

# Spermatogenesis

- By the end of 5<sup>th</sup> week, the PGCs migrate into the developing testis then divide and differentiate into spermatogonia → stay inactive inside primitive sex cords.
- At birth, the sex cords show spermatogonia surrounded by supporting Sertoli cells.
- Spermatogonia stay resting during childhood within sex cords surrounded by Sertoli cells.
- Just before puberty, the sex cord obtains a lumen and becomes seminiferous tubules.

\* Two types of cells in seminiferous epithelium:-

1) Spermatogenic cells: sperm forming cells

2) Sertoli cells: they are embedded among the spermatogenic cells in the ( ) .

↳ They nourish spermatocytes, spermatids, and sperm.

↳ phagocytize excess spermatid cytoplasm.

↳ Control movement of spermatogenic cells and release of sperm into the lumen.

↳ Produce fluid for sperm transport.

↳ They secrete the hormone-inhibin, and regulate the effects of FSH and

testosterone; secreted by Leydig (interstitial) cells located in the spaces between adjacent seminiferous tubules.

↳ The most prevalent androgen

a hormone that promotes the development of masculine characteristics,

↳ promotes a man's libido (sexual drive)

\* Neighboring Sertoli cells are connected to one another by tight junctions

(BTB) The blood-testis barrier

(The Sertoli cell seminiferous epithelium barrier)

↳ it divides the seminiferous epithelium into the

apical compartment

basal compartment

meiosis I, II and spermiogenesis all take place behind the BTB in it.

spermatogonial (mitosis) renewal and differentiation and cell cycle progression up to the spermatocyte stage take place outside of the BTB in it.

\* By isolating the developing gametes

from the blood, the BTB prevents

an immune response against the spermatogenic cell's surface antigens, which are recognized as foreign by the immune system.

\* Spermatogenesis: occurs in the seminiferous tubules. (take 65-75 days in human)

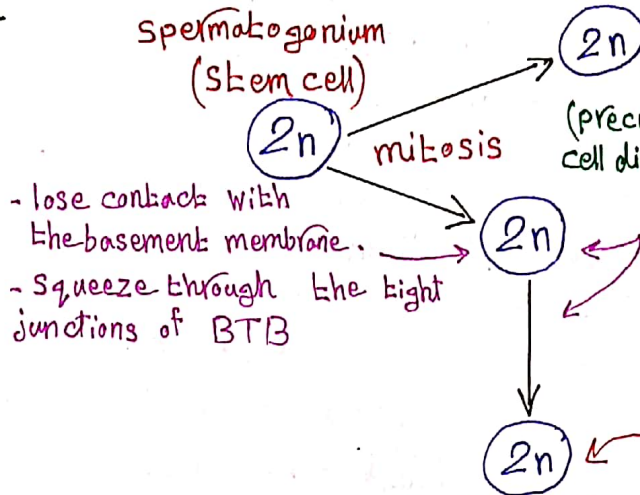
- cells start to mature on the outside and move inward (towards the lumen) as they become mature sperm.

Basement membrane

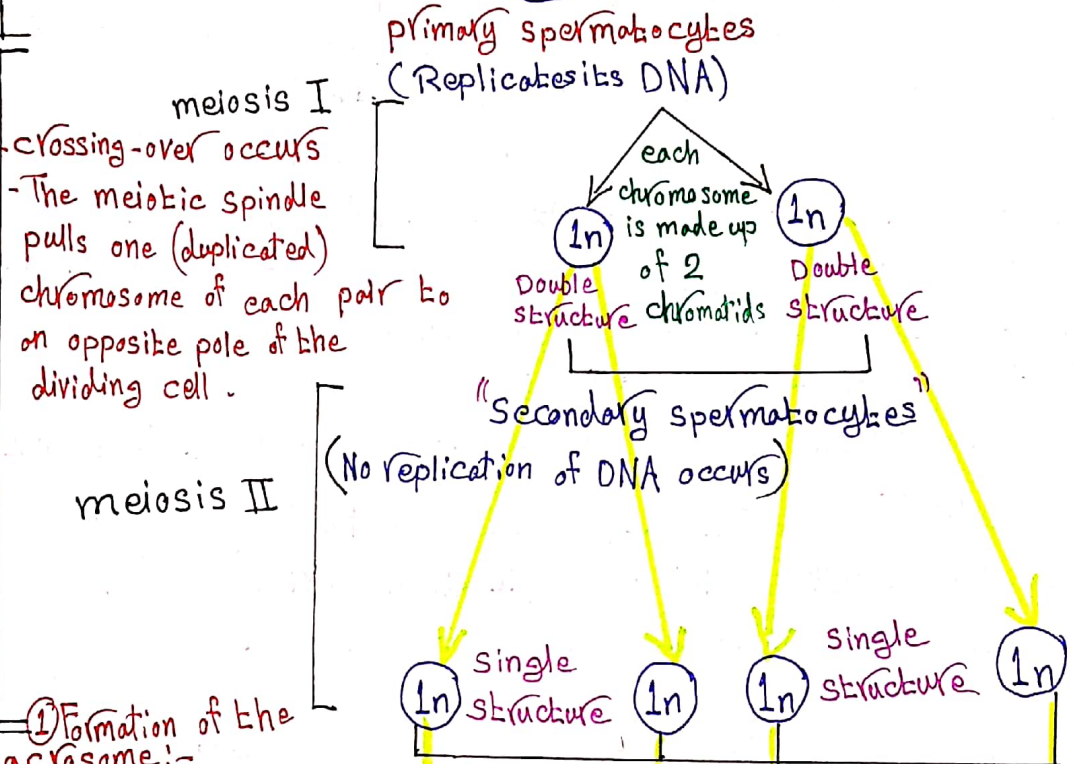
# \* Spermatogenesis phases \*

Remain near the basement membrane in an undifferentiated state to serve as reservoir of cells (precursor stem cells) for future cell division and subsequent sperm production.

① Spermatogonial phase

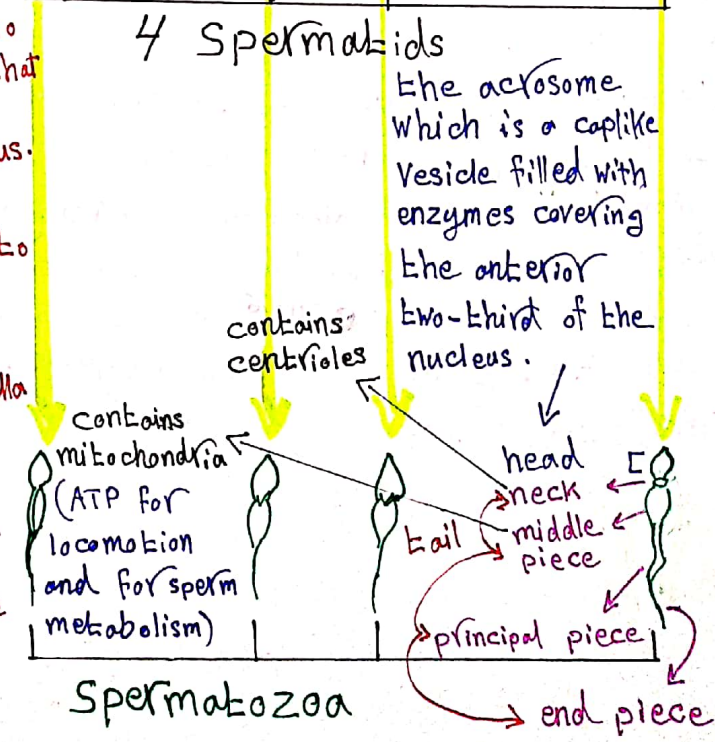


② Spermatocyte phase



③ Spermiogenesis phase

- ① Formation of the acrosome! - The golgi vesicles combine to form an acrosomal vesicle that lies over the nucleus.
- ② Condensation of the nucleus.
- ③ Centrioles start to organize microtubules into long flagella.
- ④ Mitochondria start to localize next to the flagella to provide ready energy.
- ⑤ Formation of neck, middle piece, and tail.
- ⑥ Shedding of most of the cytoplasm as residual bodies that are phagocytized by Sertoli cells.



Lumen