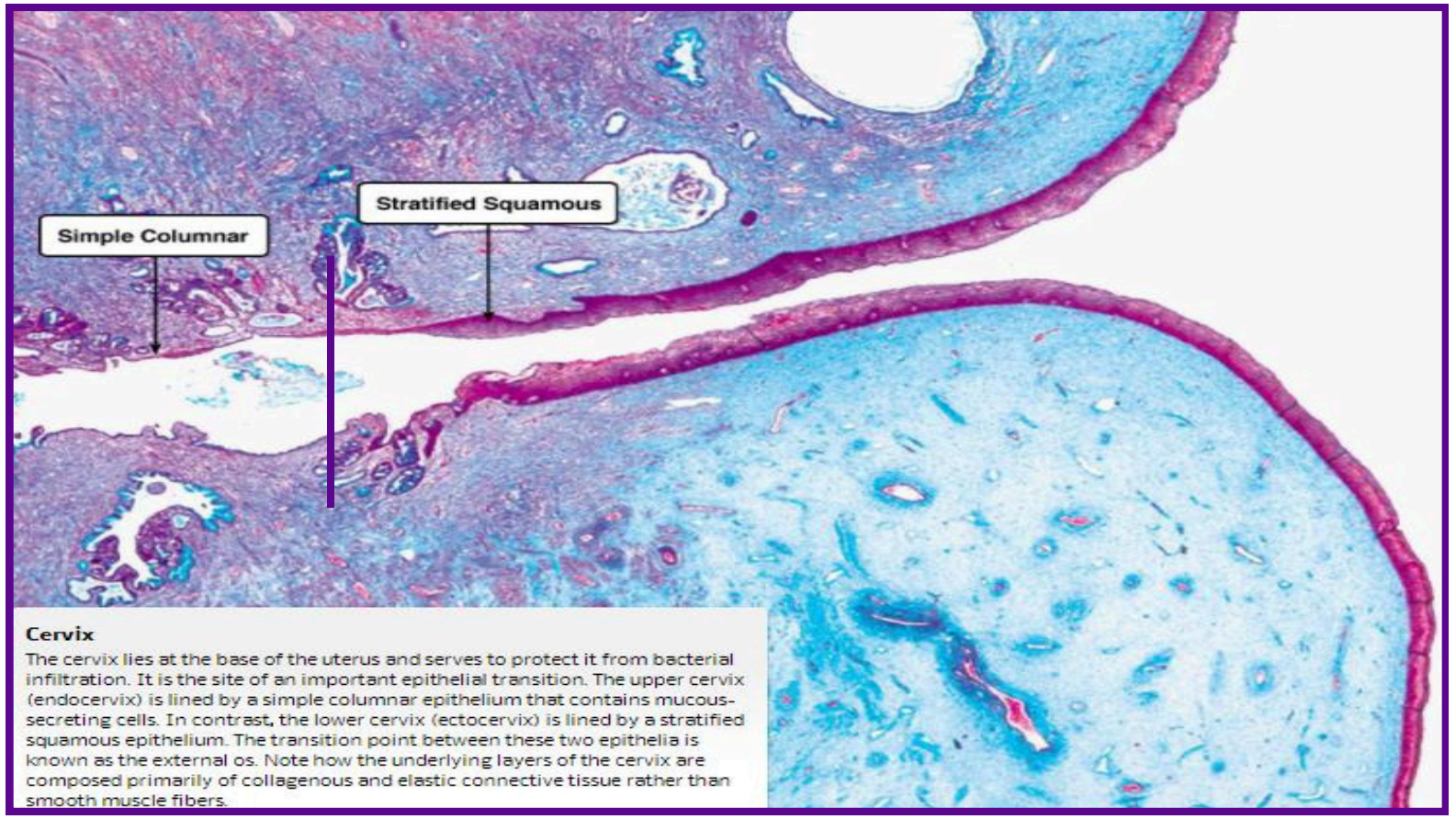
The uterus is divided into several layers that have distinct structural and functional characteristics. The simplest classification of these layers is their division into a mucosal layer, or endometrium, a muscularis layer, or myometrium, and a serosal layer, or perimetrium. The endometrium itself is divided into two layers, the stratum functionalis and stratum basalis. During the menstrual cycle, the stratum functionalis expands and vascularizes and is subsequently sloughed off during the process of menstruation, whereas the stratum basalis remains relatively constant. The myometrium allows for the expansion and contraction of the uterine cavity and is responsive to the hormone oxytocin.

Cervix

- **Two parts:**

1. **Endouterine cervix lined by simple columnar epithelium.**
2. **Vaginal cervix lined by stratified squamous epithelium.**

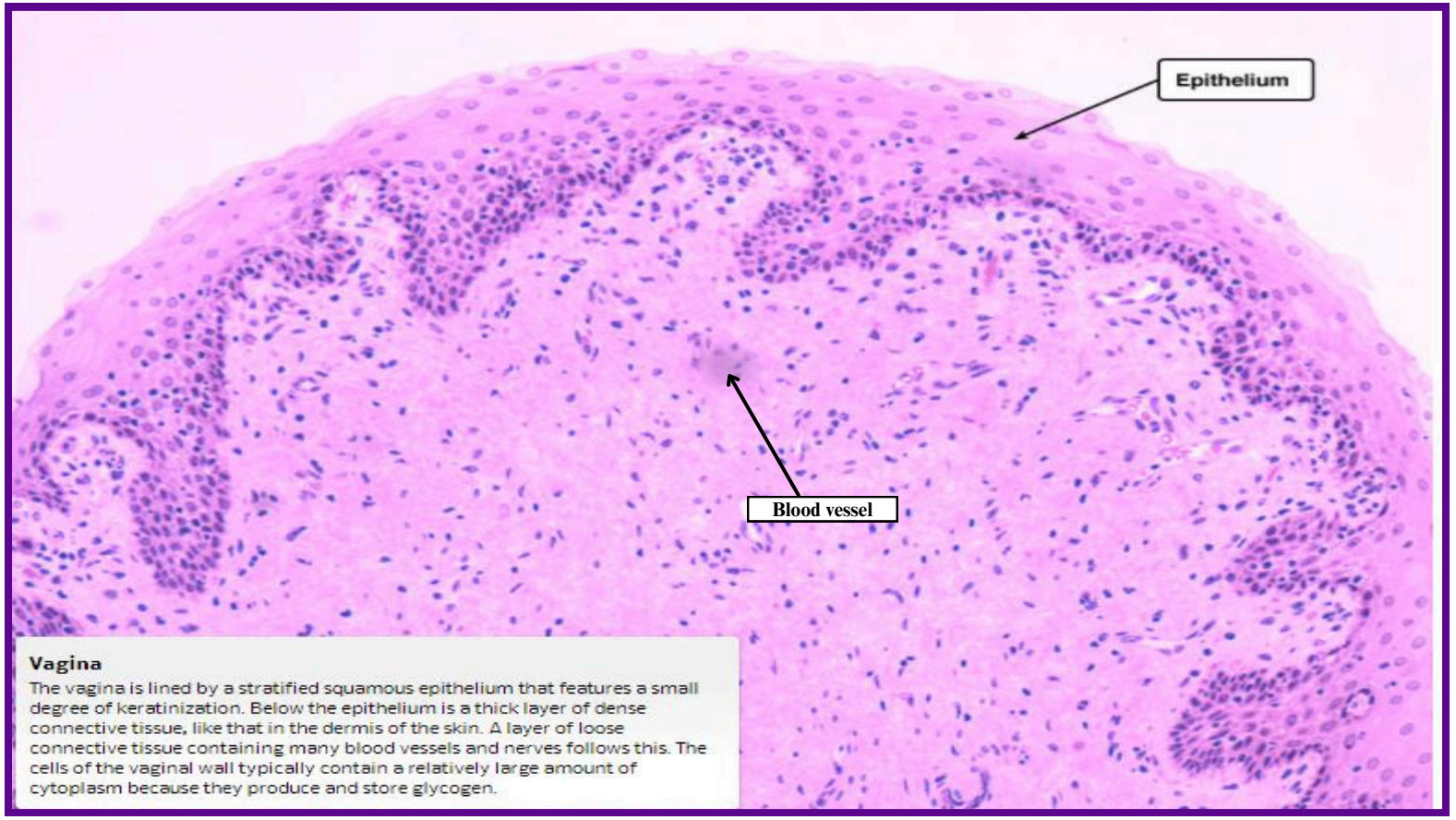
- **The line in the pic represents the line of transition.**

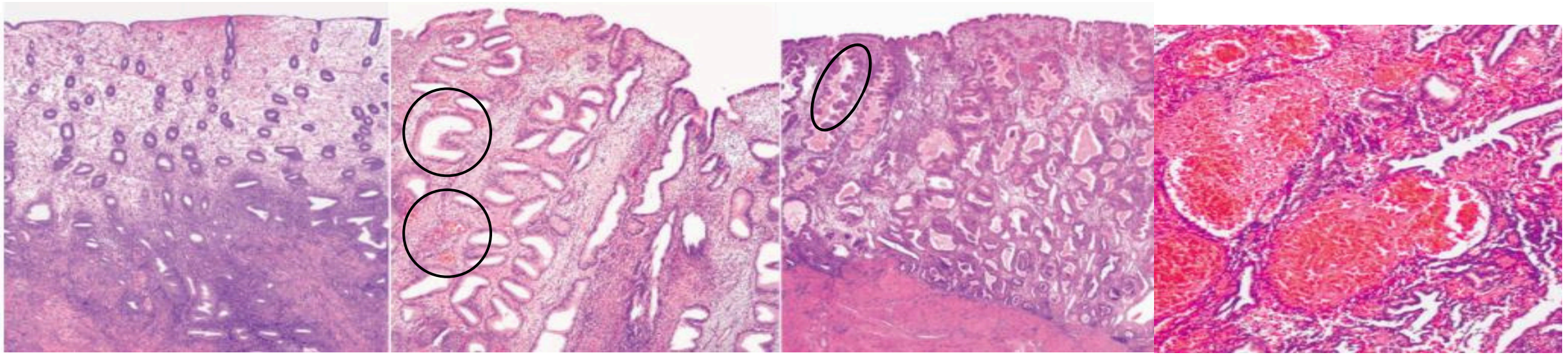


Cervix
The cervix lies at the base of the uterus and serves to protect it from bacterial infiltration. It is the site of an important epithelial transition. The upper cervix (endocervix) is lined by a simple columnar epithelium that contains mucous-secreting cells. In contrast, the lower cervix (ectocervix) is lined by a stratified squamous epithelium. The transition point between these two epithelia is known as the external os. Note how the underlying layers of the cervix are composed primarily of collagenous and elastic connective tissue rather than smooth muscle fibers.

Vagina

- Lining epithelium: stratified squamous non keratinized.
- Lamina propria: CT with many elastic fibers and blood vessels.
- Muscular layer: not shown in the picture
  A. Inner circular
  B. Outer longitudinal





Early proliferative

- Very small glands
- Coiled arteries not developed

Late proliferative

- Larger glands
- Coiled arteries start to develop

Secretory

- Developed, full of secretions glands
- Coiled arteries well developed

Menstural

- Blood in the endometrium.
- Distruction of the glands.
- Rupture of the coiled arteries.

(a) The mammary glands of adult, non-pregnant women are inactive, with small ducts and few lobules

- **CT is more than the secretory alveoli.**

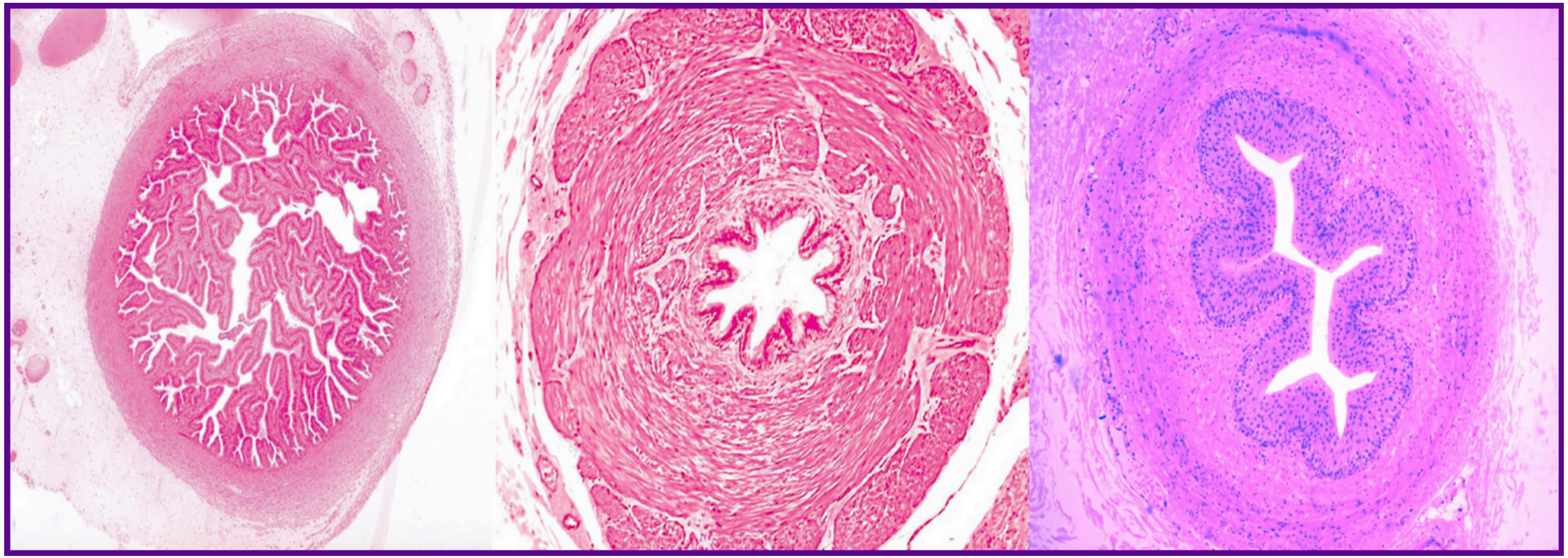
(b) During pregnancy,

- **Secretory alveoli starts to increase.**
- **CT starts to reduce.**
- **Vasculatory starts to increase.**

(c) During lactation, the lobules are greatly enlarged and the lumens of both the numerous glandular alveoli (A) and the excretory ducts (D) are filled with milk.

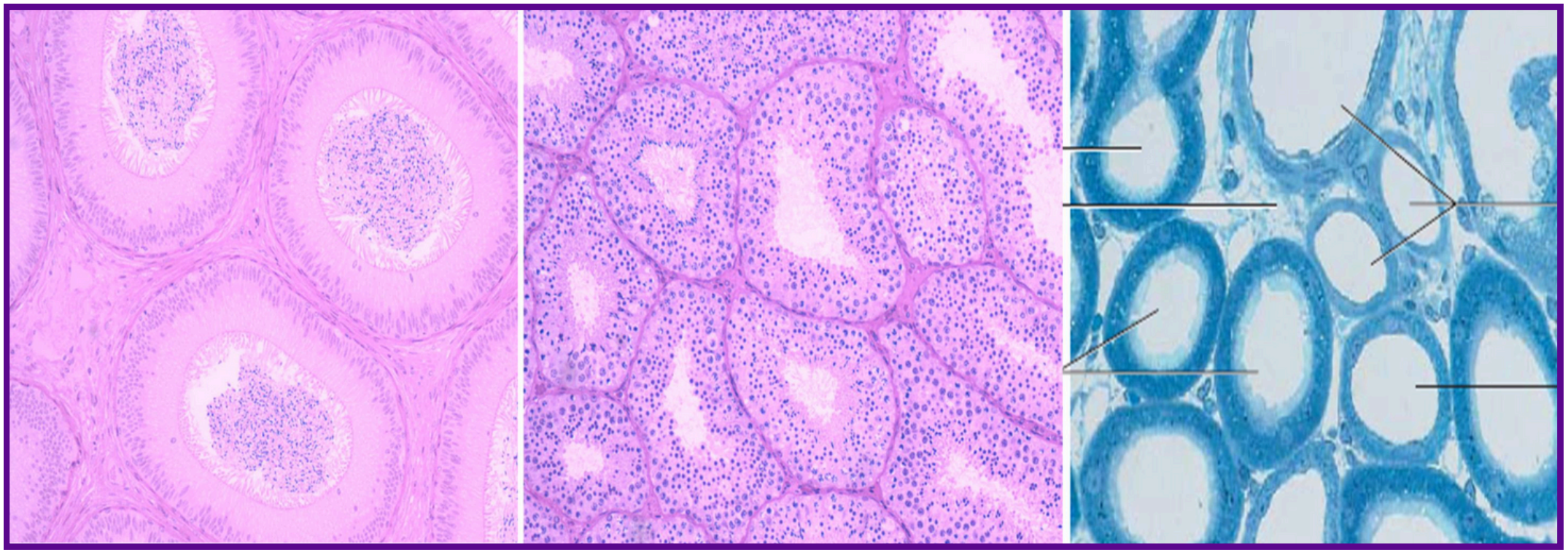
- **CT disappears.**

Recap…



Uterine Tube | Vas Deferens | Ureter

Recap…



Epididymis **Testis** **Kidney**