

The male reproductive system 2

Seminiferous tubules

1. Overview

- a. Seminiferous tubules are 30 to 70 cm long, with a diameter of 150 to 250 μm .
- b. They are enveloped by a fibrous connective tissue tunic composed of several layers of fibroblasts and extensive capillary beds.
- c. They form tortuous pathways through the testicular lobules and then narrow into short, straight segments, the **tubuli recti**, which connect with the **rete testis**.
- d. They are lined by a thick complex epithelium (**seminiferous** or **germinal epithelium**).

This epithelium consists of four to eight cell layers and contains **spermatogenic cells**, from which the germ cells eventually develop (spermatogenesis), and **Sertoli cells**, which have several functions.

2. Sertoli cells

a. Structure

- (1) Sertoli cells have a pale, oval nucleus that displays frequent indentations; they are highly infolded and possess a large nucleolus.
- (2) They have a well-developed smooth endoplasmic reticulum (SER), some rough endoplasmic reticulum (RER), an abundance of mitochondria and lysosomes, and an extensive Golgi complex.

b. Function

- (1) Sertoli cells support, protect, and nourish the spermatogenic cells.
- (2) They phagocytose excess cytoplasm discarded by maturing spermatids.
- (3) They secrete a fructose-rich fluid into the lumen that nourishes and facilitates the transport of spermatozoa through the seminiferous tubules to the genital ducts.
- (4) They synthesize **androgen-binding protein (ABP)** under the influence of FSH. **ABP** assists in maintaining the necessary concentration of testosterone in the seminiferous tubule so that spermatogenesis can progress.
- (5) They secrete **inhibin**, a hormone that inhibits the synthesis and release of FSH by the anterior pituitary.
- (6) They establish a blood-testis barrier.

(7) They synthesize and release **antimüllerian hormone**, which determines maleness.

Seminal vesicles

1. Epithelium

a. Epithelium of the seminal vesicles is **pseudostratified columnar**, with a height that varies with testosterone levels; it lines the **extensively folded mucosa**.

b. It contains many **yellow lipochrome pigment granules** and secretory granules, a large Golgi complex, many mitochondria, and abundant RER.

2. The **lamina propria** consists of **fibroelastic** connective tissue surrounded by an inner circular and outer longitudinal layer of smooth muscle.

3. The **adventitia** is composed of **fibroelastic** connective tissue.

4. The seminal vesicles **secrete** a yellow, viscous fluid containing substances that **activate sperm** (e.g., fructose); this fluid constitutes about 70% of the human ejaculate.

B. Prostate gland

1. Overview

a. The prostate gland surrounds the urethra as it exits the urinary bladder.

b. It consists of 30 to 50 discrete **branched tubuloalveolar glands** that empty their contents via excretory ducts into the prostatic urethra. These glands are arranged in three concentric layers (**mucosal**, **submucosal**, and **main**) around the urethra.

c. The gland is covered by a **fibroelastic capsule** that contains smooth muscle. Septa from the capsule penetrate the gland and divide it into lobes. s maleness.

2. Epithelium

a. The epithelium of the prostate gland is **simple** or **pseudostratified columnar** and lines the individual glands that constitute the prostate.

b. It is composed of cells that contain abundant RER, a well-developed Golgi complex, numerous lysosomes, and many secretory granules.

3. **Corpora amylacea** are prostatic **concretions**, composed of glycoprotein, which may become calcified; their numbers increase with age.

4. The **prostate secretes** a thin whitish fluid, a part of the semen containing proteolytic enzymes, citric acid, acid phosphatase, fibrinolysin, and lipids. The prostatic secretion serves to liquefy the coagulated semen after it is deposited in the female genital tract. Its synthesis and release are regulated by dihydrotestosterone