



# MALE REPRODUCTIVE SYSTEM

By the end of the lecture the student should be able to:

✓ Describe the microscopic structure of :

1. Testis and epididymis.
2. Vas deferens.
3. Seminal vesicles.
4. Prostate.

**Color index:**

Slides.. Important ..Notes ..Extra..



# TESTIS

*Stroma:*

Tunica vaginalis

Tunica albuginea

Tunica vasculosa.

Septa.

Interstitial tissue.

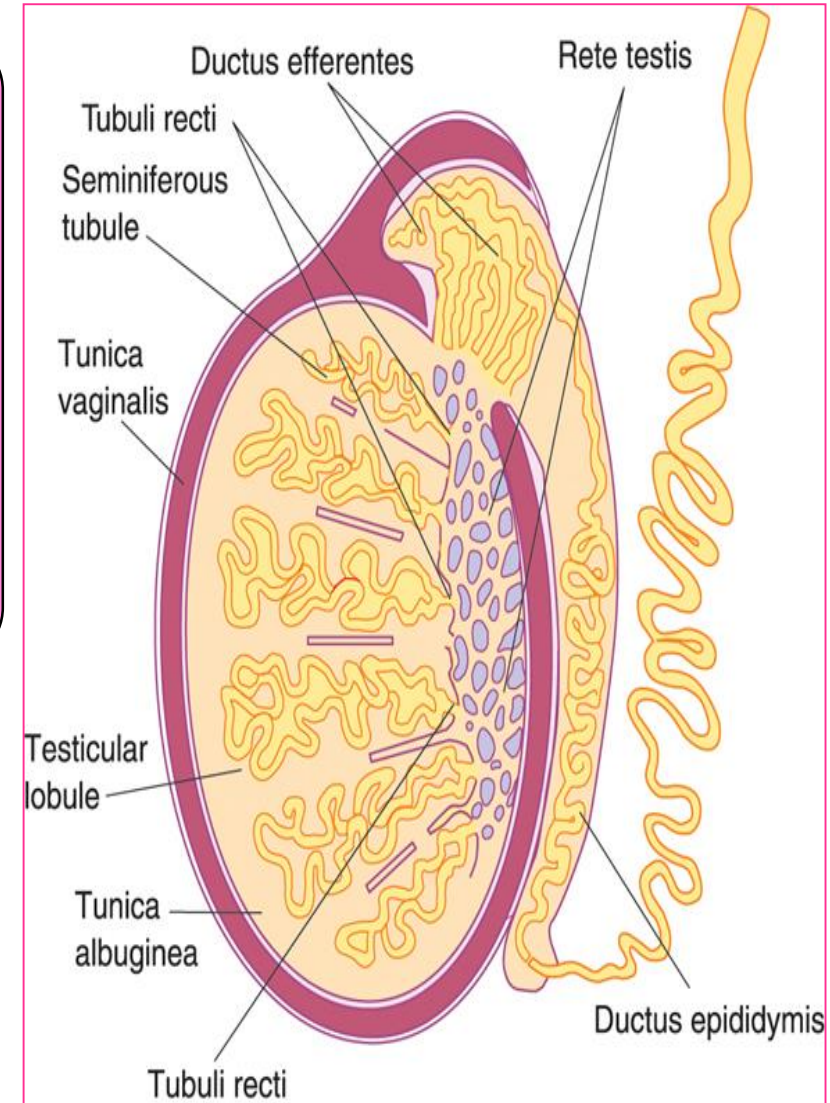
*Parenchyma:*

Seminiferous tubules.

Exocrine part

Interstitial cells of Leydig.

Endocrine part



## Stroma of the testis:

### 1. Tunica vaginalis

It is formed of **mesothelial epithelial cells**. Peritoneum covering of the testes

### 2. Tunica albuginea

Dense irregular collagenous C.T

### 3. Tunica vasculosa

It is formed of loose **highly** vascular C.T. **lining tunica albuginea & speta from inside.**

## Septa of the Testis:

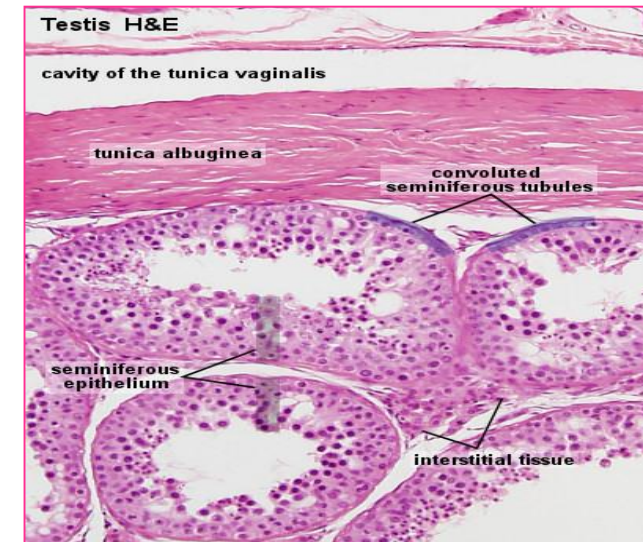
- Dense irregular collagenous C.T.
  - Divide the testis into **about 250** intercommunicating compartments or lobules , each lobule contains 1-3 seminiferous tubules
- (testicular lobules = lobuli testis).

## Interstitial Tissue:

Loose **areolar** vascular C.T. in between the seminiferous tubules of parenchyma.

Contents:

- 1- Loose vascular C.T.
- 2- **Interstitial cells of Leydig.**

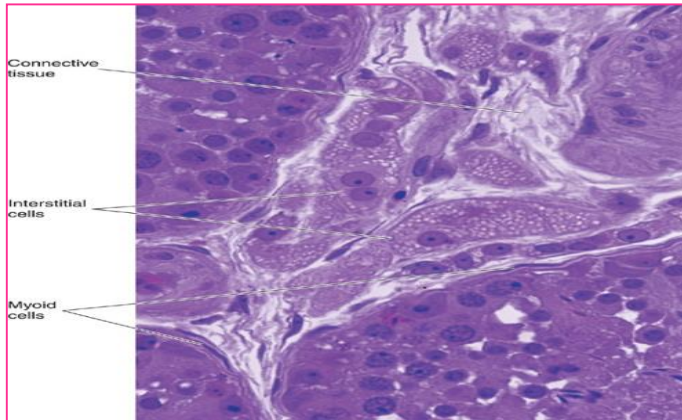


# PARENCHYMA OF THE TESTIS

## Endocrine part:

- interstitial cells of Leydig which produce **testosterone**.

### Interstitial Cells of Leydig



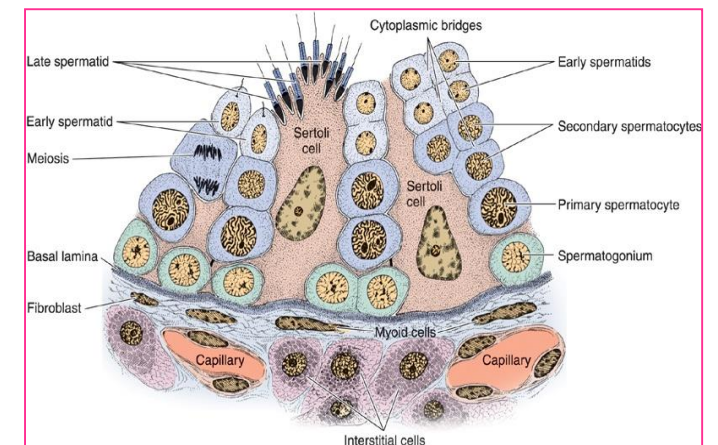
- Are rounded or polygonal cells with central rounded nucleus. **Located in the interstitium**
- Cytoplasm: acidophilic & vacuolated.
- **Function:** Secrete testosterone.  
It secretes steroid hormone ,so it has:  
Lipids droplets , acidophilic Cytoplasm , abundant SER + mitochondria with with tubular cristae.

## Exocrine part:

- The seminiferous tubules which produce spermatozoa.

### Seminiferous Tubules

- Each tubule is surrounded by a basement membrane.
- Each tubule is lined with a **stratified epithelium called seminiferous epithelium** which is formed of 2 types of cells:
  - 1- Spermatogenic cells.
  - 2- Sertoli cells.



# Sertoli Cell

Are <b>columnar or pyramidal</b> cells (cytoplasm is pale basophilic)	
<b>Nucleus</b>	Basal, vesicular, irregular with prominent nucleolus.
<b>Functions</b>	1- <u>Support &amp; Nutrition</u> of spermatogenic cells.
	2- <u>Phagocytosis</u> of cytoplasmic remnants of spermatogenesis.
	3- <u>Secretion</u> : -Testicular fluid (nutritive medium for transport of immotile spermatozoa). -Androgen Binding Protein (ABP) (combines with testosterone and concentrate it inside the seminiferous tubules). -Inhibin hormone (inhibits FSH and LH thus controlling rate of spermatogenesis).
	4- Formation of <u>blood-testis barrier</u> .

# Spermatogenic Cells

A series of cells lining the seminiferous tubules extending from the BM to the lumen	
<b>Include</b>	1-Spermatogonia. (It is oval or rounded, has only one layer, and 3 types: dark type A, pale type A, type B) 2-1ry spermatocytes. (It has 2 or 3 layers) 3-2ry spermatocytes. (it is hardly to detect) 4-Spermatids. (has 23 Single chromosomes) 5-Spermatozoa.

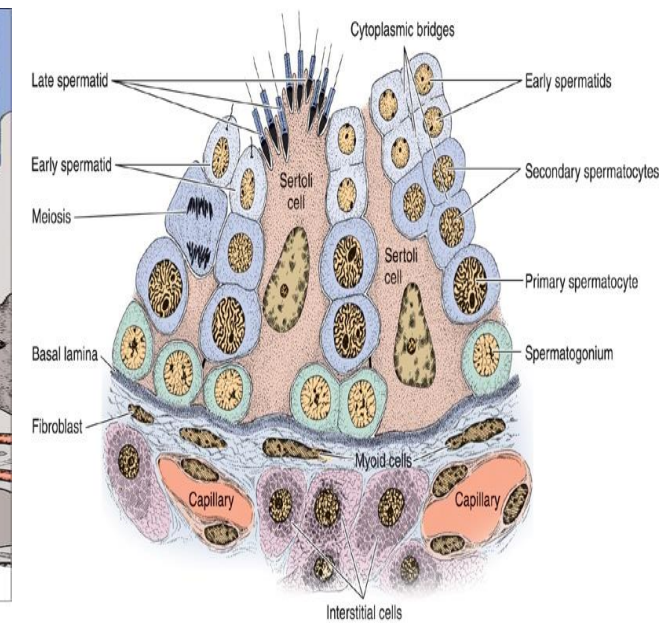
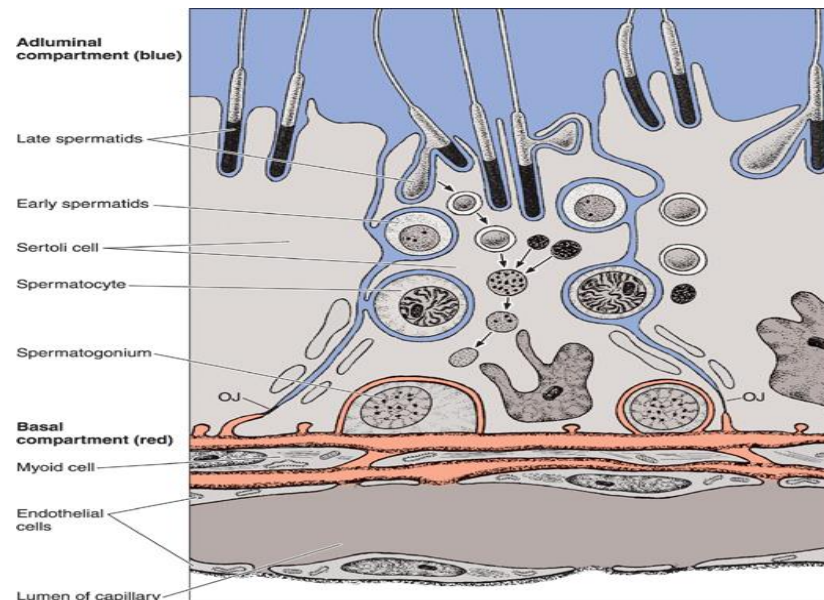
# Blood-Testis Barrier

It is formed by <b>the tight junctions</b> between the basal parts of the lateral borders of adjacent Sertoli cells	
It divides the seminiferous tubule into 2 compartments:	
<b>1-Basal compartment:</b> contains spermatogonia	<b>2-Adluminal compartment:</b> contains the other spermatogenic cells.
<b>Functions</b>	1- It protects developing spermatogenic cells from drugs and toxic materials.
	2- It prevents autoimmune infertility.

The barrier separates the tissue fluid outside the tubule from the spermatogenic cells inside the seminiferous tubule. **Isolation** and protection of the sensitive developing spermatogenic cells from any harmful substance in the blood stream.

**Prevention of autoimmune reaction:** prevents the passage of autoantibodies against the developing gametes into the tubule.

It isolates the adluminal compartment from connective tissue influences, thereby protecting the developing gametes from the immune system. Because spermatogenesis begins after puberty, the newly differentiating germ cells would be considered "foreign cells" by the immune system.



## EPIDIDYMIS (DUCTUS EPIDIDYMIS)

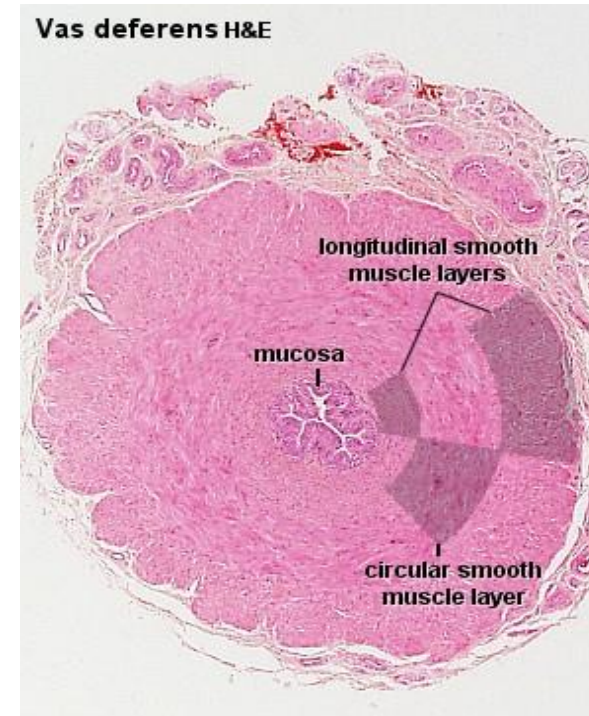
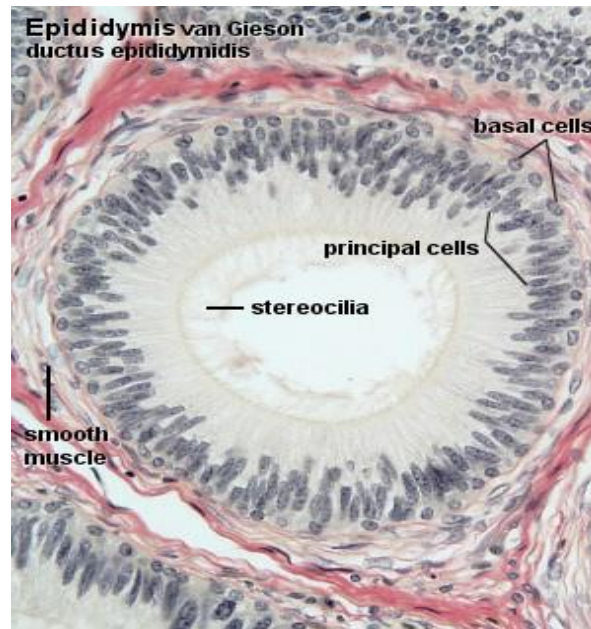
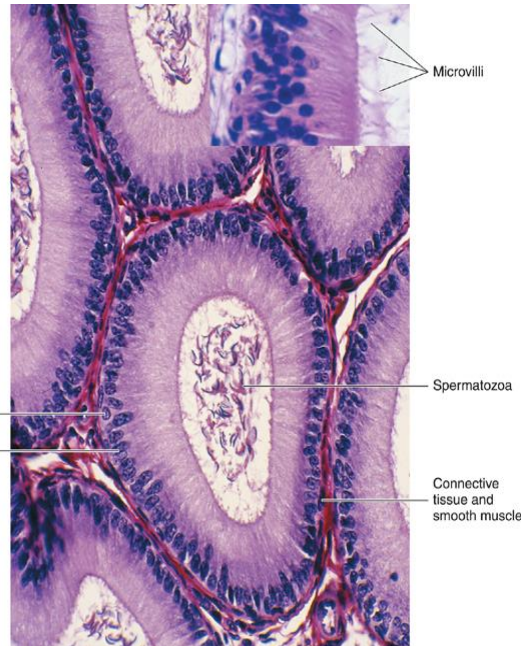
Structure	<p>1-Epithelium: pseudostratified columnar epithelium with stereocilia. (stereocilia is elongated microvilli and it doesn't has any microtubules)</p> <p>2-Basal lamina.</p> <p>3-Loose C.T.</p> <p>4-Layer of circularly-arranged smooth muscle cells.</p>
Functions	<p>a. <u>Storage &amp; maturation</u> of spermatozoa.</p> <p>b. <u>Propelling</u> spermatozoa to the vas deferens.</p>

A single tubule; 4-6 m in length.  
 Highly convoluted to form a compact organ 7.5 cm long.  
 Divided into head, body & tail.  
 Its tail gives rise to the vas deferens.

## DUCTUS DEFERENS (VAS DEFERENS)

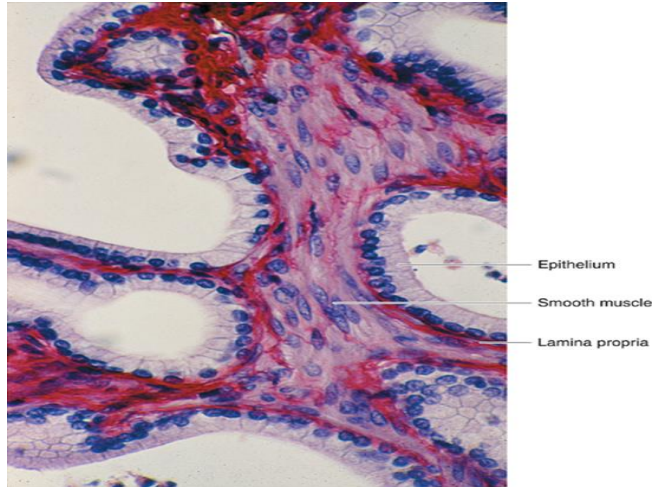
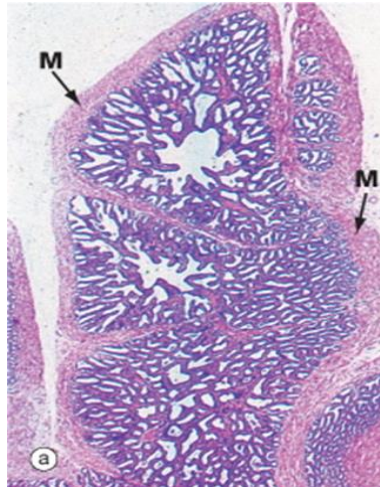
It is a muscular narrow tube with irregular lumen.	
Structure	1- <b>Mucosa</b> : Ps. Str. Col. E. with stereocilia (immotile cilia) on a corium of loose C.T.
	2- <b>Musculosa</b> (thick 3 layers) :Inner longitudinal muscle layer, Middle circular, and Outer longitudinal . (smooth muscles)
	4- <b>Adventitia</b> : loose C.T.
Functions	Propelling of spermatozoa by strong peristalsis.

starting at the tail of the epididymis, enters the abdomen through the inguinal canal to join the duct of the seminal vesicle to form the ejaculatory duct.  
 Length is about 30



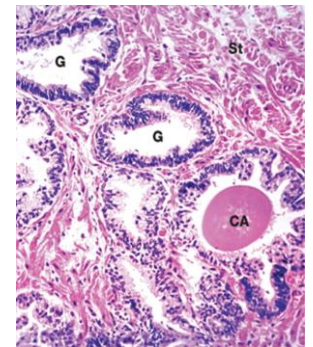
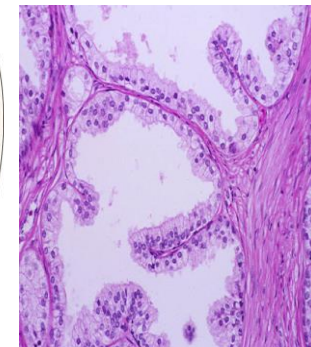
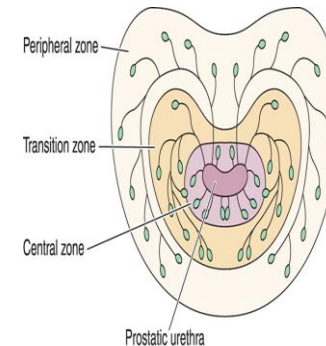
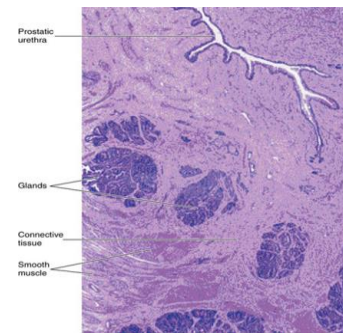
## SEMINAL VESICLES:

Mucosa:	Musculosa:	Adventitia:
<p>Is highly folded.</p> <p><b>Epithelium:</b> Ps. Str. Col. E. (Pseudostratified columnar epithelium)</p> <p>Lamina propria of C.T</p>	<p>Inner circular layer.</p> <p>Outer longitudinal layer.</p>	<p>Connective tissue (C.T.).</p>
<p><b>Function:</b> Secretion of most of seminal fluid, rich in fructose &amp; vit. C. which are the main nutrients for spermatozoa.</p>		

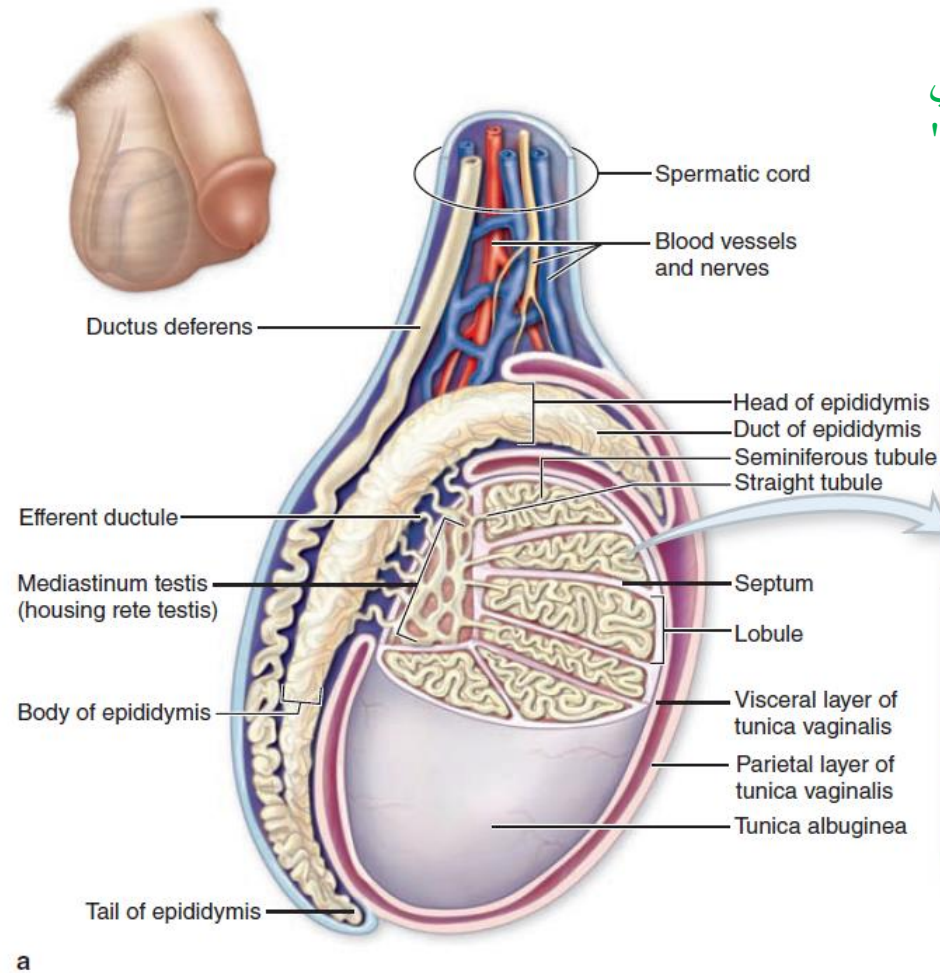


## PROSTATE:

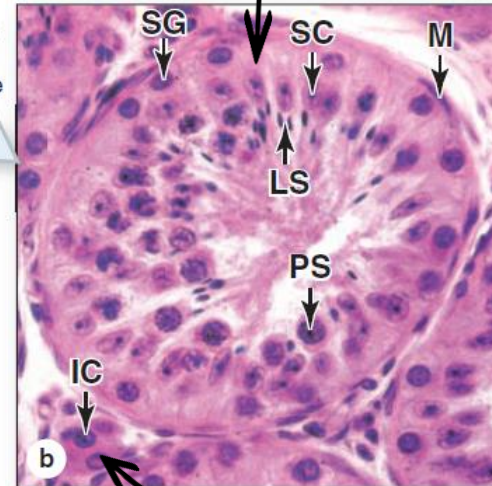
Stroma:	Parenchyma:	Acini and ducts:	Prostatic concretions (corpora amylacea):
<p>fibromuscular capsule &amp; trabeculae.</p>	<p>30-50 glands in 3 concentric groups around the prostatic urethra:</p> <p><b>Mucosal group:</b> small.</p> <p><b>Submucosal group:</b> medium-sized.</p> <p><b>Main group:</b> Large, 70% of all glands.</p>	<p>are lined with simple Col. or Ps. Str. Col. E. according to activity of the glands.</p>	<p>Round or oval masses of glycoprotein in the lumen of some glands.</p> <p>Increase with advancement of age &amp; become calcified.</p>
<p><b>Function:</b> participates in the secretion of the seminal fluid. Its secretion is rich in acid phosphatase &amp; proteolytic enzymes.</p>			



# EXTRA



\* زي ما تشوفون هنا " سيرتولي سيلز " تكون في الطرف لانها هي اللي تكون " بلود تيست بارير "



وهنا خلايا الليندق تكون بين التوبيولز في الانترستيشم

The anatomy of a testis is shown. **(a)** The diagram shows a partially cutaway sagittal section of the testis. **(b)** A seminiferous tubule cross section shows spermatogonia (**SG**) near the periphery, near nuclei of Sertoli cells (**SC**), primary

spermatocytes (**PS**), and late spermatids (**LS**) near the lumen, with interstitial cells (**IC**) in the surrounding connective tissue. X400. H&E.



**1) Mesothelial cell forms ?**

- A-Tunica vaginalis    B-Tunica albuginea
- C-Tunica vasculosa    D-Septa

**2) Which cell forms the blood testis barrier?**

- A-interstitial cells of Leydig
- B-spermatogenic cell
- C-Sertoli cells
- D-B cells

**3) The basal compartment contains?**

- A-1ry spermatocytes    B-2ry spermatocytes
- C-Spermatids    D-Spermatogonia

**4) A part of male genital duct that has a strong peristaltic movement due to thick muscular layer?**

- A- Seminiferous tubules    B- Ductus deferens
- C-Epididymis    D-Sertoli cells

**5) Site of maturation of spermatozoa?**

- A- Seminiferous tubules    B- Ductus deferens
- C-Epididymis    D-Sertoli cells

5-C  
4-B  
3-D  
2-C  
1-A



\* الحمد لله الذي بنعمته تتم الصالحات.  
تم الانتهاء من آخر محاضرة هيستولوجي للسنوات الاساسية.  
فما هذا إلا جهد مُقل ولاندعي فيه الكمال ولكن عذرنا انا بذلنا فيه قصارى جُهدنا فإن اصبنا فذاك مُرادنا وان أخطئنا فلنا شرف المُحاولة والتعلم.  
ولأنه .. " لا يَشْكُرُ اللهُ مَنْ لا يَشْكُرُ النَّاسَ " / حديث حسن .. فإننا نشكر الله أولاً أن وفقنا و أعاننا جميعاً ، ونسأل الله الاخلاص والقبول للجميع .. ونشكر جميع من ساهم في العمل خلال هاتين السنتين راجين من المولى عز وجل أن يجعله في ميزان حسناتنا. ♥

- Histology team

### Team members:

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- ✓ Mohammed Khojah

### Team leaders:

- ✓ Rana Barasain
- ✓ Faisal Alrabaii



### References:

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

