Embryology

Faculty of Medicine – JU2017

◉ Sheet ○ Slides

Number

2

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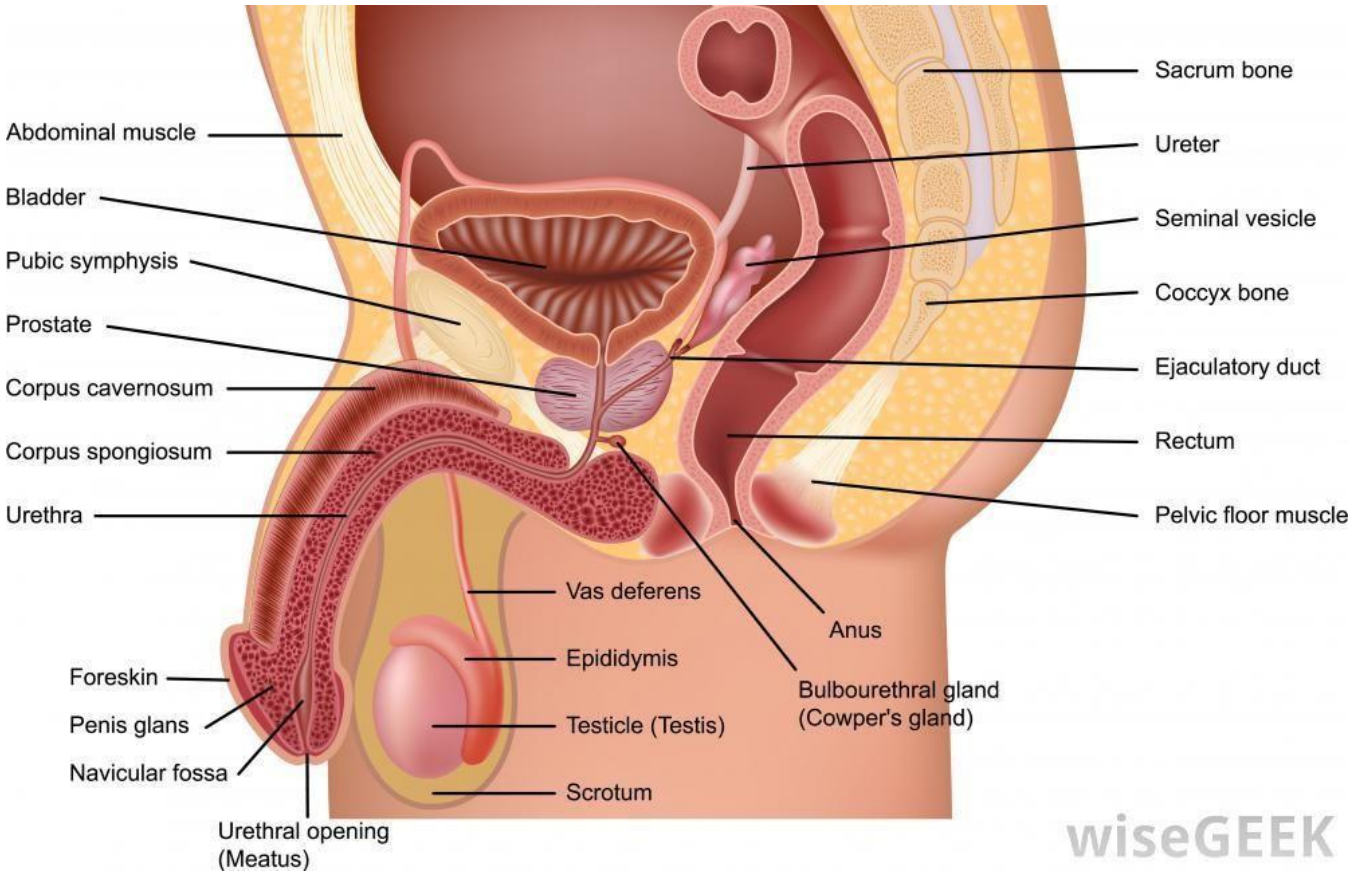
What is the "*MALE REPRODUCTIVE SYSTEM*"?

1. Consists of organs, vesicles; (ducts), and glands that are part of the human reproductive process.
2. Produces, stores and releases the male gametes (sperm).



***Testes** (singular testis)

- Mobile organ
- Males have two testis (right & left)
- Located within the scrotal sac (scrotum)

***NOTE: Scrotum**: Sac of skin and superficial fascia that hangs outside the abdominal pelvic cavity at the root of the penis.

Contains paired testicles (testes) separated by a midline septum

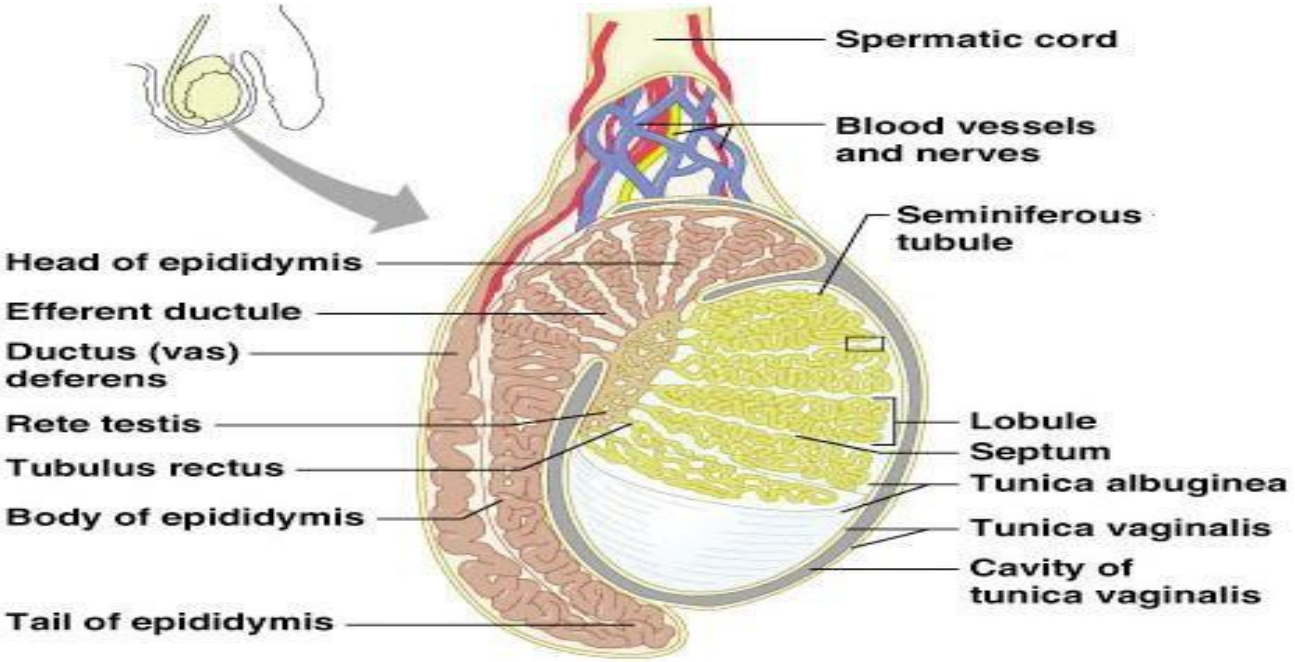
Its external positioning keeps the testes 3°C lower than core body temperature (needed for sperm production).

- A structure covered by 3 layers:

1st: **Skin layer** also known as the ***scrotum.***

2nd:**A layer of peritoneum** which forms ***tunica vaginalis*** → (the pouch of serous membrane that covers the testes. It is derived from the vaginal process of the peritoneum, which in the fetus precedes the descent of the testes from the abdomen into the scrotum.)

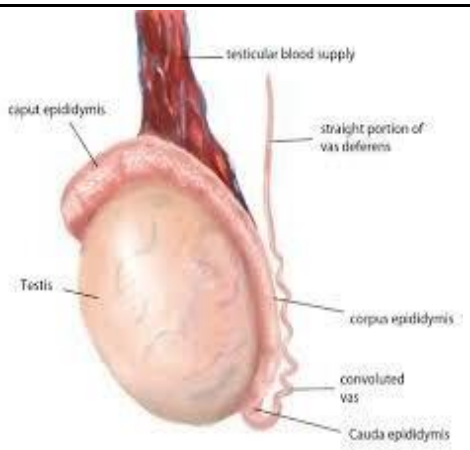
3rd:**Tunica albugine :**The Tunica albuginea's (a fibrous capsule) job is to send septa (singular septum) to divide each testes into lobules. Each testes contains about 250 lobules, which are pyramidal in shape. Each lobule contains 1-4 tortuous seminiferous tubules, their function is producing spermatids (premature (baby) sperms). The average length of the seminiferous tubules (a highly coiled tube that has one opening) inside both testicles is 70cm.



- Intratesticular ducts are found inside the testes, while extratesticular ducts are found outside the testes. →**BOTH carry sperm and seminal fluid.**

- Associated glands: They form non-cellular parts of the semen that nourishes and provide a fluid vehicle (carriers) for sperm delivery.

Testes have two functions:
1. Producing sperms (haploid 1n =23)
2. Producing the hormone testosterone (primary male sex hormone)



Testes in the embryo: At the 3rd and the 4th week of the embryo, growing testes are located in the posterior abdominal wall. With time, the abdominal cavity will be formed and covered by a membrane which is called ***peritoneum***. At the third month, the testes start to migrate posterior to the abdominal wall and stops in its place at the sixth month. It continues down by taking a cover from the peritoneum, and then goes to the anterior abdominal wall, where a hole is found and through it, the growing testes go outside the abdomen and reaches its destination. It's still covered by peritoneum and these converge to become ***rete testis*** network of delicate tubules which transport the sperm to the ***epididymis.***

Clinical case: If the testicles are still inside the abdomen and they do not reach its place outside the body, it forms an undescended testicle. It happens when the mother takes drugs during pregnancy or when she doesn't eat well (malnutrition); body temperature is not suitable for sperms production which results in sterility of the baby.

10:00

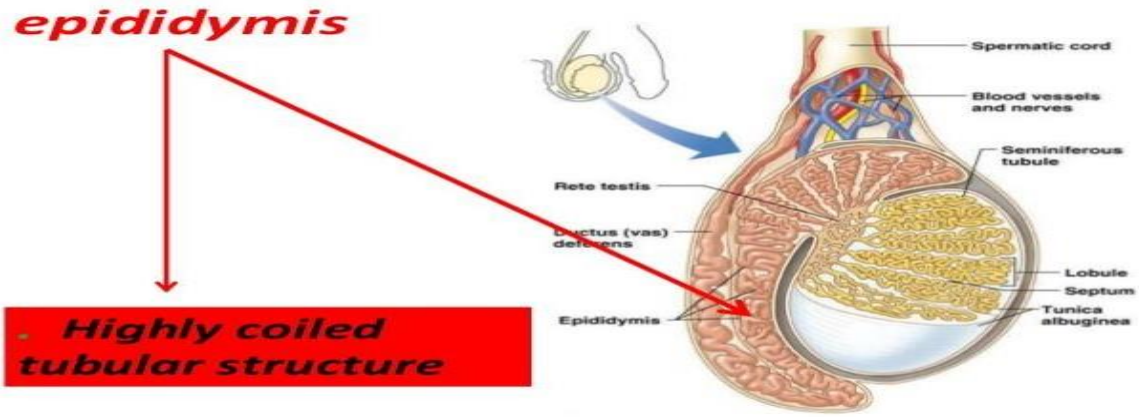
*** Epididymis**

- Shape: Comma shaped structure
- Location: Covering the posterior surface of each testis

***NOTE**: Each epididymis is a tightly coiled tube lying adjacent to the testes and leading from the testes to the vas deferens.

- Consists of 3 parts: head, body, and tail, in addition to 6 meters long, highly convoluted tubules.

- Function: Maturation and storage place for sperm.
- About 6 meters in length (same length of intestine)



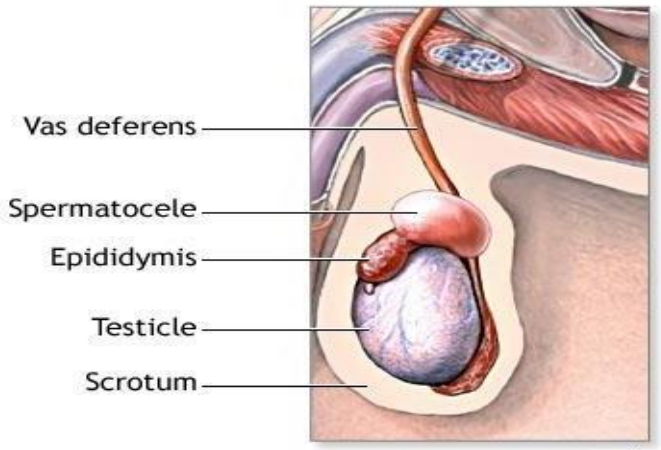
*NOTE:

- Sperms that leave the testes are immature and incapable of fertilizing ova
- They complete their maturation process and become fertile as they move through the epididymis.
- Mature sperms are stored in the lower portion (tail) of the epididymis.

18:00

* Vas deferens

- Each vas deferens is a muscular long thick -walled tube 45 centimeters in length.
- Function: To carry mature sperms from the tail of epididymis into the body cavity to the ejaculatory duct.
- Temporarily stores sperms.



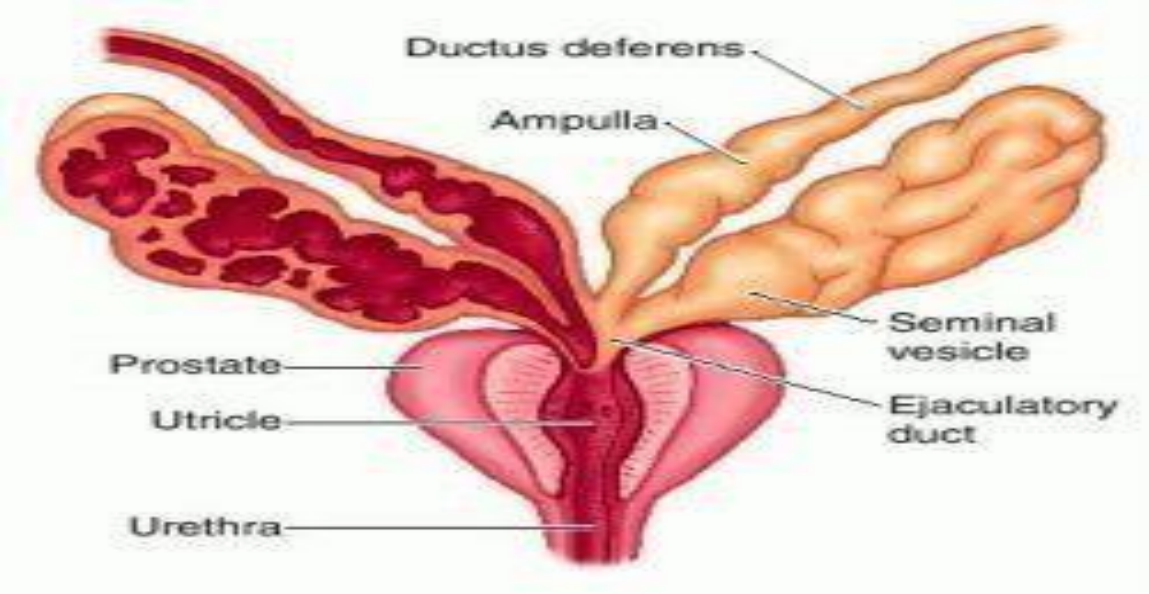
* Seminal Vesicle

- Shape : Two horn shaped, consists of 15 cm long coiled tubes.
- Location : Lying behind (posterior) and in the base of UB (urinary bladder)
- Function : Secretes fructose – rich seminal fluid that constitutes 70% of the ejaculate.

  Fructose: provides energy for the sperm (responsible for sperm movement). →Found ONLY in males!

  ** **Note:** The only part in the male body that secretes fructose is seminal vesicle. (Fructose is what is used to be detected in rape cases)

Clinical case : In some cases, seminal vesicle can't secrete fructose, which can lead to the sperms not reaching the ovum to fertilize it, this problem can be treated by fructose injection.



* Prostate

- Pyramidal- shaped fibromuscular glandular organ
- Location: Interiorly inferior to the urinary bladder, it surrounds prostatic urethra and contains 5 lobes.
- Function: Secretes a milky fluid that contains:

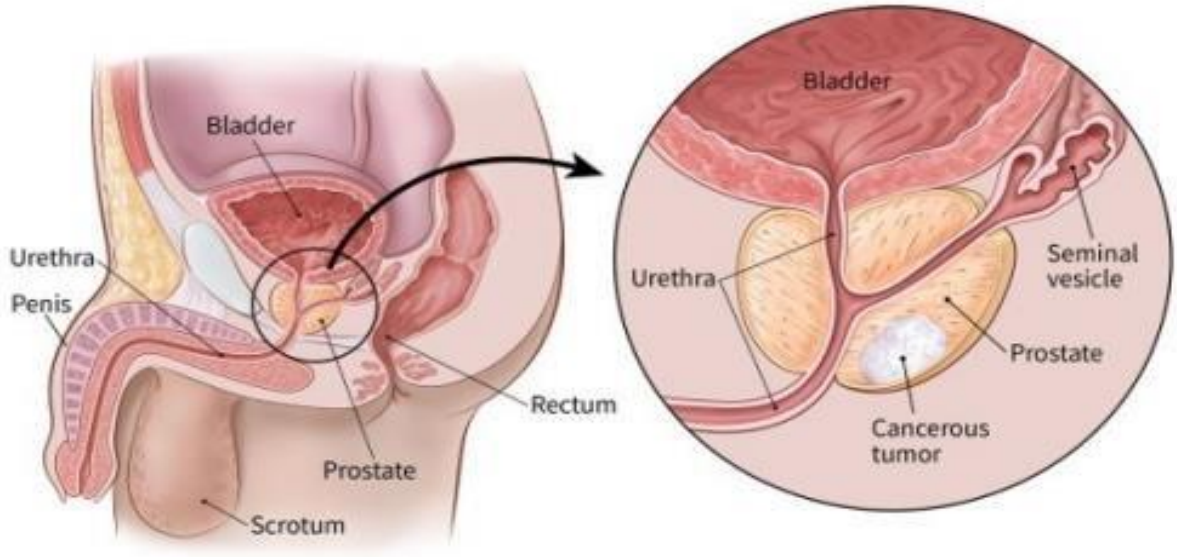
1. **Alkali fluid** (Alkaline phosphatase) to neutralize acidic vaginal secretion
2. **Prostaglandins** (antibiotic) why? Sometimes he or she may have a urinary tract infection.

- Shape: Chestnut shaped, its base is above the apex, traverse by urethra.

Clinical case: Acidic secretion of prostate kill sperms which leads to sterility.

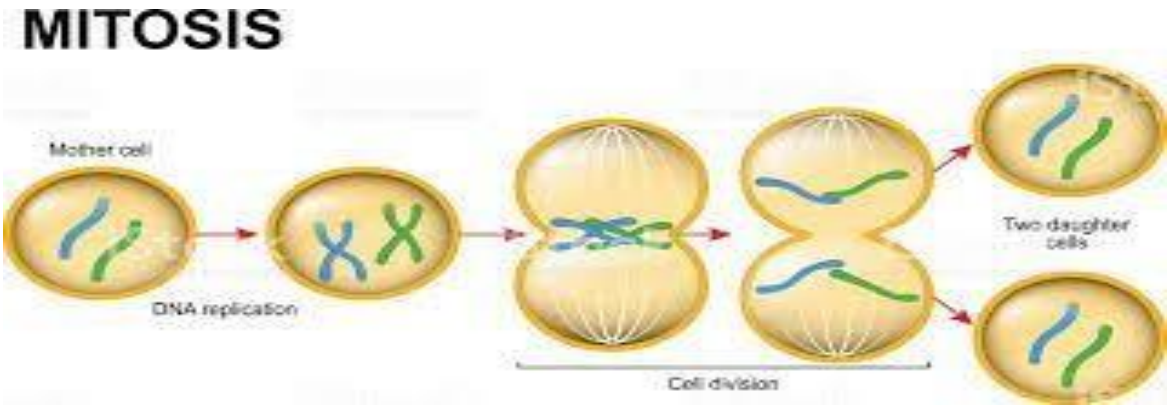
***Contraception method: Highly acidic environment of vagina to prevent fertilization by killing sperms (Vagina pills).

30:00



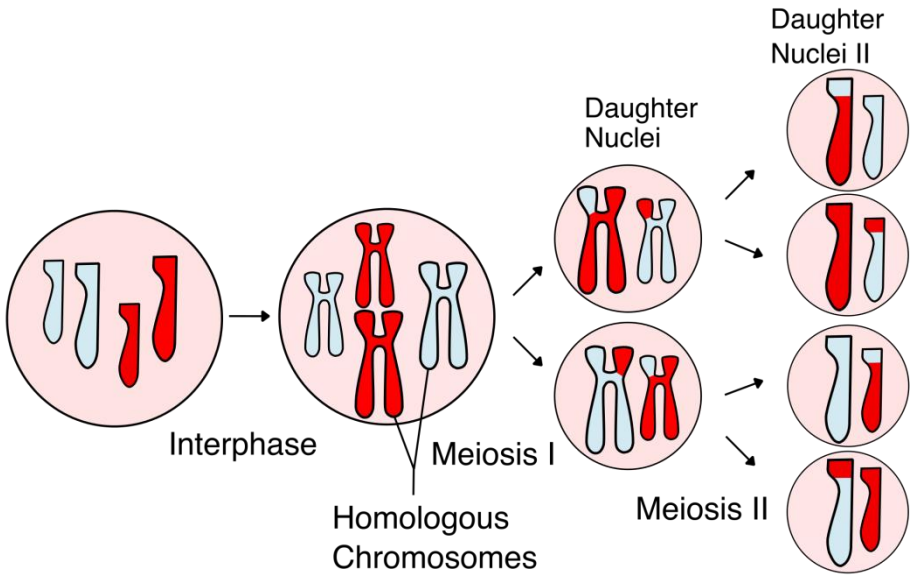
*Cell division

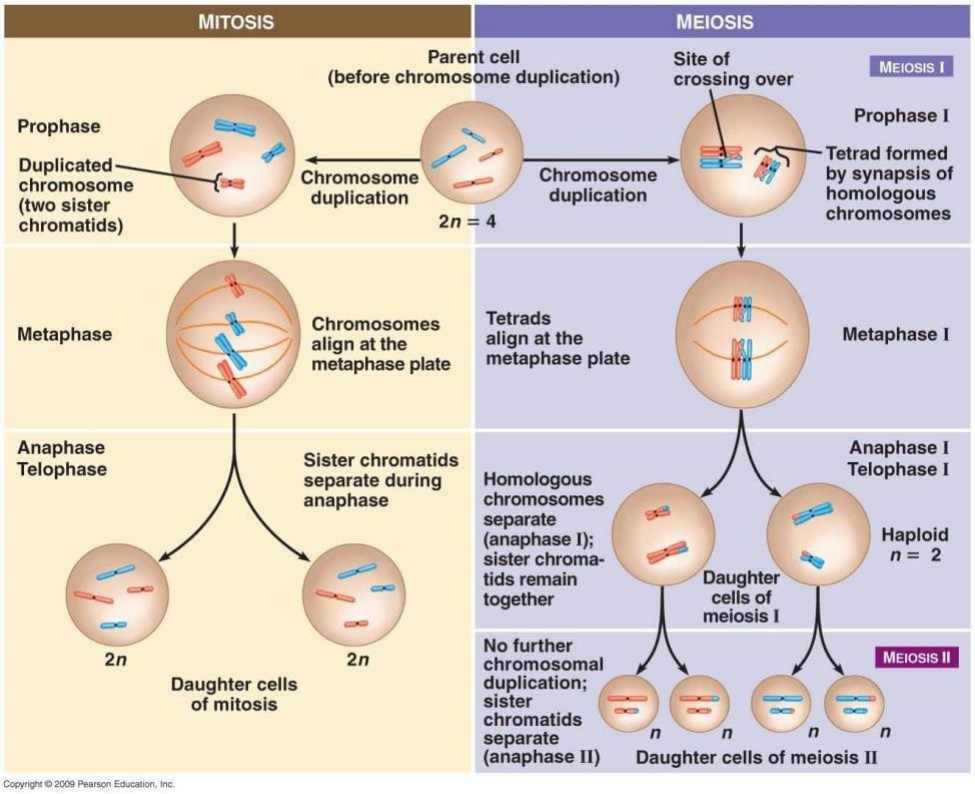
- **Mitosis**: The division of the mother cell into two daughter cells genetically identical to each other.



- **Meiosis**: type of cell division that produces four haploid cells that are non-identical

  ***NOTE:**Responsible for production of gametes (ova & sperm)





Crossing over (chiasmata): Is the exchange of genetic material between homologous chromosomes that results in recombinant chromosomes during sexual reproduction.

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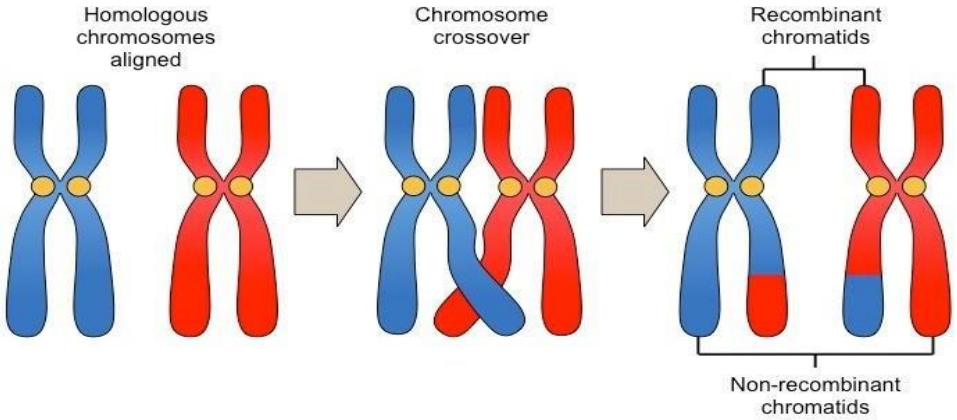

I LOVE YOU ALL,
GOOD LUCK!