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Spermatogenesis 218

Class - DIH and VII S

Process of formation of sperm in seminiferous tubules of testis is called spermatogenesis.

An adult male produces over 10^{12} to 10^{13} sperm cells each day. The process of spermatogenesis occur through successive formation of spermatogonia, Primary spermatocyte, Secondary spermatocyte, spermatids and spermatozoa (Mature sperm). Entire process of spermatogenesis may be divided into

- (1) Formation of spermatids
- (2) Metamorphosis of spermatids into spermatozoa (Spermiogenesis or spermatoliosis).

(1) Formation of spermatids

The process of formation of spermatids from the primary germ cells is distinguished into 3 phases.

- (a) Multiplication phase
- (b) Growth phase
- (c) Maturation phase

(a) Multiplication phase -

The primordial germ cells of the germinal epithelium lining the seminiferous tubules divide by mitosis and form spermatogonia. Each spermatogonia contain 2n chromosome.

(b) Growth phase - During this phase, spermatogonia grow and attain maturity. Mature spermatogonia are called primary spermatocyte.

(C) Maturation phase - ⁽²⁾ Each primary divide by reduction division (1st maturation division) as a result two daughter cells (secondary spermatocyte) formed which contain half chromosomal number (n number) only. The second spermatocyte undergo 2nd maturation division, which is simple mitosis resulting in the formation of four spermatids.

(2) Metamorphosis of spermatid (Spermiogenesis or spermatoliosis) - In this process non motile rounded spermatid gradually changed into spermatozoa (motile long sperm). The changes are

(a) changes in the nucleus -

Nucleus shrinks by losing water RNA and other nonchromatic material removed. Nucleus changes to elongated and narrow form.

(b) Changes in Mitochondria -

Mitochondria from different site, accumulate around distal centriside & part of axial filament and fuse together to form two densely packed body one on either side of axial filament. Later these bodies twisted spirally and form sheath around axial filament. This sheath is called

(3)

nebenkeron. This sheath provide energy to

sperm when it moves towards ovum.

(c) changes in centrioles -

Two centrioles move and come to lie behind the nucleus. One of them enters in a depression developed in the posterior part of the nucleus and called proximal centriole. The other one is called distal centriole. Distal centriole give rise to axial filament of the flagellum and acts as basal granule.

(d) Formation of acrosome.

Golgi complex of the spermatids forms the acrosome of the spermatozoa.

(e) Loss of cytoplasm

Most of the cytoplasm spermatid is lost and remaining forms a condensed layer around the periphery of the spermatozoa. This is known as manchette.

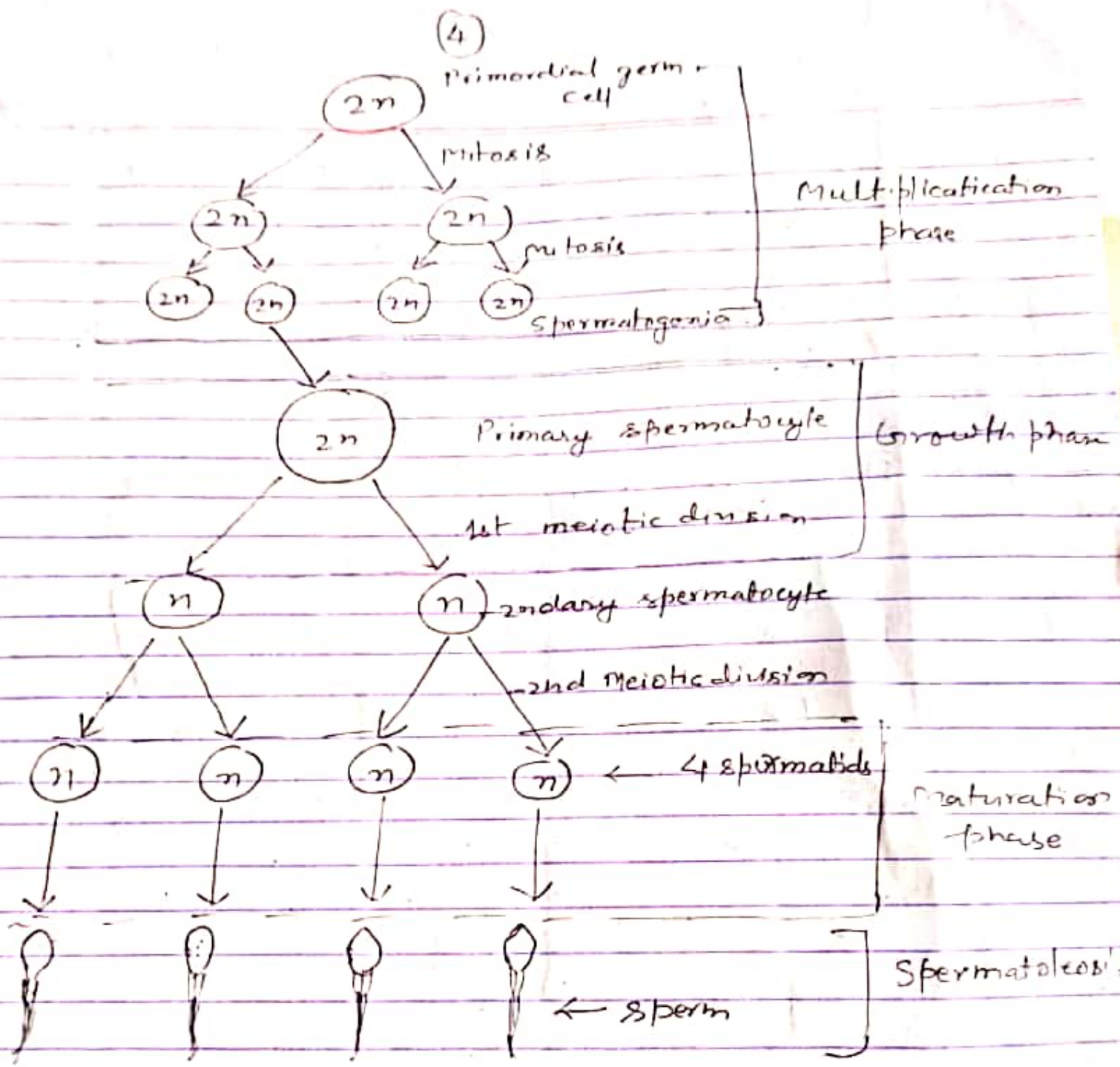


Fig - Spermatogenesis.