

Chromosomal Sex Determination

- our cells contain 23 pairs of chromosomes
 - 22 pairs of autosomes
 - 1 pair of sex chromosomes (XY males: XX females)
 - males produce half Y carrying sperm and half X carrying sperm
 - all eggs carry the X chromosome
- sex of child determined by type of sperm that fertilizes mother's egg
 - X-carrying sperm fertilizes female
 - Y-carrying sperm fertilizes

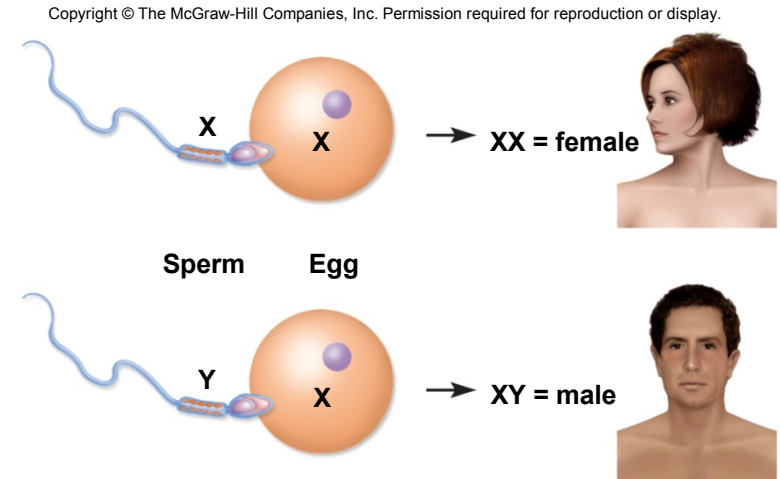


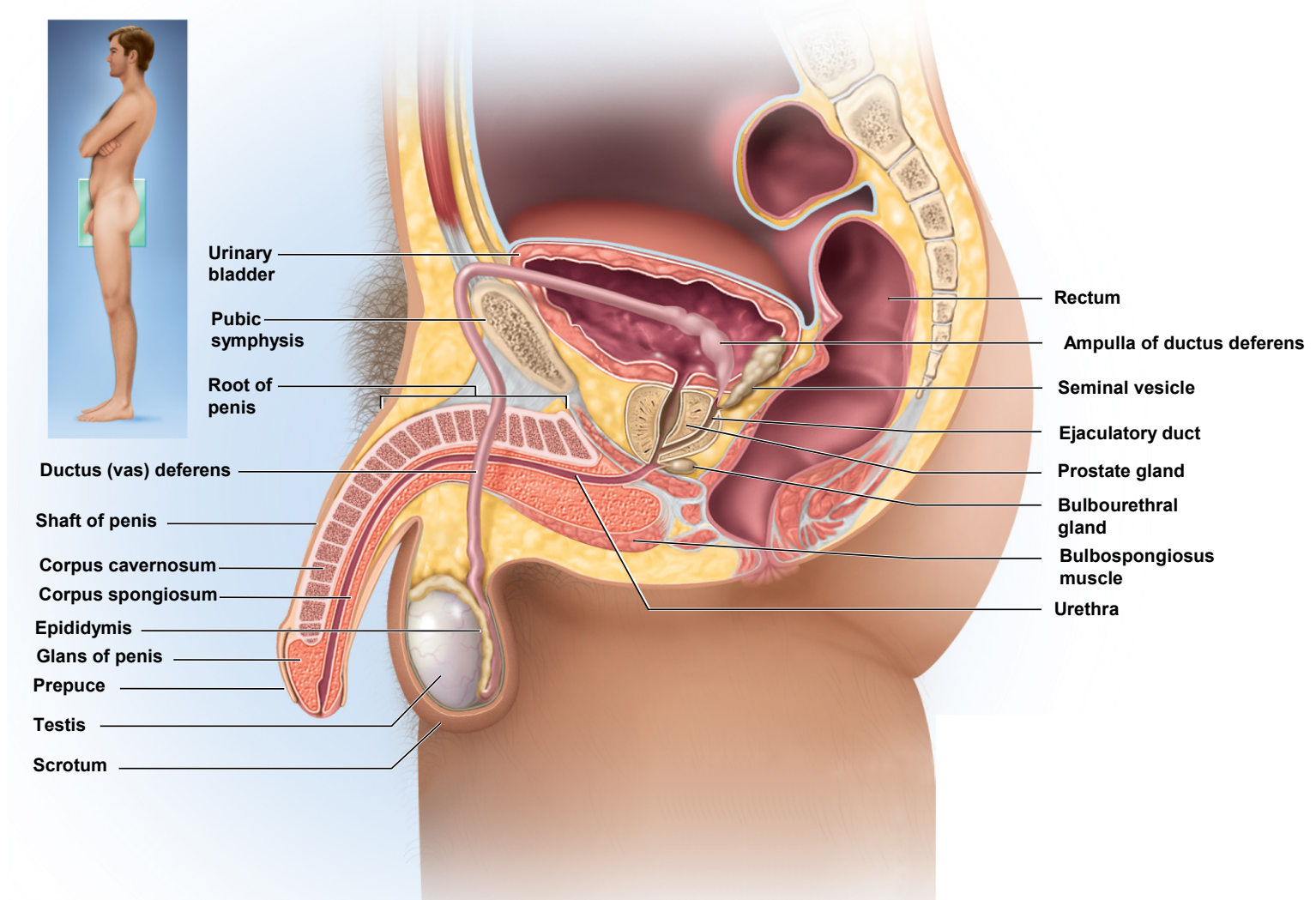
Figure 27-20 - male

Prenatal Hormones and Sex Differentiation

- initially, a fetus is **sexually undifferentiated** as to which sex it will become
- **SRY gene** (sex-determining region of Y chromosome)
 - in males, codes for a protein, **testes-determining factor (TDF)**, that initiates development of testes
 - begin to secrete testosterone **8 to 9 weeks**
- **estrogen levels** are always high in pregnancy
 - if estrogen was the hormone that directed the female development, all fetuses would be feminized
- female development occurs in **absence of androgen hormones**

Male Reproductive System

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(a) Sagittal section

Figure 27.11a

Testis and Associated Structures

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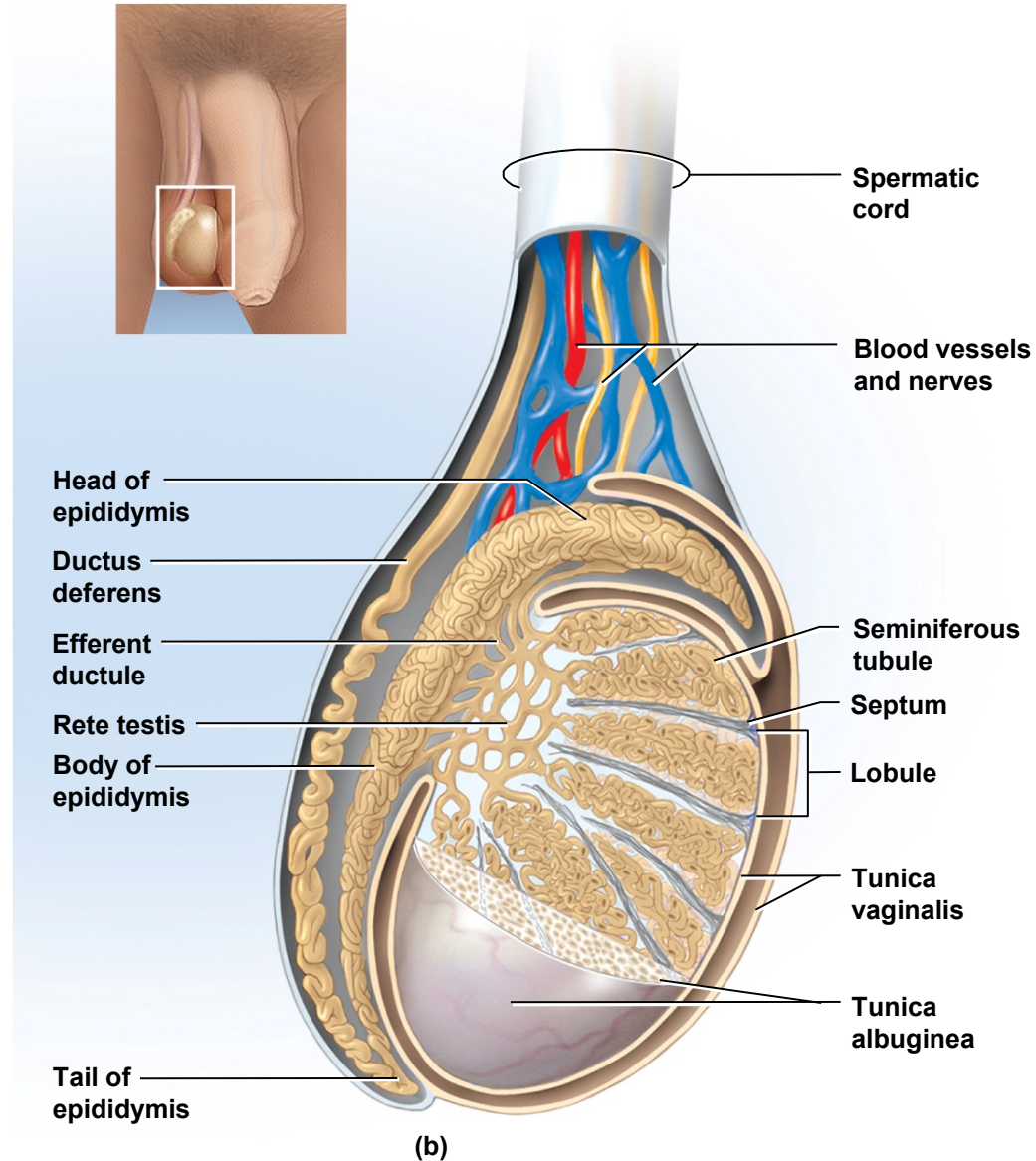


Figure 27.9b

Testes

- **testes** (testicles) – combined endocrine and exocrine glands that produce **sex hormones** and **sperm**
- **seminiferous tubules**
 - each tubule lined with a thick germinal epithelium for sperm generation
- **interstitial (Leydig) cells** between tubules produce **testosterone**

Spermatic Ducts

- spermatic ducts from testis to the urethra
 - **epididymis**
 - site of sperm maturation and storage (fertile for 40 to 60 days)
 - contains a single 6 m long coiled duct adhering to posterior of testis
 - sperm mature as they travel through the duct
 - if not ejaculated, they disintegrate and epididymis reabsorbs them
 - **vas deferens**
 - muscular tube 45 cm long passing up from scrotum through inguinal canal to posterior surface of bladder
 - duct ends by uniting with the duct of the seminal vesicle
 - **ejaculatory duct**
 - 2 cm duct formed from ductus deferens and seminal vesicle and passing through prostate to empty into **urethra**

Male Duct System

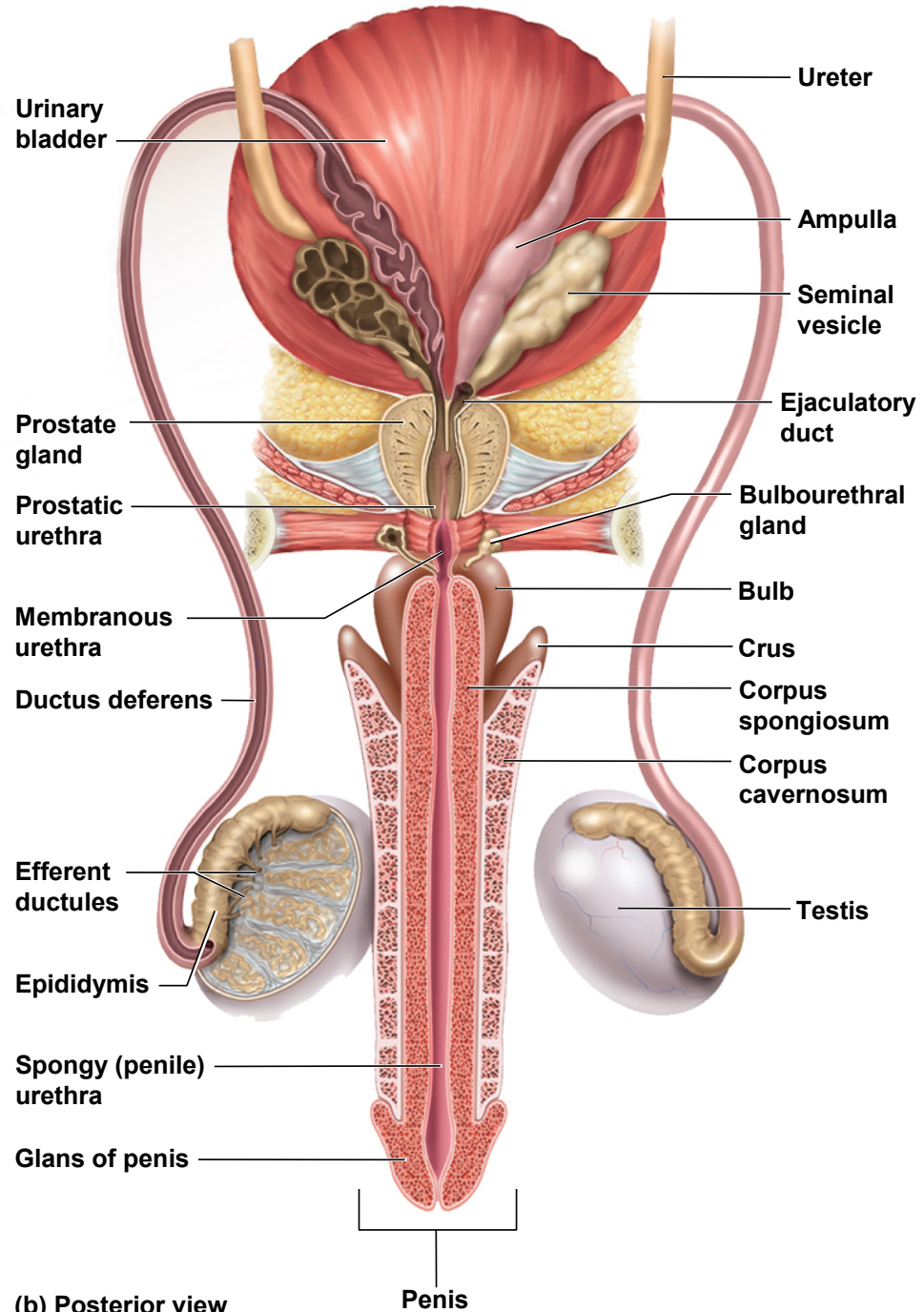
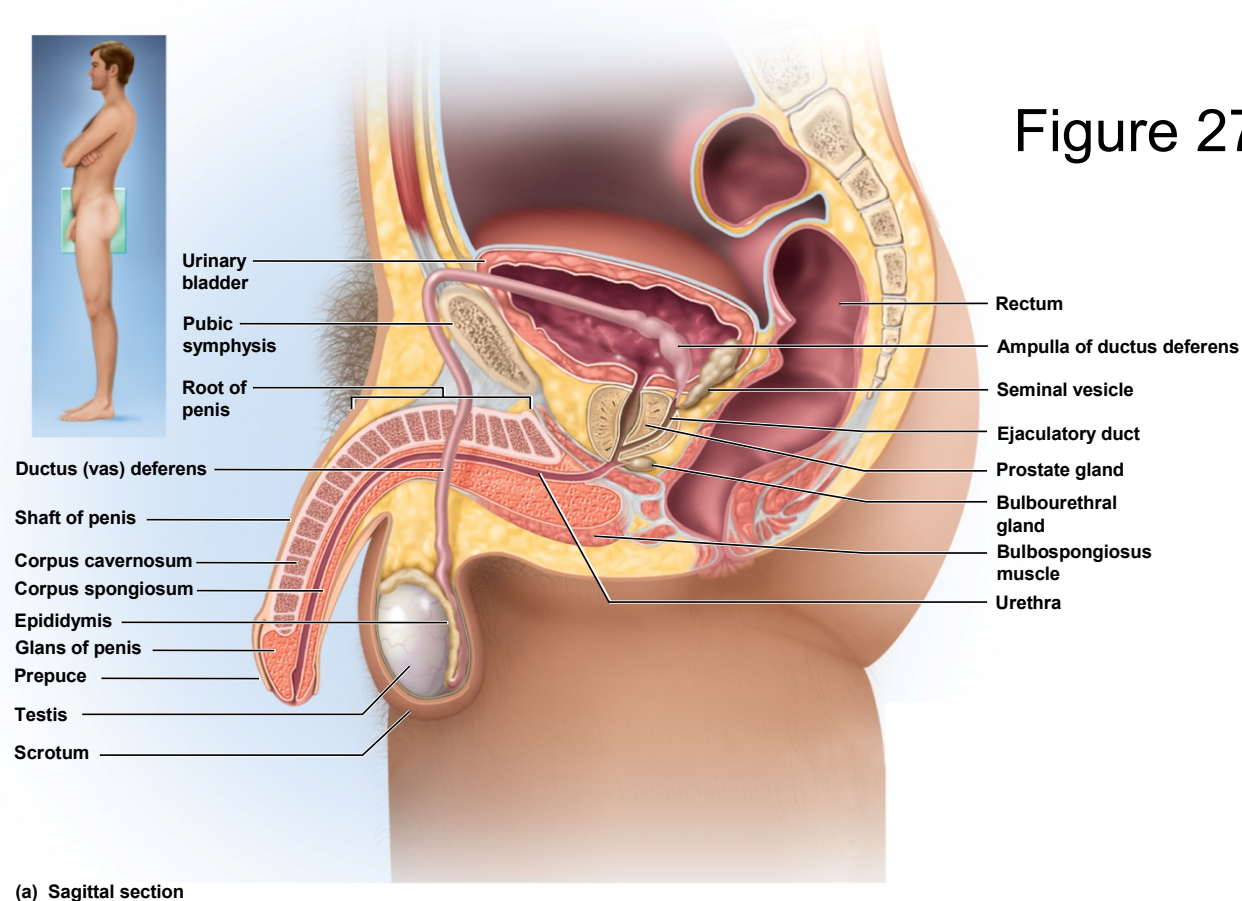


Figure 27.11b

(b) Posterior view

Male Urethra

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- 18 cm long male urethra is shared by the reproductive and urinary systems

Accessory Glands

- there are three sets of glands in the male reproductive system
 - **seminal vesicles**
 - forms 60% of semen
 - Secretes – alkaline fluid containing fructose, proseminalogelin and prostaglandins.
 - **prostate gland**
 - Secretes – seminalplasmin (antibiotic), serine protease
 - thin milky secretion forms 30% of semen
 - **bulbourethral (Cowper) glands**
 - Secretes – alkaline mucous

Endocrine Control

As hypothalamus matures it produces **gonadotropin-releasing hormone (GnRH)**

- GnRH stimulates anterior pituitary cells (**gonadotropes**) to secrete:
 - **follicle stimulating hormone (FSH)**
 - stimulates spermatogenesis
 - **luteinizing hormone (LH)**
 - stimulates **interstitial cells** to produce **testosterone**

Spermatogenesis

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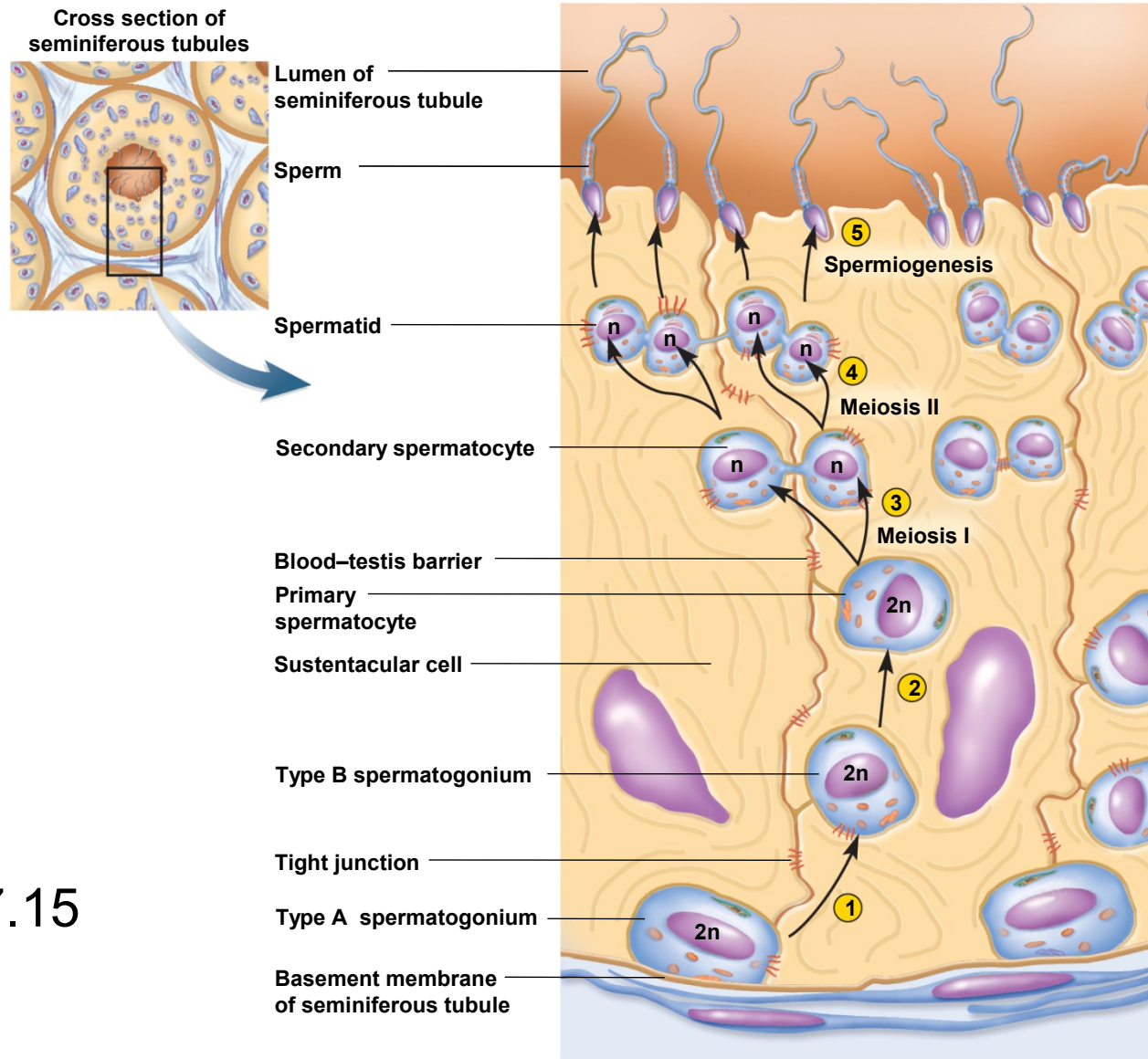
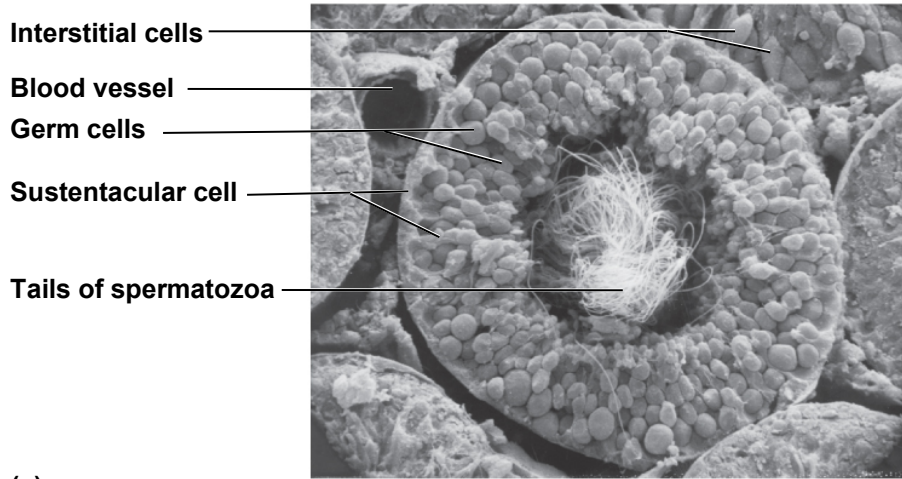


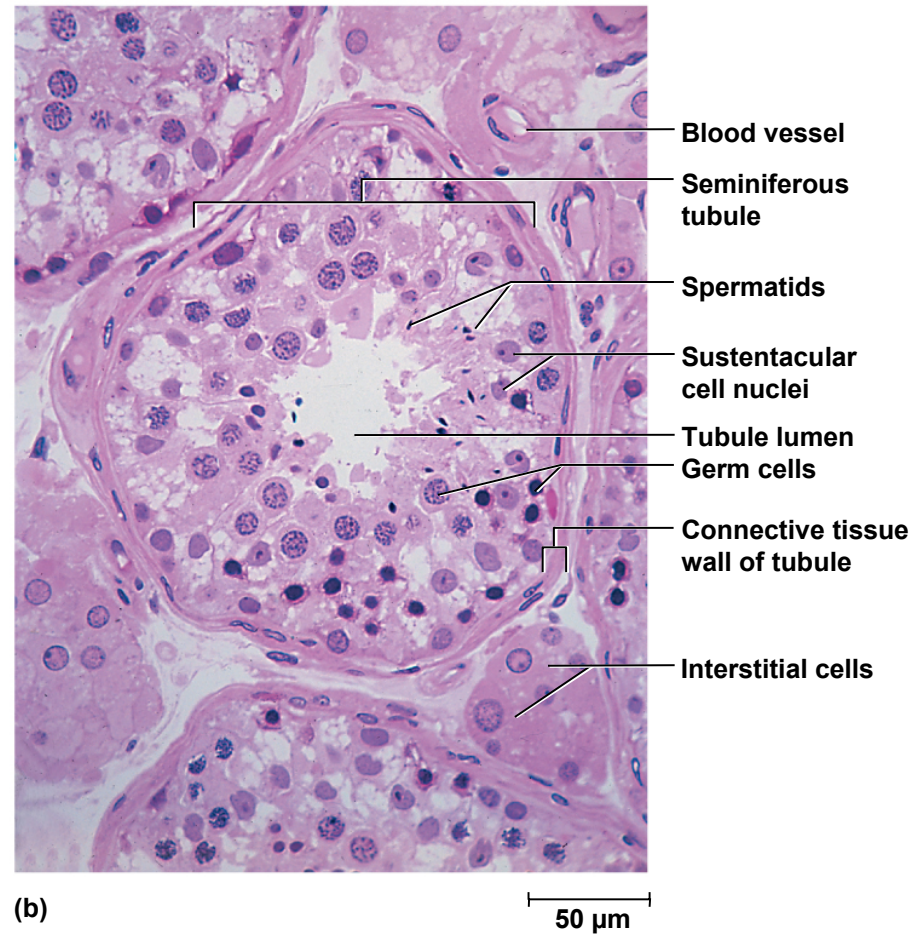
Figure 27.15

Histology of Testis

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(a)



(b)

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Figure 27.10 a-b

Spermatozoon

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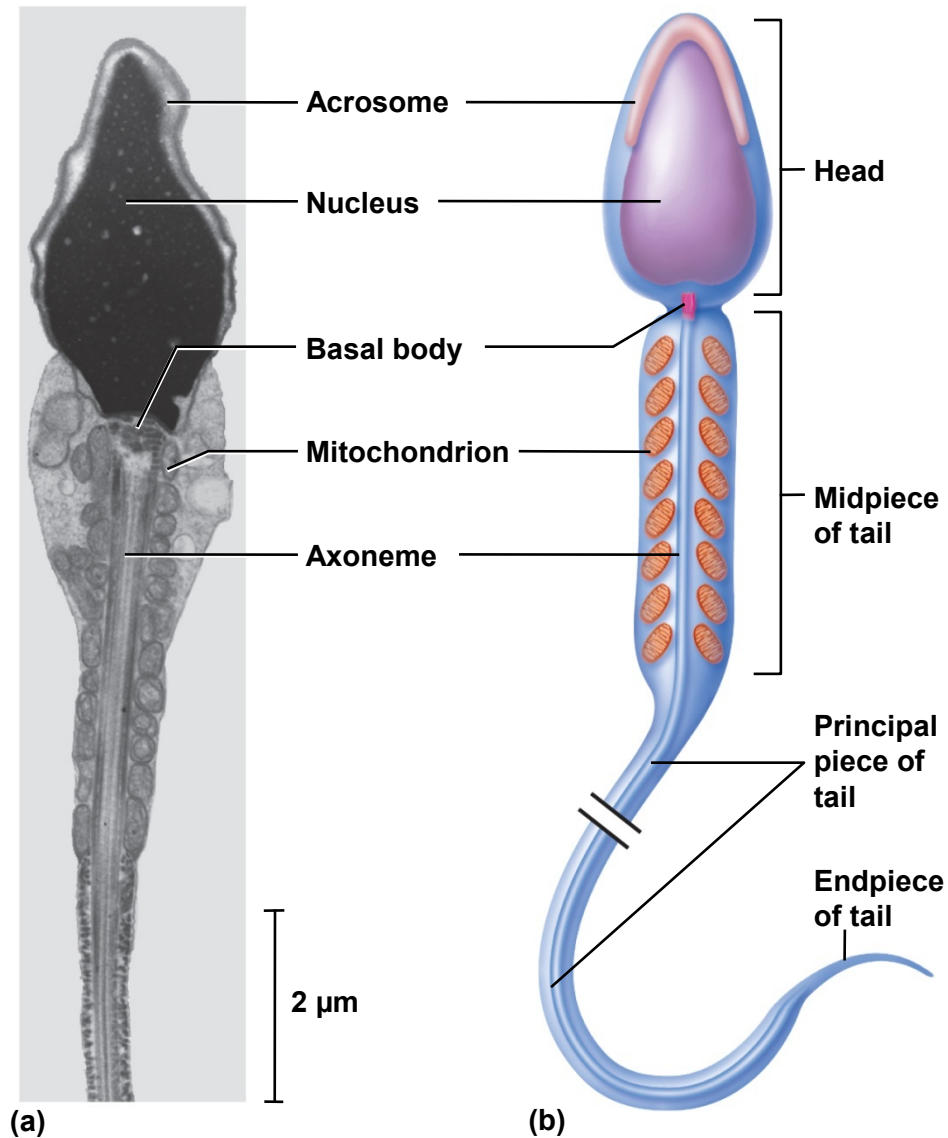


Figure 27.17 a-b