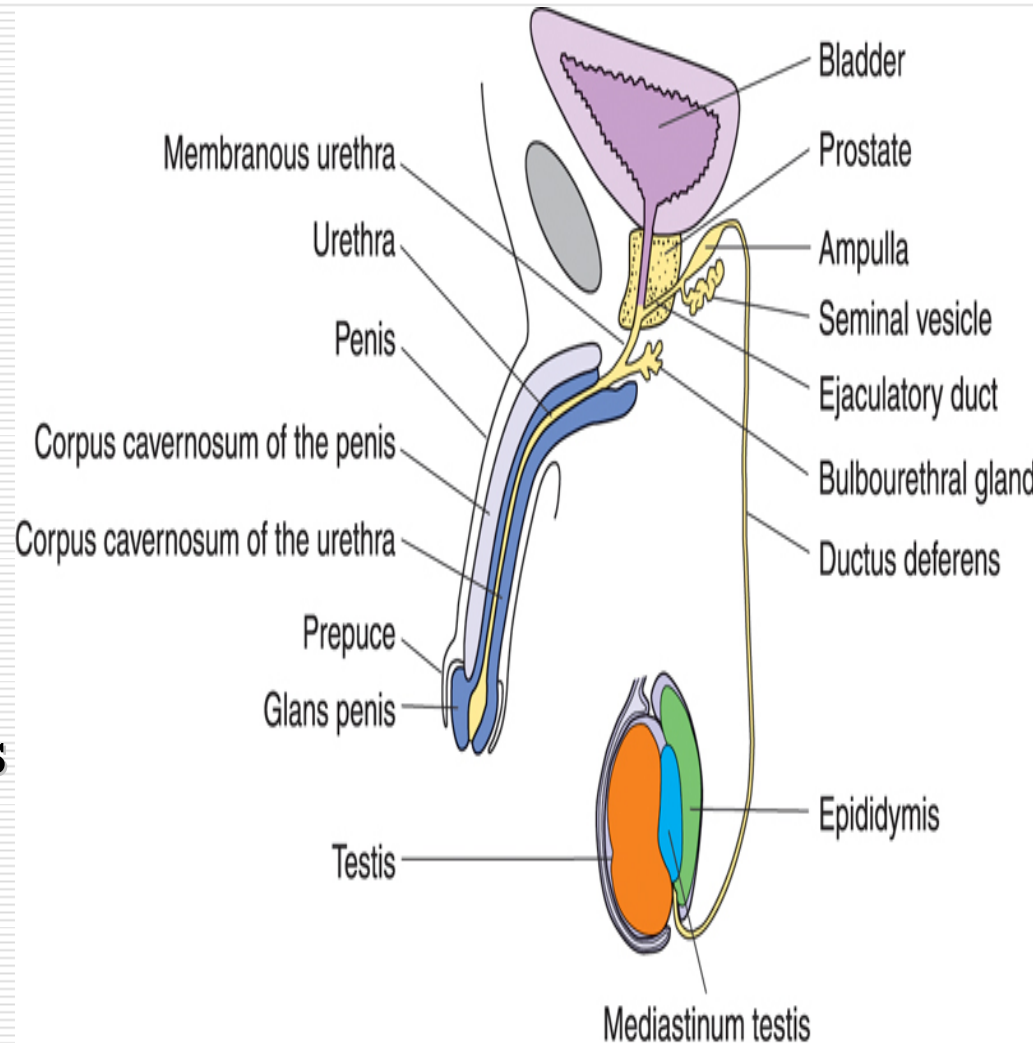


MALE REPRODUCTIVE SYSTEM

Structural components

- ❖ I. Testes
- ❖ **II. Genital ducts**
 - ❖ **1. Epididymis**
 - ❖ **2. Ductus deferens**
 - ❖ **3. Ejaculatory ducts**
 - ❖ **4. Urethra**
- ❖ **III. Accessory sex glands**
 - ❖ **1. Seminal vesicles**
 - ❖ **2. Prostate**
 - ❖ **3. Bulbourethral glands**
- ❖ **IV. Penis**



I . Testes

1. Testicular capsule

- ✠ **Tunica vaginalis**
- ✠ **Tunica albuginea**
 - ❖ **Mediastinum testis, septula testis**
- ✠ **Tunica vasculosa**

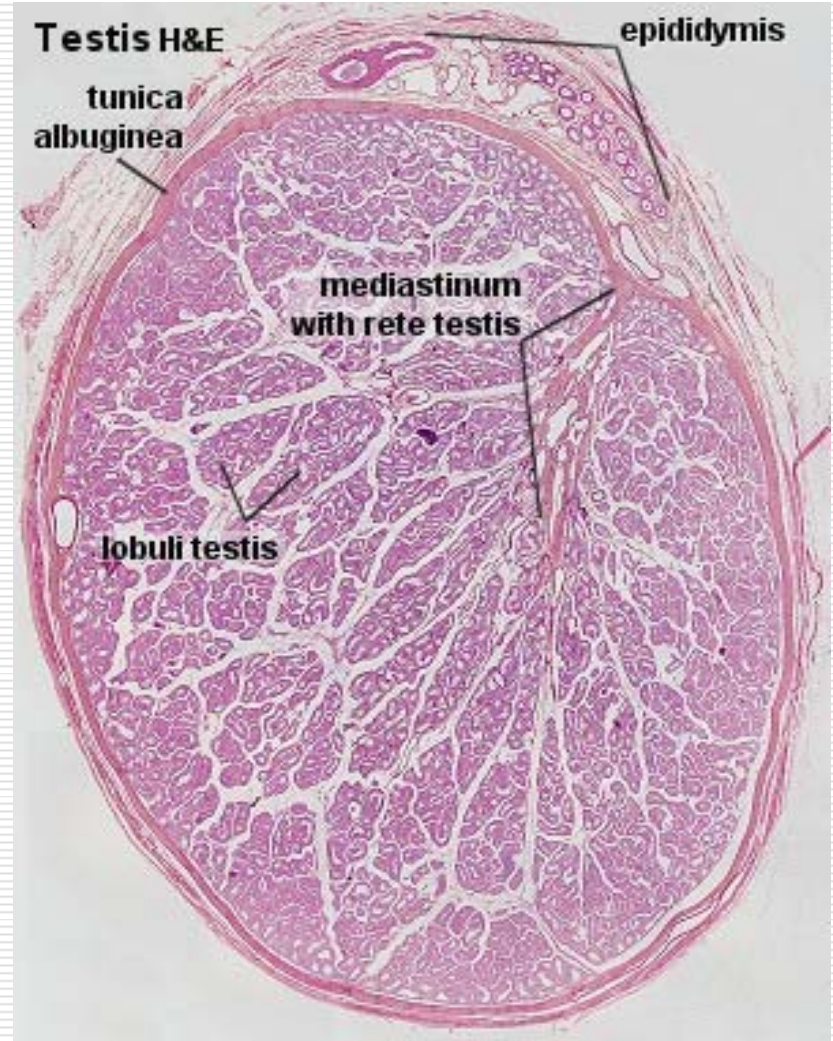
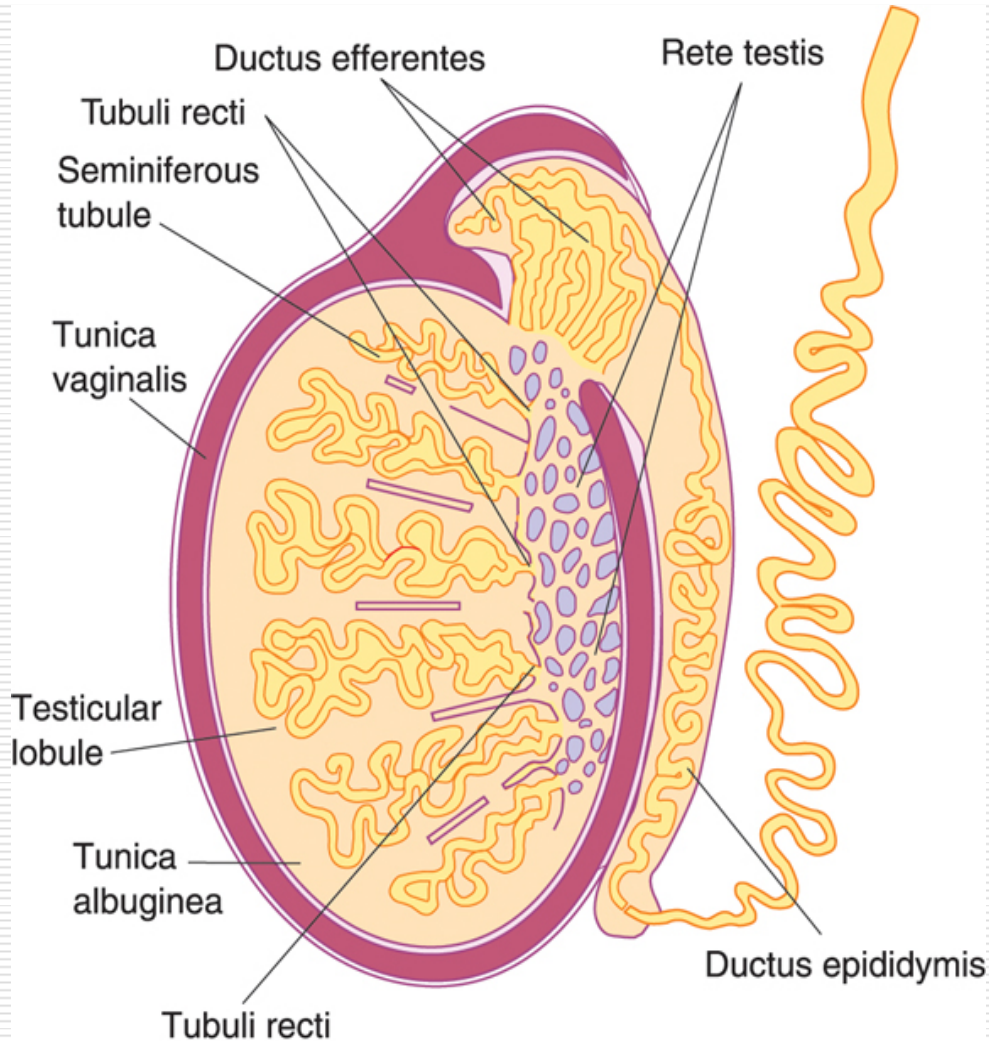
2. Seminiferous tubules

3. Interstitial tissue

4. Intratesticular genital ducts

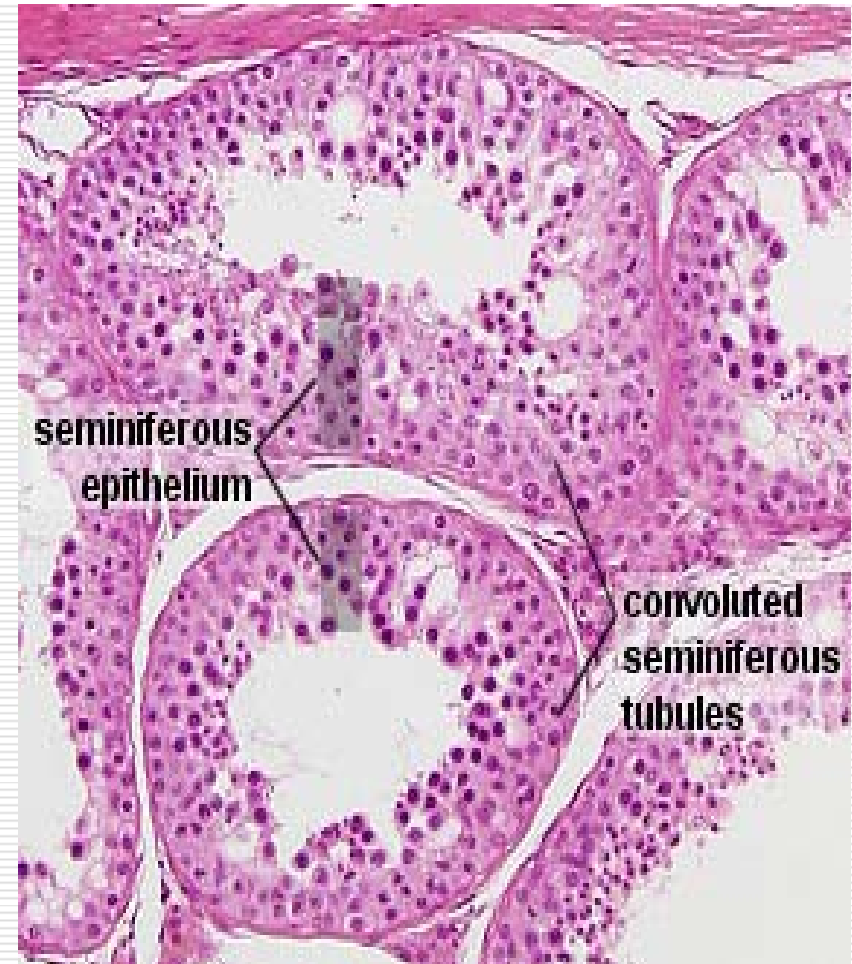
- ✠ **Straight tubule(or tubulus rectus)**
 - ✠ **Rete testis**
 - ✠ **Ductuli efferentes**
-

Testes

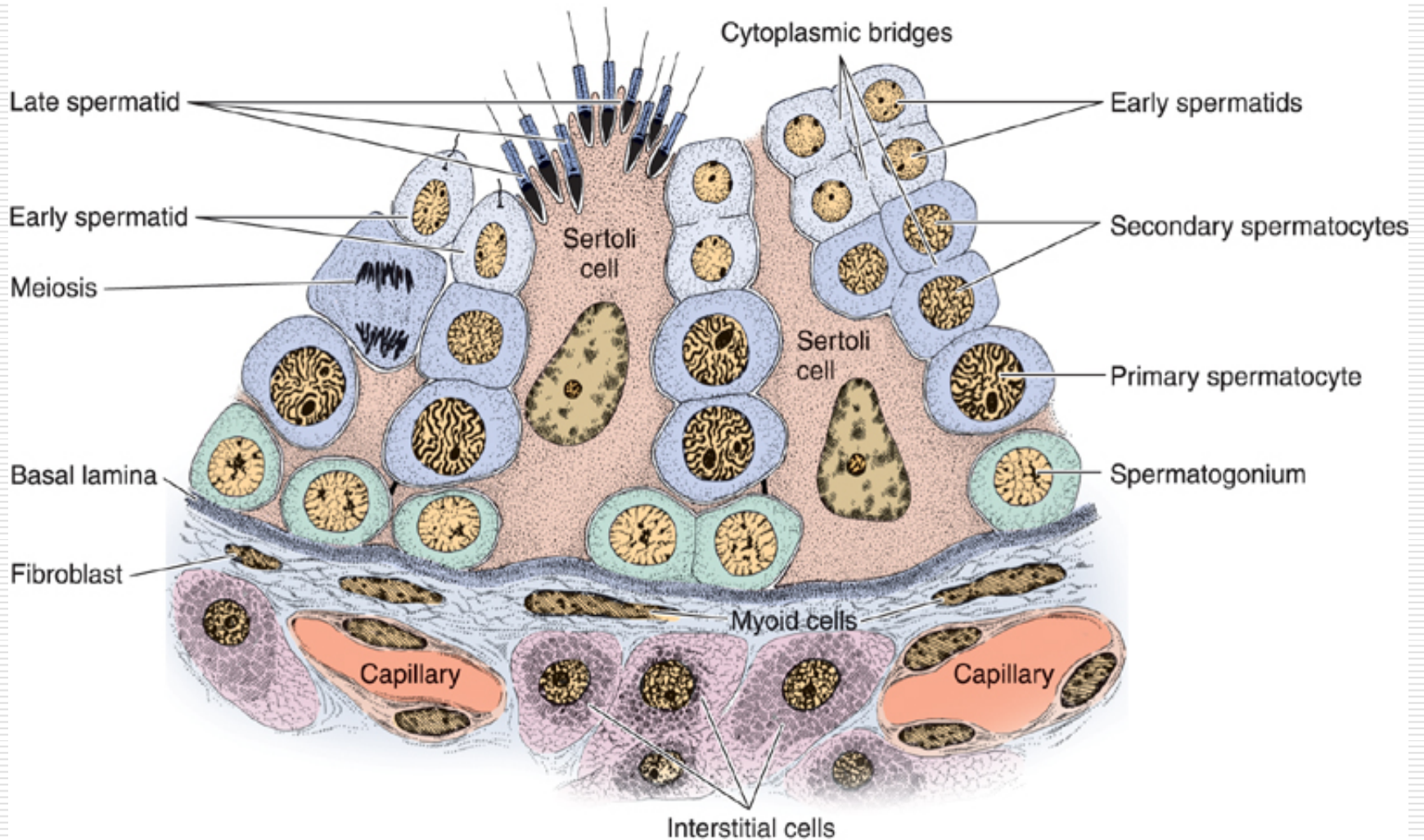


2. Seminiferous tubules

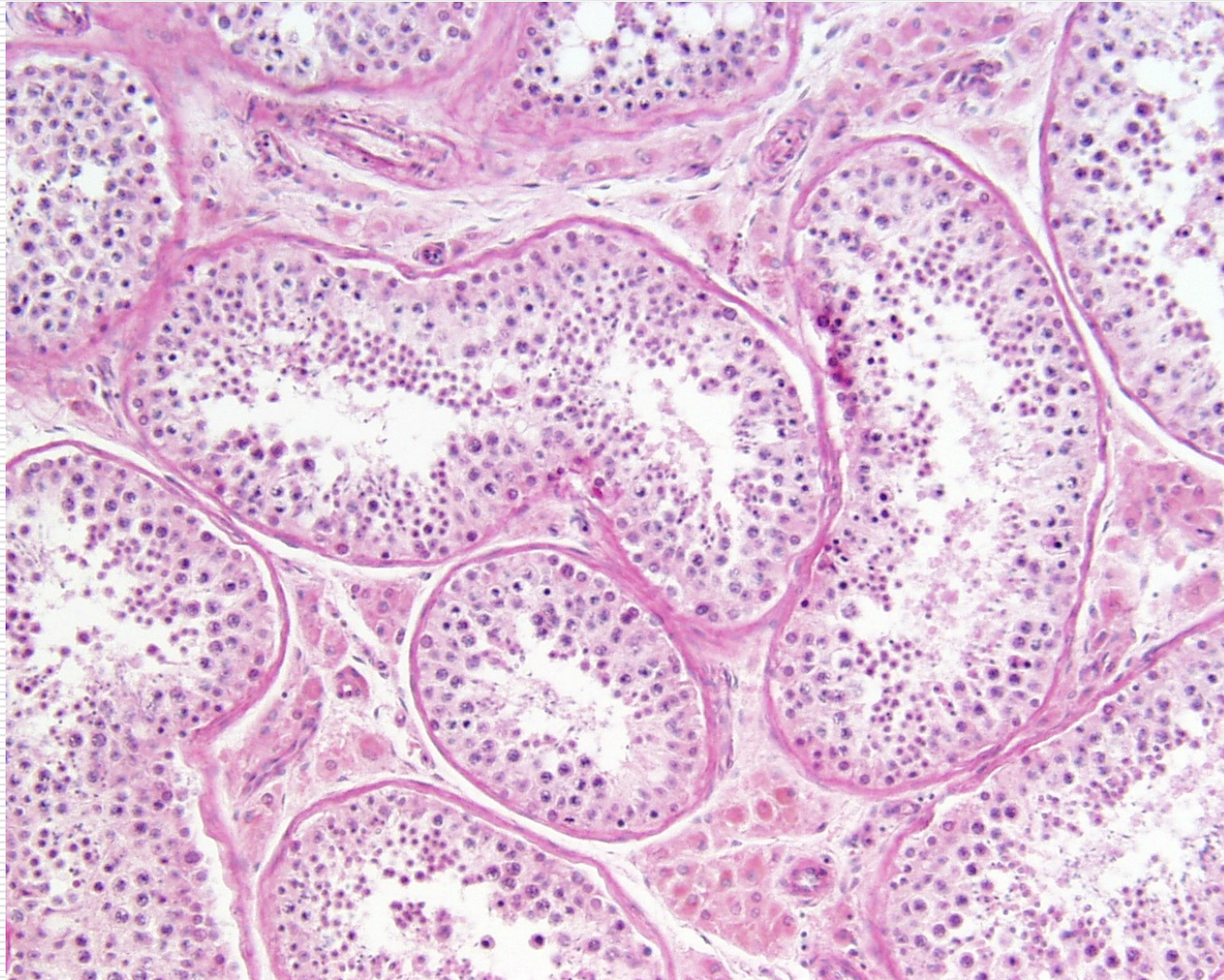
- ❖ **Basement membranes**
- ❖ **Seminiferous epithelium**
 - (1) **Spermatogenic cells**
 - (2) **Sertoli cells**
(or supporting cells)
- ❖ **Tunica propria**
 - ❖ **Collagen fibrils**
 - ❖ **Myoid cells**



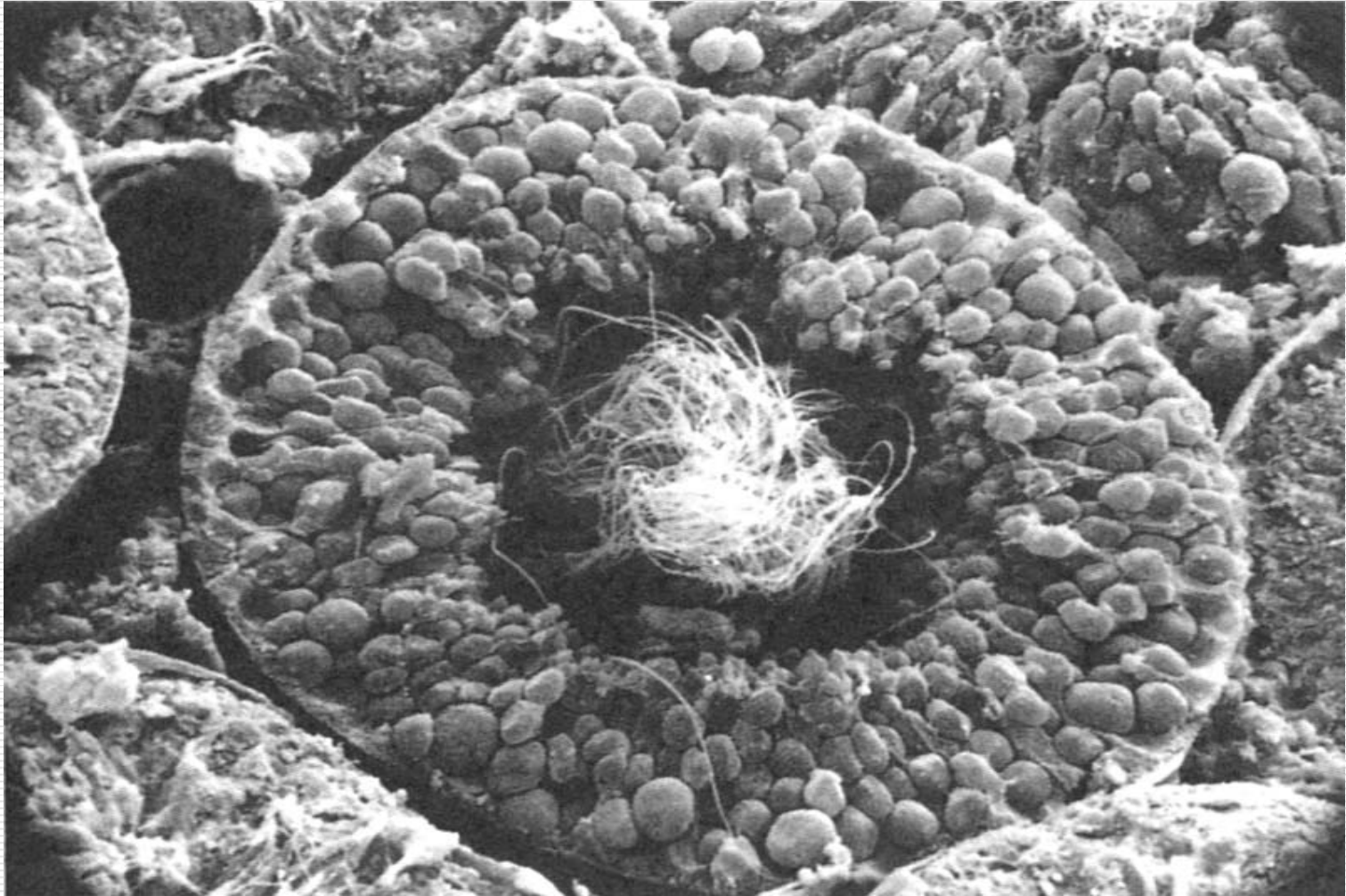
Seminiferous tubules



Seminiferous tubules & interstitial tissue



Seminiferous tubules



(1) Spermatogenic cells

① Spermatogonia

✦ type A; type B

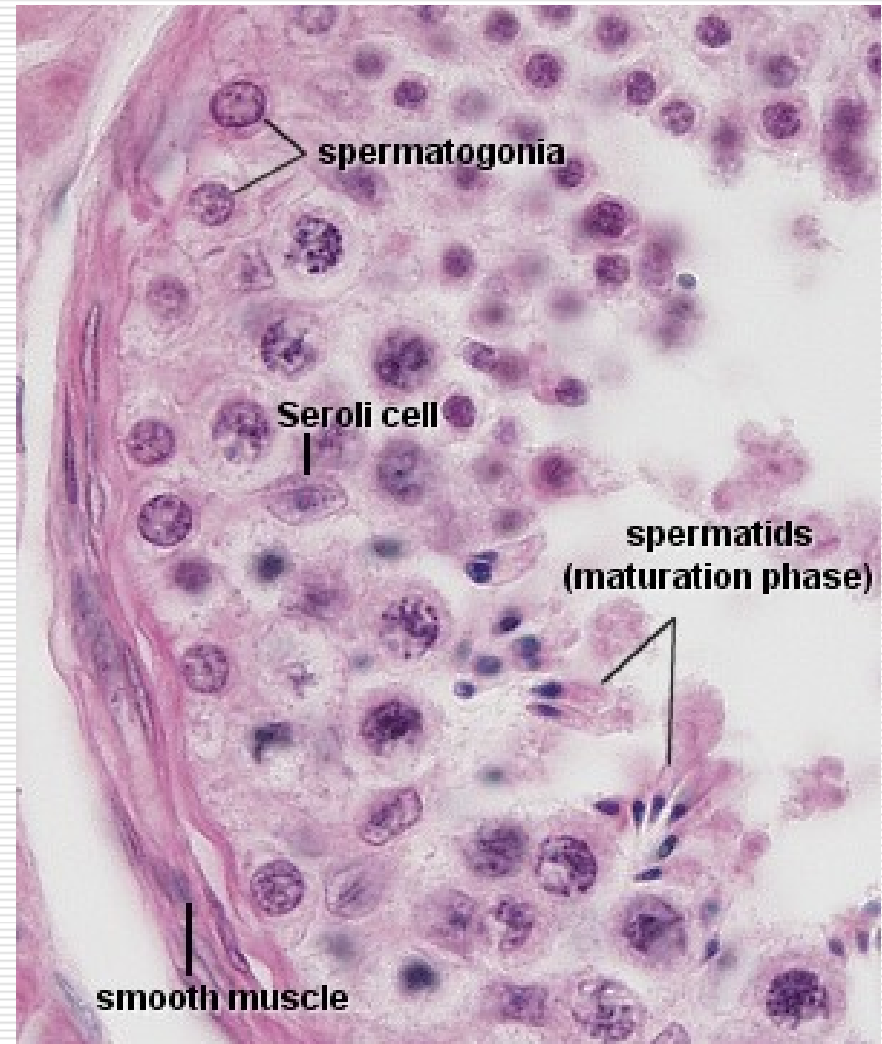
② Primary spermatocytes

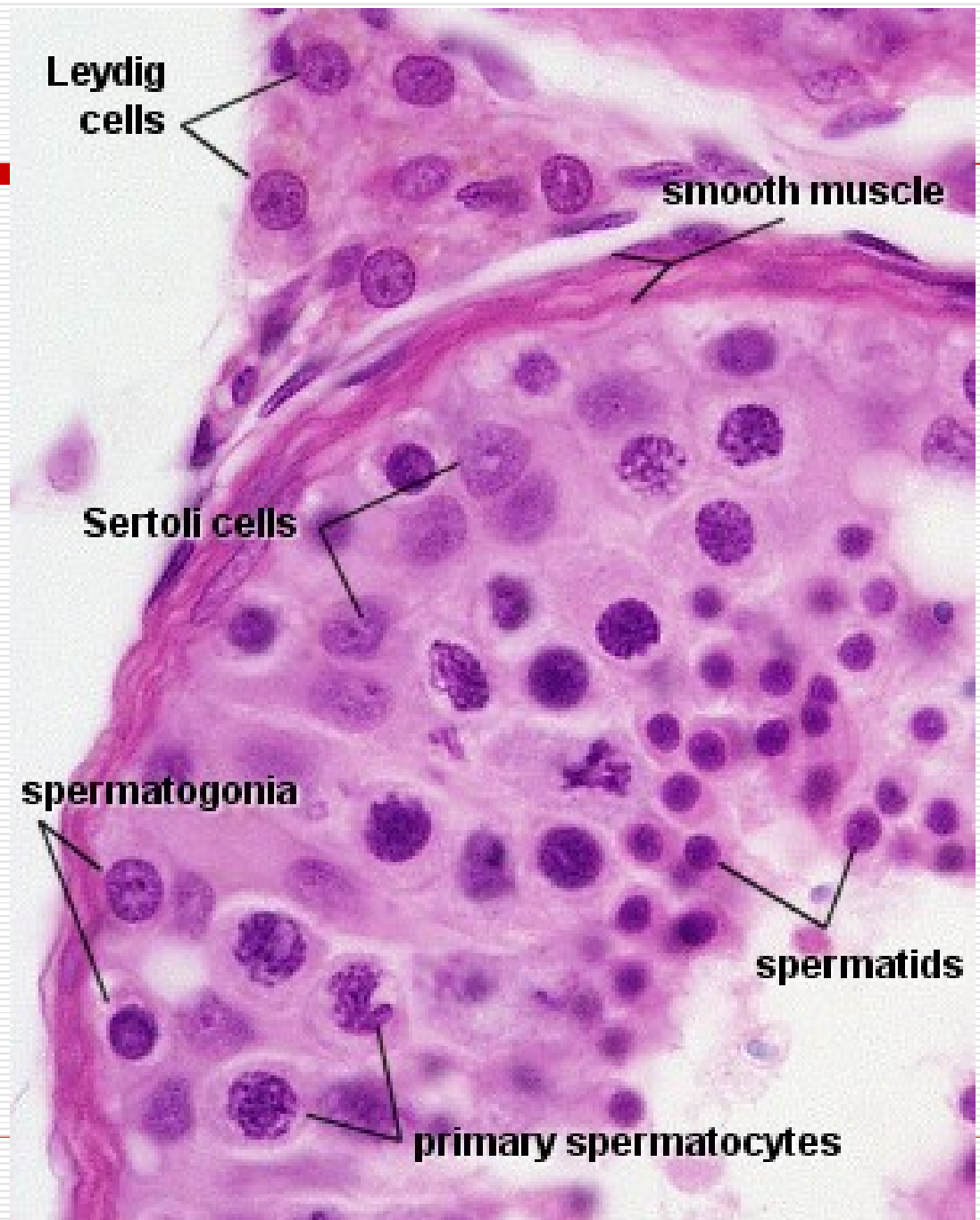
③ Secondary spermatocytes

✦ 23, X ; 23, Y

④ Spermatids

⑤ Spermatozoa





Leydig cells

smooth muscle

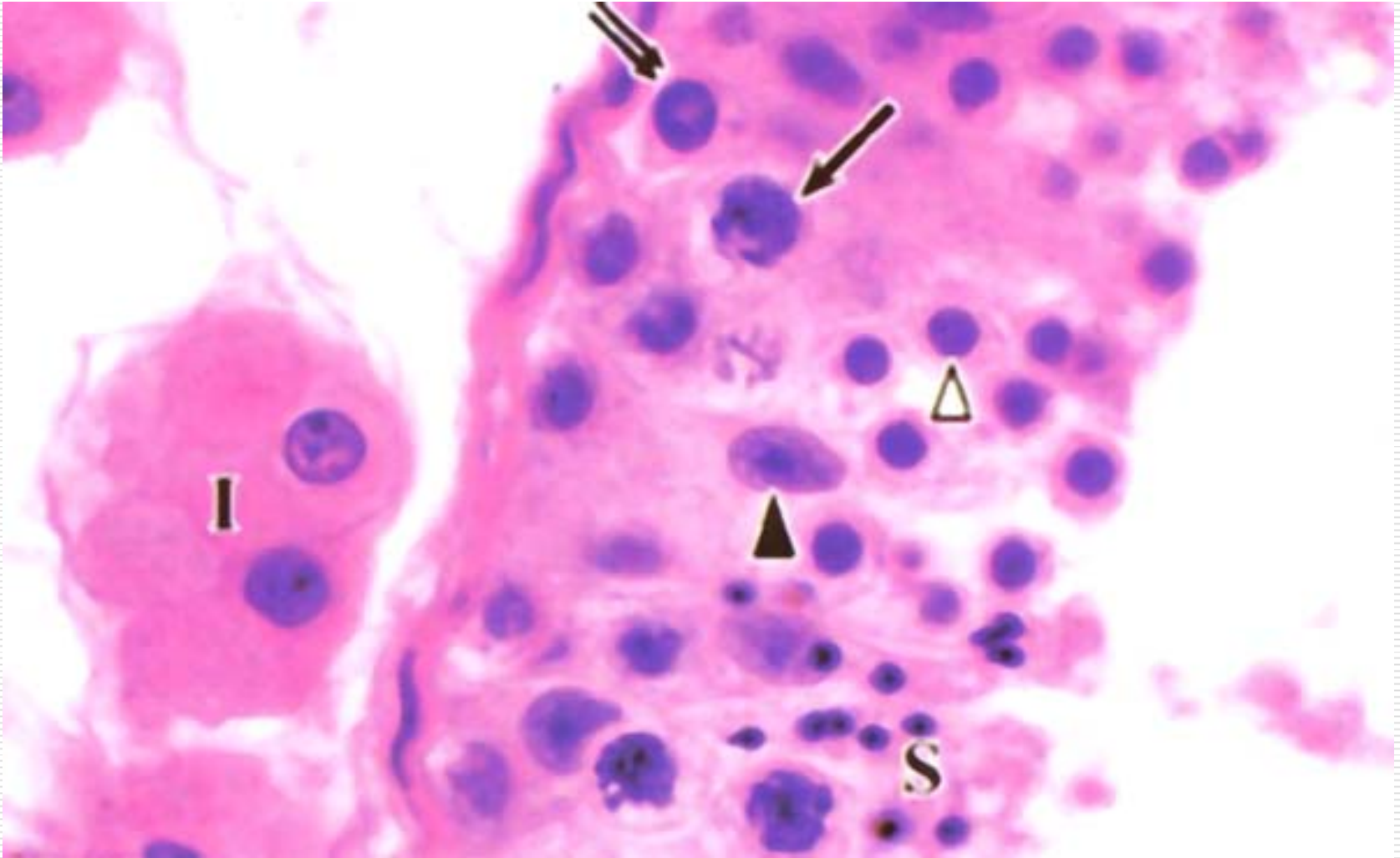
Sertoli cells

spermatogonia

spermatids

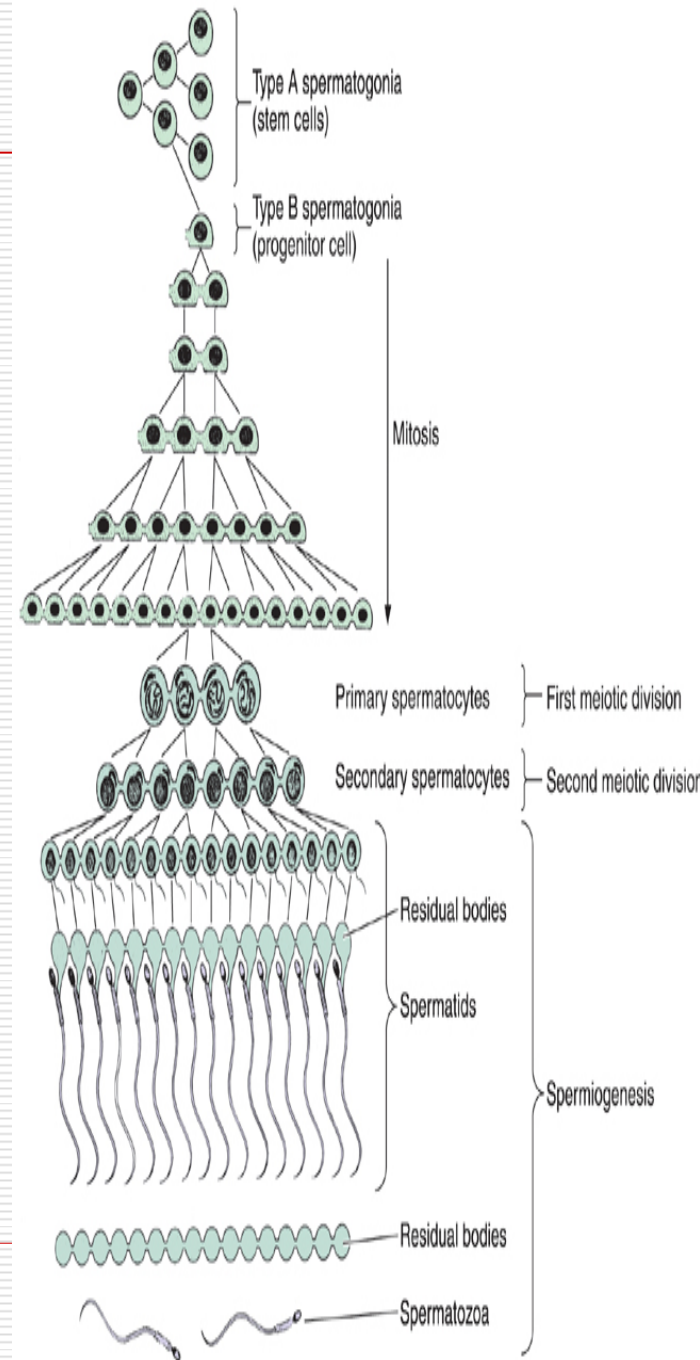
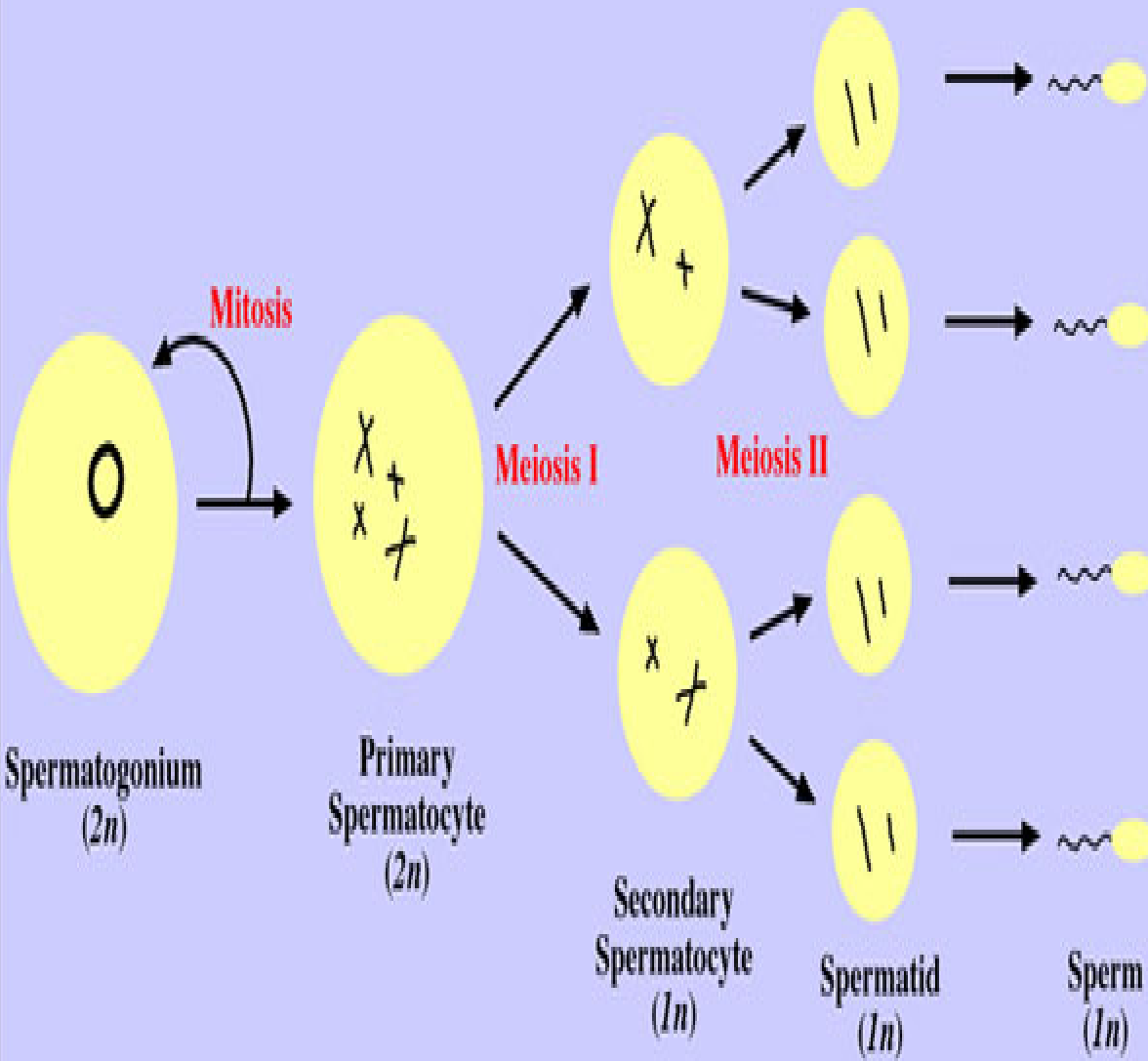
primary spermatocytes

Seminiferous tubules



↓ ↓ Spermatogonia ; ↓ Primary spermatocytes ; △ Secondary spermatocytes ; S Spermatis ; ▲ Sertoli cells ; I Leydig cell

Spermatogenesis



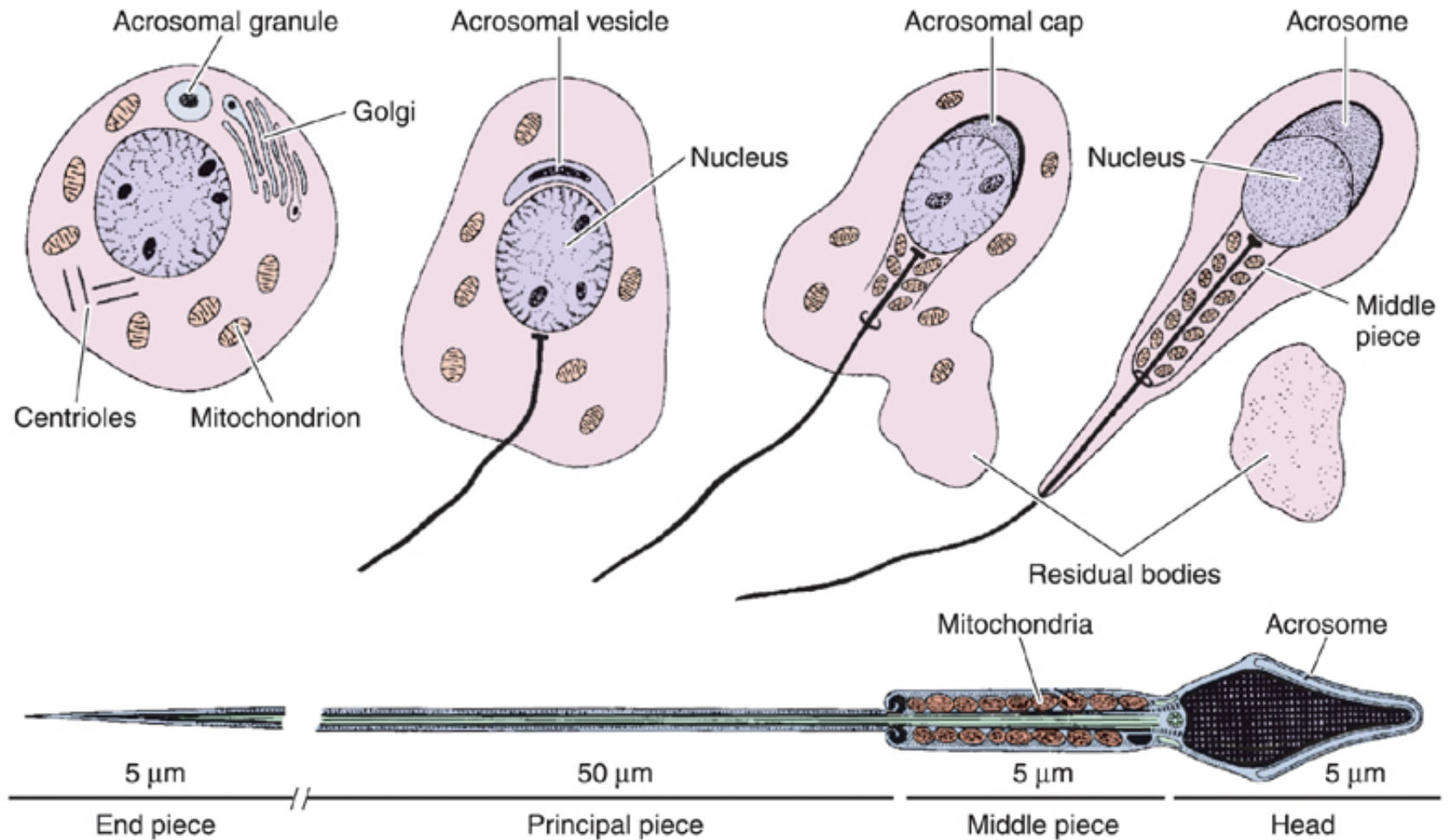
Seminiferous tubules



Spermiogenesis

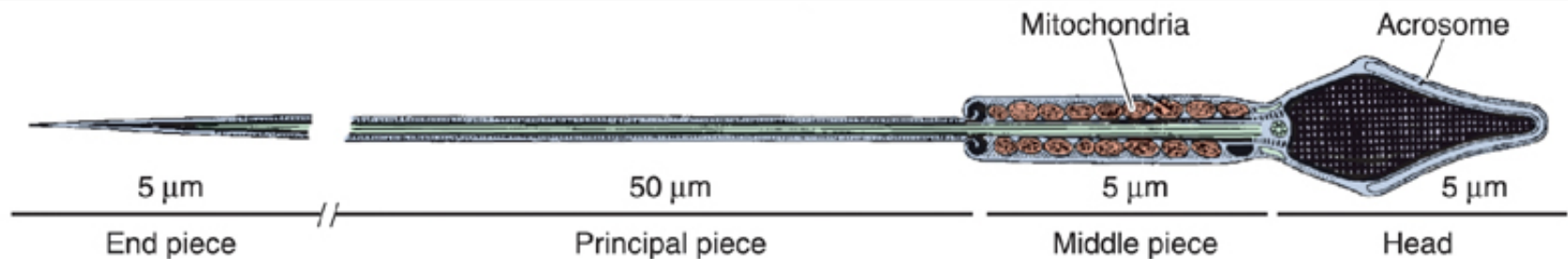
- ❖ **Formation of the acrosome**
 - ❖ **Condensation and elongation of the nucleus**
 - ❖ **Formation of the flagellum**
 - ❖ **Discharge of organelles and cytoplasm**
-

Spermiogenesis

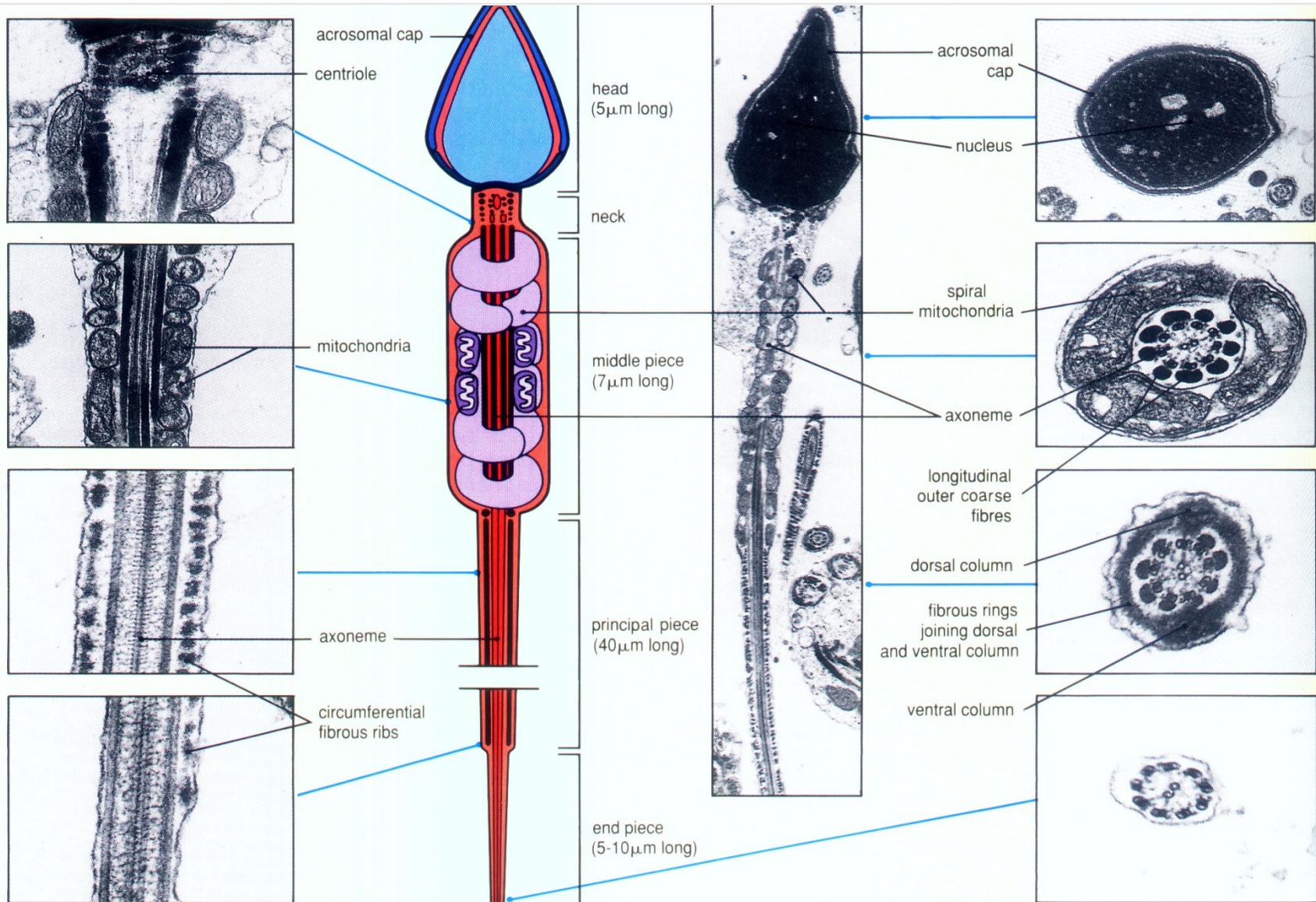


Spermatozoon

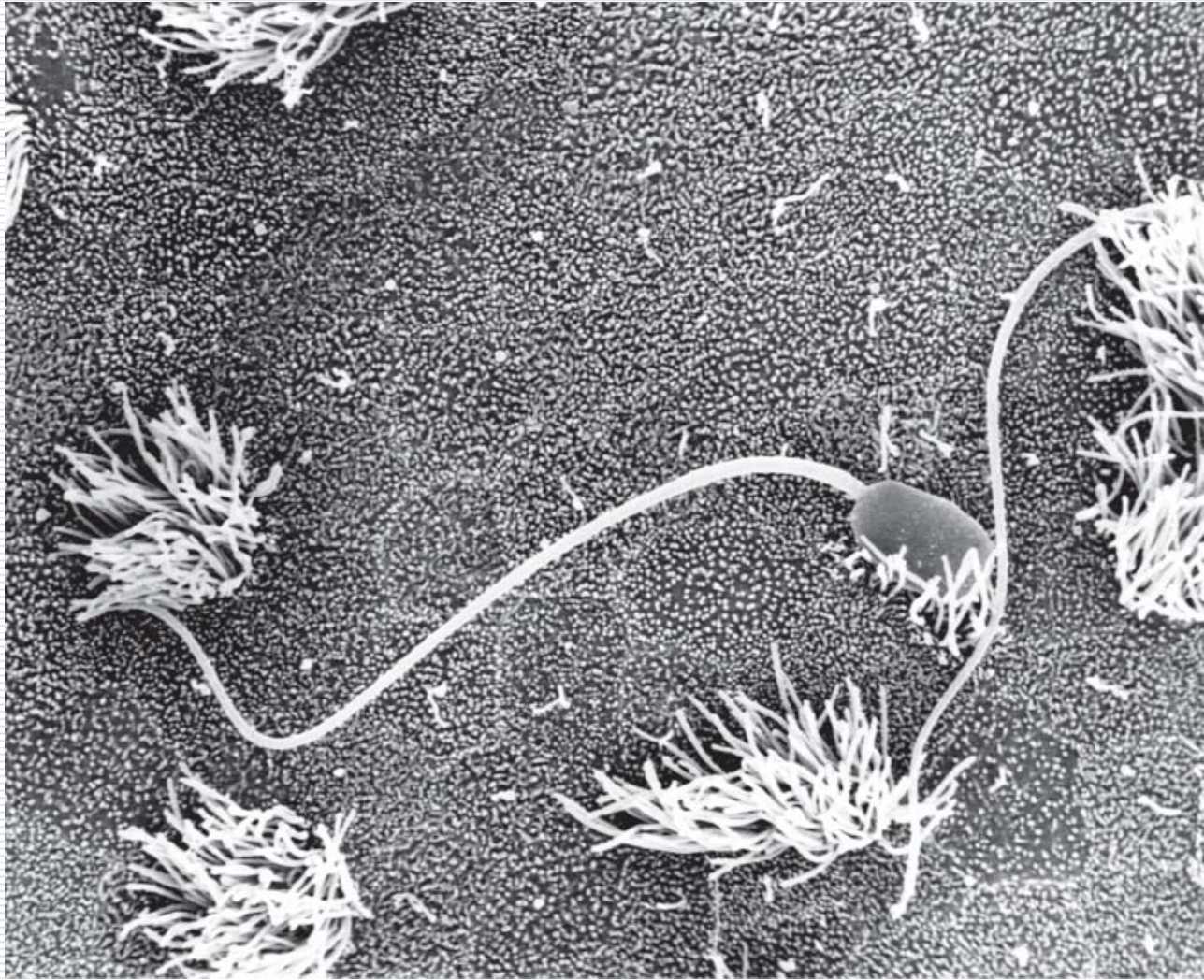
- ❖ **Head**
 - ❖ **Nucleus**
 - ❖ **Acrosome**
- ❖ **Tail**
 - ❖ **Neck**
 - ❖ **Middle segment (mitochondria sheath)**
 - ❖ **Principal segment (fibrous sheath)**
 - ❖ **End piece**



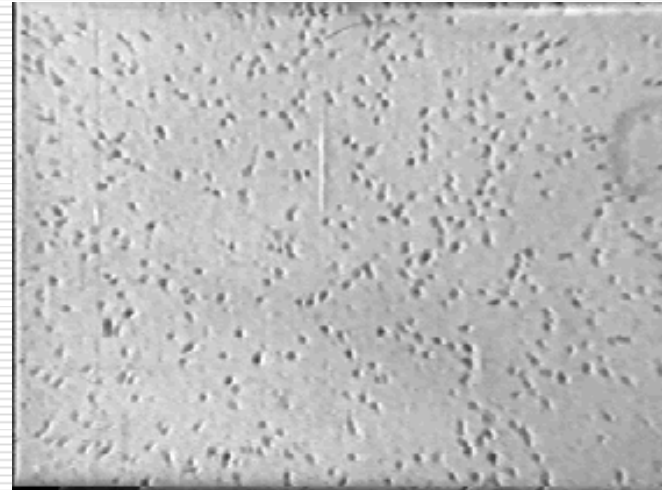
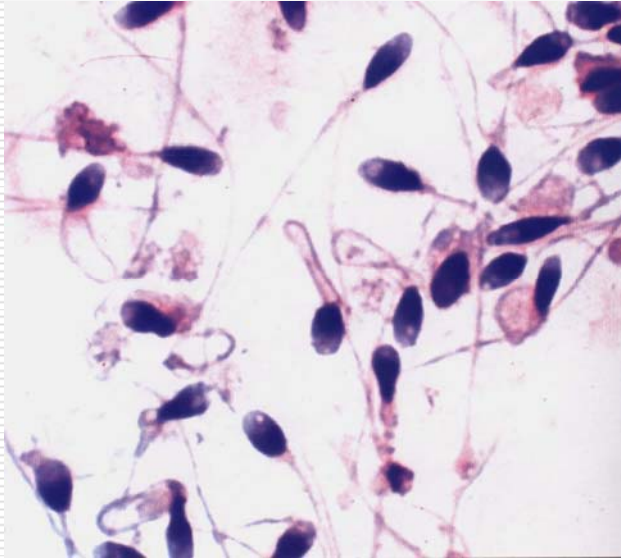
Spermatozoon



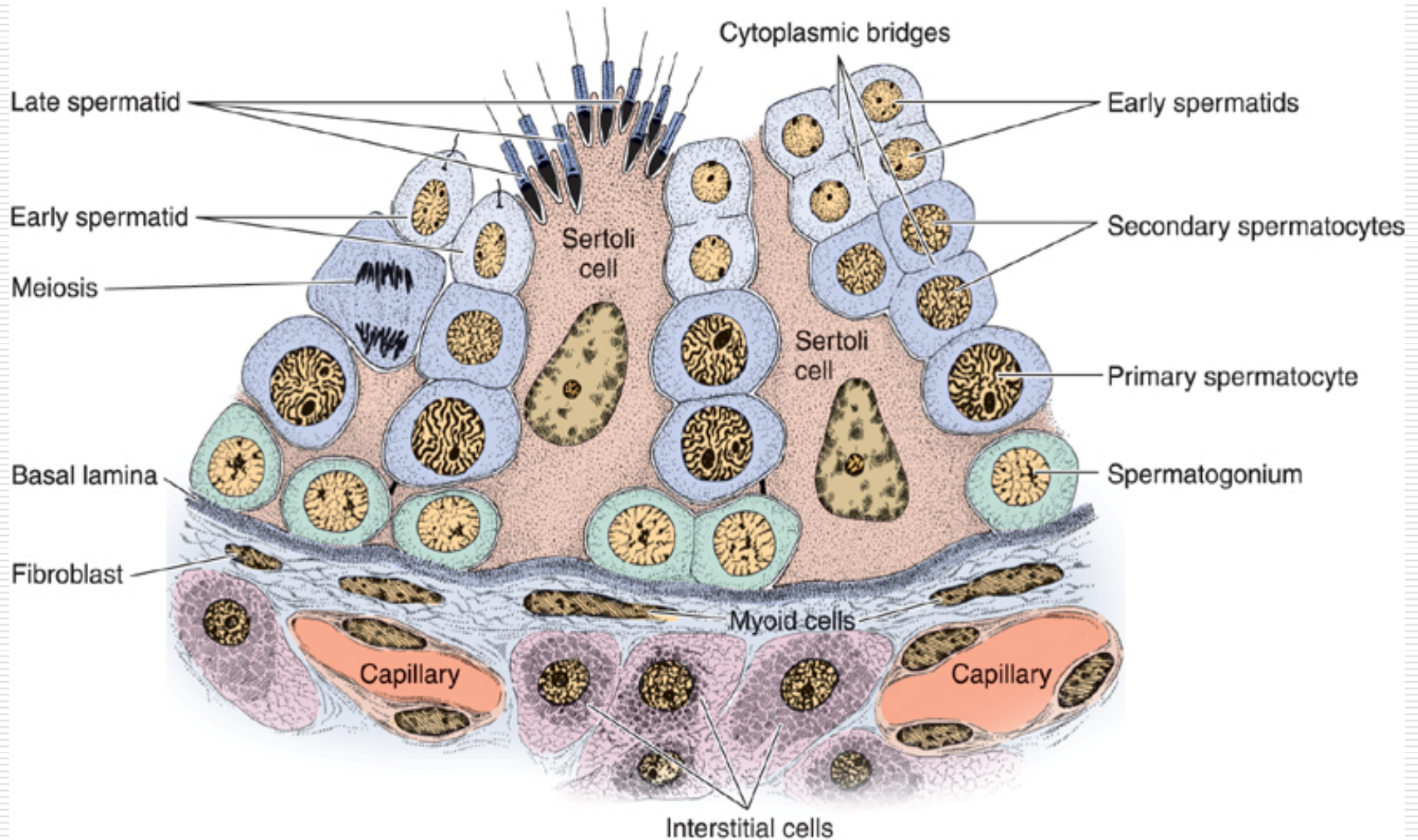
Spermatozoon



Spermatozoa

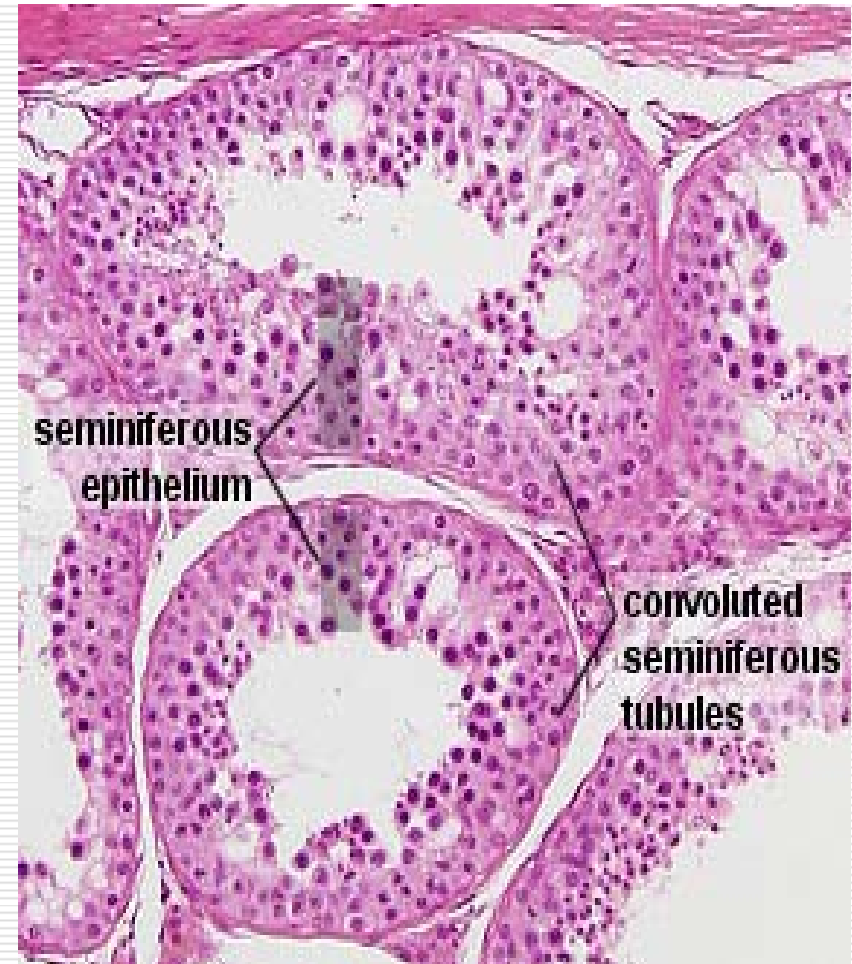


Seminiferous epithelium & interstitial tissue



2. Seminiferous tubules

- ❖ **Basement membranes**
- ❖ **Seminiferous epithelium**
 - (1) **Spermatogenic cells**
 - (2) **Sertoli cells**
(or supporting cells)
- ❖ **Tunica propria**
 - ❖ **Collagen fibrils**
 - ❖ **Myoid cells**



(2) Sertoli cell

❖ Structure

❖ LM

❖ EM

❖ **Functions: support, protect, nourish, regulate and release germinal elements**

❖ **Produce a fluid secretion to help move sperm into the intratesticular genital ducts;**

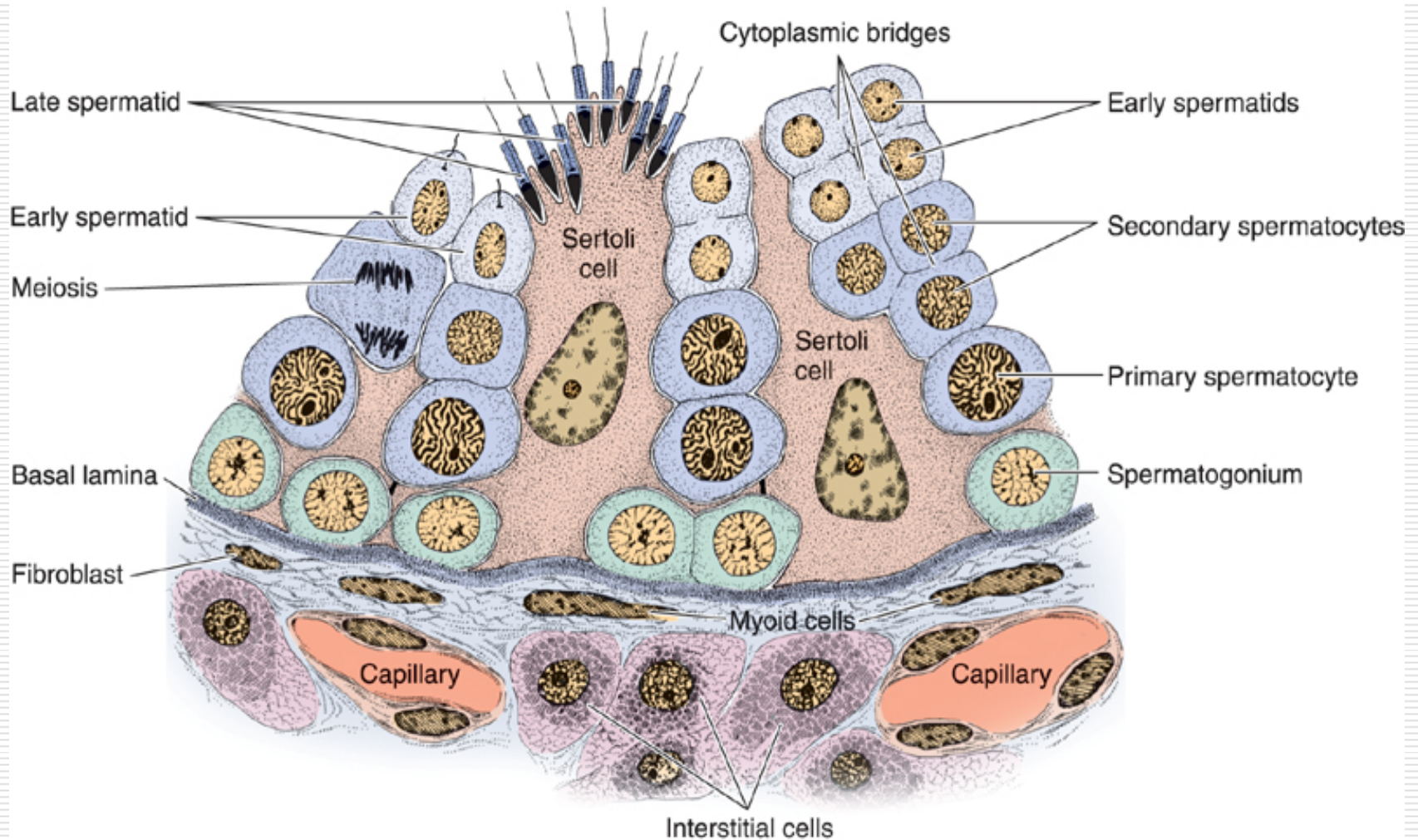
❖ **Secrete androgen binding protein (ABP);**

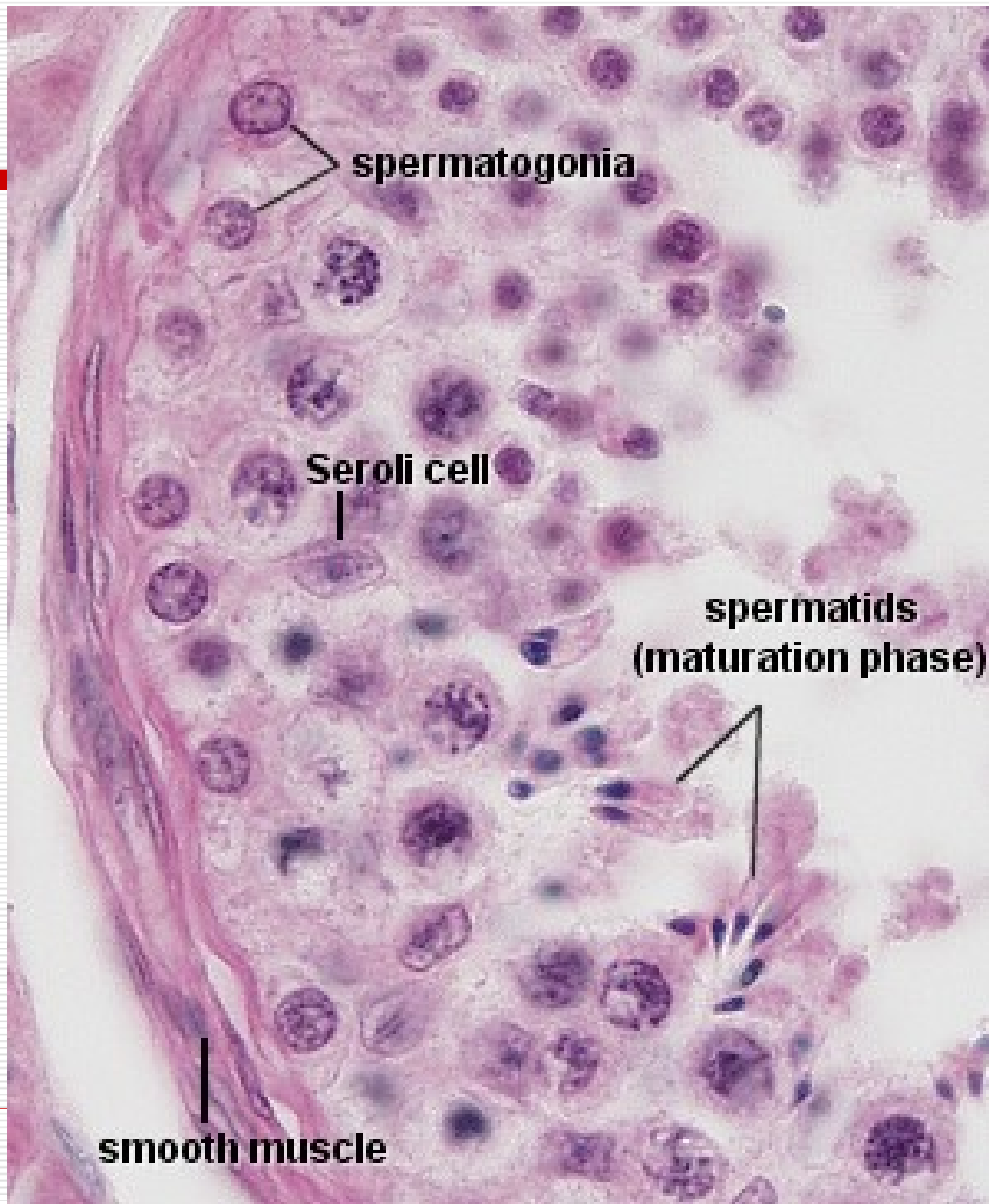
❖ **Phagocytose degenerated germinal cells and spermiogenic residual bodies;**

❖ **Resist to radiation, high temperature, infection;**

❖ **Constitute blood-testis barrier.**

Seminiferous epithelium & interstitial tissue





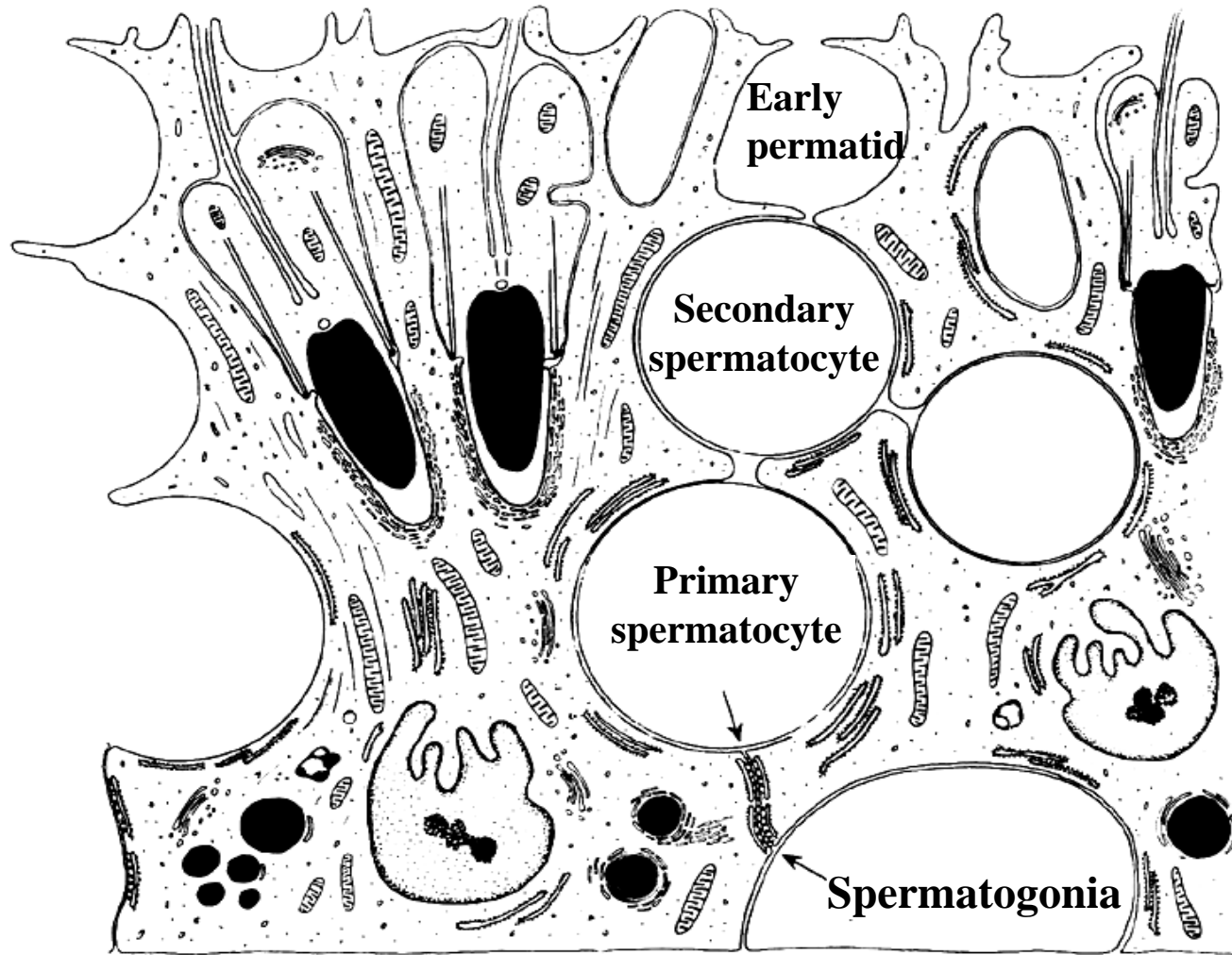
spermatogonia

Sertoli cell

spermatids
(maturation phase)

smooth muscle

Sertoli cell



↑ tight junction

Blood-testis barrier

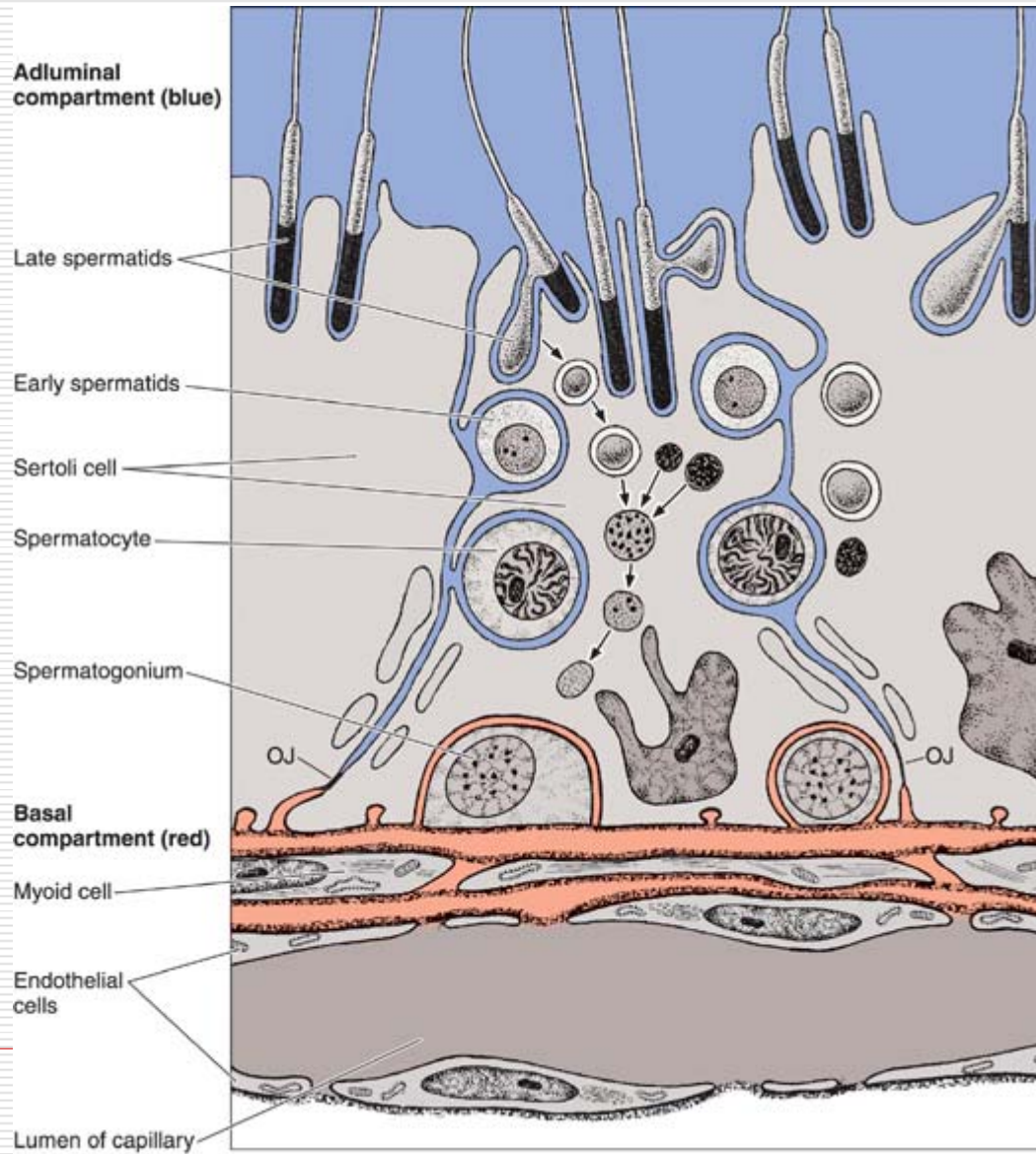
❖ Composition

- ❖ Endothelium and basement membrane of blood vessels
- ❖ Connective tissue
- ❖ Basement membrane of spermatogenic epithelium
- ❖ Tight junction between Sertoli cells

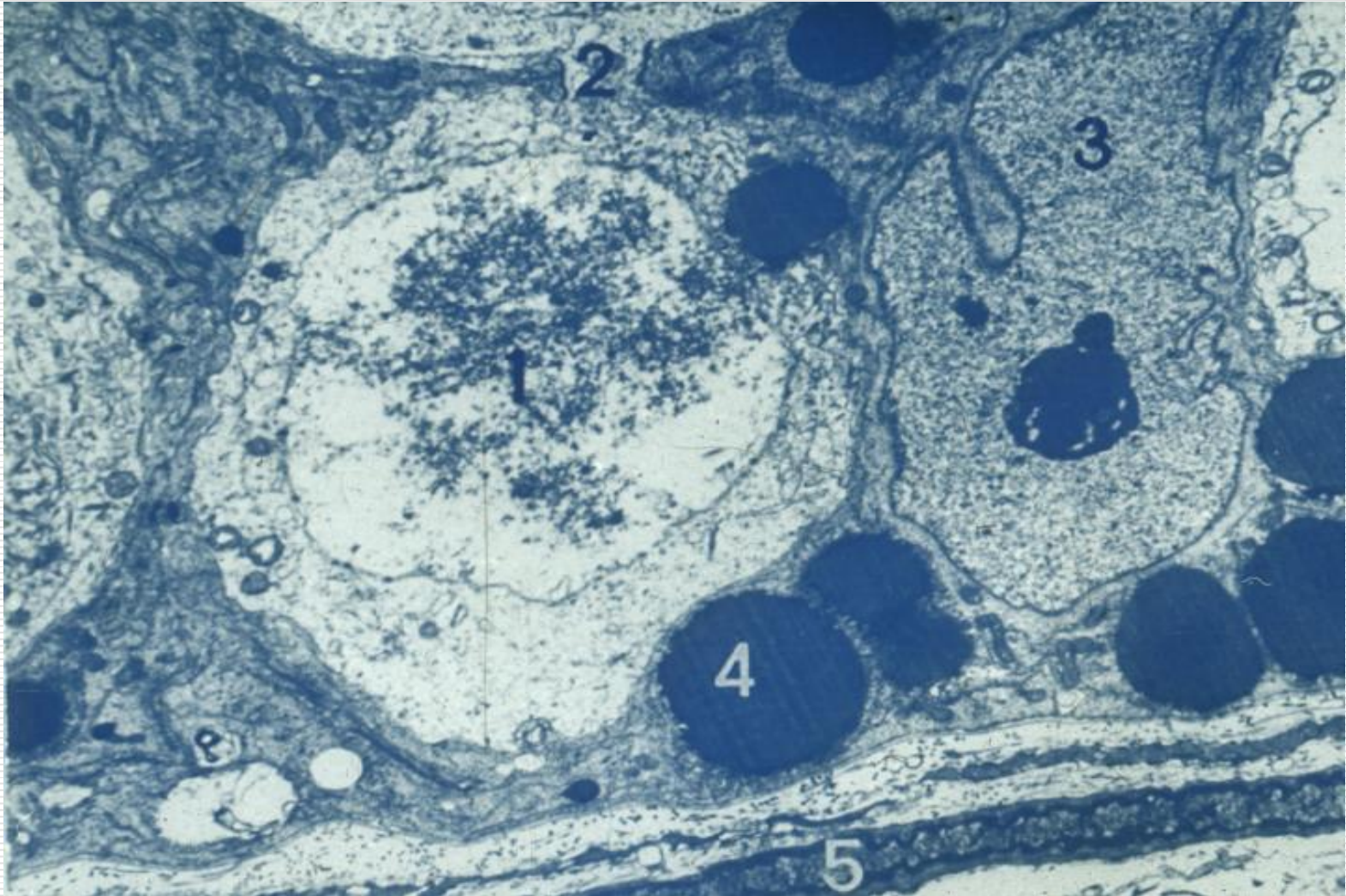
❖ Functions

- ❖ Excludes the genetically different haploid germ cells from the immune system;
 - ❖ Protects the seminiferous epithelium against auto-immune reaction.
-

Blood-testis barrier



Blood-testis barrier



I .Testes

1. Testicular capsule

- ✠ Tunica vaginalis
- ✠ Tunica albuginea
 - ❖ Mediastinum testis, septula testis
- ✠ Tunica vasculosa

2. Seminiferous tubules

3. Interstitial tissue

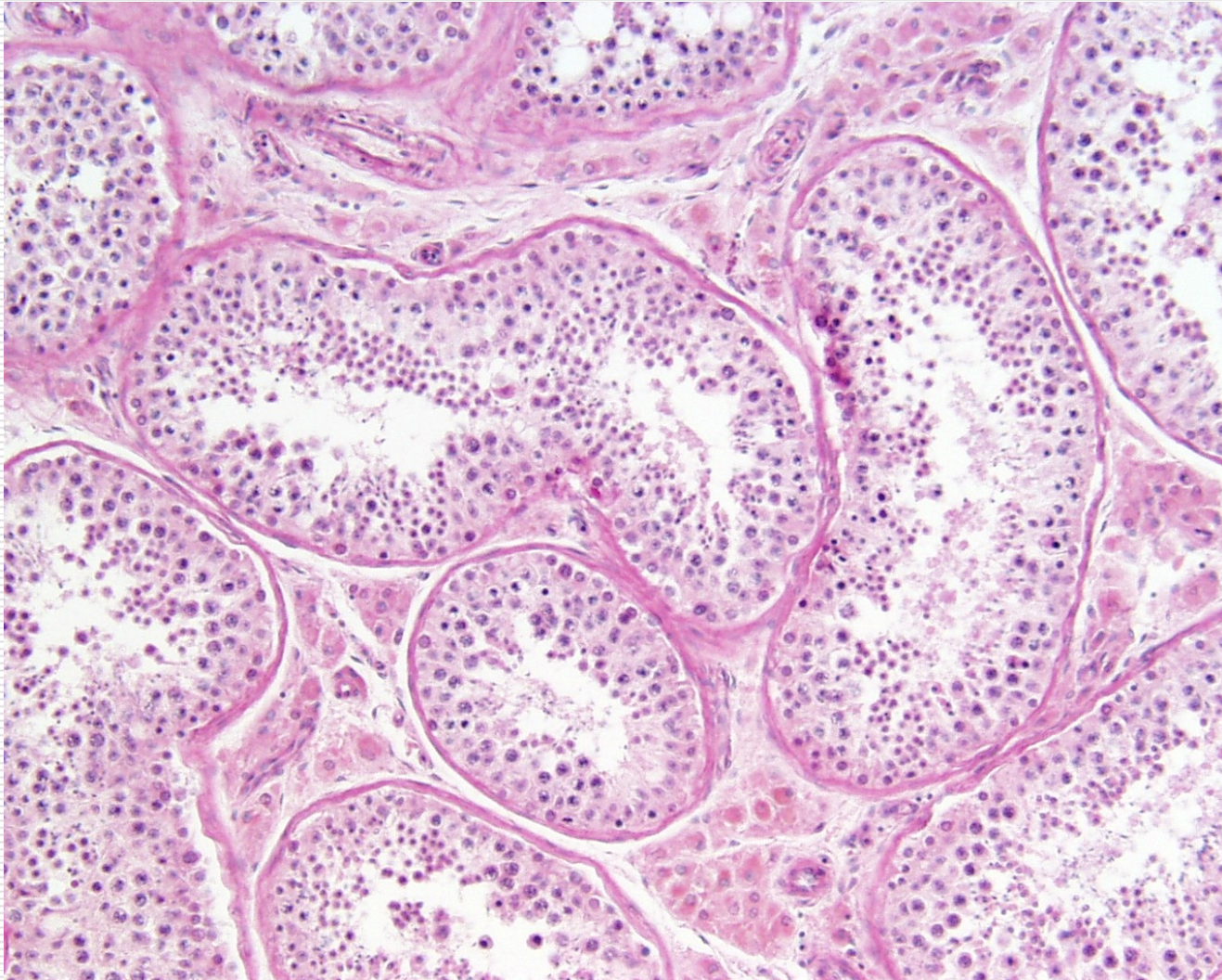
4. Intratesticular genital ducts

- ✠ Straight tubule(or tubulus rectus)
 - ✠ Rete testis
 - ✠ Ductuli efferentes
-

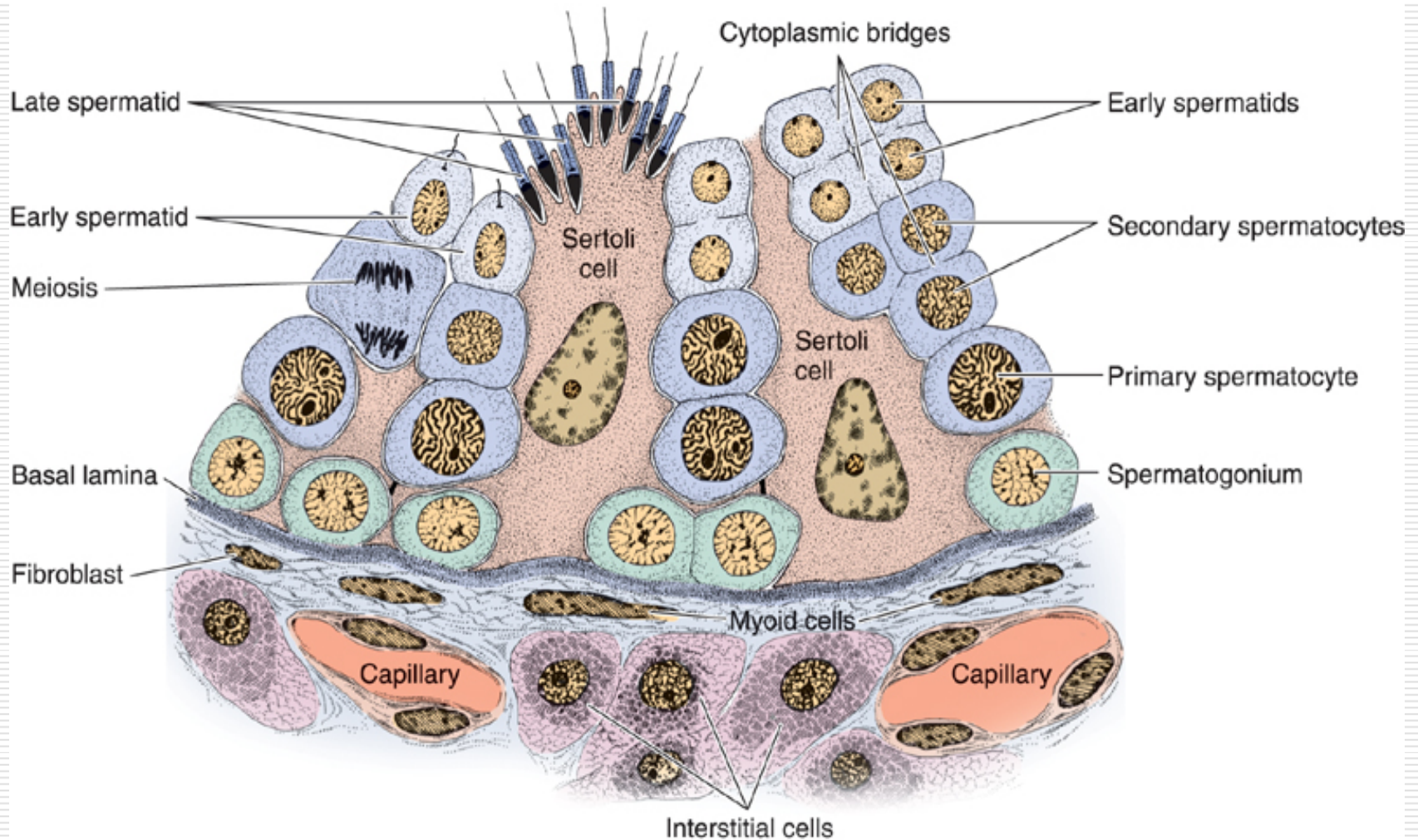
3. Interstitial tissue

- ❖ **Extends from the tunica vasculosa**
 - ❖ **Fills the spaces between the seminiferous tubules**
 - ❖ **Contains numerous small blood and lymphatic vessels, nerves and several types of cell**
 - ❖ **Leydig cell (Interstitial cell)**
-

Seminiferous tubules & interstitial tissue



Seminiferous epithelium & interstitial tissue



Leydig cell

❖ Structure

- ❖ **LM:** large, irregular polygonal cells with a rounded, chromatic nucleus. The cytoplasm is acidophilic.
- ❖ **EM:** have an elaborate, abundant and tubular sER, mt, lipid droplets, Golgi apparatus, lysosomes and lipofuscin pigment granules.

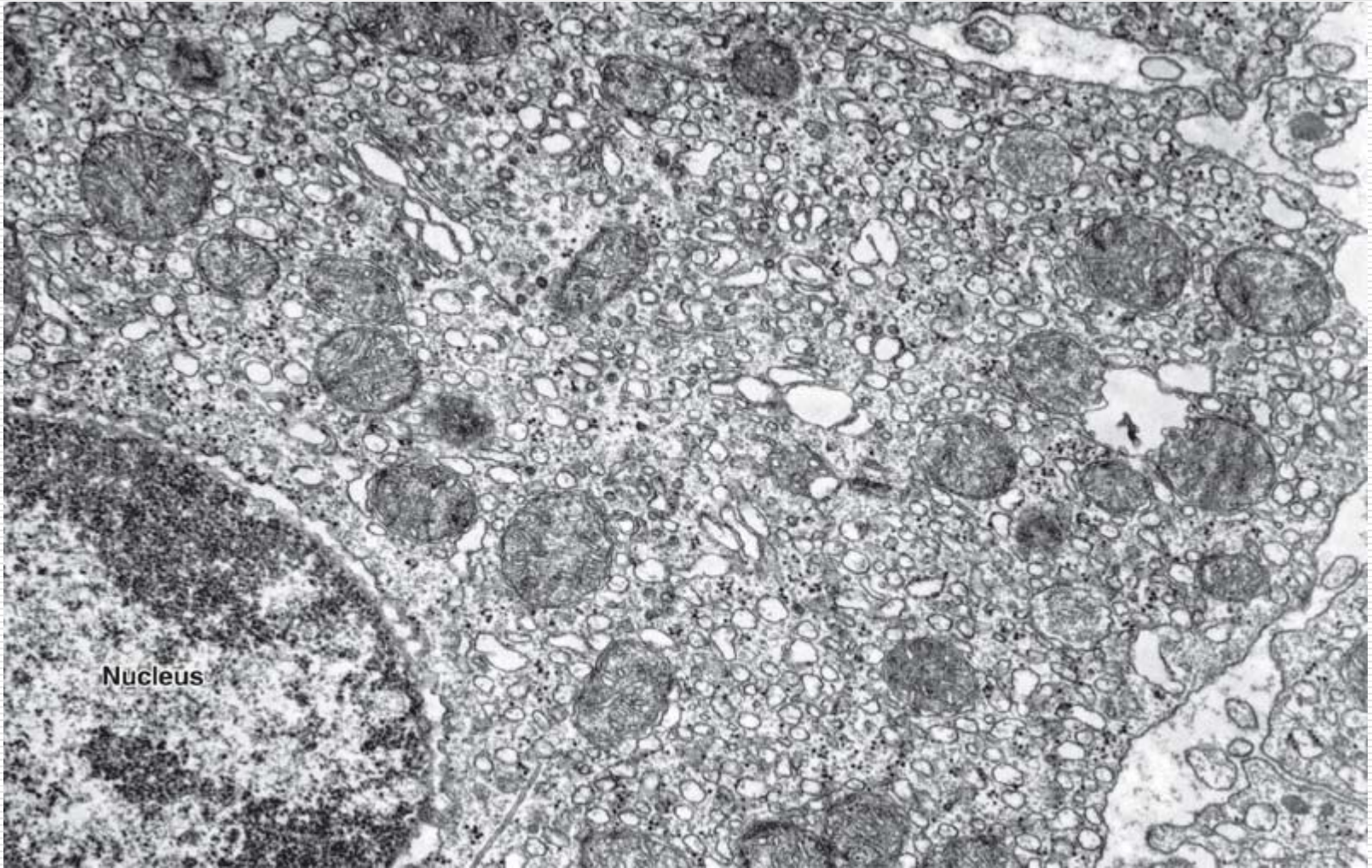
❖ Function: secrete testosterone which is essential for

- ❖ the proliferation and differentiation of germ cells,
 - ❖ the proper maintenance of the genital ducts and accessory glands,
 - ❖ the development and maintenance of male secondary sex characteristics.
-

Seminiferous epithelium & interstitial tissue



Leydig cell



I .Testes

1. Testicular capsule

- ✠ Tunica vaginalis
- ✠ Tunica albuginea
 - ❖ Mediastinum testis, septula testis
- ✠ Tunica vasculosa

2. Seminiferous tubules

3. Interstitial tissue

4. Intratesticular genital ducts

- ✠ Straight tubule(or tubulus rectus)
 - ✠ Rete testis
 - ✠ Ductuli efferentes
-

4. Intratesticular genital ducts

❖ Straight tubules

- ❖ A single, short straight tubule**
- ❖ Spermatogenic cells disappear**
- ❖ Simple cuboidal or columnar epithelium**

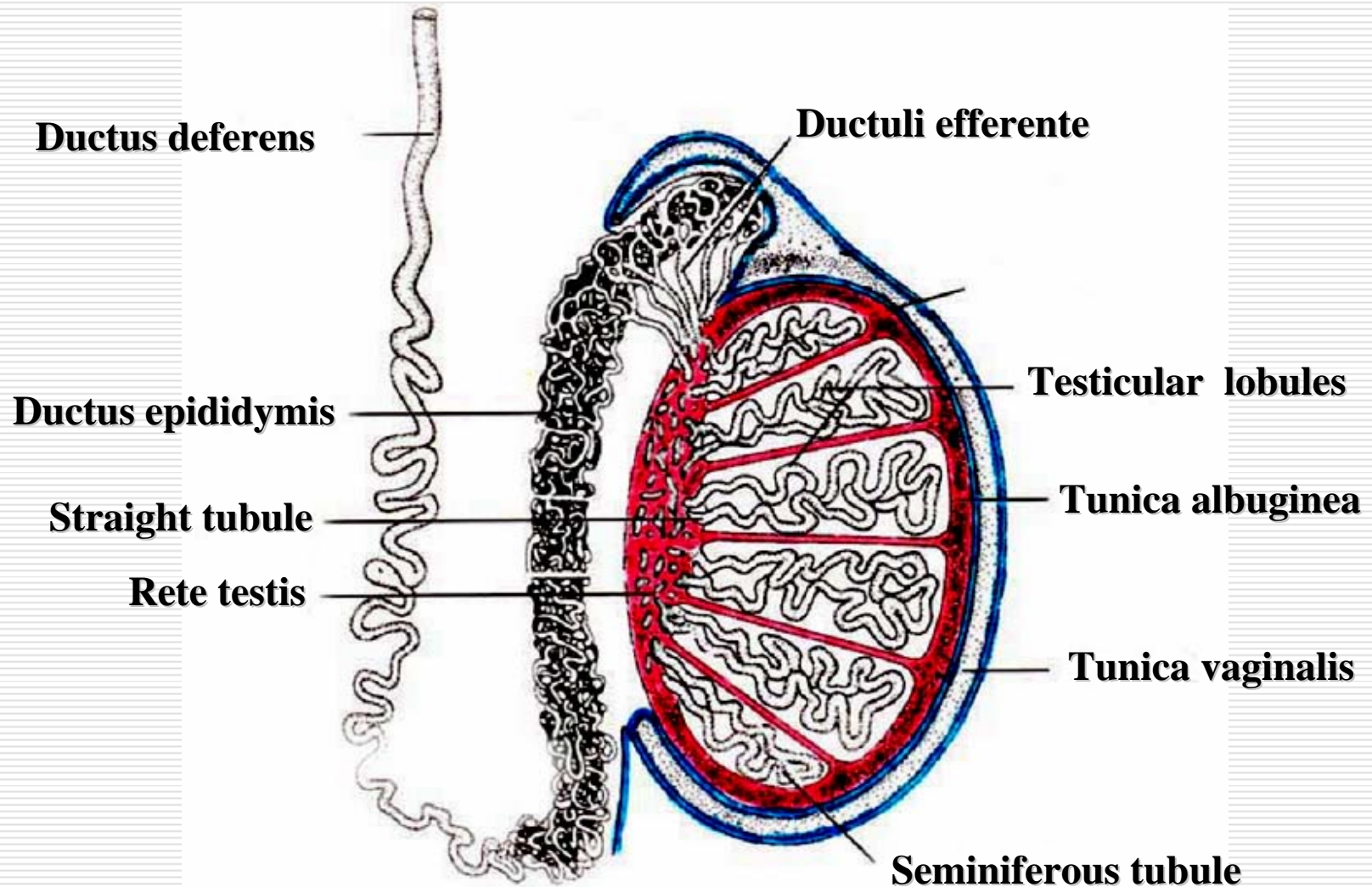
❖ Rete testis

- ❖ A labyrinthine network of channels within the mediastinum**
- ❖ Flattened or cuboidal cells**
- ❖ Microvilli and cilium**

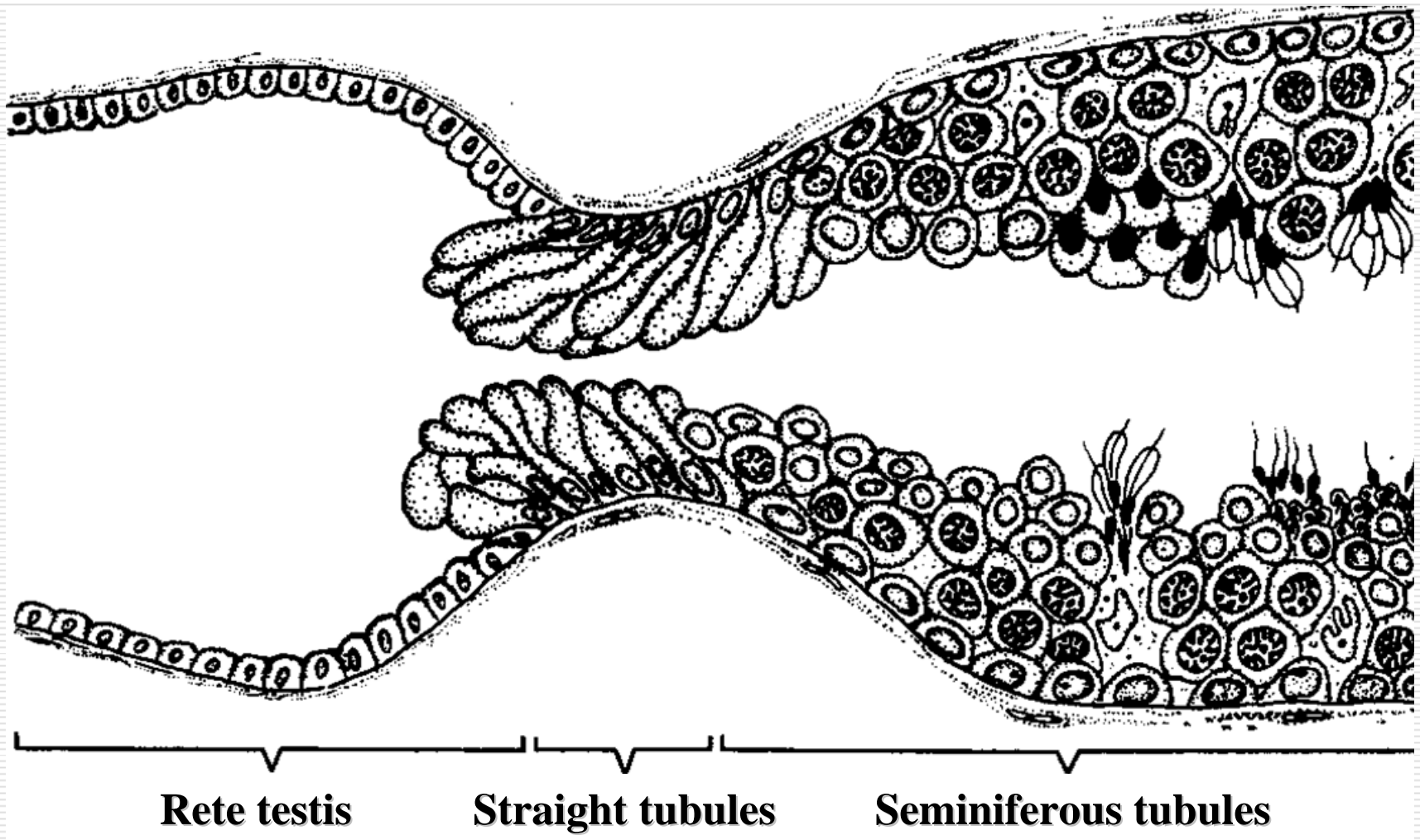
❖ Ductuli efferentes

- ❖ A characteristic simple columnar epithelium**
 - ❖ Tall columnar ciliated cells**
 - ❖ Short columnar nonciliated cells (microvilli)**
-

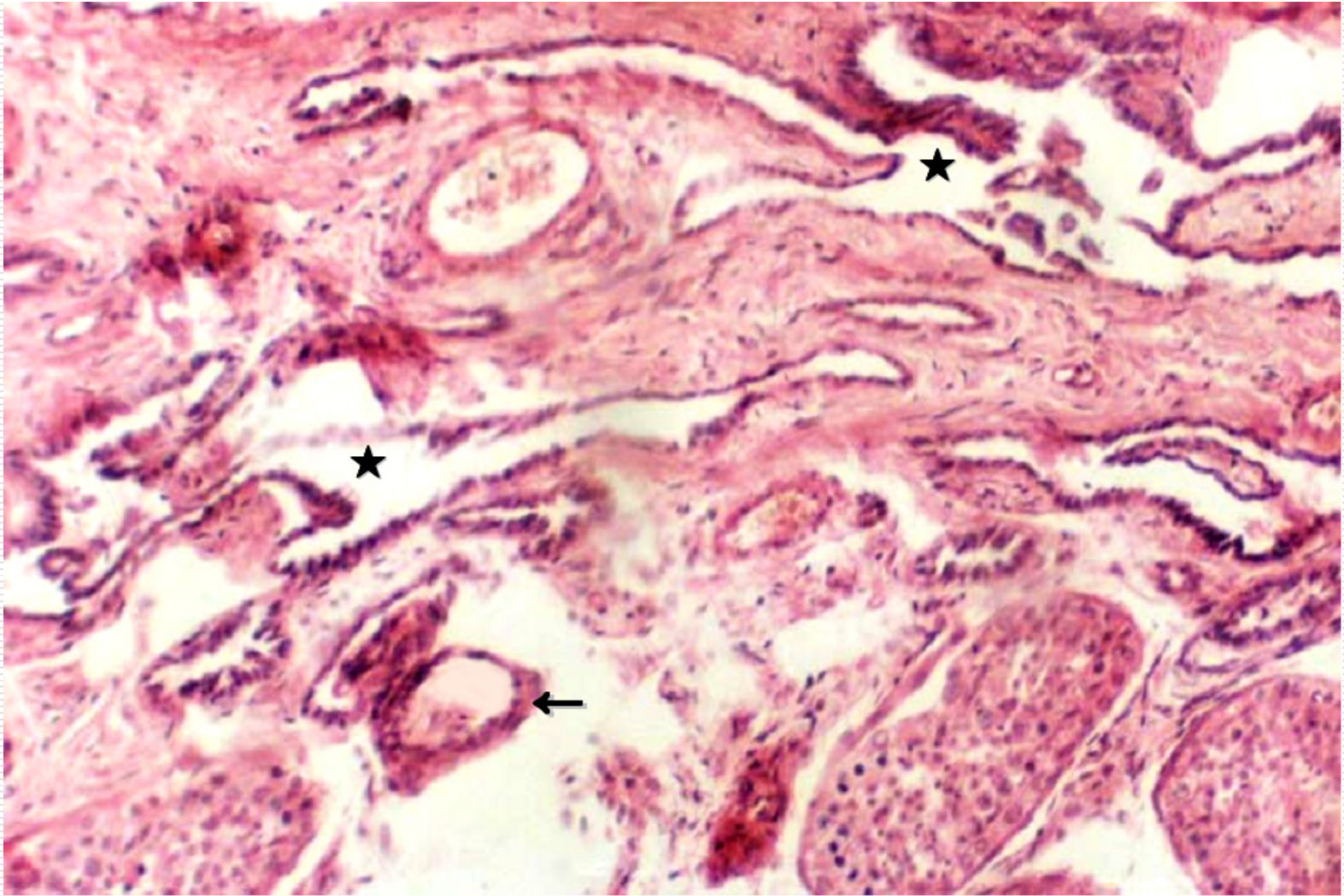
Testis & Epididymis



Intratesticular genital ducts

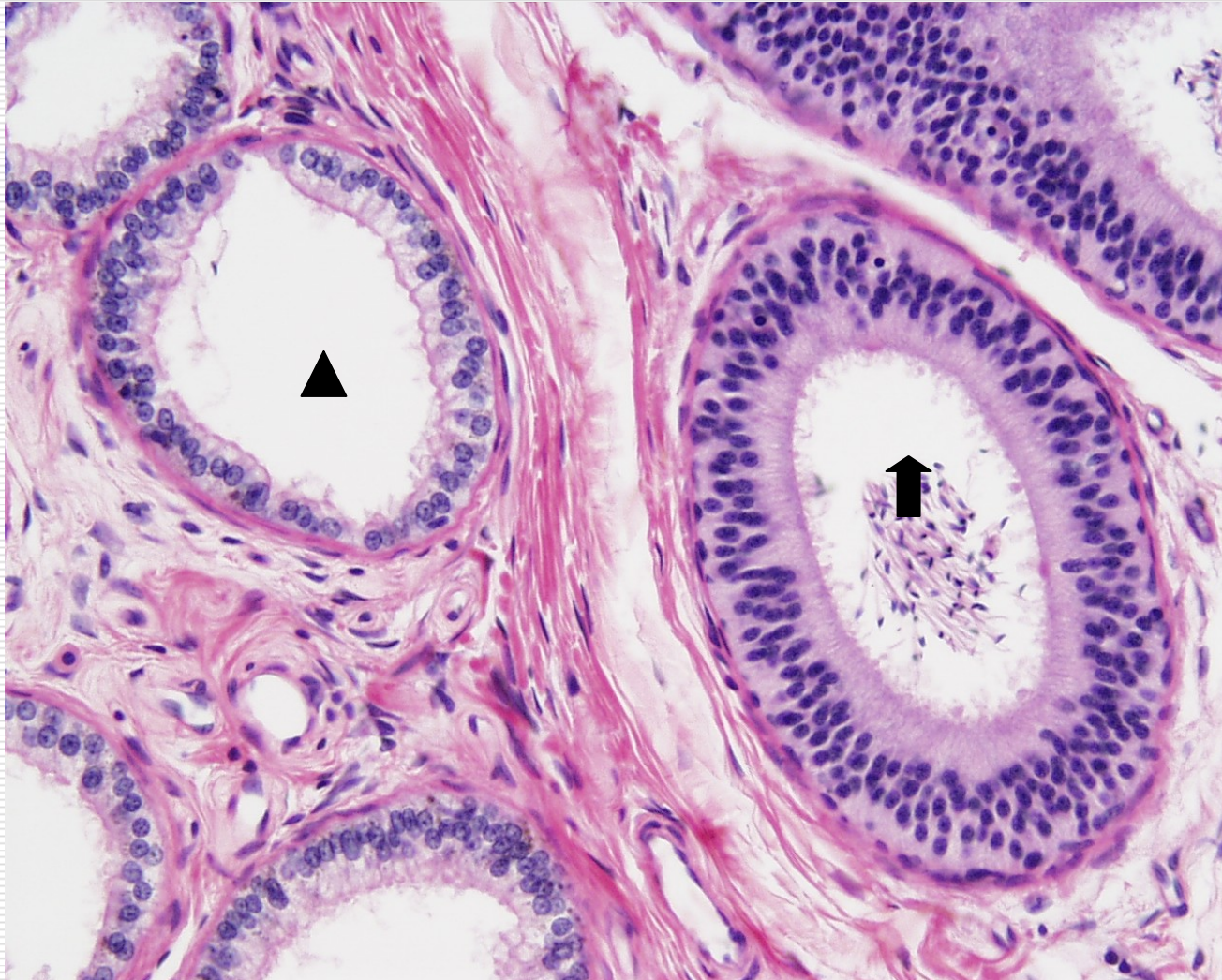


Straight tubules & rete testis



↑ Straight tubules ★ Rete testis

Ductuli efferents & Ductus epididymis

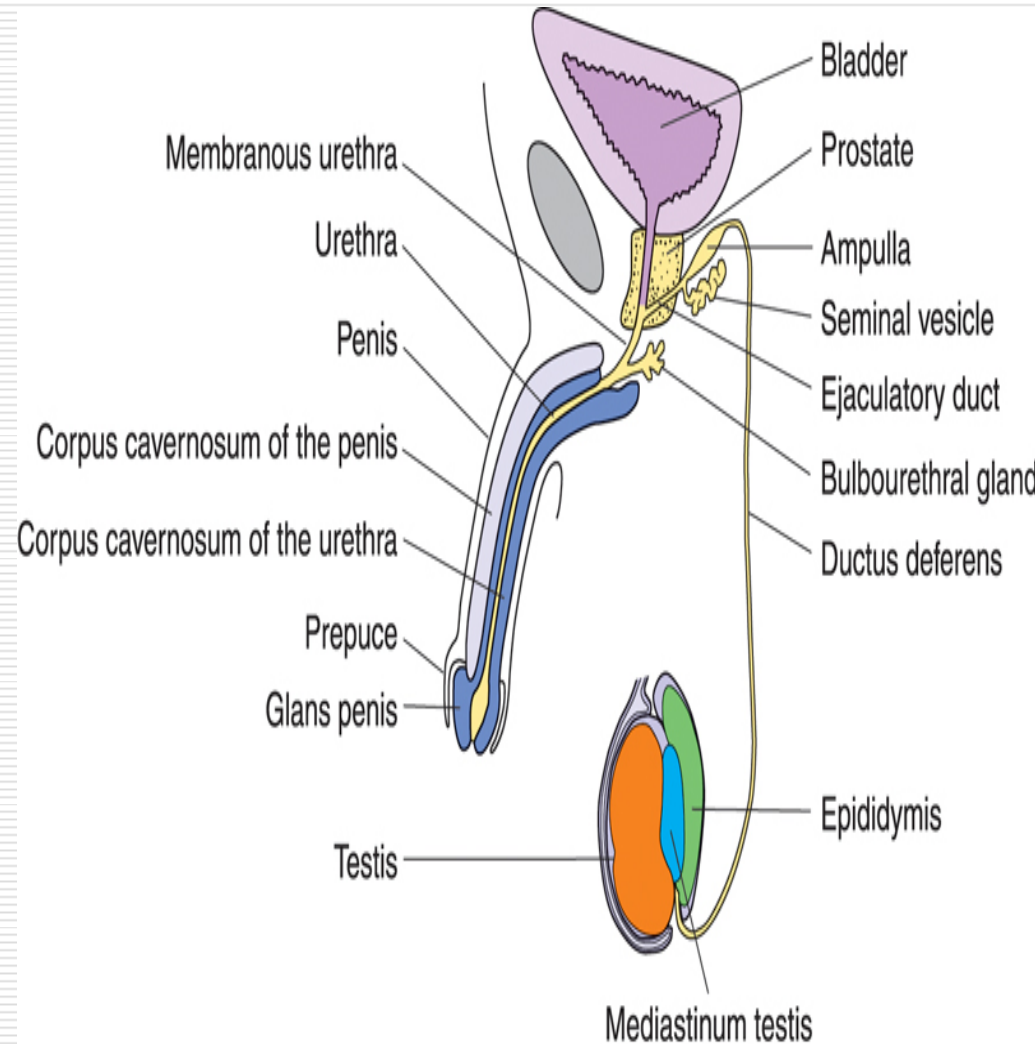


▲ Ductuli efferent

↑ Ductus epididymis

Structural components

- ❖ I .Testes
- ❖ II .Genital ducts
 - ❖ 1.Epididymis
 - ❖ 2.Ductus deferens
 - ❖ 3.Ejaculatory ducts
 - ❖ 4.Urethra
- ❖ III.Accessory sex glands
 - ❖ 1.Seminal vesicles
 - ❖ 2.Prostate
 - ❖ 3.Bulbourethral glands
- ❖ IV.Penis



1. Epididymis

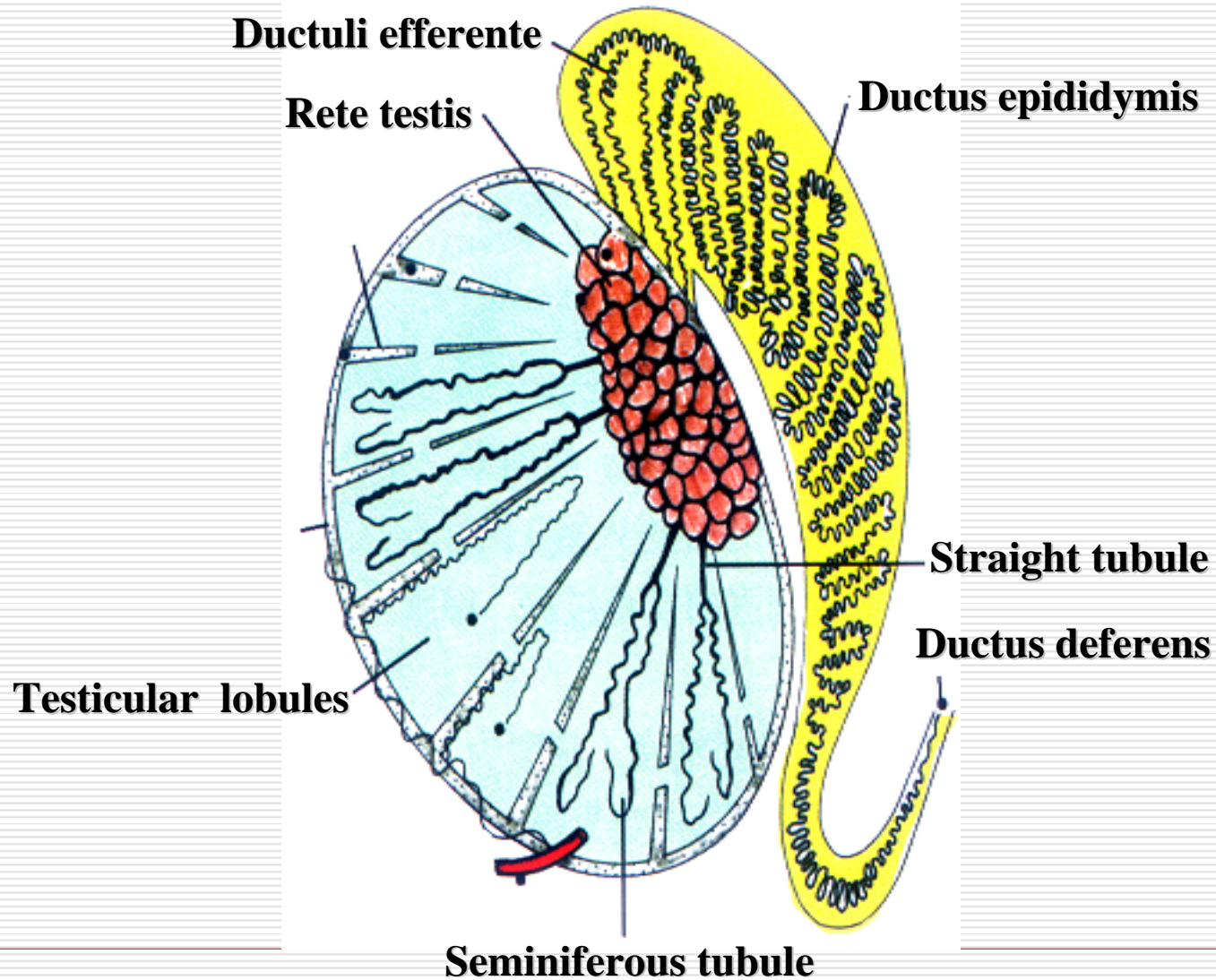
❖ Structure

- ❖ **Head: single ductus epididymis**
- ❖ **Body and tail :convolutions of the ductus epididymis**
- ❖ **Pseudostratified columnar epithelium**
 - ❖ **Principal cells and basal cells**

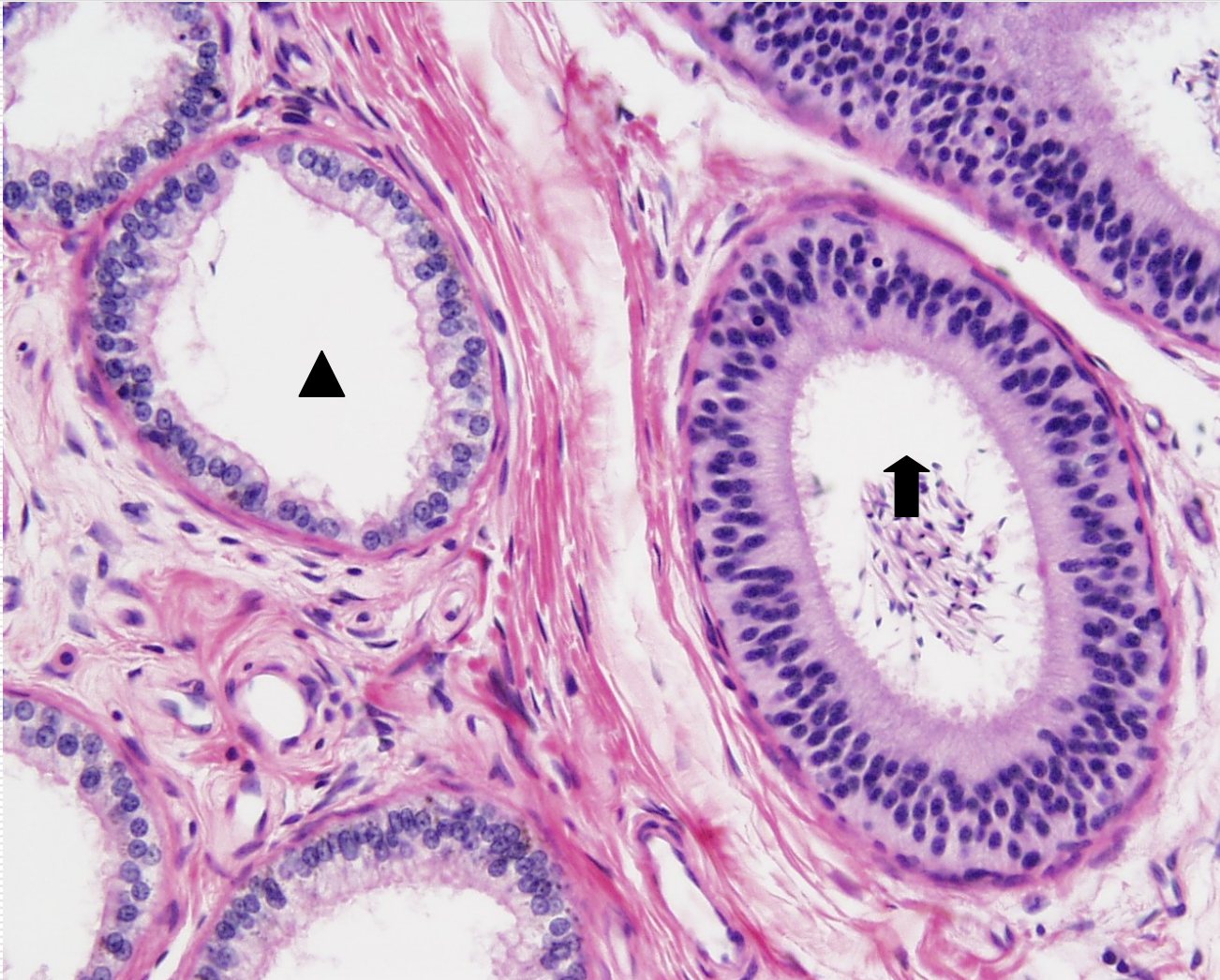
❖ **Functions**

- ❖ **Absorbs the fluid that leaves the testis;**
 - ❖ **Secretes glyceryl phosphorylcholine, sialic acid, glycoproteins and steroids;**
 - ❖ **Serves as a storage place for mature sperm.**
-

Testis & Epididymis



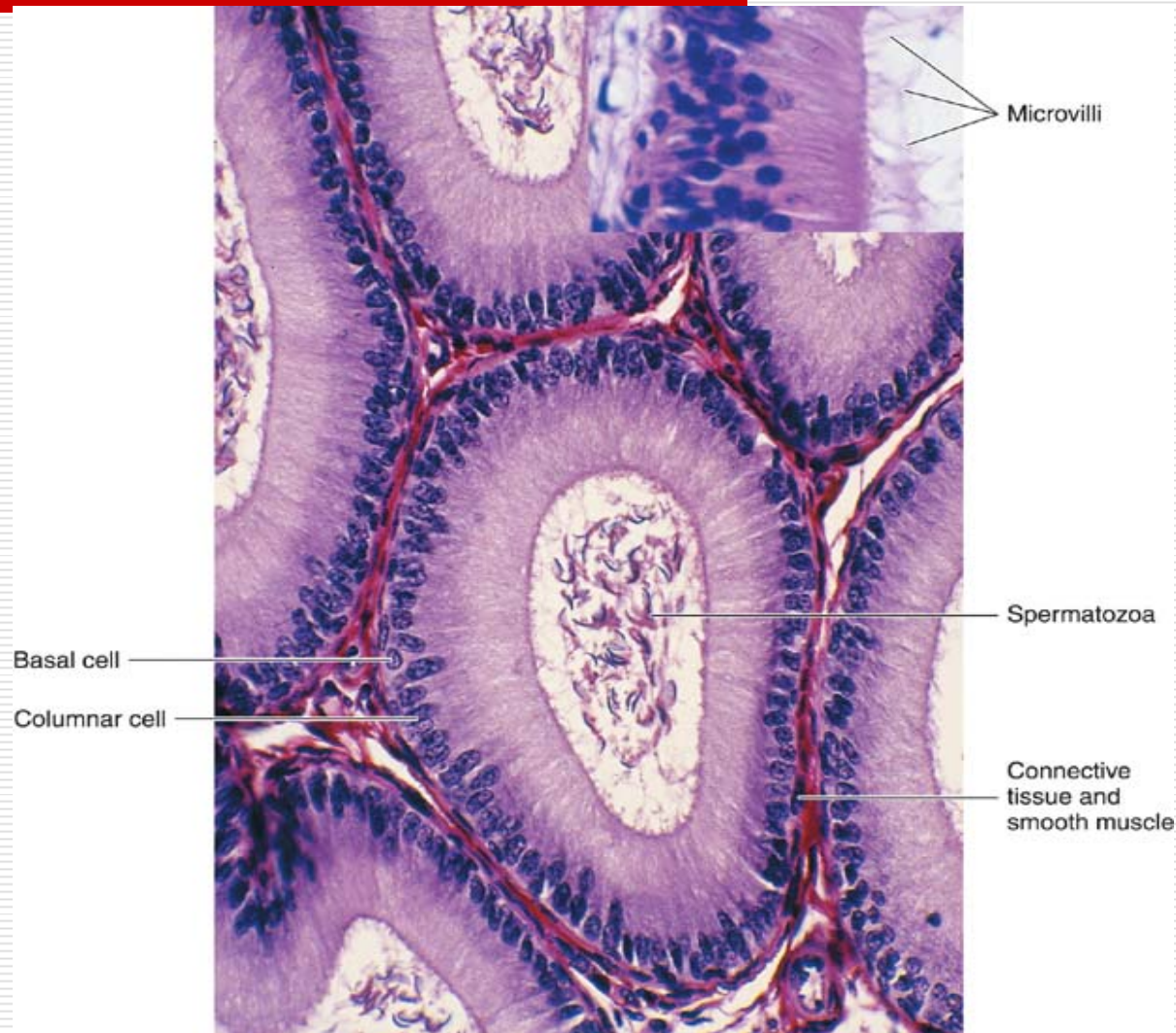
Ductuli efferents & Ductus epididymis



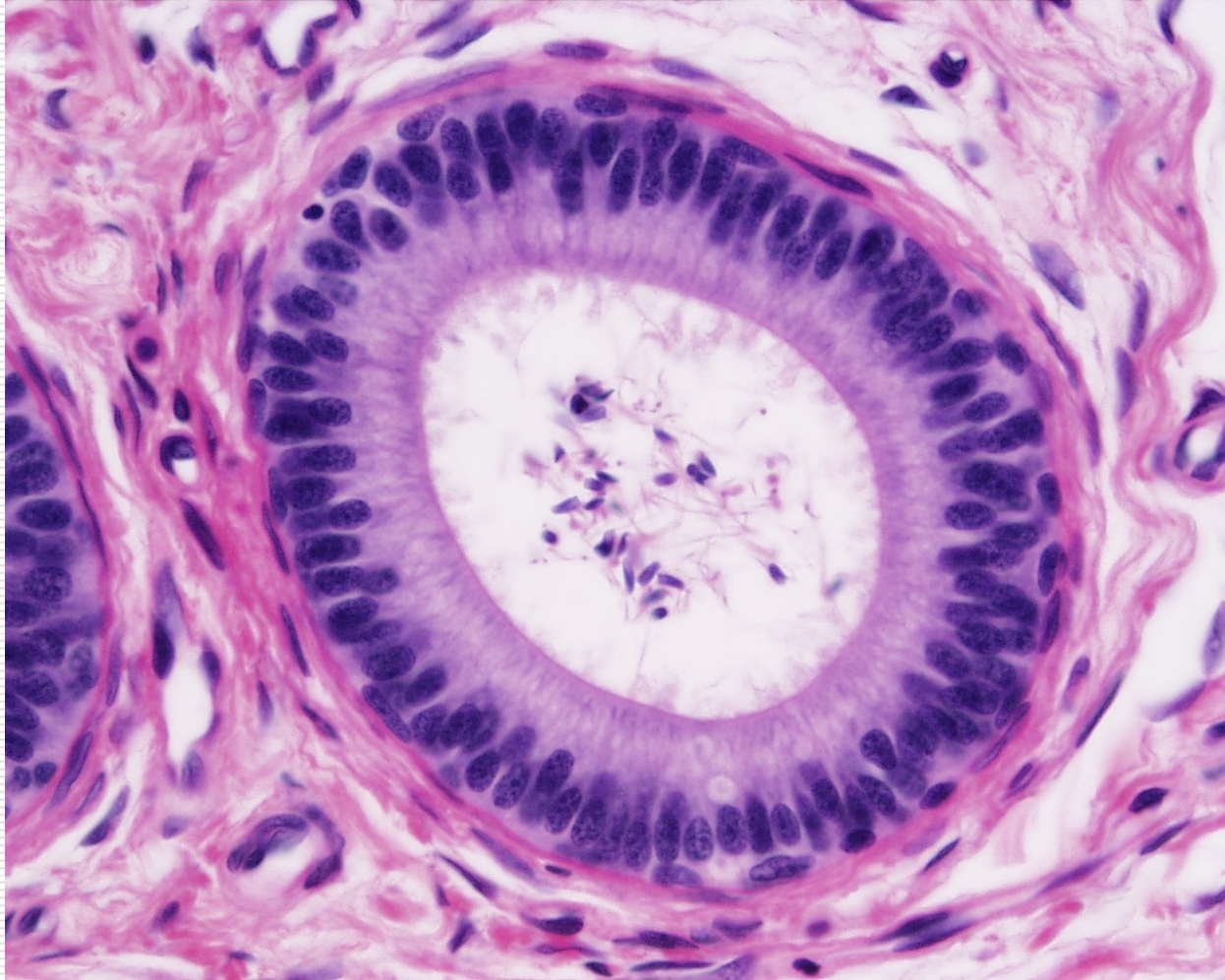
▲ Ductuli efferent

↑ Ductus epididymis

Ductus epididymis

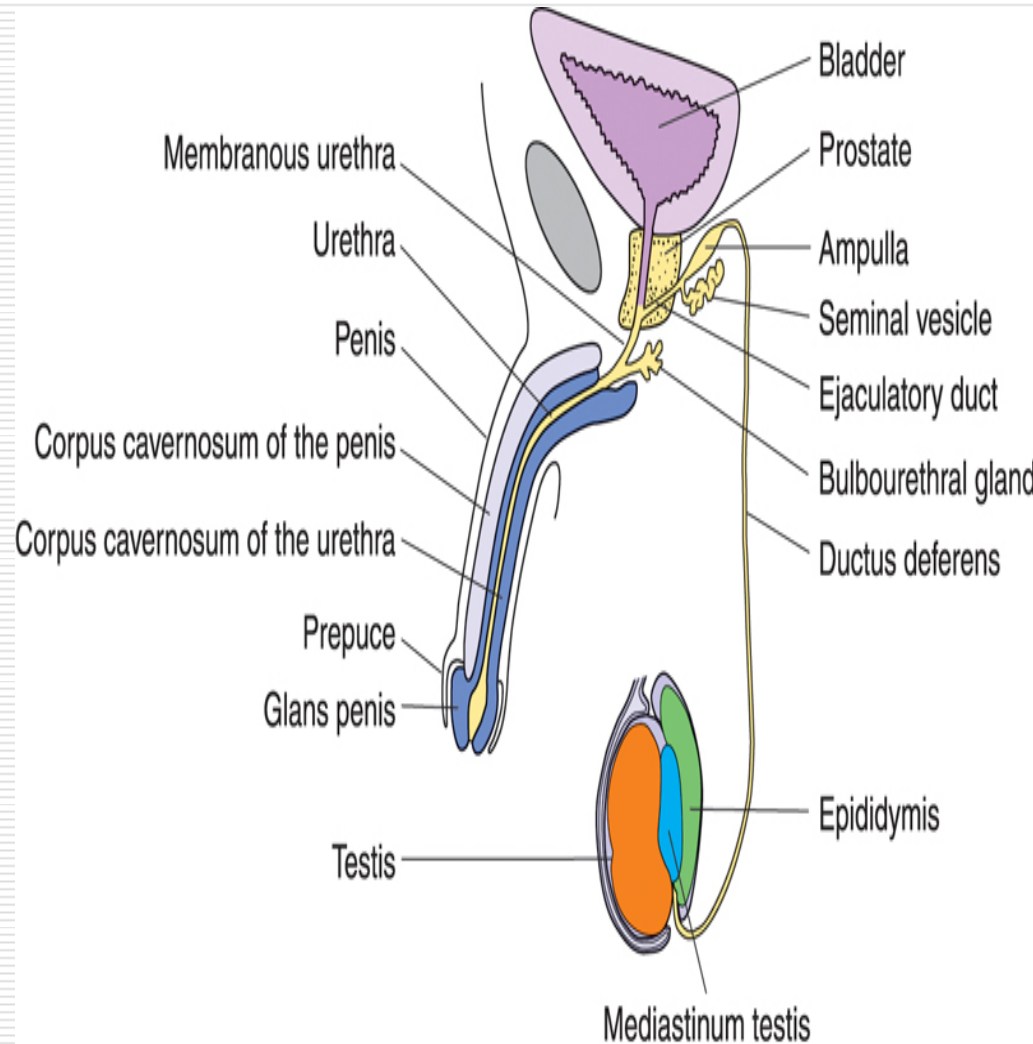


Ductus epididymis



Structural components

- ❖ I .Testes
- ❖ II .Genital ducts
 - ❖ 1.Epididymis
 - ❖ 2.Ductus deferens
 - ❖ 3.Ejaculatory ducts
 - ❖ 4.Urethra
- ❖ III.Accessory sex glands
 - ❖ 1.Seminal vesicles
 - ❖ 2.Prostate
 - ❖ 3.Bulbourethral glands
- ❖ IV.Penis



2. Ductus deferens

❖ Mucosa

- ❖ Pseudostratified columnar epithelium
- ❖ lamina propria : rich in elastic fibers

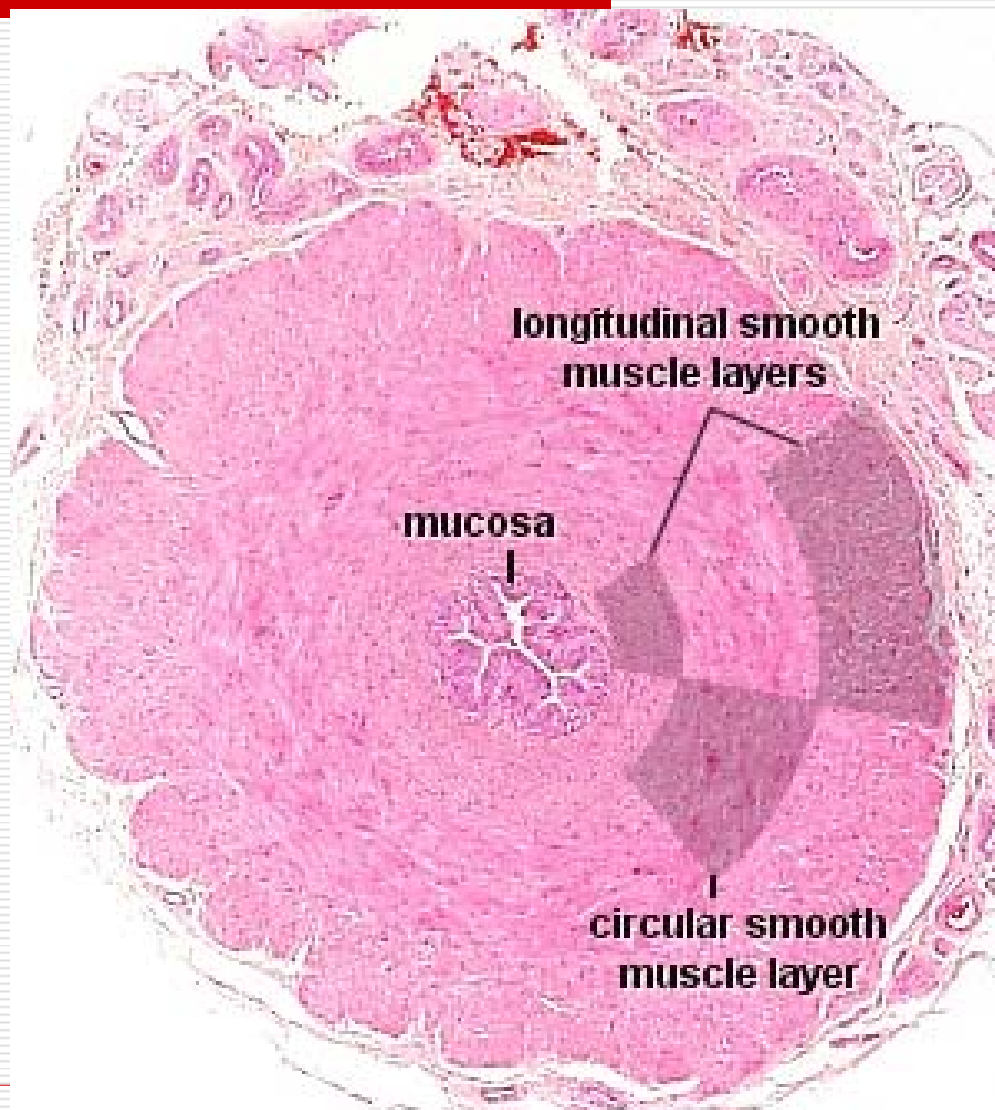
❖ Muscularis

- ❖ Inner longitudinal layers
- ❖ Middle circular layer
- ❖ Outer longitudinal layers

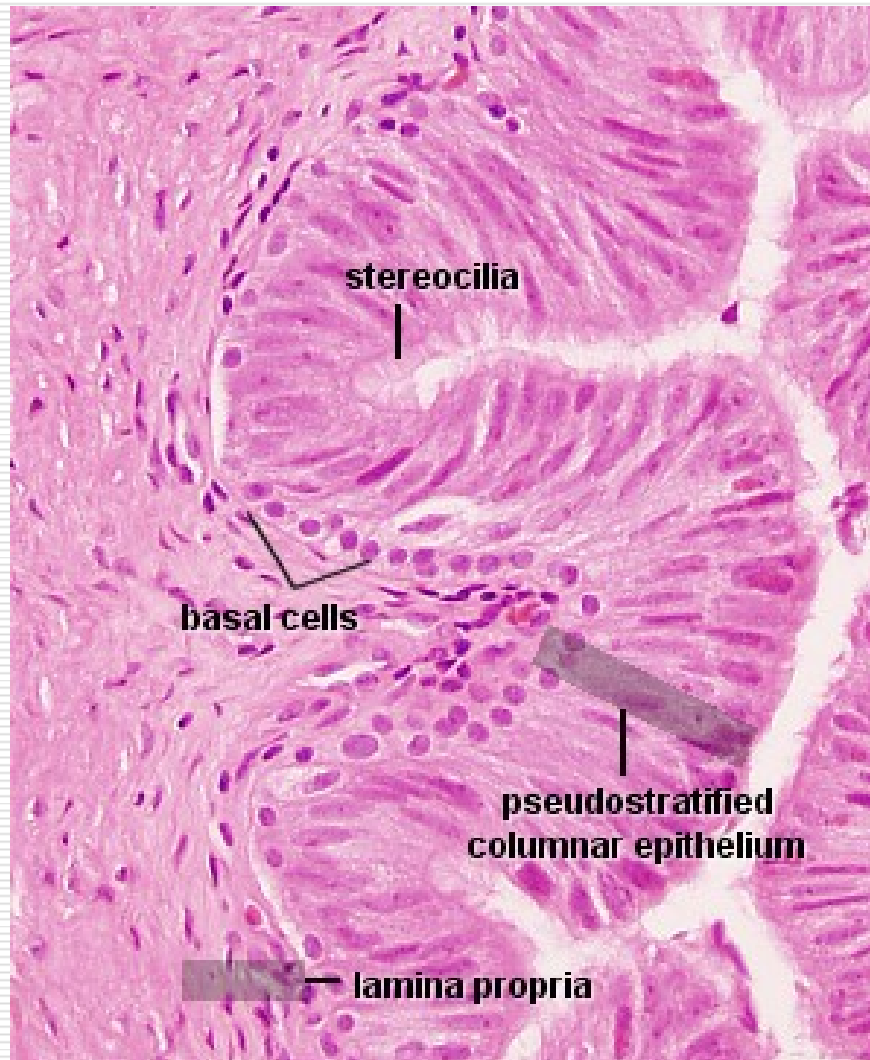
❖ Adventitia

- ❖ Dense connective tissue
-

Ductus deferens

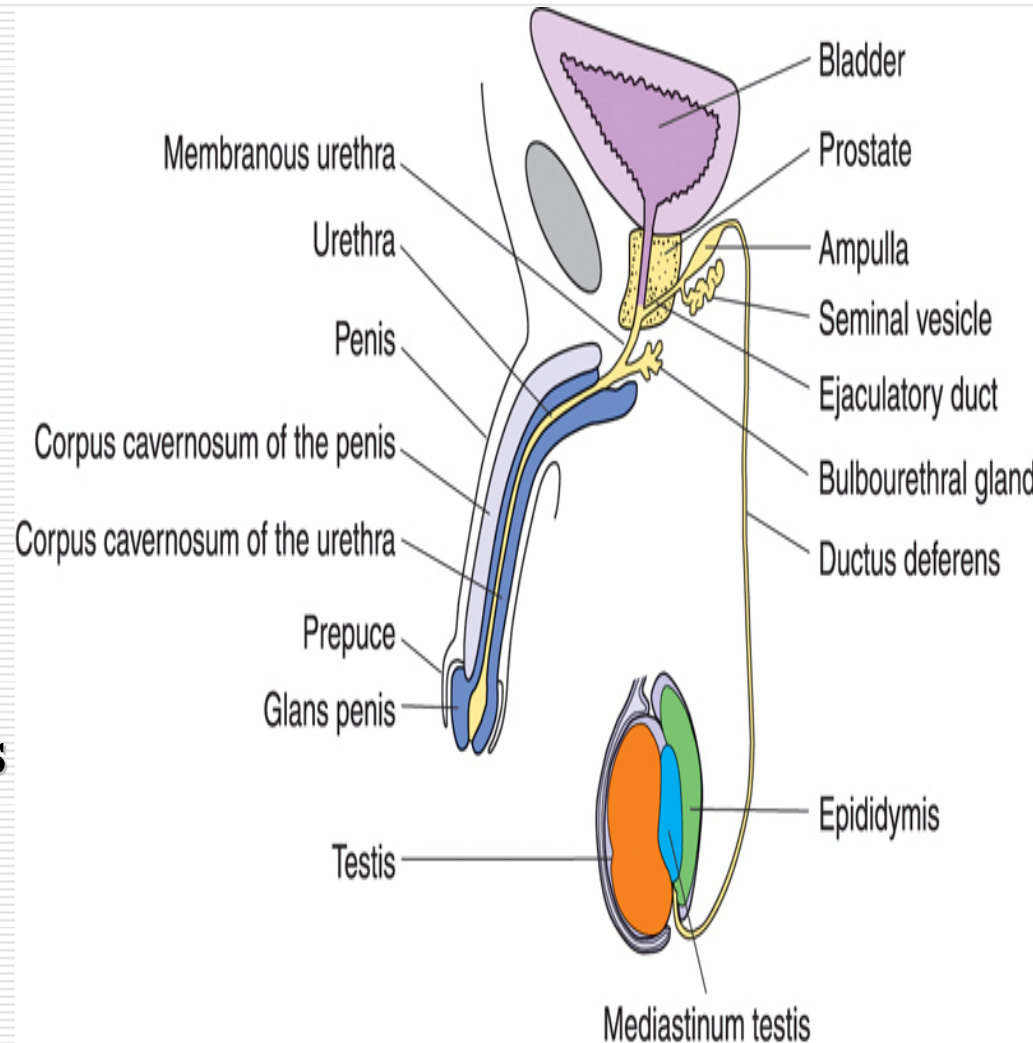


Ductus deferens



Structural components

- ❖ I .Testes
- ❖ II .Genital ducts
 - ❖ 1.Epididymis
 - ❖ 2.Ductus deferens
 - ❖ 3.Ejaculatory ducts
 - ❖ 4.Urethra
- ❖ III.Accessory sex glands
 - ❖ 1.Seminal vesicles
 - ❖ 2.Prostate
 - ❖ 3.Bulbourethral glands
- ❖ IV.Penis



Prostate

❖ Structure

❖ Capsule

❖ Parenchyma

❖ 30 ~ 50 compound tubuloalveolar glands

❖ Innermost zone : mucosal glands

❖ Middle zone : submucosal glands

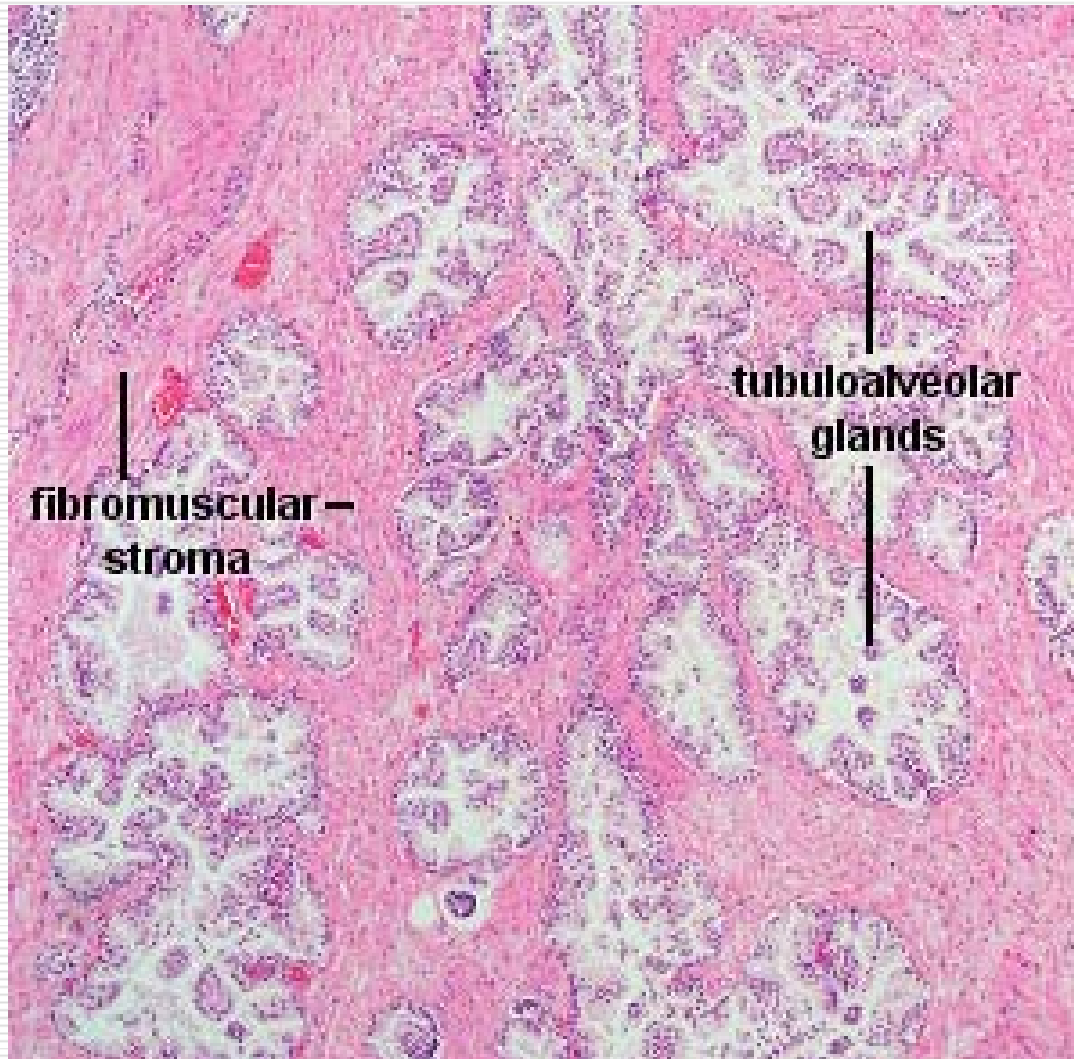
❖ Peripheral zone : main glands

❖ Corpora amylacea (prostatic concretions)

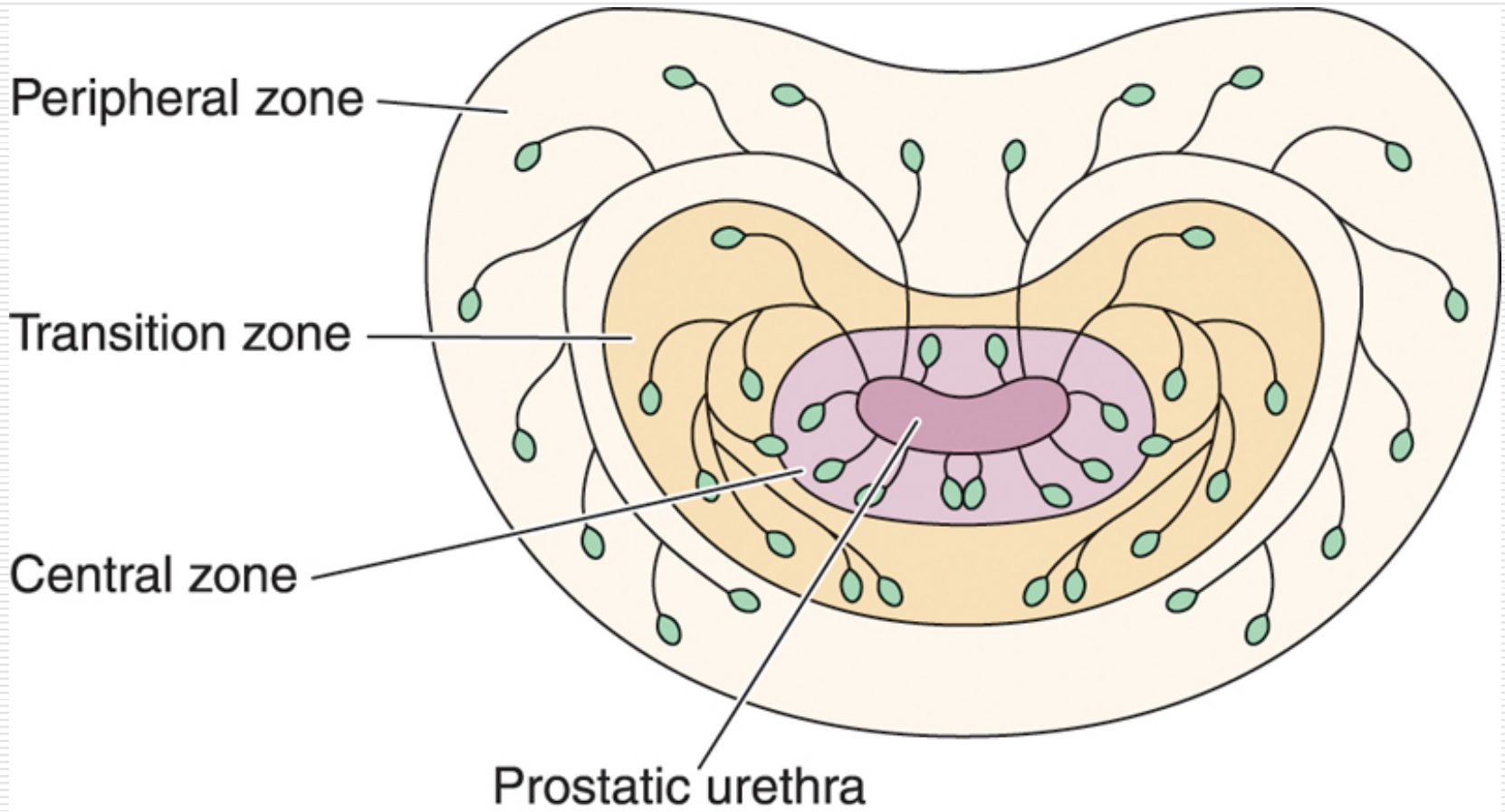
❖ Functions

❖ Secrets faintly acid fluid which contains citric acid, proteolytic enzymes, fibrinolysin, acid phosphatase and lipids and makes up the bulk of the seminal fluid

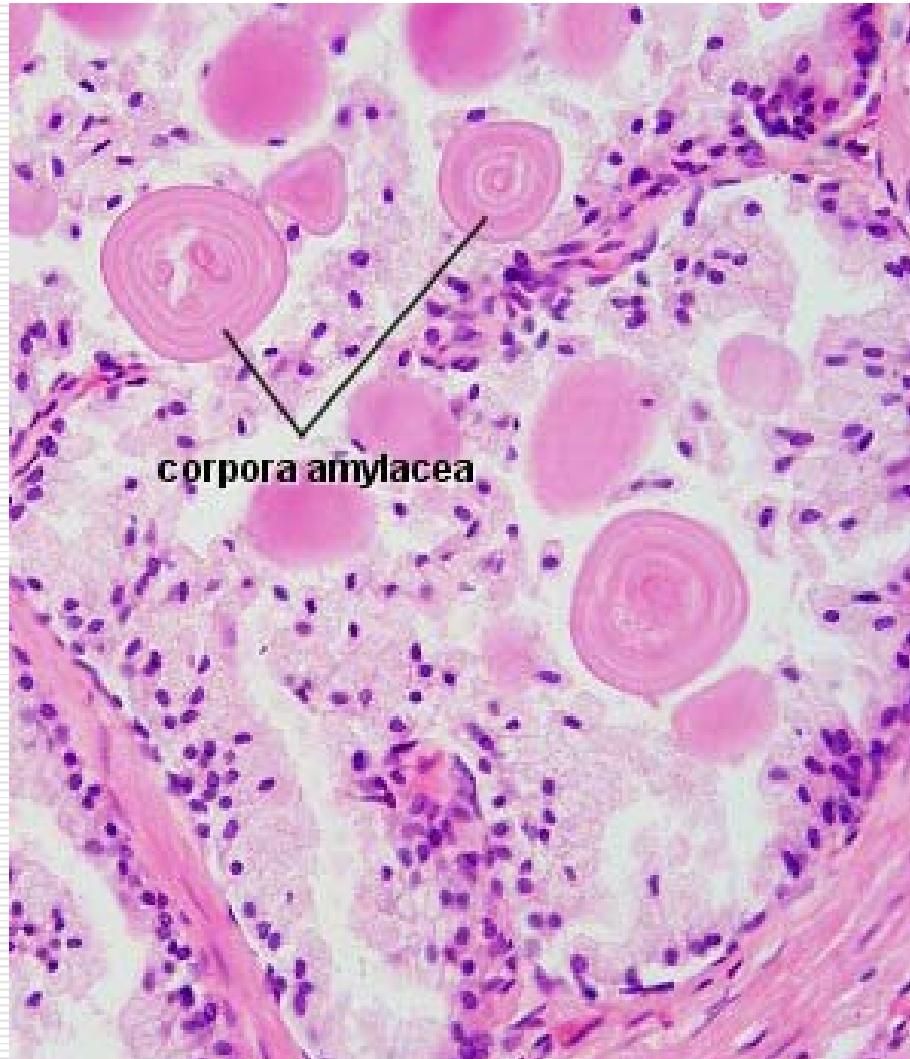
Prostate



Prostate



Corpora amylacea (prostatic concretions)



Requirements

- ❖ **Understand the general structure of testis and epididymis.**
 - ❖ **Master the structure of seminiferous tubule, the process of spermatogenesis, the structure and functions of Sertoli cell and Leydig cell.**
 - ❖ **Understand the structure and functions of epididymis.**
 - ❖ **Understand the structure and functions of prostate.**
-

Requirements

Understand the structure and functions of eyeball wall and refractive assembly, circulatory passages of aqueous humor.

Master the structure and functions of crista ampullaris, maculae staticae and spiral organ.
