

# GAMETOGENESIS

The Primary sex organs: -

Testis (Male)

↓ Produce

gametes (sperms)

Ovaries (Female)

↓ Produce

gametes (ovum)

└─ gametogenesis ─┘

## Spermatogenesis

↓

spermatogonia → seminiferous tubules  
mitotic division (46 chromosome)

Primary spermatocytes

↓  
meiosis (R/D)

sec. spermatocytes (23 chromosome)  
↓ meiotic division.

4 unequal haploid spermatids

↓  
spermatids → spermatozoa (sperms)

sperm embedded in Sertoli cells.

↓  
Release called spermiation.

Age of puberty → GnRH increase

↓  
Act at the ant. pituitary gland  
& stimulates secretion of - gonadotropin

lactiferous duct

### 3.3 GAMETOGENESIS

The primary sex organs – the testis in the males and the ovaries in the females – produce gametes, i.e, sperms and ovum, respectively, by the process called gametogenesis. In testis, the immature male germ cells (spermatogonia) produce sperms by spermatogenesis that begins at puberty. The spermatogonia (sing. spermatogonium) present on the inside wall of seminiferous tubules multiply by mitotic division and increase in numbers. Each spermatogonium is diploid and contains 46 chromosomes. Some of the spermatogonia called primary spermatocytes periodically undergo meiosis. A primary spermatocyte completes the first meiotic division (reduction division) leading to formation of two equal, haploid cells called secondary spermatocytes, which have only 23 chromosomes each. The secondary spermatocytes undergo the second meiotic division to produce four equal, haploid spermatids (Figure 3.5). What would be the number of chromosome in the spermatids? The spermatids are transformed into spermatozoa (sperms) by the process called spermiogenesis. After spermiogenesis, sperm heads become embedded in the Sertoli cells, and are finally released from the seminiferous tubules by the process called spermiation.

Spermatogenesis starts at the age of puberty due to significant increase in the secretion of gonadotropin releasing hormone (GnRH). This, if you recall, is a hypothalamic hormone. The increased levels of GnRH then acts at the anterior pituitary gland and stimulates secretion of two gonadotropins – luteinising hormone (LH) and follicle stimulating hormone (FSH). LH acts at the Leydig cells and stimulates synthesis and secretion of androgens. Androgens, in turn, stimulate the process of spermatogenesis. FSH acts on the Sertoli cells and stimulates

alveoli  
M. tubules  
M. Duct  
M.O M.O  
Ampulla  
lactiferous duct

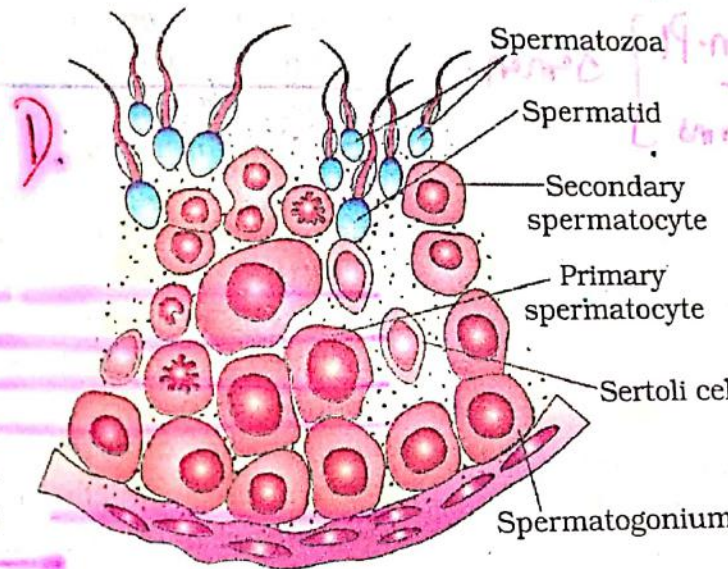
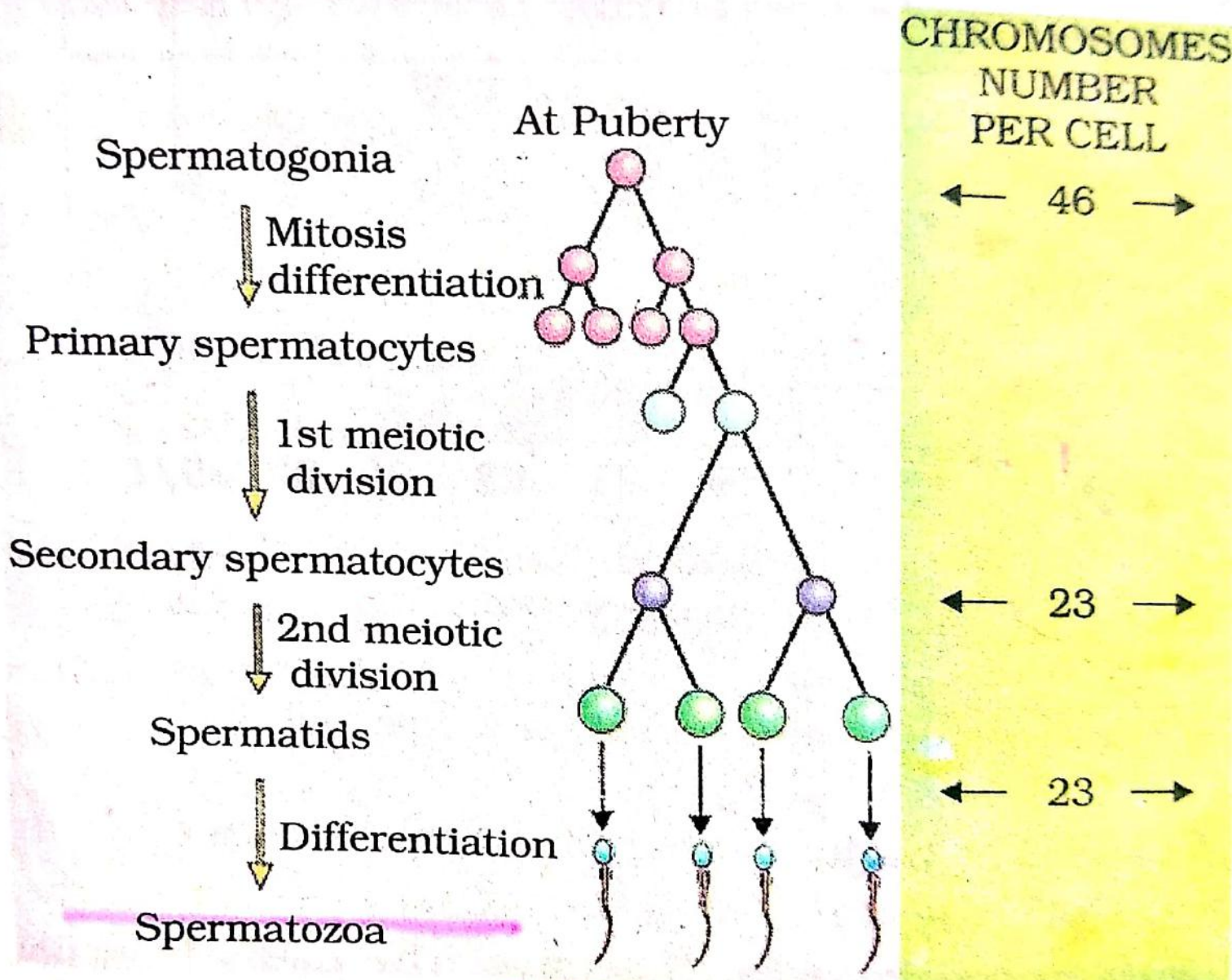


Figure 3.5 Diagrammatic sectional view of seminiferous tubule (enlarged)

LH + Leydig  
↓  
Androgen

... as given below (Figure



(a)

Hormone - LH & FSH

↓  
Leydig cells

↓  
secretion of androgen

↓  
Process of - spermatogenesis

→ Sertoli cells  
stimulates  
secretion of -  
some factors  
which help in the  
process of - spermiogenesis