

# **MICROSCOPIC STRUCTURE OF THE MALE REPRODUCTIVE SYSTEM**

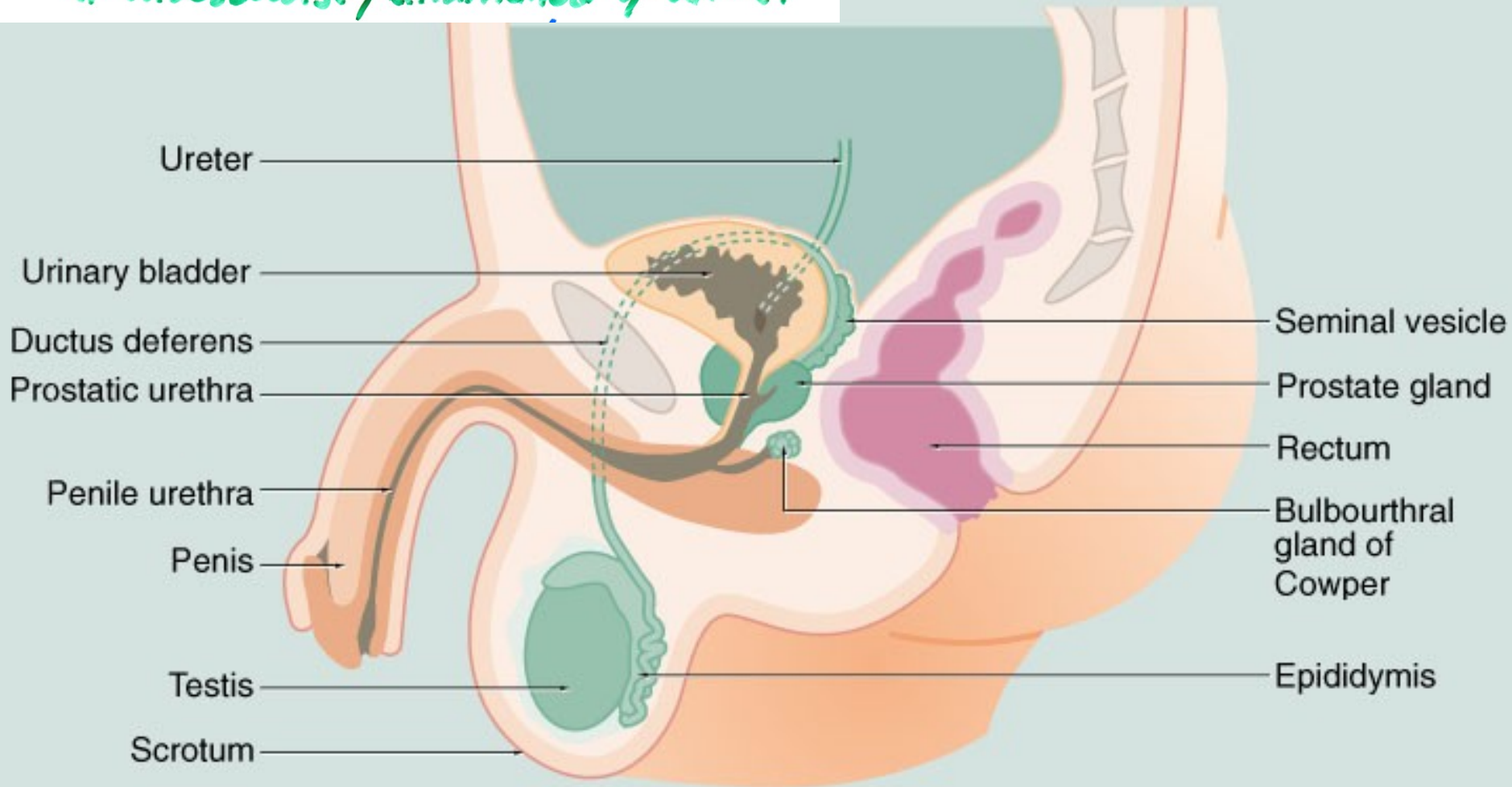
**Testis, excretory genital ducts, accessory genital glands, and penis**

**Spermato- and spermiogenesis**

**Composition of the sperm (ejaculate)**

# TESTES, GENITAL DUCTS, ACCESSORY GLANDS, PENIS

Functions: production of gametes, production of fluid medium for gametes, production of male sex hormones, sexual intercourse, elimination of urine.



## Microscopic anatomy of testes

paired organ located in the scrotum

the tunica albuginea = capsule of dense collagenous tissue

the mediastinum testis - fibrous septa penetrate the gland and divide it into about 250 pyramidal compartments - testicular lobules

testicular lobule - 1-4 seminiferous tubules enmeshed in a web of loose connective tissue - interstitial tissue with interstitial = LEYDIG cells

the seminiferous tubule - 150 - 200  $\mu\text{m}$  in d.  
30 - 70 cm long

250 m  
straight tubules = tubuli recti

rete testis = labyrinth of channels in the mediastinum testis

# Testis

Greek - **orchis**

**tunica albuginea**

mediastinum testis

**septula testis**

**lobuli testis**

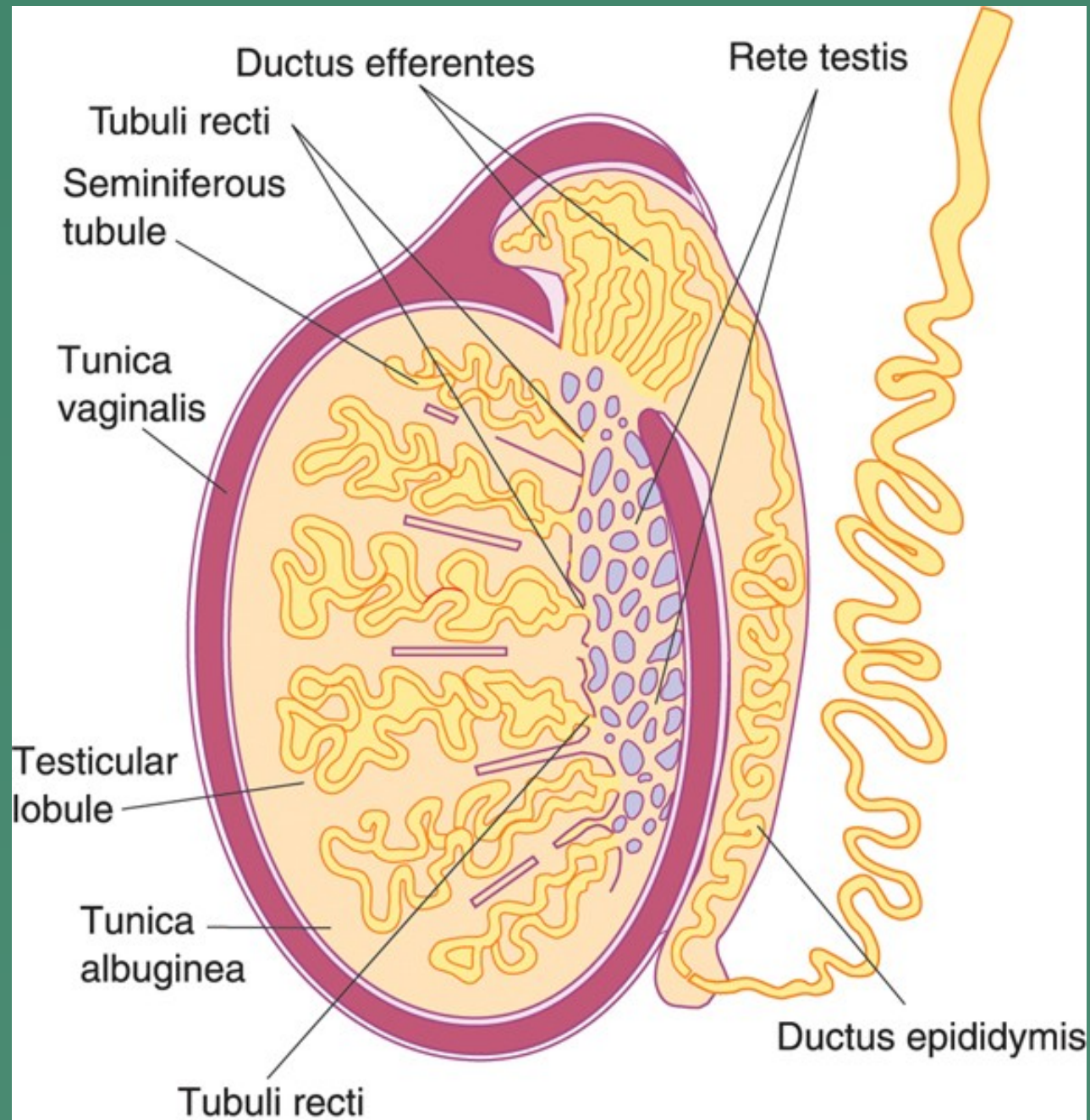
**200 – 250**

**2-4 seminiferous  
tubules +**

**interstitial tissue**

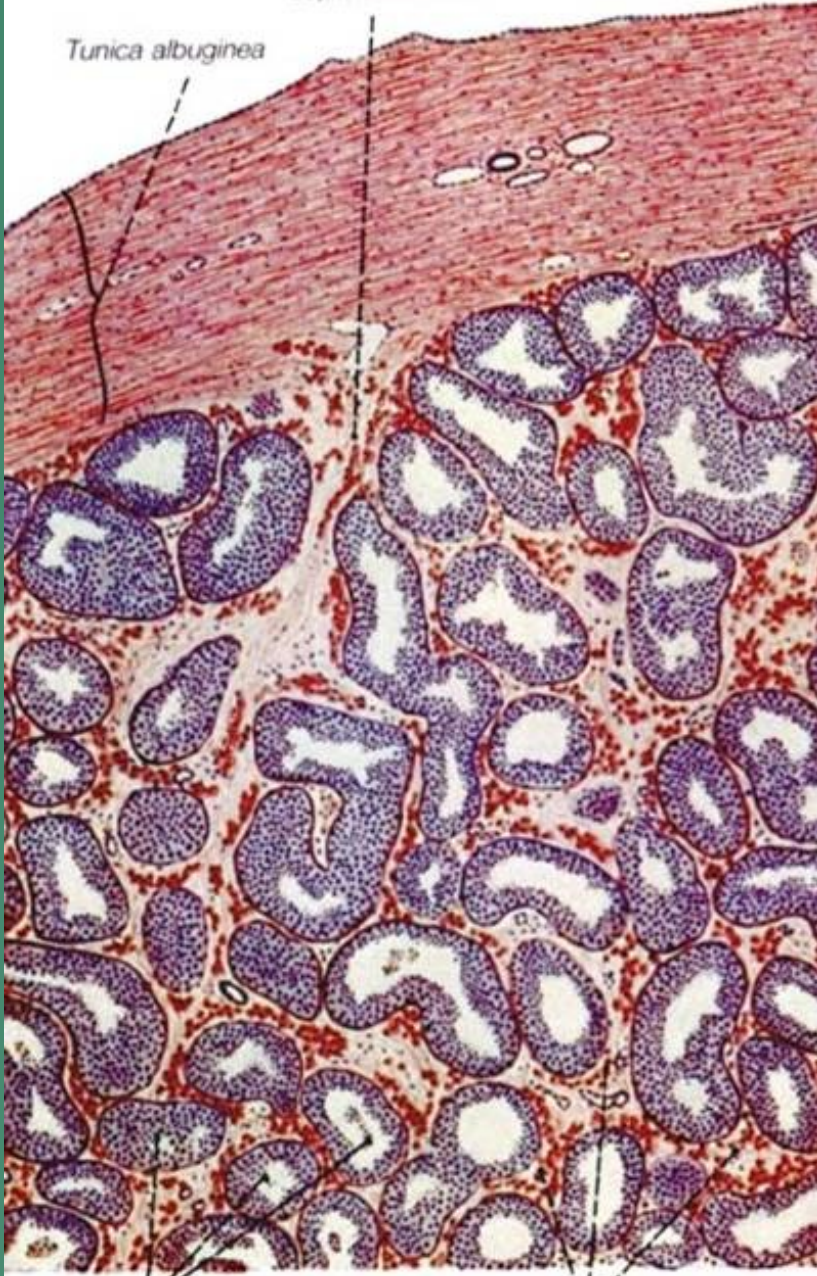
**with LEYDIG's cells**

**scrotum**



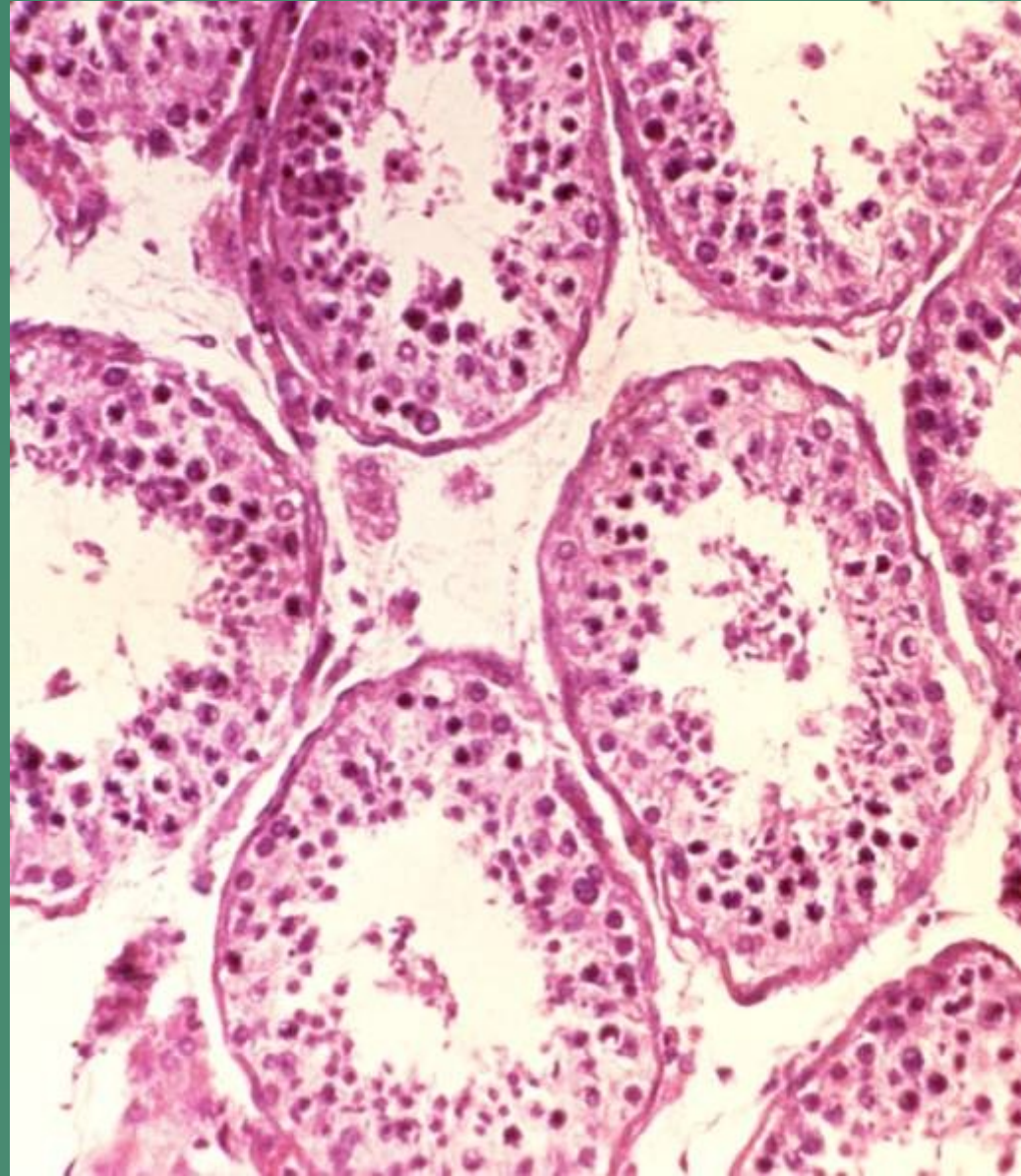
Septulum testis

Tunica albuginea



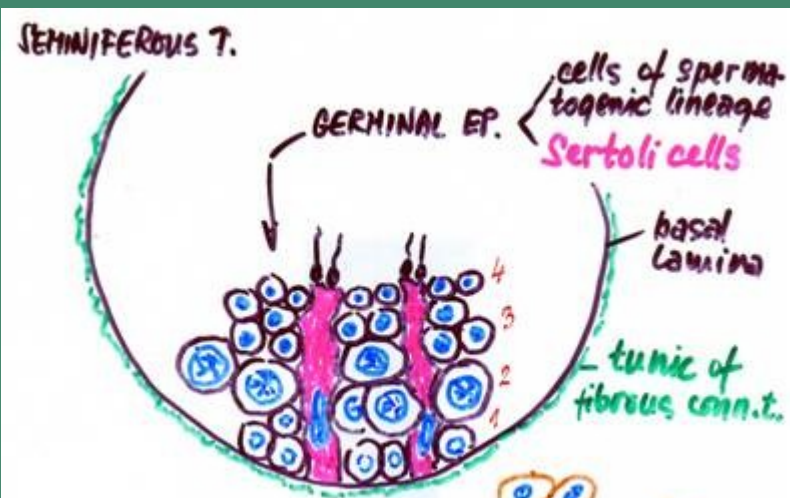
Seminiferous tubules

Interstitial tissue with Leydig cells (stained red)



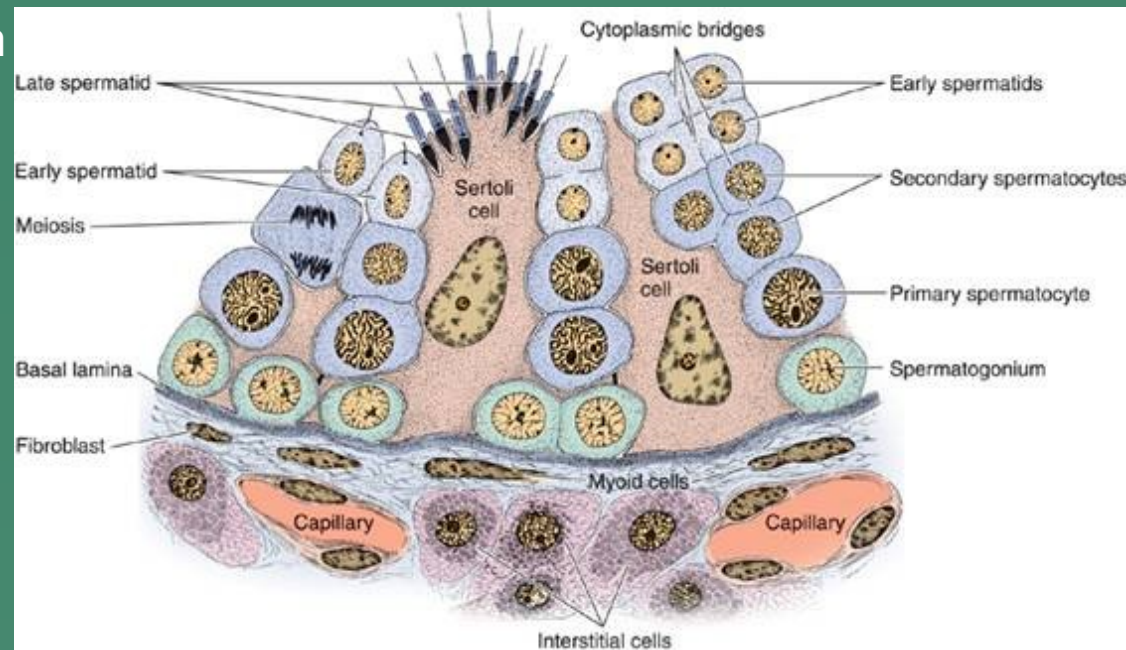
# Seminiferous tubule:

membrana propria, basal lamina and germinal epithelium



Cells of spermatogenic lineage: 4-8 layers, be divided into 4 groups (from the periphery to lumen):

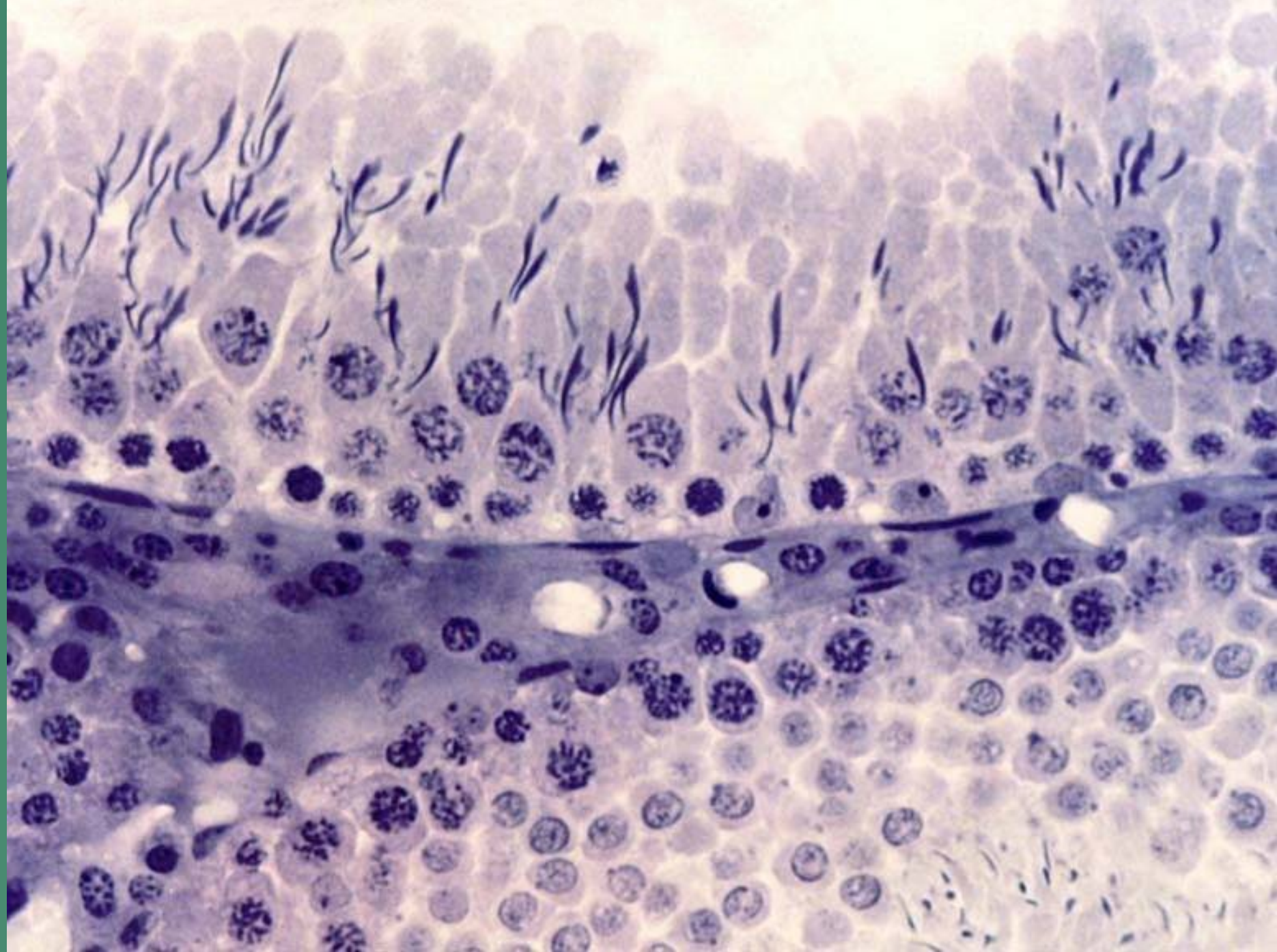
- 1 - spermatogonia (primitive germ cells) - 12µm in d., pale nucleus, 2n chromosomes
- 2 - primary spermatocytes - largest (25-30µm), chromosomes are visible (coiling process) 2n (prophase of the first meiotic div.)
- 3 - secondary spermatocytes - 15µm, short-lived cells, n-chromosomes
- 4 - spermatids - 6-8µm, near apices of Sertoli cells → transform into mature spermatozoa



Sertoli cells - elongated, pyramidal, numerous processes, nucleus near basal lamina  
abundant SER, well-developed G.app, mitochondria, lysosomes

function:

- support, protection, and nutritional regulation of developing spermatozoa
- phagocytic f. - break down fragments of spermatid cytoplasm
- secretory f. - fluid for sperm transport
- production of the anti-MÜLLERIAN hormone



**Adluminal compartment (blue)**

Late spermatids

Early spermatids

Sertoli cell

Spermatocyte

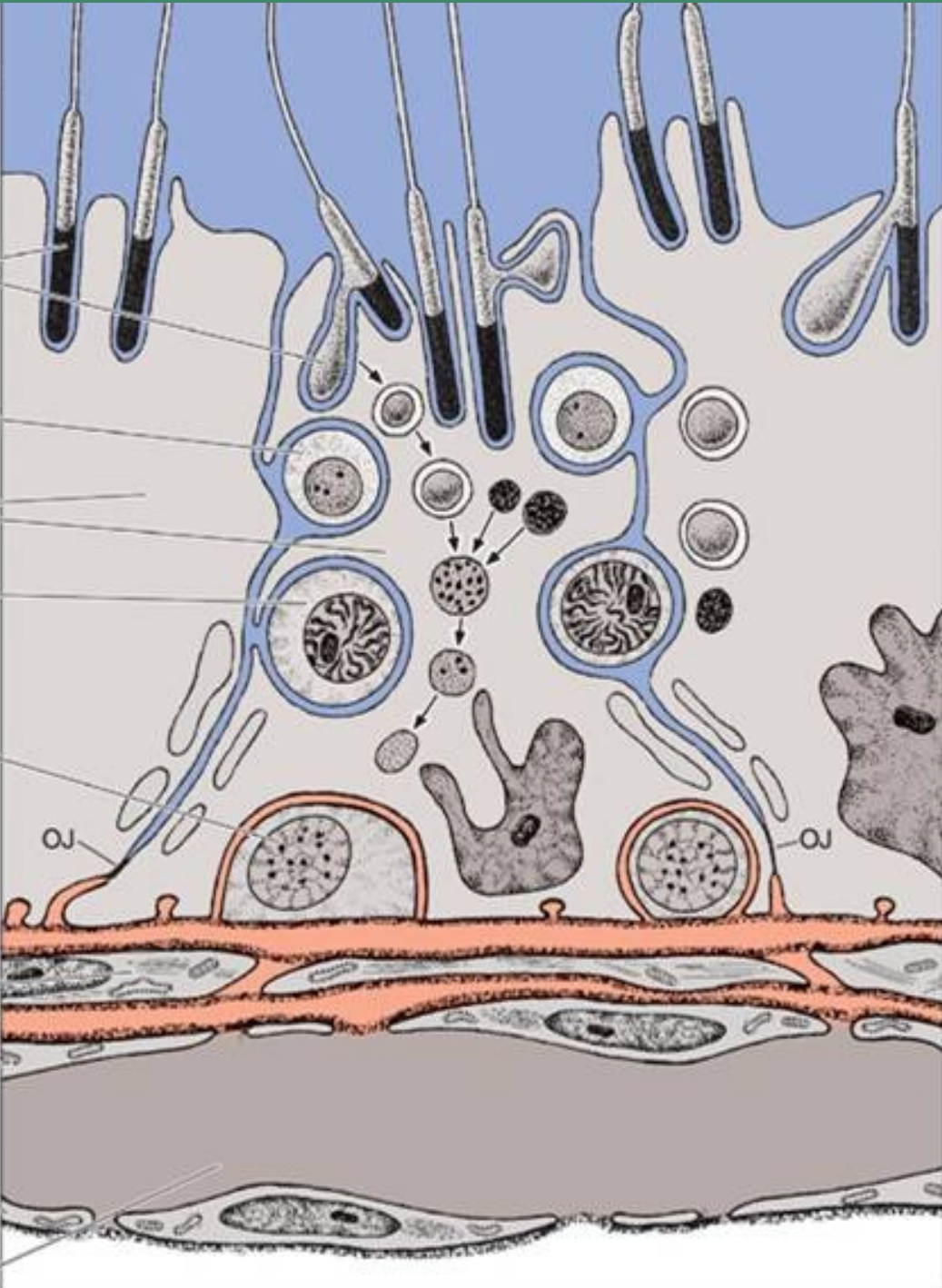
Spermatogonium

**Basal compartment (red)**

Myoid cell

Endothelial cells

Lumen of capillary



**adluminal**

compartment

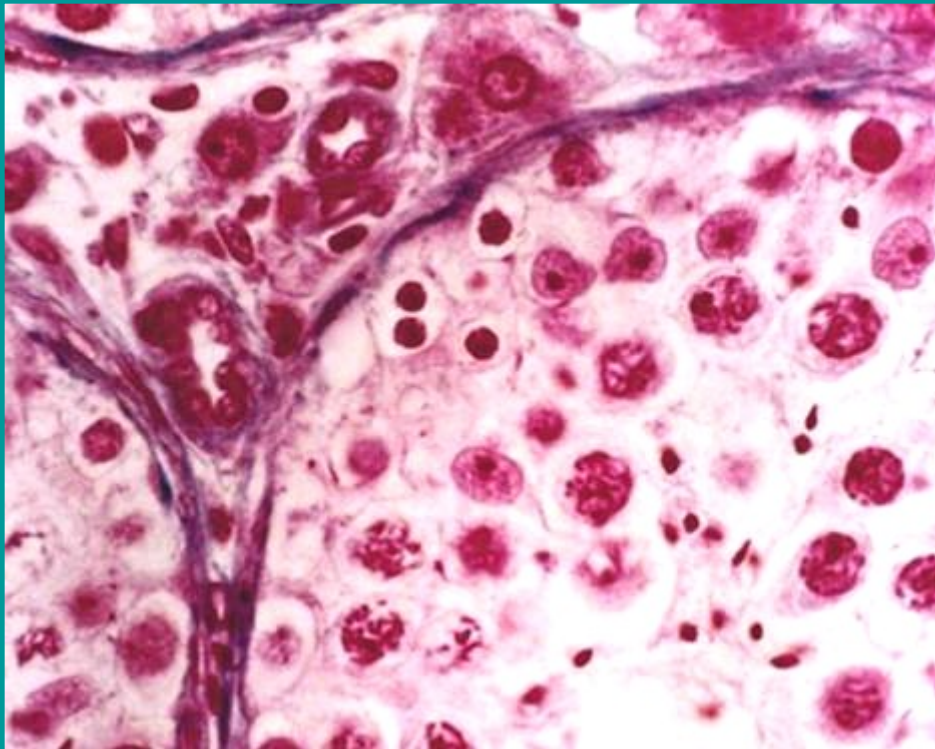
**basal**

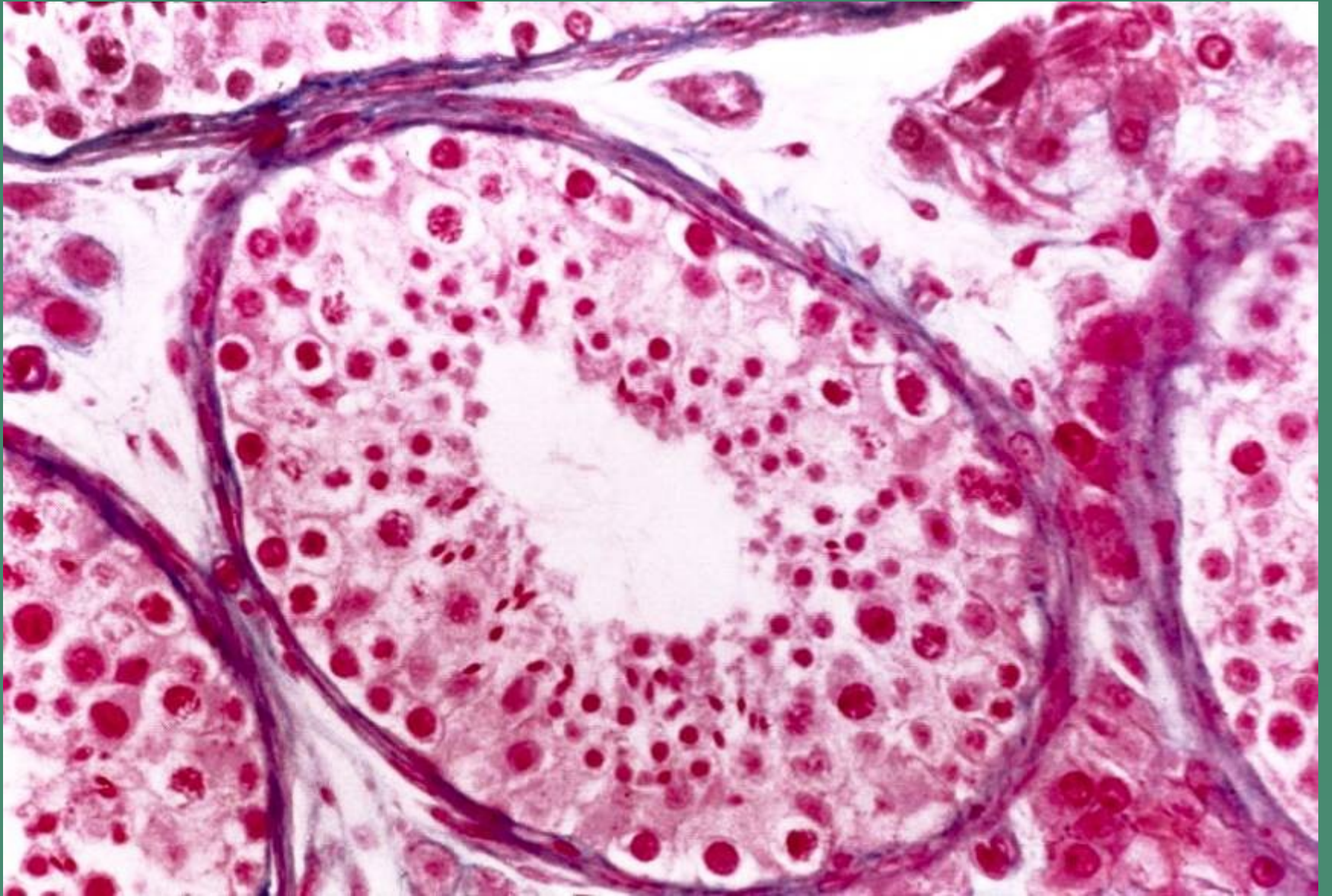


## INTERSTITIAL TISSUE

spaces between the seminiferous tubules, rich in fenestrated blood capillaries, lymph vessels, and nerves

Cells: fibroblasts, undifferentiated mesenchymal cells, mast cells, macrophages, and **INTERSTITIAL LEYDIG cells** (polygonal, eosinophilic cytoplasm, lipid droplets) - **TESTOSTERONE** - development of the secondary male char., accessory glands, and Sertoli cells.



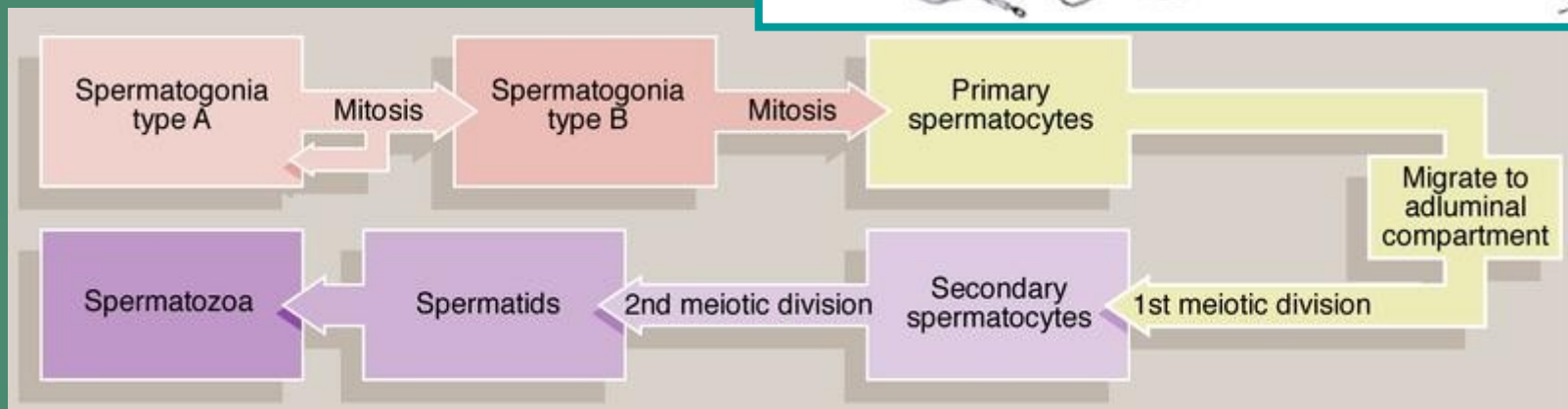
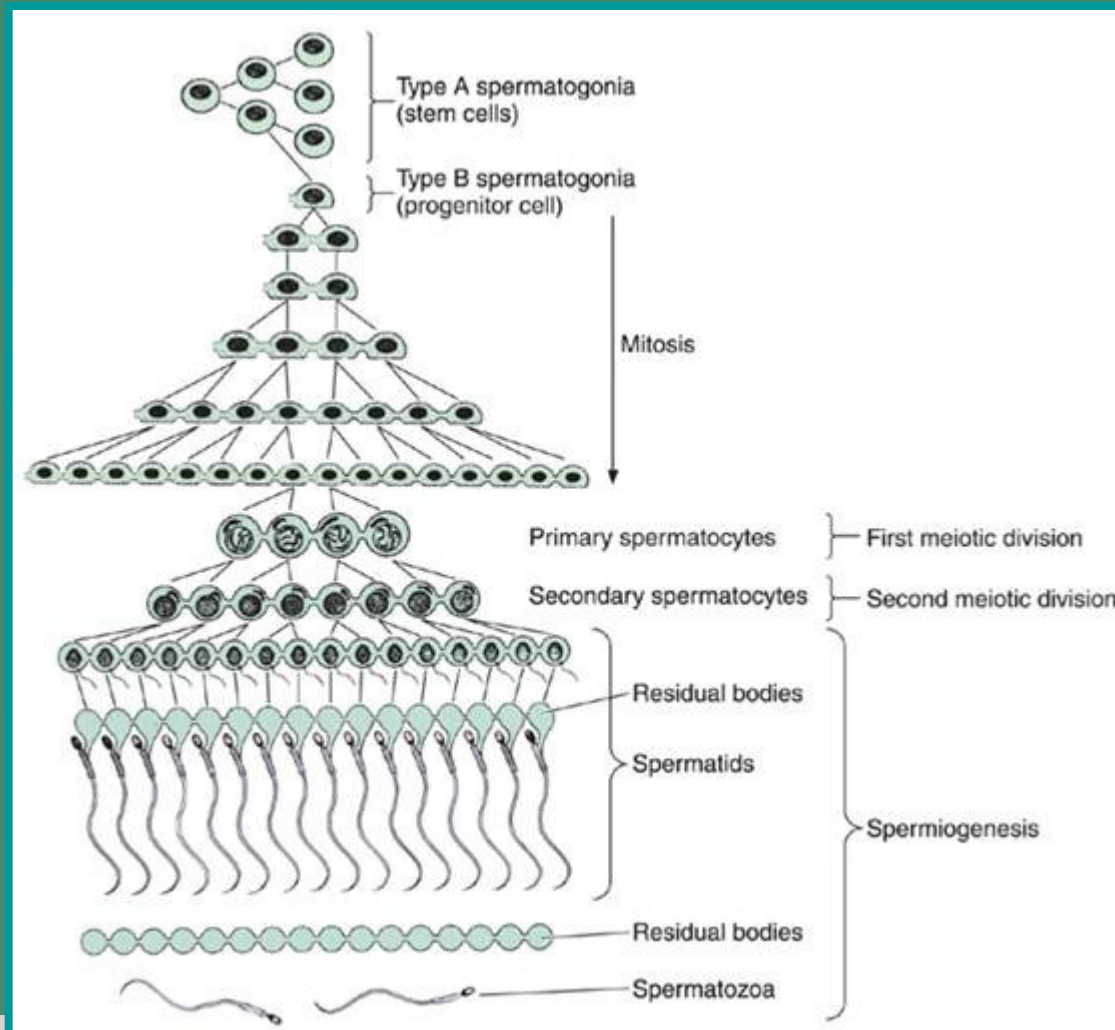


# Spermatogenesis

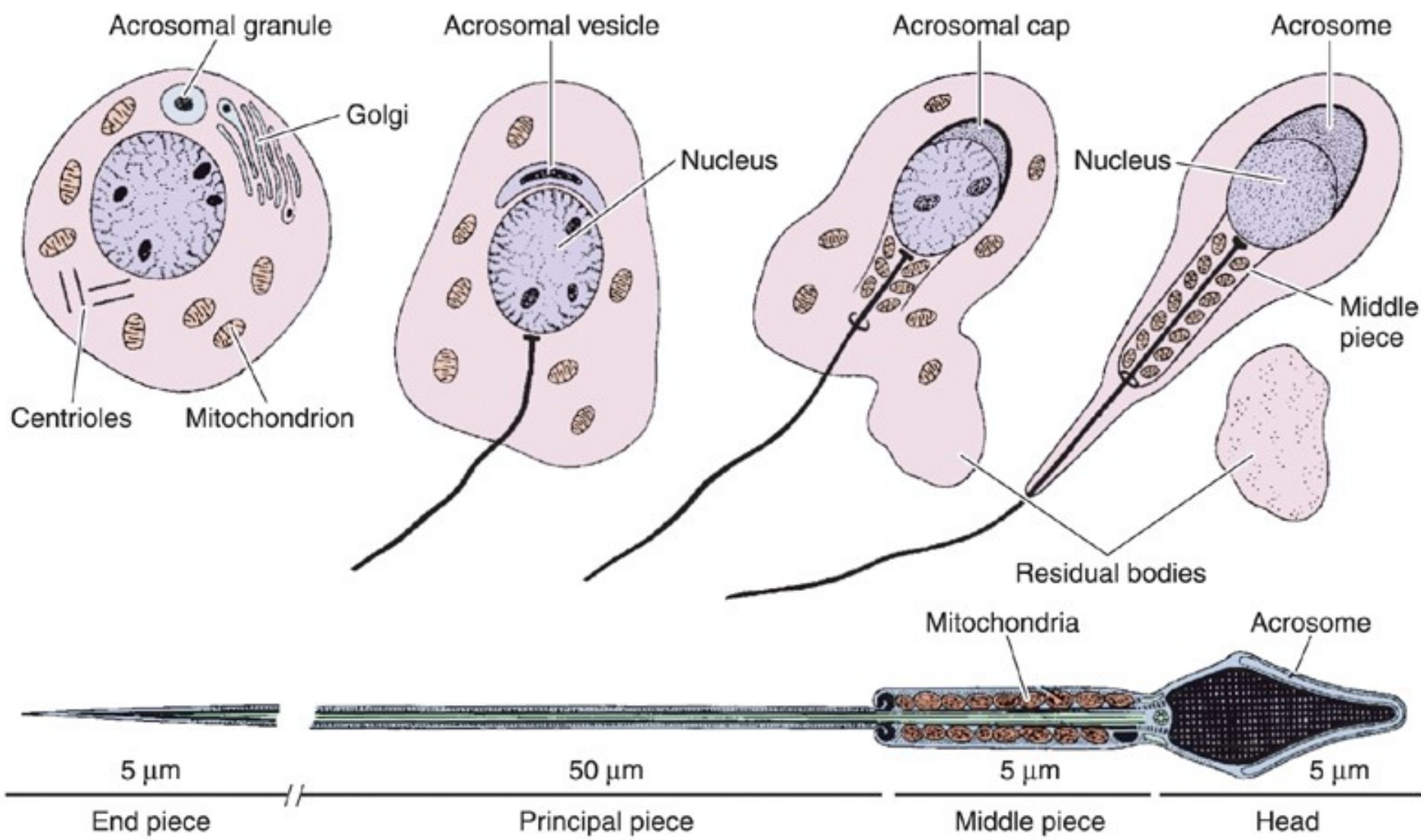
spermatocytogenesis

meiosis

spermiogenesis



# Spermiogenesis





## EXCRETORY GENITAL DUCTS

DUCTULI EFFERENTES (vasa efferentia) } EPIDIDYMIIS

DUCTUS EPIDIDYMIIS

DUCTUS DEFERENS

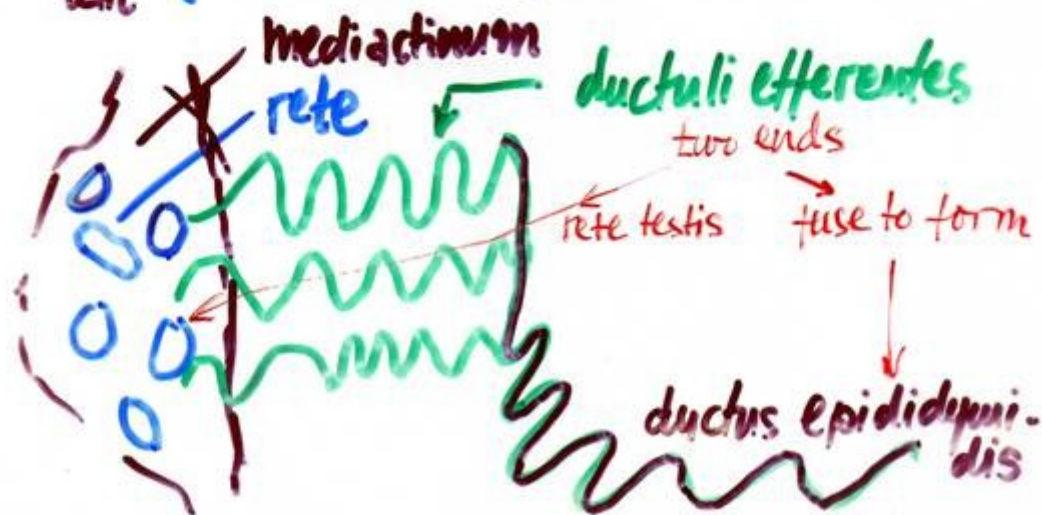
DUCTUS EJACULATORIUS (ejaculatory duct)

a part <sup>of</sup> URETHRA (prostatic, membranous,  
and cavernous)

### Epididymis

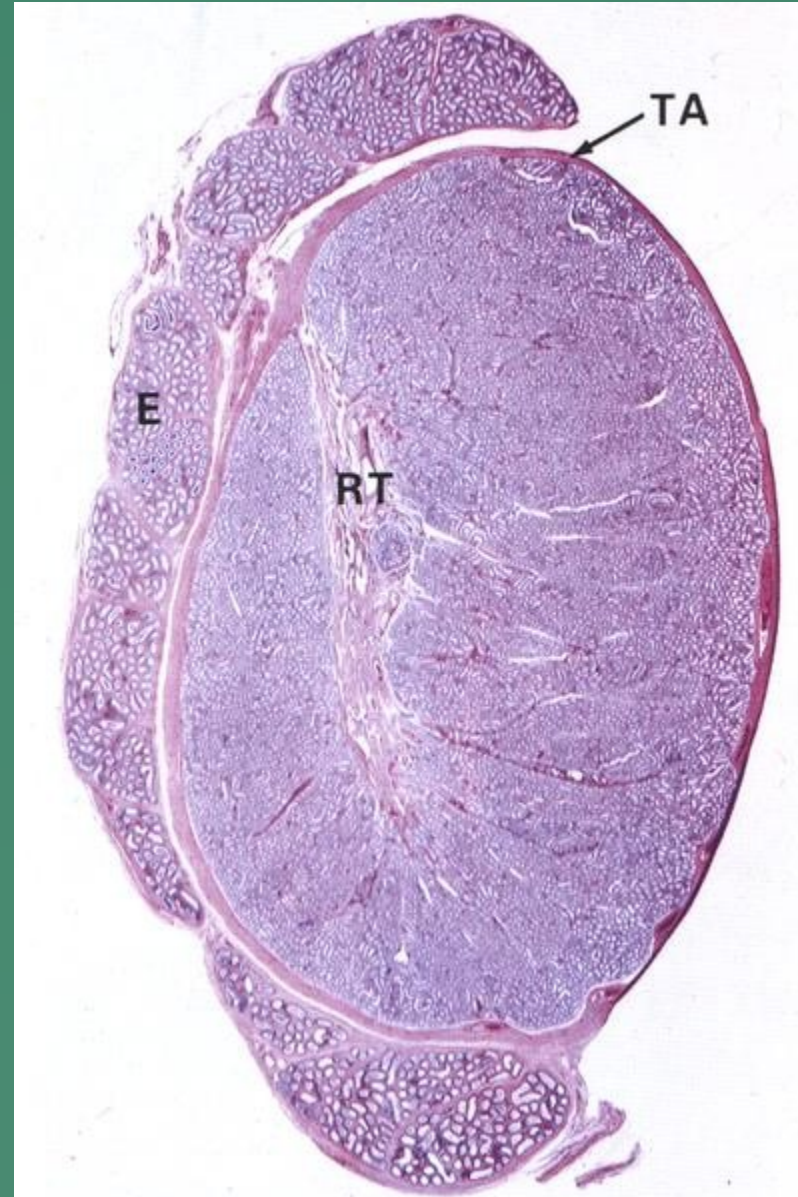
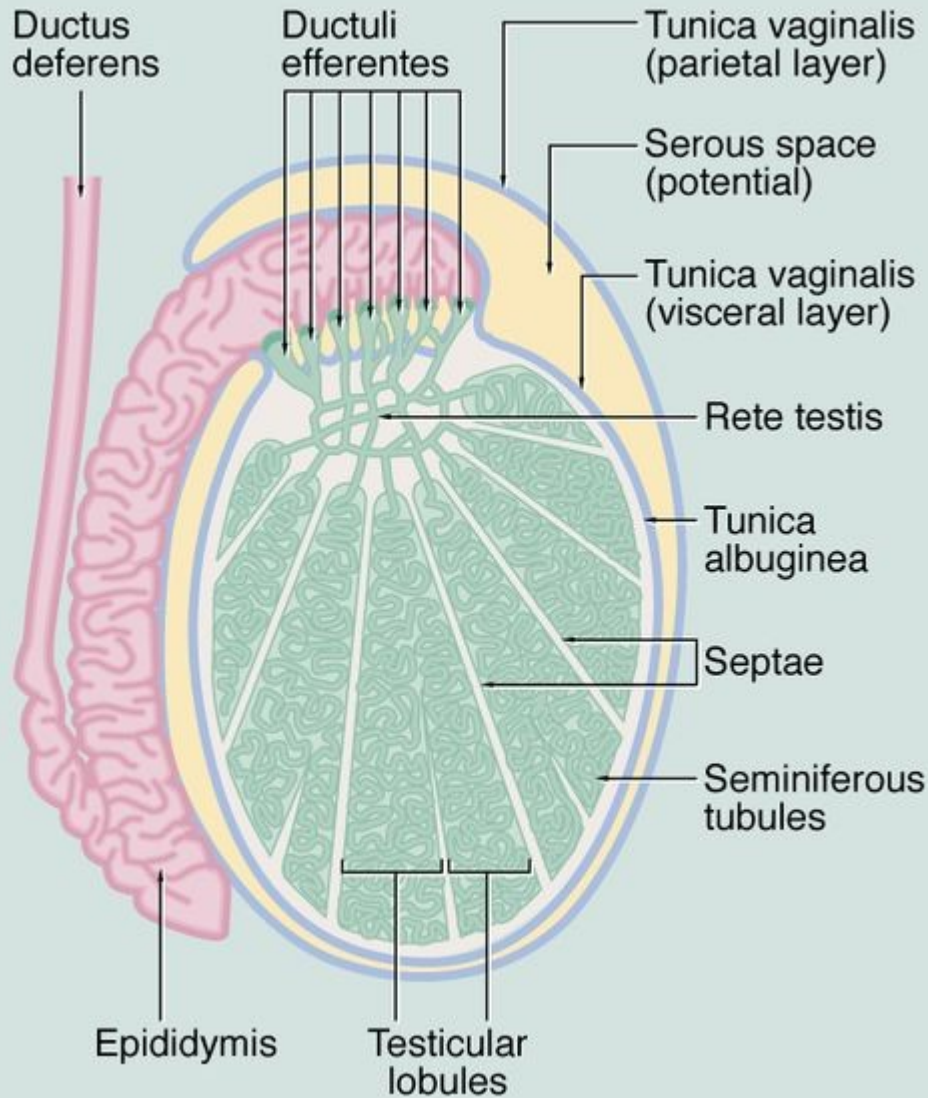
on dorsal aspect of testis, 3 parts: the  
head - 10-20 ductuli efferentes

body } ductus epididymidis - 4-6 m long  
tail }



# Epididymis

7.5 cm in length, elongated shape (head, body and tail)  
**ductuli efferentes testis + ductus epididymidis**



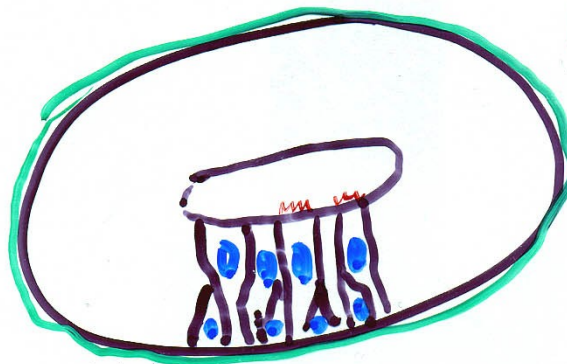
Ductuli efferentes: epithelium  
basal lamina  
thin tunic of conn. tissue

scalloped appearance

cuboid to  
high columnar  
ciliated epithelium



Ductus epididymidis



pseudostratified  
columnar epith.

basal cells

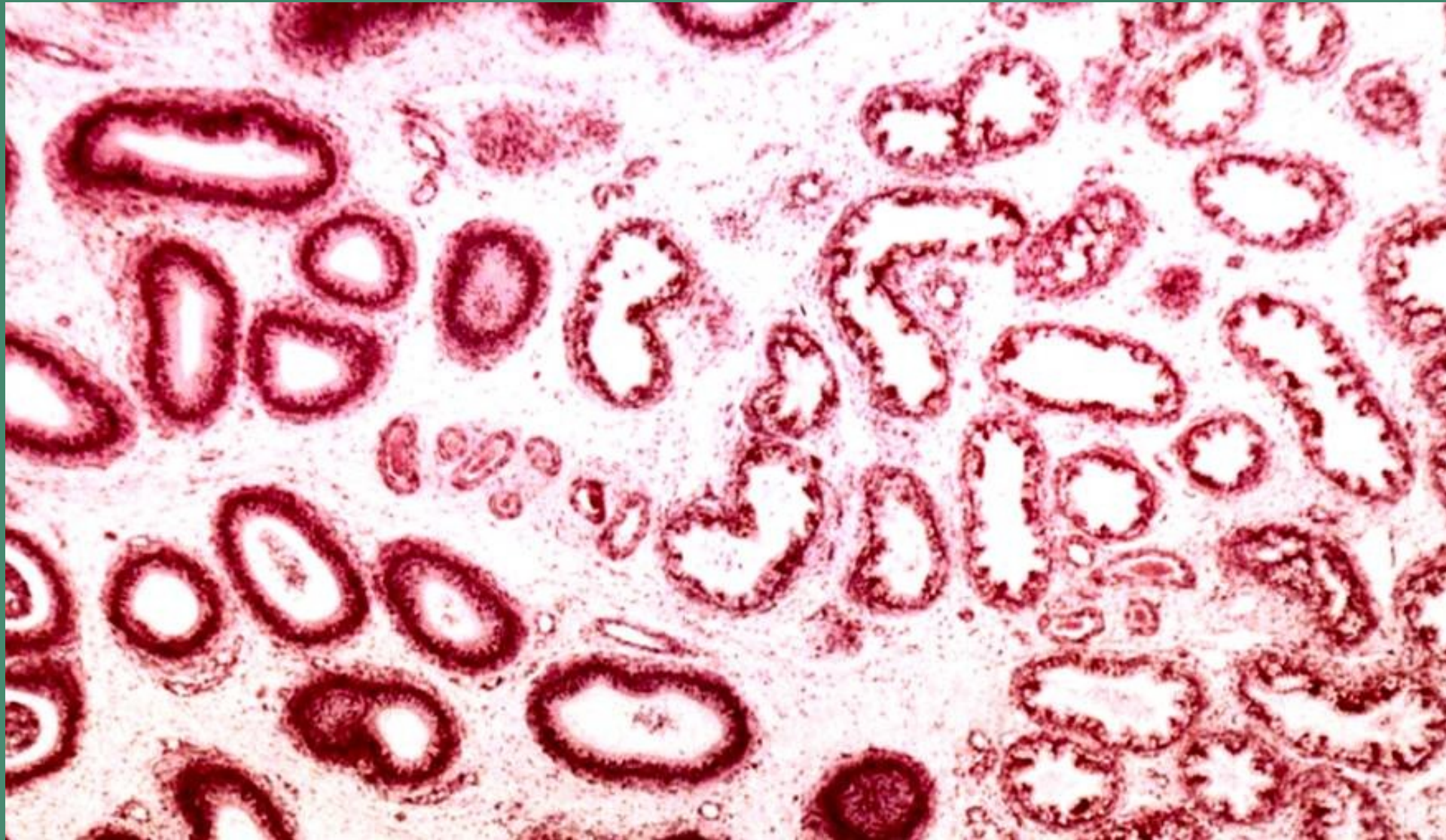
columnar

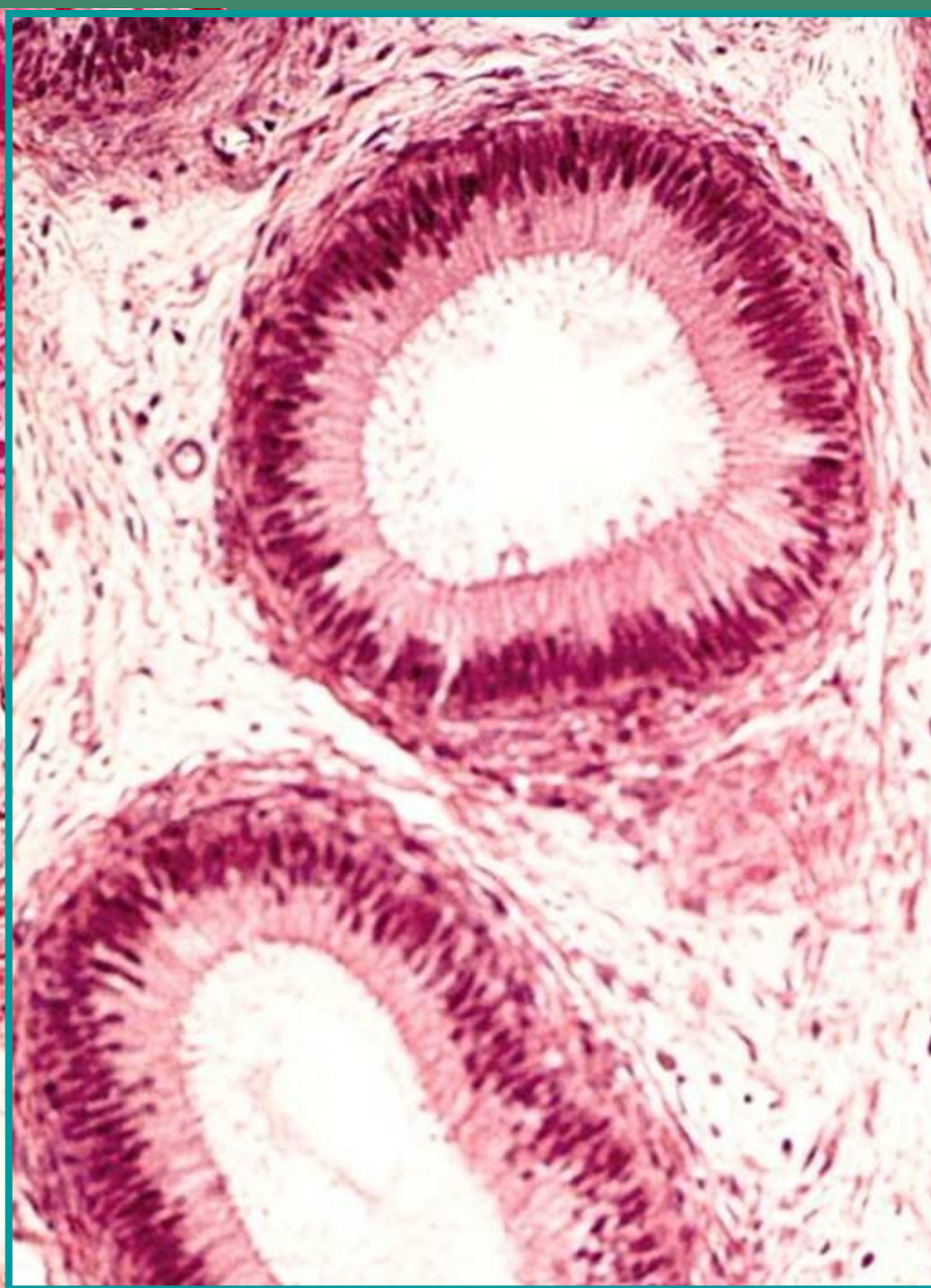
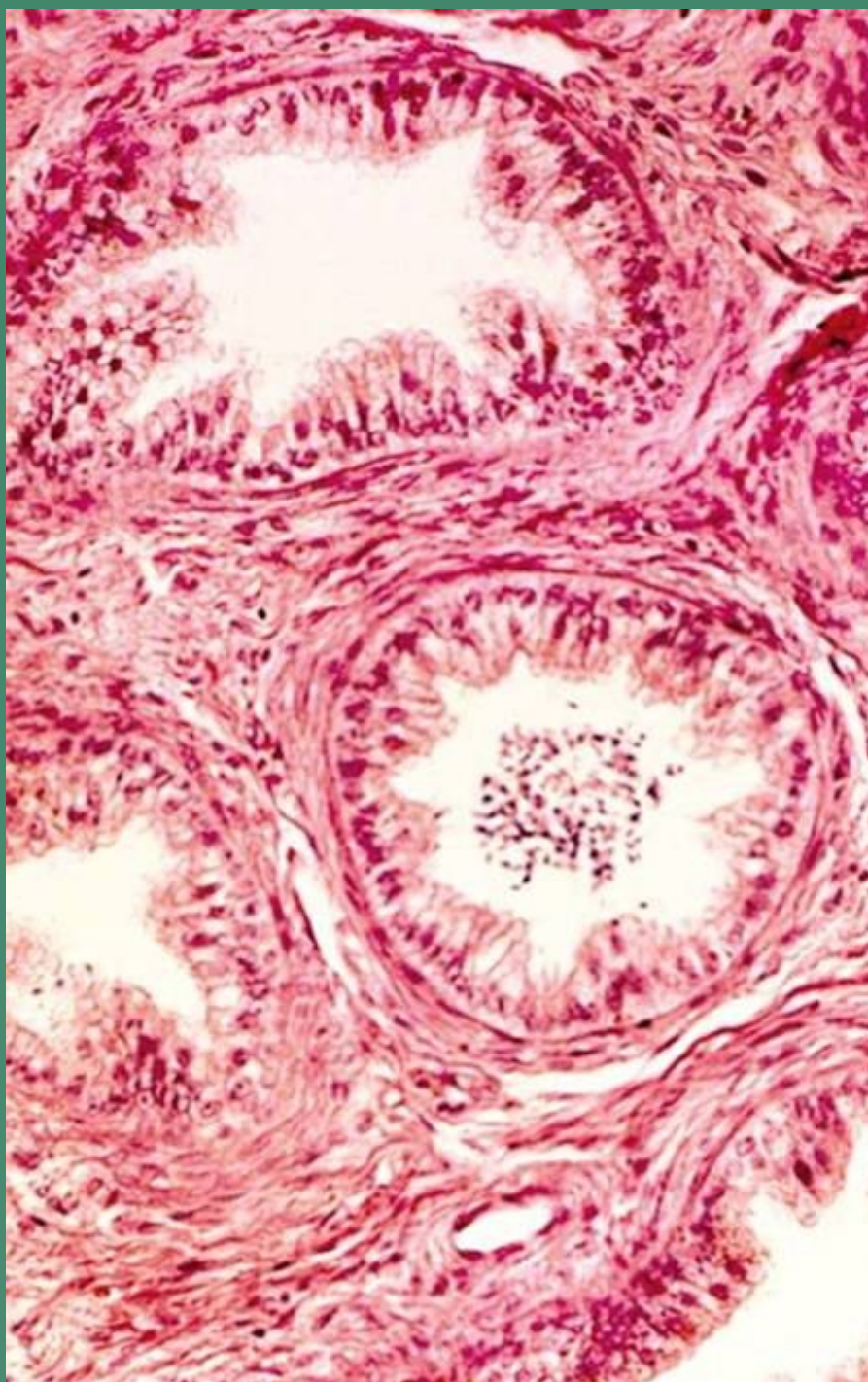
with STEREOCILIA =  
long branched microvilli



**Ductuli efferentes:** epithelium, basement membrane and thin lamina propria

**Ductus epididymidis:** pseudostratified epithelium, basement membrane and lamina propria with smooth muscle cells





# Funiculus spermaticus



# Ductus deferens

40 cm long

2–3 mm thick tubular organ

## DUCTUS DEFERENS

thick, narrow lumen

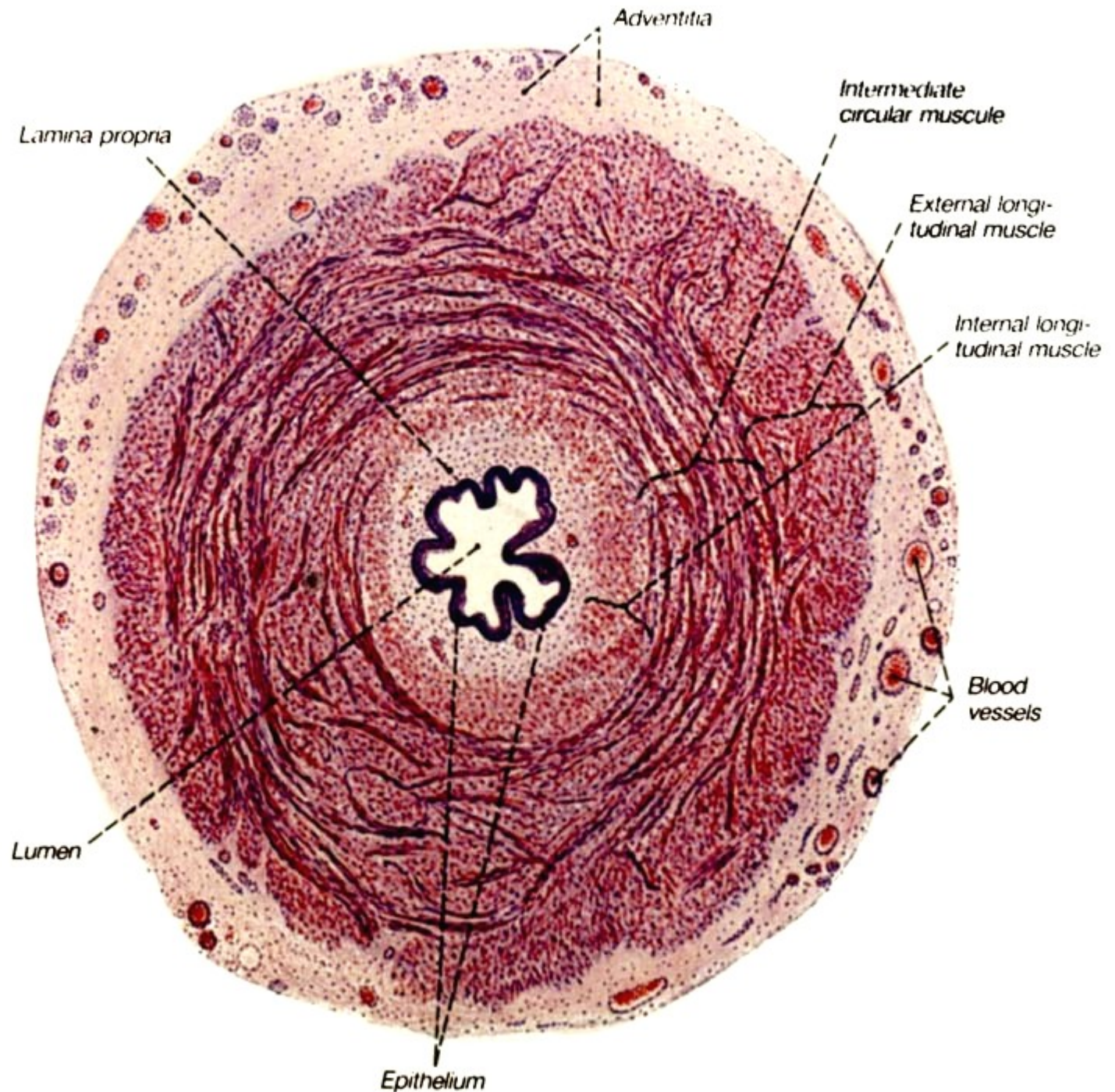
- mucosa - pseudostratified col. epith.
  - lamina propria
- muscularis - longitudinal layer
  - circular
  - longitudinal
- adventitia

# Ductus deferens

mucous coat

muscular coat

adventitia





Distal part of d.d. is dilated - ampulla of d.d. - cuboidal or columnar ep.

ampulla



duct of seminal vesicle

DUCTUS EJACULATORIUS

opens into the prostatic urethra

simple columnar or pseudostratified  
muscularis - is missing

### ACCESSORY GENITAL GLANDS

seminal vesicles, prostate, bulbourethral glands

### SEMINAL VESICLES

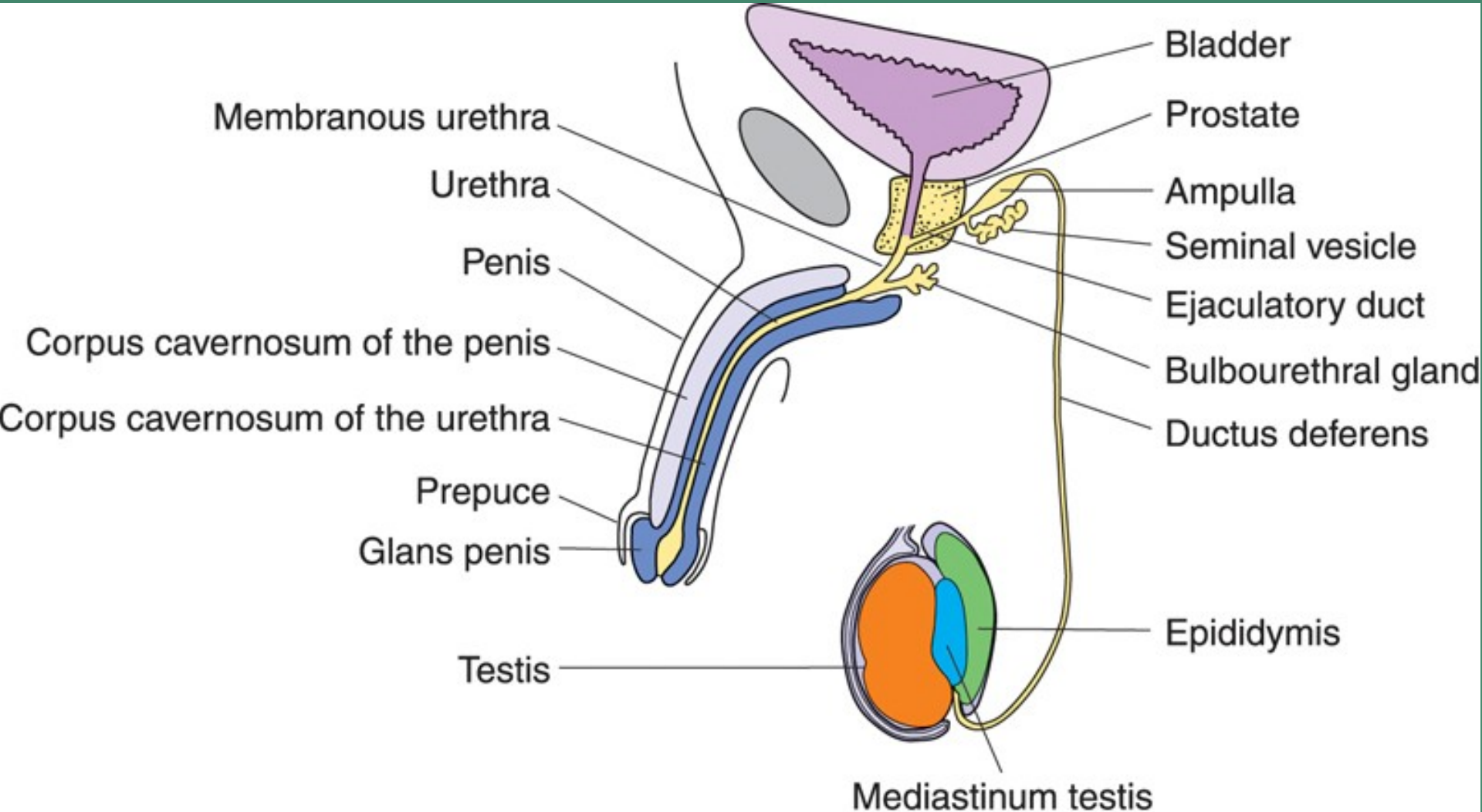
highly tortuous tube 15 cm length, wall consists of:

mucosa - pseudostratified col. ep. rich in secretory granules  
- lamina propria rich in elastic f.

muscularis - thin and irregularly (not neatly) arranged

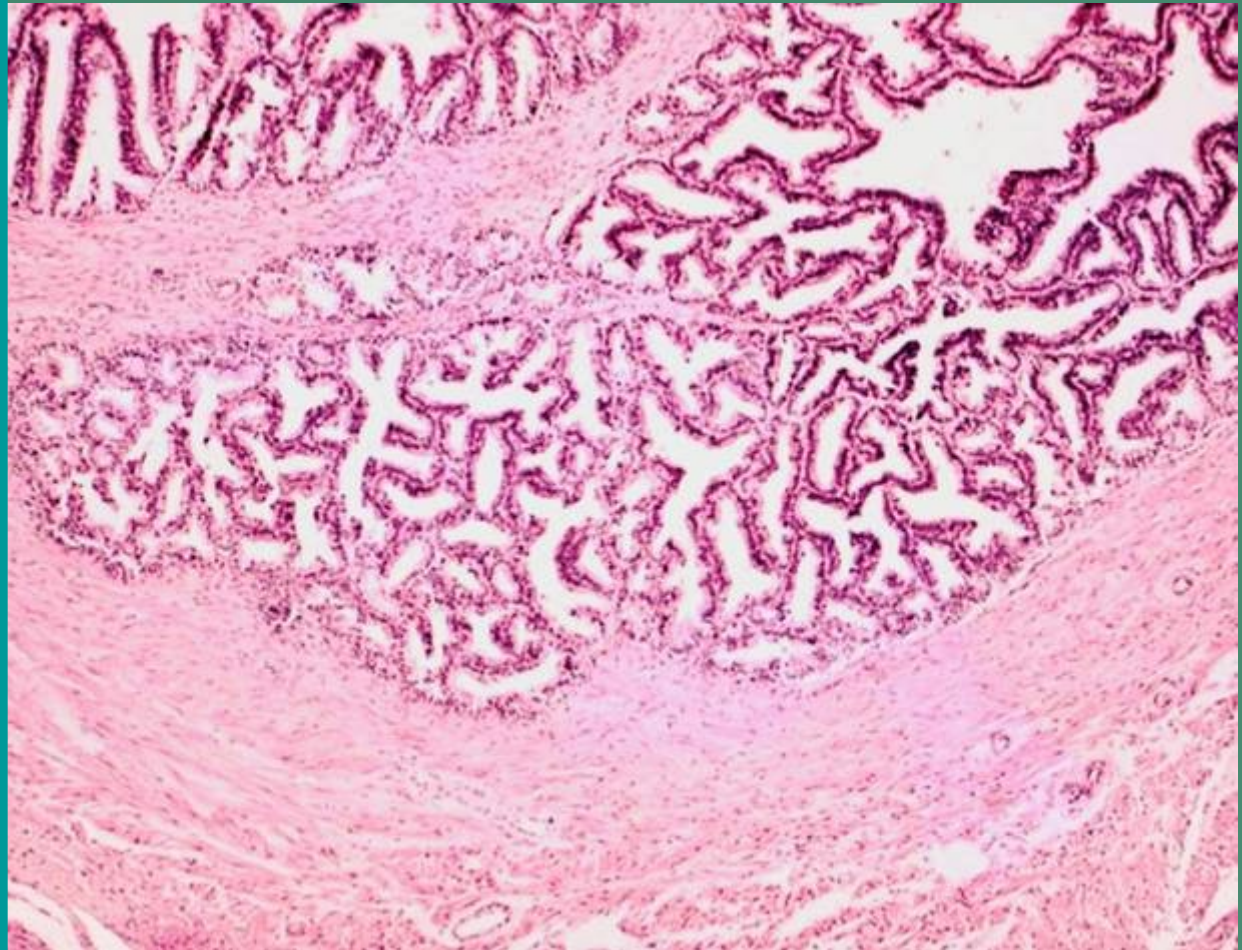
fructose, citrate, inositol, prostaglandins, proteins - activate spermatozoa

# Accessory genital glands





# Accessory genital glands: **seminal vesicles**



## PROSTATE

fibroelastic capsule

STROMA OF PROSTATE - smooth muscle cells  
+ elastic fibers

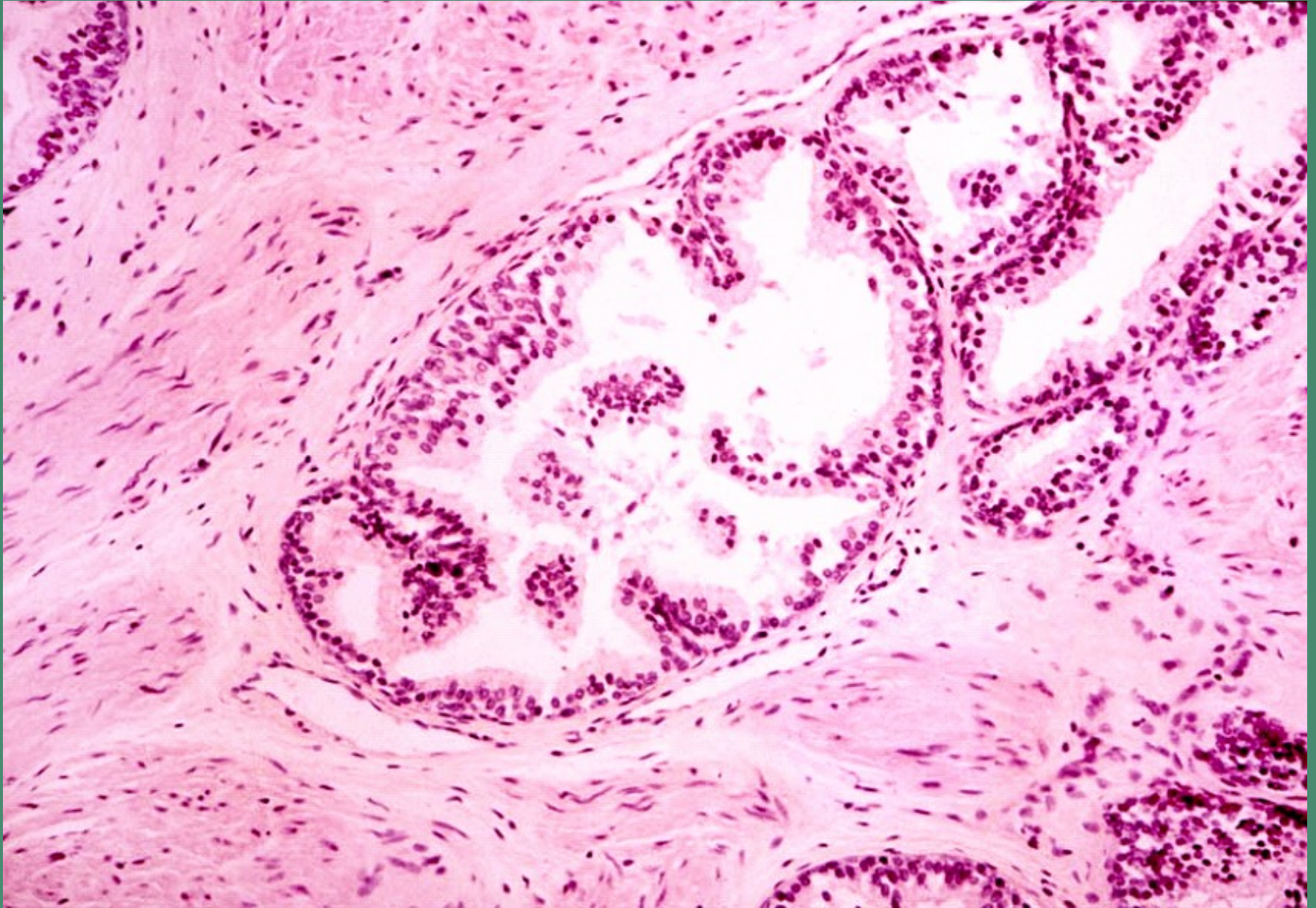
30-50 PROSTATIC GLANDS - tubuloalveolar  
prostatic concretions (calcified)

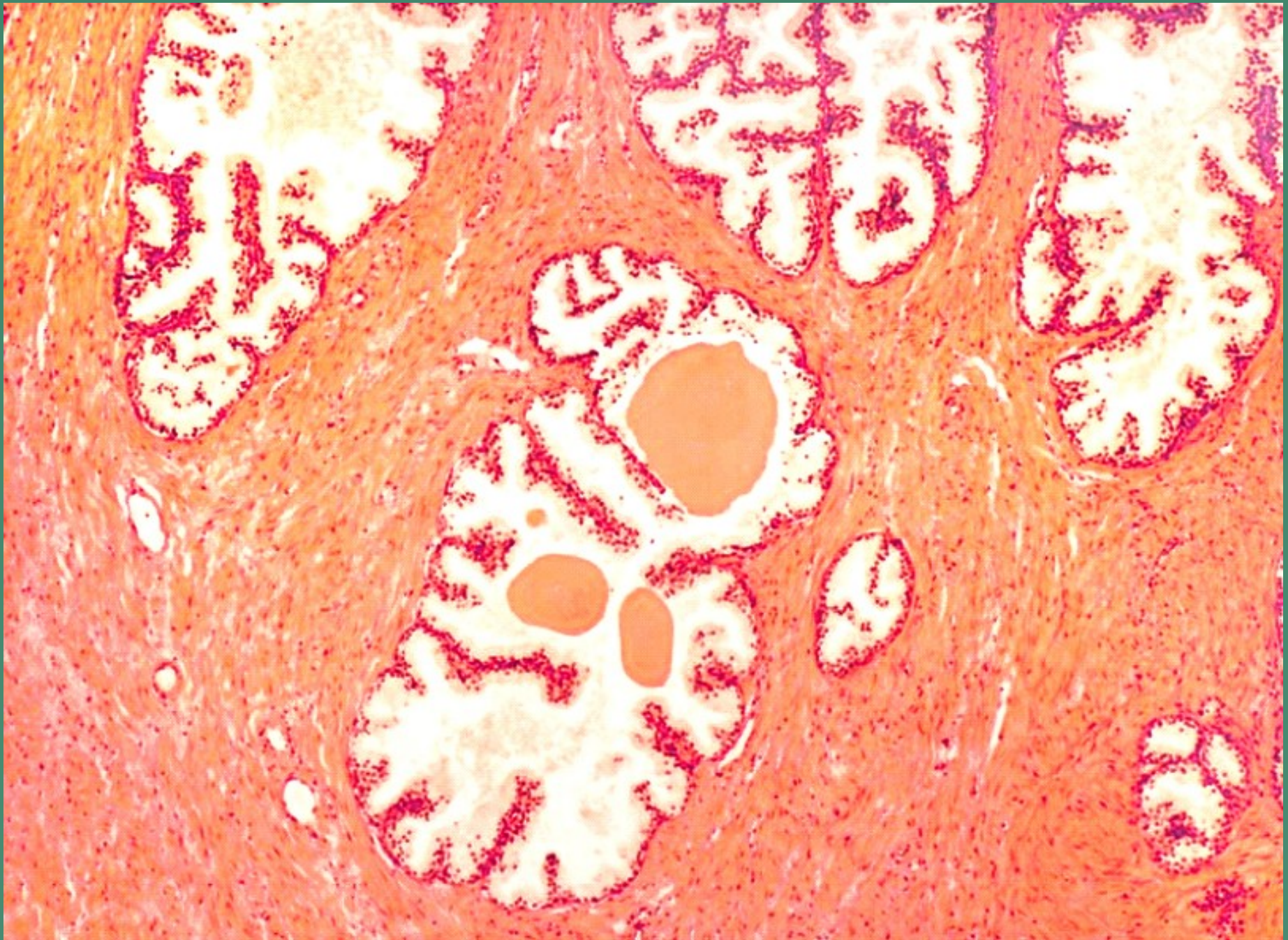
## BULBOURETHRAL GLANDS

located proximal to the membranous  
portion of the urethra

tubuloalveolar glands - mucus secre-  
ting epithelium

## Accessory genital glands: **prostate**





# PENIS

3 cylindrical masses of erectile tissue

urethra

skin

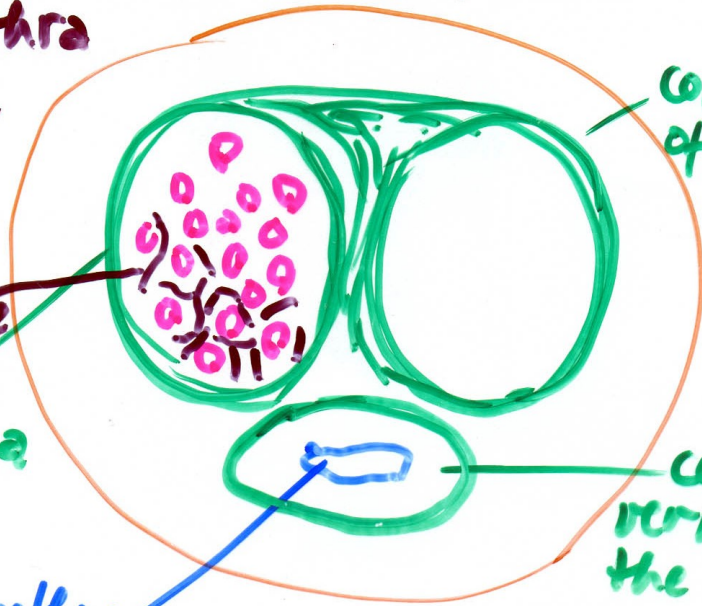
venous  
spaces  
trabeculae  
tunica  
albuginea

Corpora cav.  
of the penis

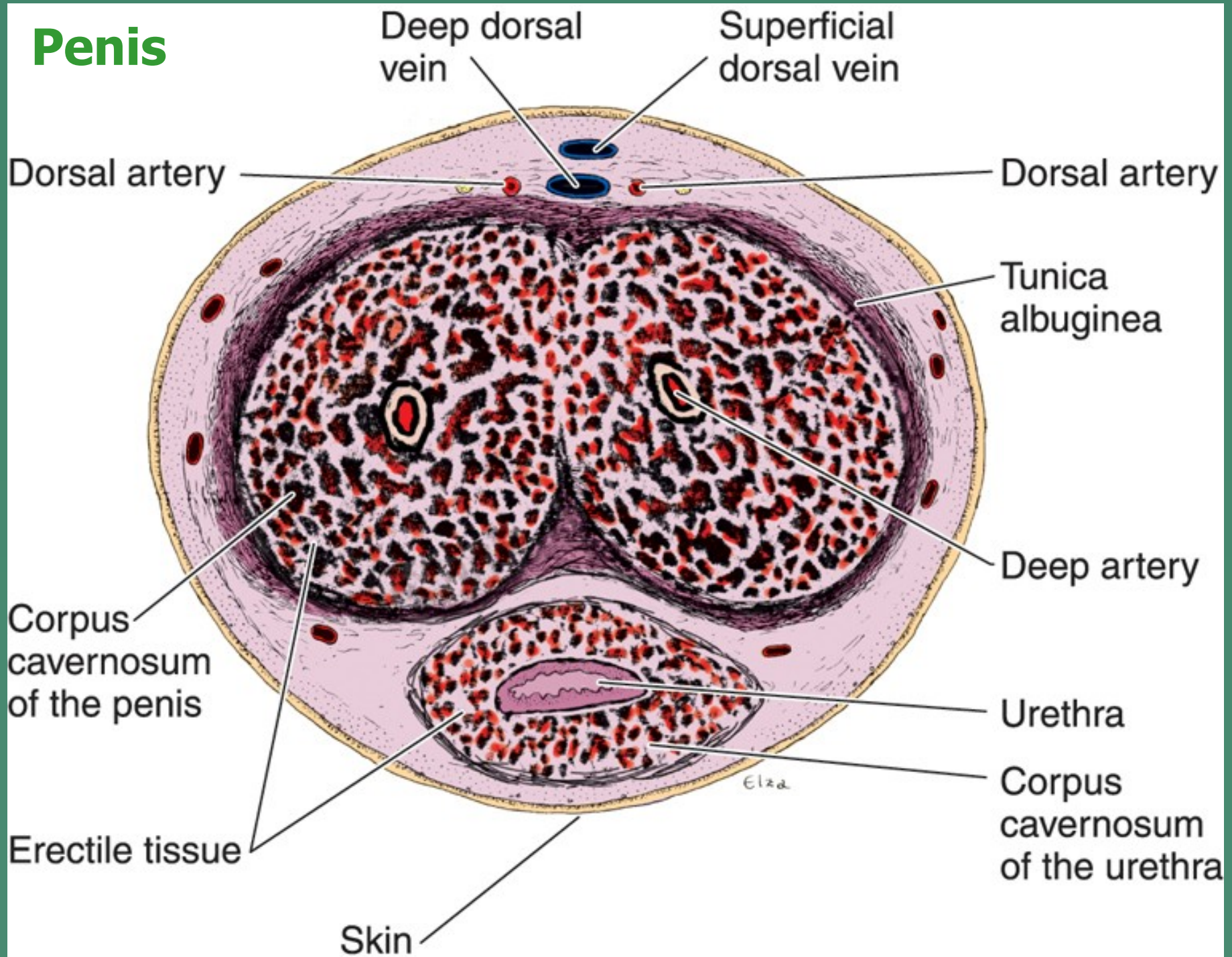
skin

Corpus ca.  
vernosum of  
the urethra

urethra



# Penis



# Penis

