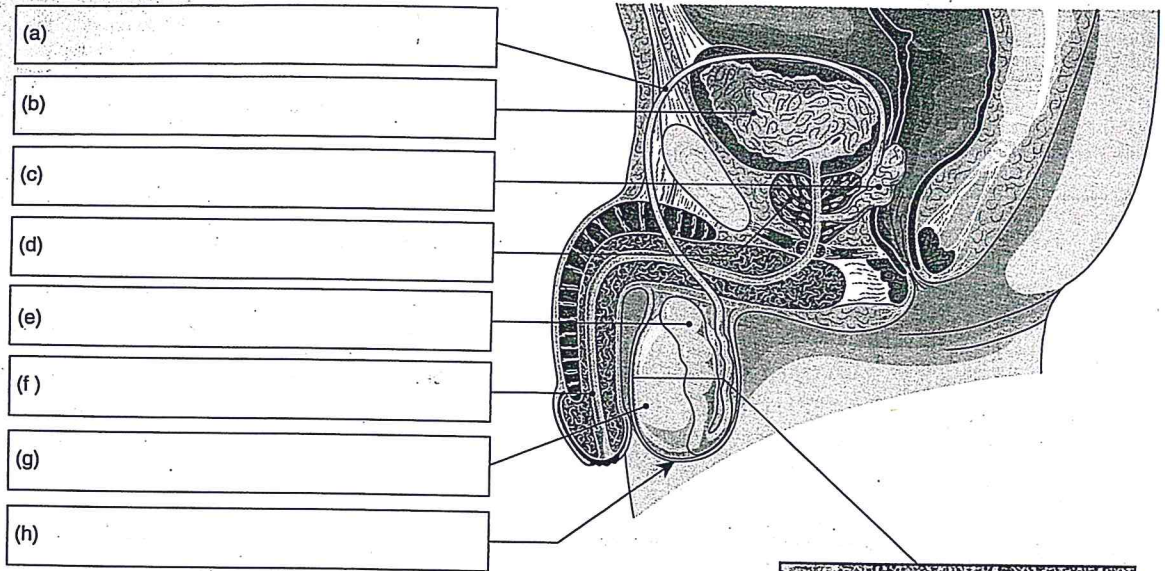


The Male Reproductive System

The male reproductive system (below) is concerned with producing sperm and delivering them to the female urogenital tract. Mature sperm are ejaculated with fluids from the seminal

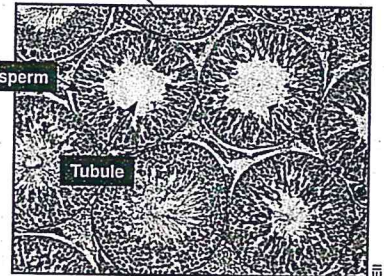
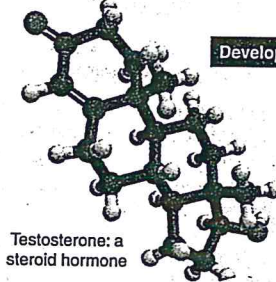
vesicles and prostate as semen. When a sperm combines with an egg, it contributes half the genetic material of the offspring and, in humans and other mammals, determines its sex.



The Role of Testosterone

Testosterone plays three main roles in males:

- ▶ Development of the male **primary sexual characteristics** (male genitalia) in the embryo. This occurs at about 6 weeks.
- ▶ Development of the male **secondary sexual characteristics** in puberty (sperm production, growth of body hair, development of muscles, deepening of voice).
- ▶ Maintains sex drive and sperm production in adults after puberty.



Cross section through a testis to show the seminiferous tubules where the sperm are formed.

1. The male human reproductive system and associated structures are shown above. Using the following **word list** and the **weblinks provided below**, identify the labeled parts (write your answers in the spaces provided on the diagram).
Word list: *bladder, scrotal sac, sperm duct (vas deferens), epididymis, seminal vesicle, testis, urethra, prostate gland*
2. In a short sentence, state the function of each of the structures labeled (a)-(h) in the diagram above:
 - (a) _____
 - (b) _____
 - (c) _____
 - (d) _____
 - (e) _____
 - (f) _____
 - (g) _____
 - (h) _____
3. Describe the three roles of testosterone in male development and the male reproductive system: _____

4. State the two main roles of the male reproductive system: _____

Spermatogenesis

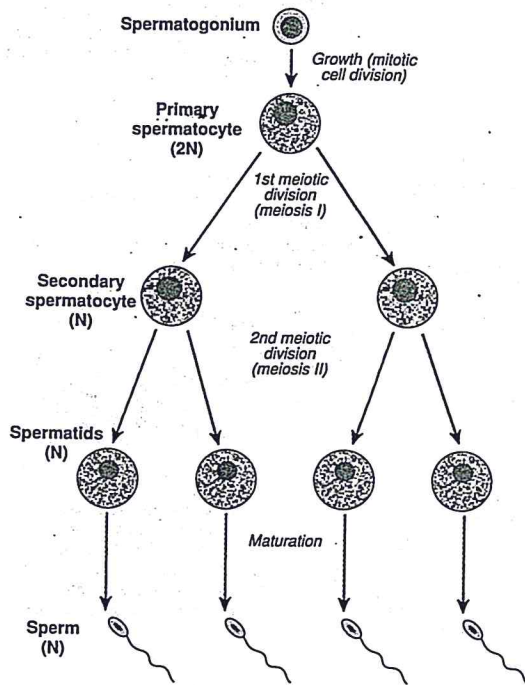
Gametogenesis involves meiotic division to produce male and female gametes (sperm and eggs) for the purpose of sexual reproduction. Males produce sperm in the testis by spermatogenesis. In humans, sperm production begins at

puberty and continues throughout life, although it declines with age. Fluids secreted from various parts of the male reproductive tract support and transport the sperm. Thousands of sperm are produced every second, and take about two months to mature.

Spermatogenesis

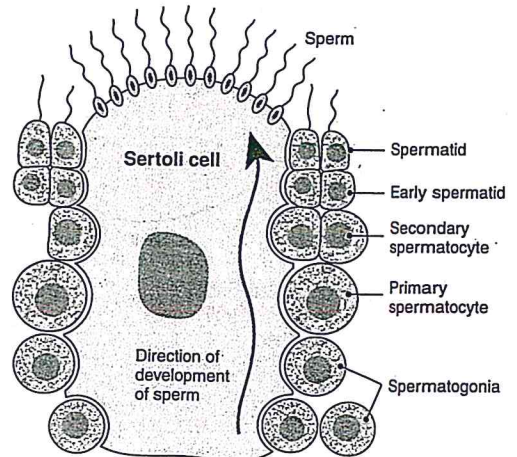
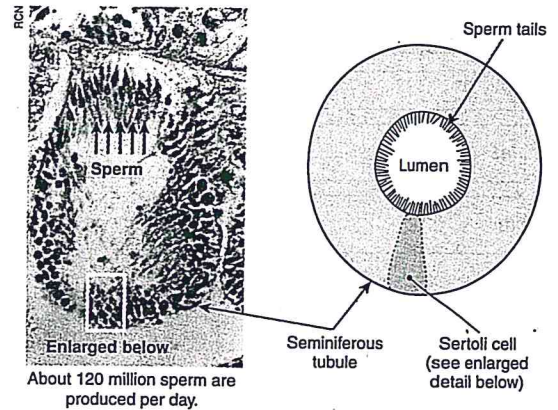
Spermatogenesis is the process by which mature spermatozoa (sperm) are produced in the testis. The process is regulated by the hormones follicle stimulating hormone (FSH) (from the anterior pituitary) and testosterone (secreted from the testes) in response to luteinizing hormone (LH) (from the anterior pituitary).

Spermatogonia, in the outer layer of the seminiferous tubules, multiply throughout reproductive life. Some of them divide by meiosis into spermatocytes, which produce spermatids. These are transformed into mature sperm by the process of spermiogenesis in the seminiferous tubules of the testis. Full sperm motility is achieved in the epididymis.



Cross Section Through Seminiferous Tubule

The photograph below shows maturing sperm (arrowed) with tails projecting into the lumen of the seminiferous tubule. Their heads are embedded in the Sertoli cells in the tubule wall and they are ready to break free and move to the epididymis where they complete their maturation. The same cross-section is illustrated diagrammatically (bottom).



- (a) Name the process by which mature sperm are formed: _____

(b) Identify where this process takes place: _____

(c) State how many mature sperm form from one primary spermatocyte: _____

(d) State the type of cell division which produces mature sperm cells: _____
- Describe the role of FSH and LH in sperm production: _____

- Each ejaculation of a healthy, fertile male contains 100-400 million sperm. Suggest why so many sperm are needed: _____
