

Bio 250
Anatomy-Male

Male Reproductive System

- Testes
- Duct system
 - Epididymis
 - Ductus deferens
 - Urethra

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The Reproductive System

- Gonads – primary sex organs
 - Testes in males
 - Ovaries in females
- Gonads produce gametes (sex cells) and secrete hormones
 - Sperm – male gametes
 - Ova (eggs) – female gametes

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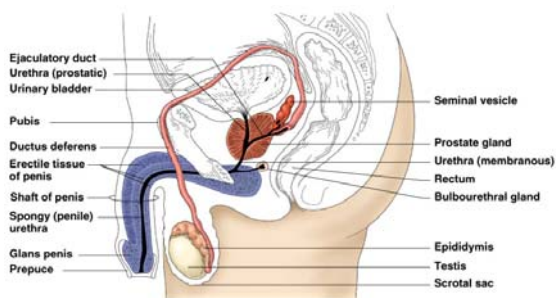
Male Reproductive System

- Accessory organs
 - Seminal vesicle
 - Prostate gland
 - Bulbourethral gland
- External genitalia
 - Penis
 - Scrotum

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Male Reproductive System

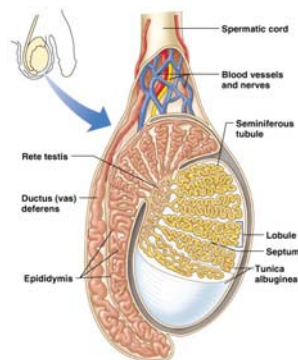


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Testes

- Coverings of the testes
 - Tunica albuginea – capsule that surrounds each testis



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Testes

- Coverings of the testes (continued)
 - Septa – extensions of the capsule that extend into the testis and divide it into lobules

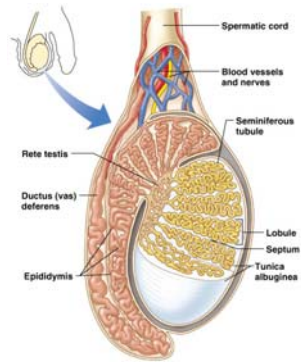


Figure 16.1

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Testes

- Each lobule contains one to four seminiferous tubules
 - Tightly coiled structures
 - Function as sperm-forming factories
 - Empty sperm into the rete testis
- Sperm travels through the rete testis to the epididymis
- Interstitial cells produce androgens such as testosterone

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Epididymis

- Comma-shaped, tightly coiled tube
- Found on the superior part of the testis and along the posterior lateral side
- Functions to mature and store sperm cells (at least 20 days)
- Expels sperm with the contraction of muscles in the epididymis walls to the vas deferens

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Ductus Deferens (Vas Deferens)

- Carries sperm from the epididymis to the ejaculatory duct
- Passes through the inguinal canal and over the bladder
- Moves sperm by peristalsis
- Spermatic cord – ductus deferens, blood vessels, and nerves in a connective tissue sheath

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Ductus Deferens (Vas Deferens)

- Ends in the ejaculatory duct which unites with the urethra
- Vasectomy – cutting of the ductus deferens at the level of the testes to prevent transportation of sperm

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Urethra

- Extends from the base of the urinary bladder to the tip of the penis
- Carries both urine and sperm
- Sperm enters from the ejaculatory duct

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Urethra

- Regions of the urethra
 - Prostatic urethra –surrounded by prostate
 - Membranous urethra – from prostatic urethra to penis
 - Spongy (penile) urethra – runs the length of the penis

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Seminal Vesicles

- Located at the base of the bladder
- Produces a thick, yellowish secretion (60% of semen)
 - Fructose (sugar)
 - Vitamin C
 - Prostaglandins
 - Other substances that nourish and activate sperm

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Prostate Gland

- Encircles the upper part of the urethra
- Secretes a milky fluid
 - Helps to activate sperm
 - Enters the urethra through several small ducts

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Bulbourethral Glands

- Pea-sized gland inferior to the prostate
- Produces a thick, clear mucus
 - Cleanses the urethra of acidic urine
 - Serves as a lubricant during sexual intercourse
 - Secreted into the penile urethra

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Semen

- Mixture of sperm and accessory gland secretions
- Advantages of accessory gland secretions
 - Fructose provides energy for sperm cells
 - Alkalinity of semen helps neutralize the acidic environment of vagina
 - Semen inhibits bacterial multiplication
 - Elements of semen enhance sperm motility

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External Genitalia

- Scrotum
 - Divided sac of skin outside the abdomen
 - Maintains testes at 3° C lower than normal body temperature to protect sperm viability

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External Genitalia

- Penis
 - Delivers sperm into the female reproductive tract
 - Regions of the penis
 - Shaft
 - Glans penis (enlarged tip)
 - Prepuce (foreskin)
 - Folded cuff of skin around proximal end
 - Often removed by circumcision

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External Genitalia

- Internally there are three areas of spongy erectile tissue around the urethra

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Spermatogenesis

- Production of sperm cells
- Begins at puberty and continues throughout life
- Occurs in the seminiferous tubules

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Processes of Spermatogenesis

- Spermatogonia (stem cells) undergo rapid mitosis to produce more stem cells before puberty
- Follicle stimulating hormone (FSH) modifies spermatogonia division
 - One cell produced is a stem cell
 - The other cell produced becomes a primary spermatocyte

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Processes of Spermatogenesis

- Primary spermatocytes undergo meiosis
- Haploid spermatids are produced

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Processes of Spermatogenesis

- Spermiogenesis
 - Late spermatids are produced with distinct regions
 - Head – contains DNA covered by the acrosome
 - Midpiece
 - Tail
 - Sperm cells result after maturing of spermatids
- Spermatogenesis takes 64 to 72 days

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Processes of Spermatogenesis

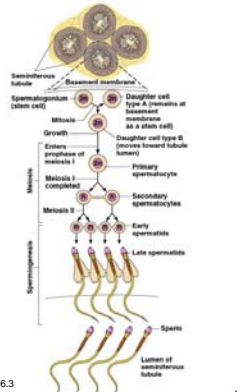


Figure 16.3

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Anatomy of a Mature Sperm Cell

- The only human flagellated cell
- DNA is found in the head

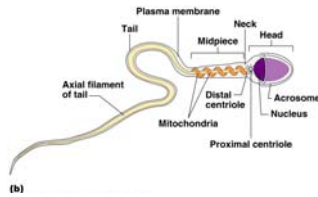


Figure 16.5

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Testosterone Production

- The most important hormone of the testes
- Produced in interstitial cells

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Testosterone Production

- Functions of testosterone
 - Stimulates reproductive organ development
 - Underlies sex drive
 - Causes secondary sex characteristics
 - Deepening of voice
 - Increased hair growth
 - Enlargement of skeletal muscles
 - Thickening of bones

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Regulation of Male Androgens (Sex Hormones)

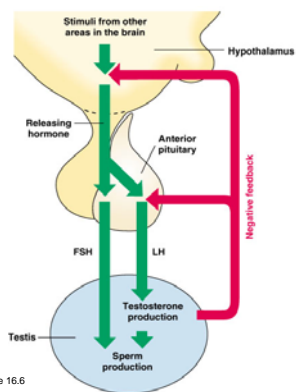


Figure 16.6

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