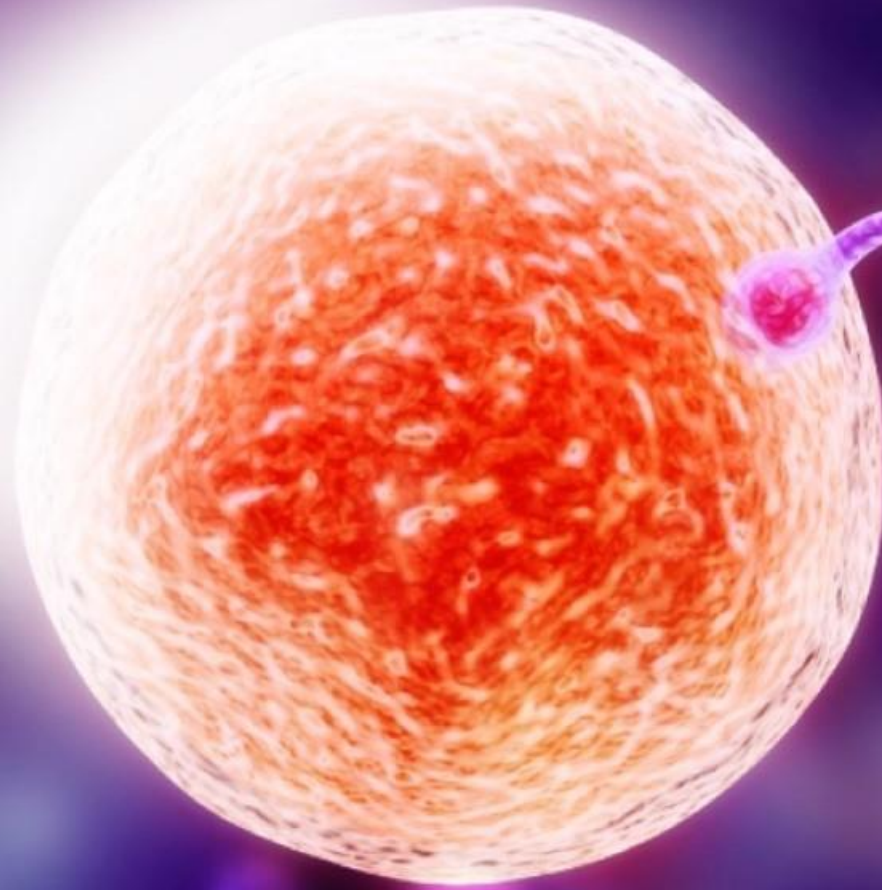




HUMAN REPRODUCTION

HUMAN REPRODUCTION



- **Reproduction** is the production of young ones by an organism.
- Humans are **sexually reproducing and viviparous**.

HUMAN REPRODUCTIVE SYSTEM

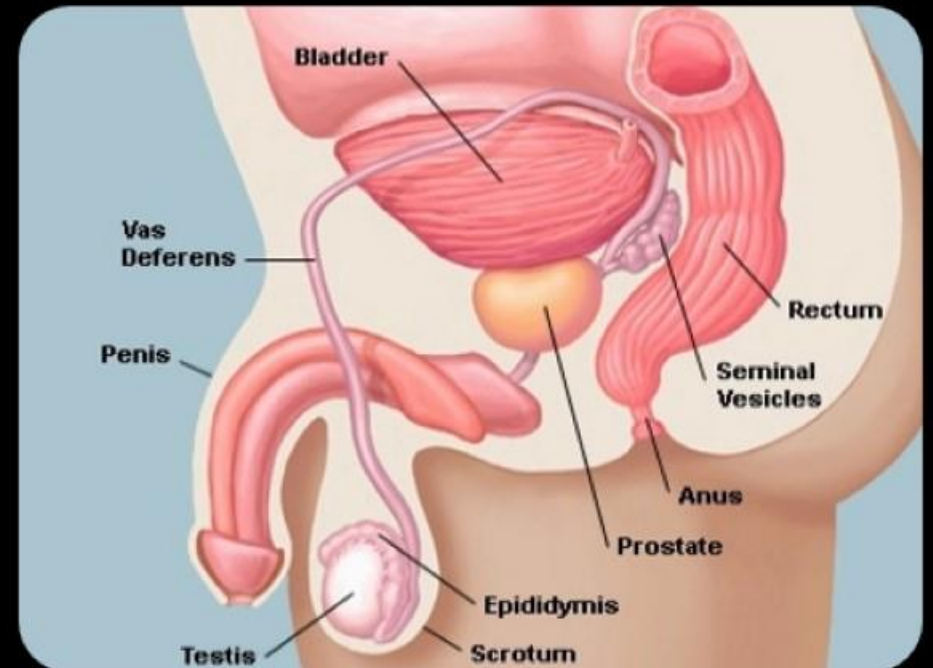
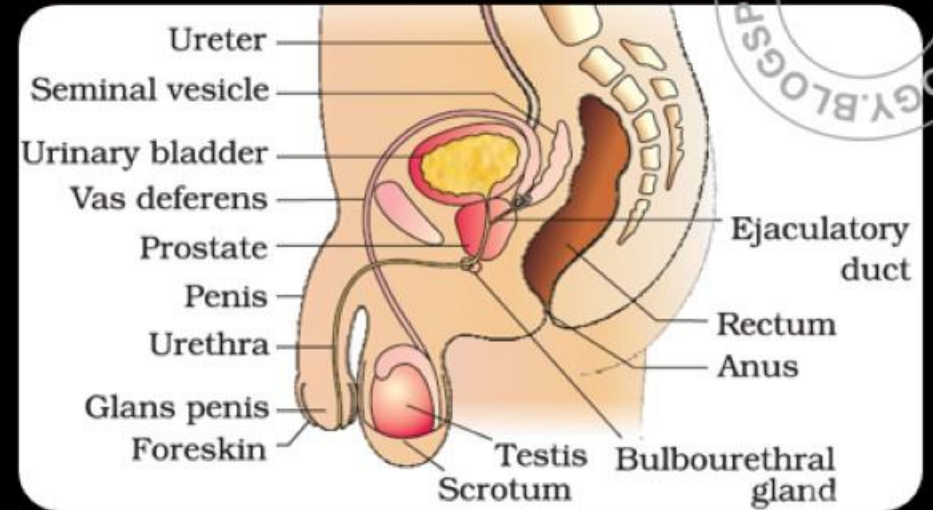
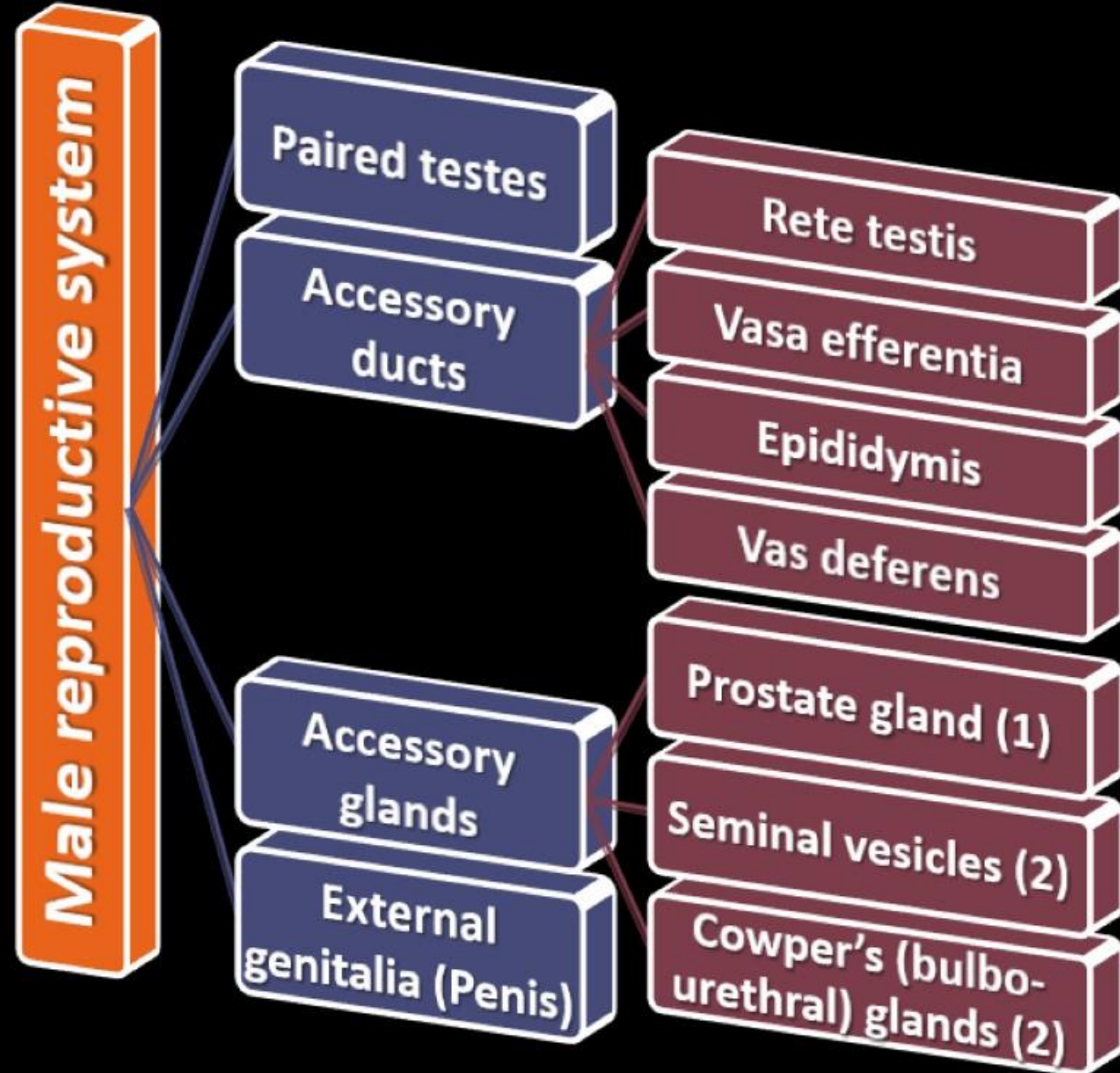
MALE
REPRODUCTIVE
SYSTEM

FEMALE
REPRODUCTIVE
SYSTEM



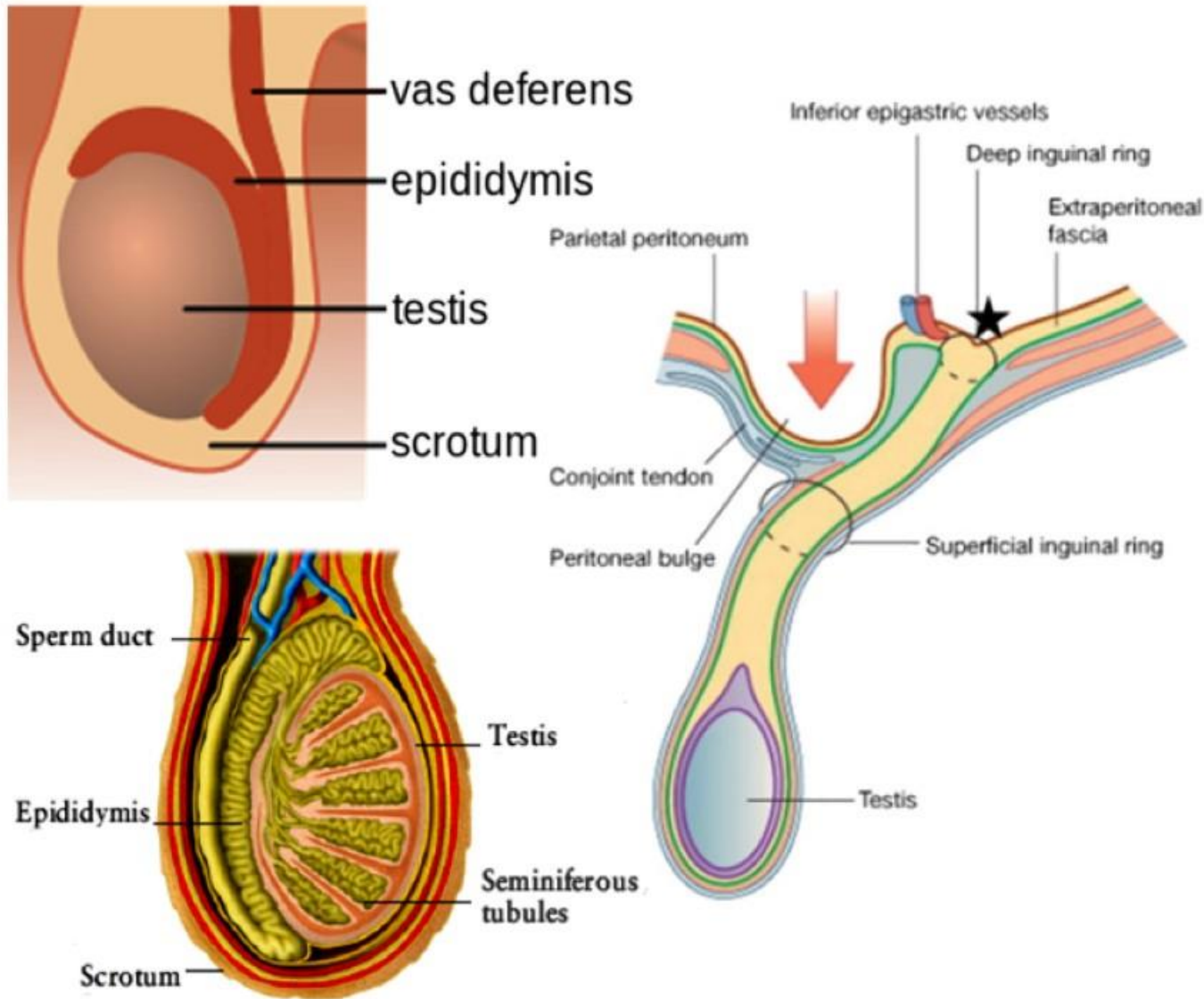
MALE REPRODUCTIVE SYSTEM

MALE REPRODUCTIVE SYSTEM



MALE REPRODUCTIVE SYSTEM

1. PAIRED TESTES



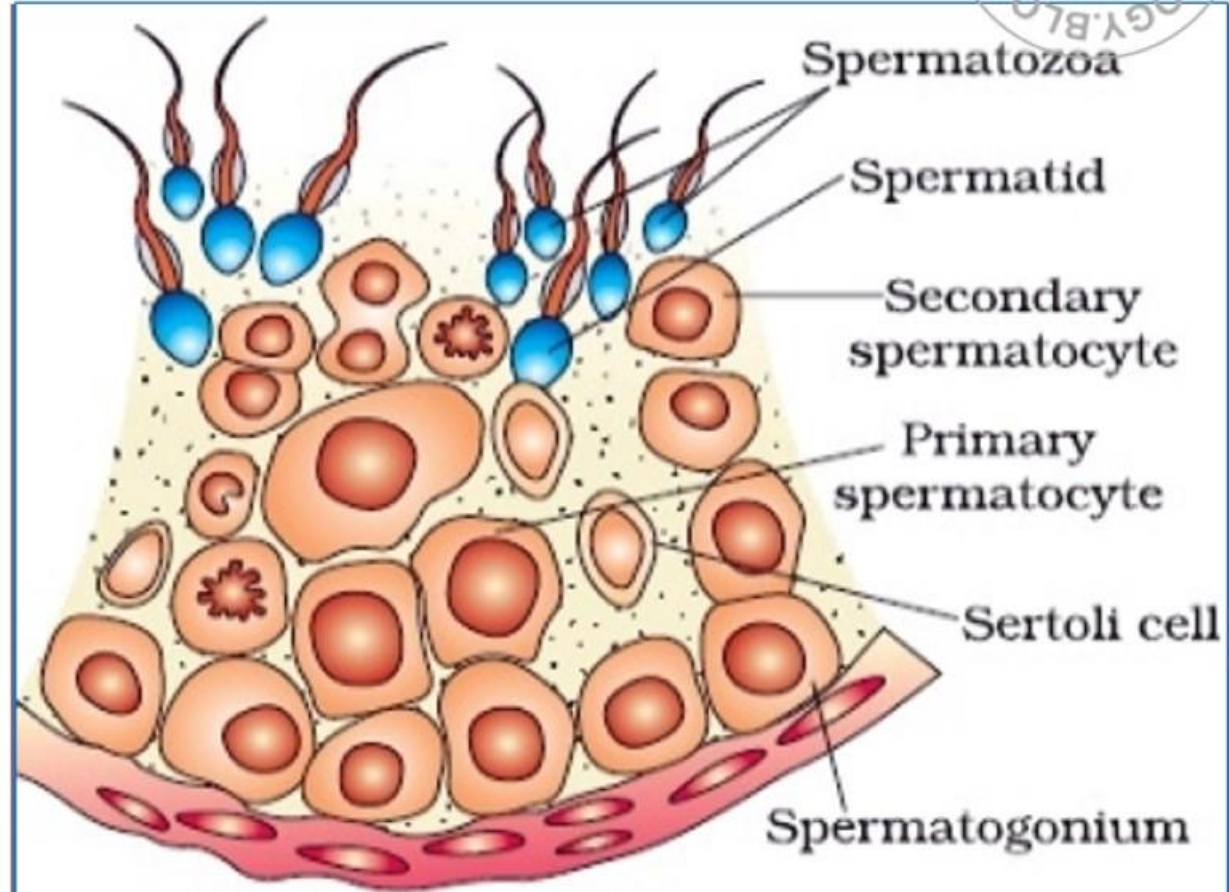
- **Primary sex organs** that produce **sperms & testosterone**.
- Testes are formed within abdomen.
- Soon after the birth or at the 8th month of pregnancy, they descent into the **scrotal sac (scrotum)** through **inguinal canal**.
- The **low temperature (2-2.5° C less than the body temperature)** of scrotum helps for proper functioning of testes and for **spermatogenesis**.

MALE REPRODUCTIVE SYSTEM

1. PAIRED TESTES

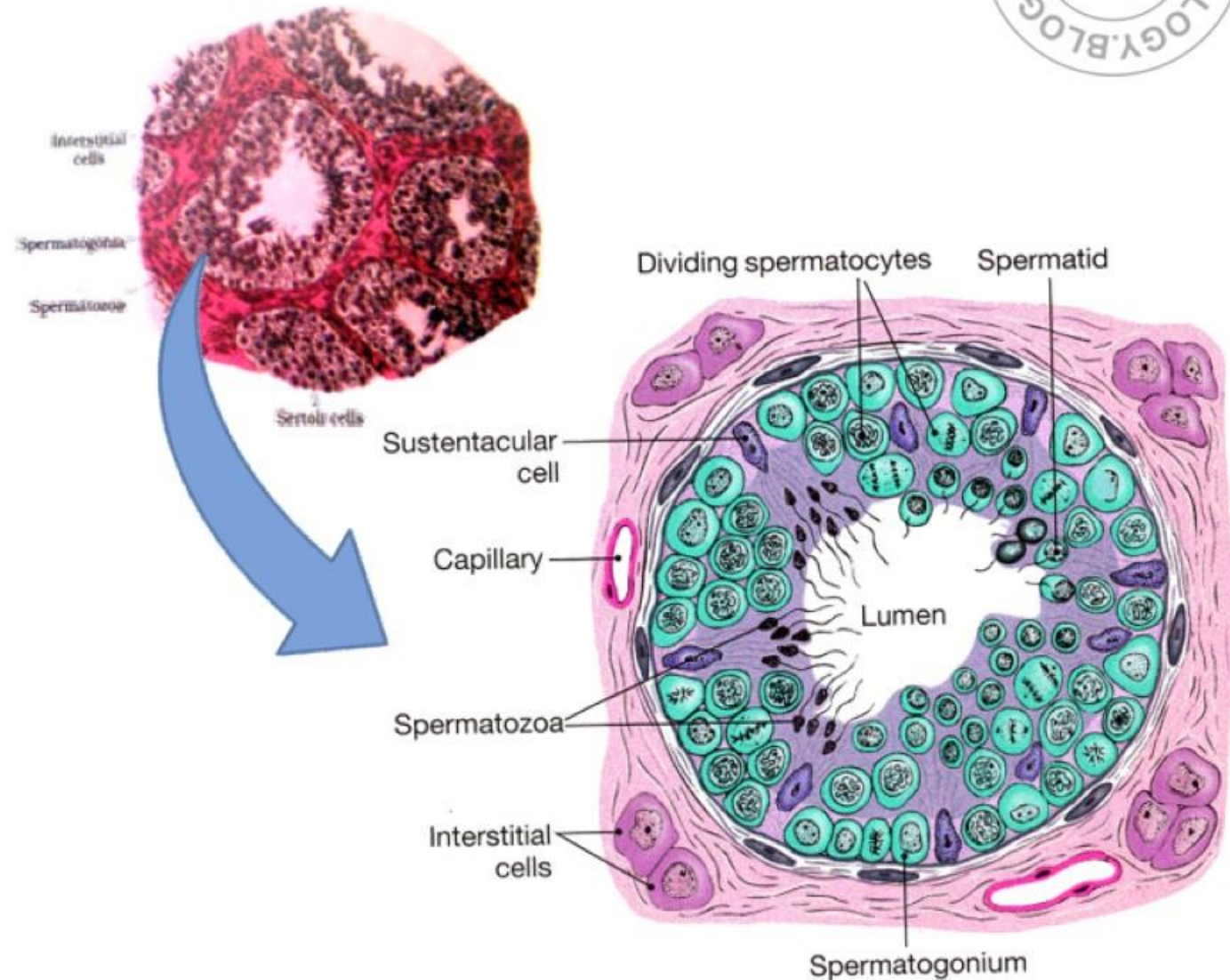


- Each testis is oval in shape.
- Length **4-5 cm**, width: **2-3 cm**.
- Each testis has about **250 testicular lobules**.
- Each lobule contains **1-3 coiled seminiferous tubules**.
- Seminiferous tubule is lined internally with **spermatogenic cells** (spermatogonia or male germ cells) & **Sertoli cells** (supporting cells).
- Sertoli cells give shape and nourishment to developing spermatogonia.



Diagrammatic sectional view of a seminiferous tubule (enlarged)

- The regions outside the seminiferous tubules (**interstitial spaces**) contain
 - Small blood vessels.
 - Interstitial cells or Leydig cells.
 - Immunologically competent cells.
- Leydig cells secrete testicular hormones (**androgens**).



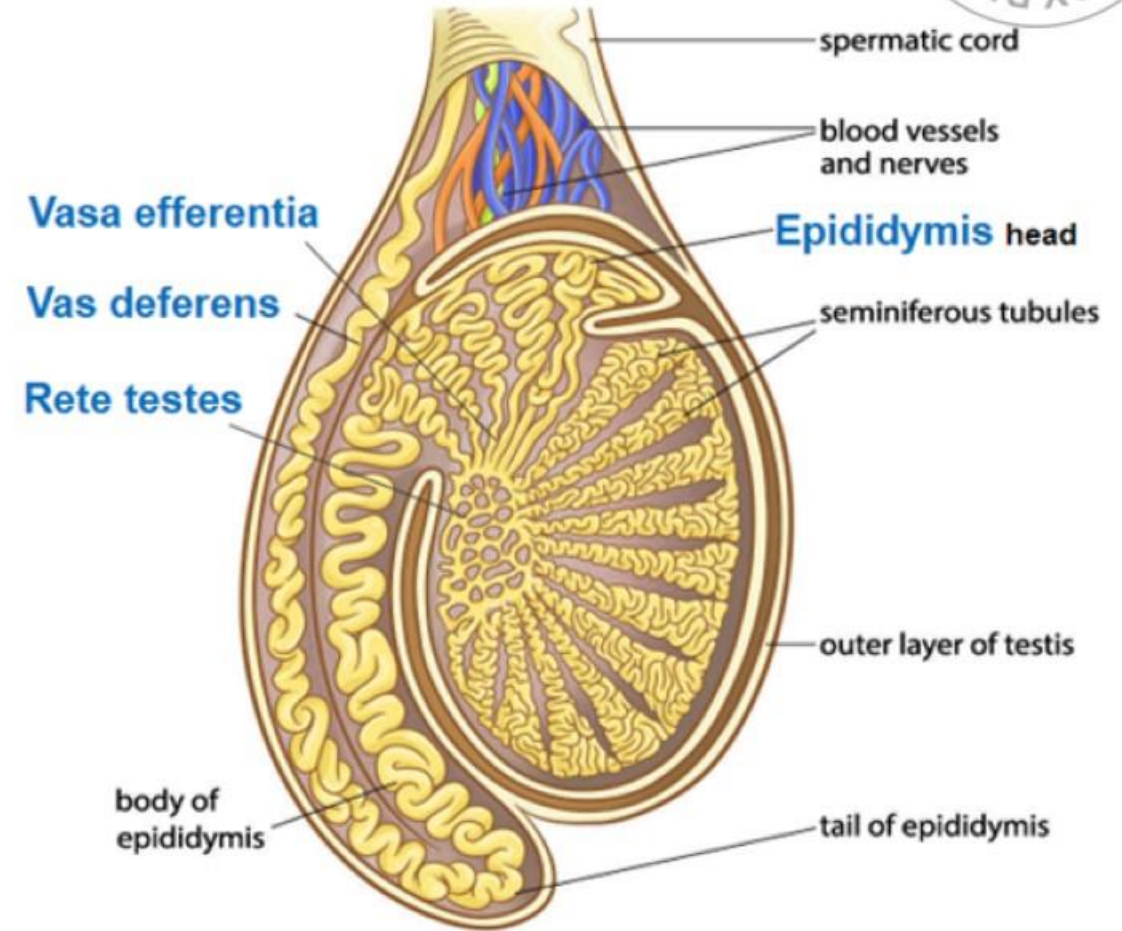
Accessory ducts (Duct system)

Rete testis
(irregular cavities)

Vasa efferentia
(series of fine tubules)

Epididymis
(stores sperms temporarily)

Vas deferens



Vas deferens joins with a duct of seminal vesicle to form common-ejaculatory duct.

Conduction of sperms through Accessory ducts

Seminiferous tubules

Rete testis

Vasa efferentia

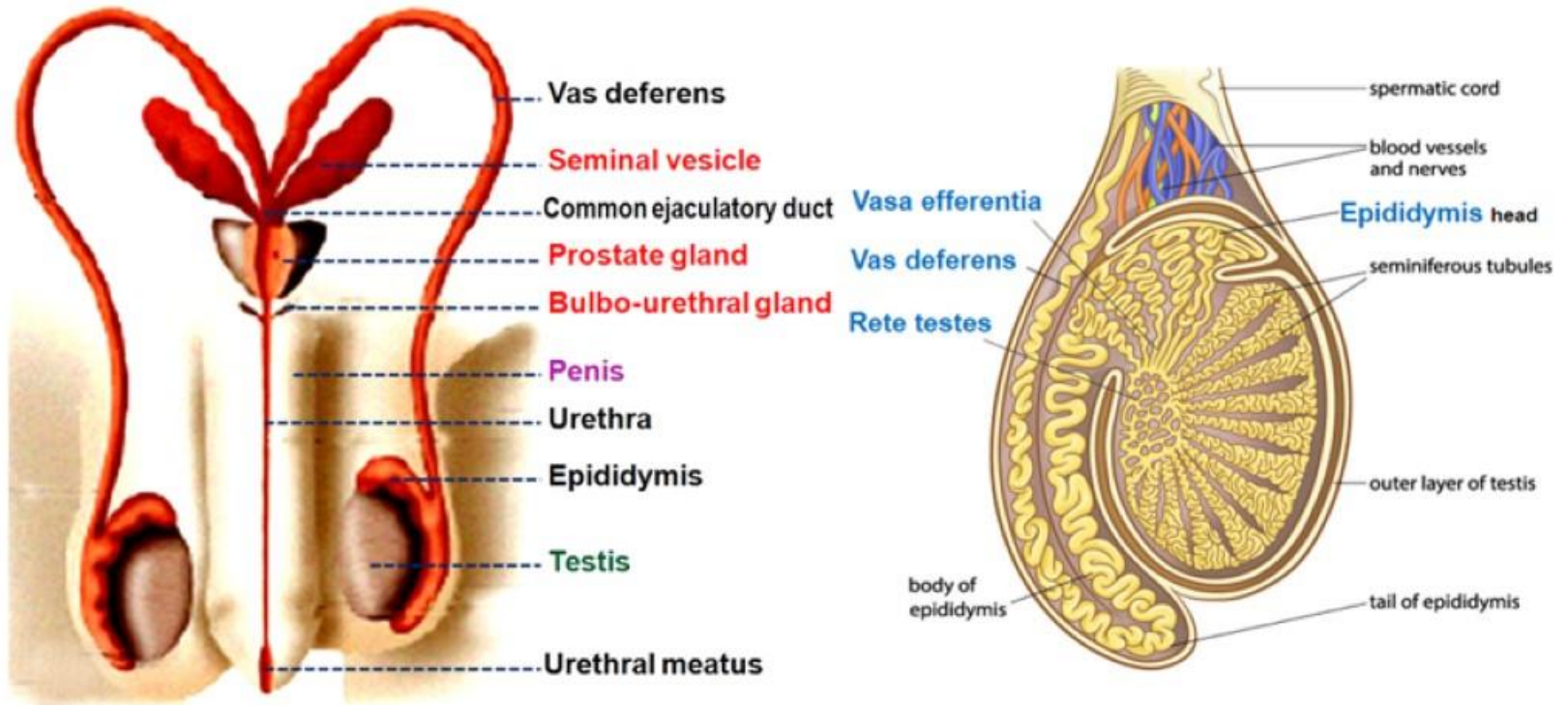
Epididymis

Vas deferens

Common ejaculatory duct

Urethra

Urethral meatus

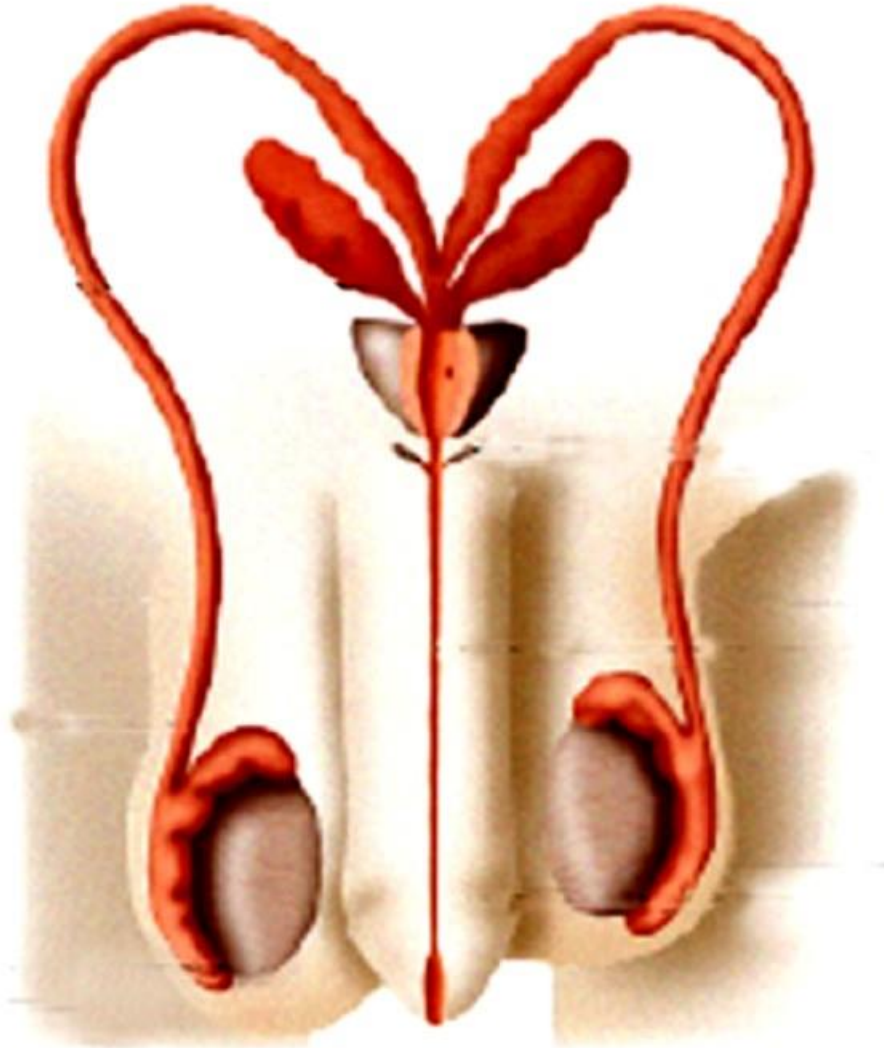


The urethra receives the ducts of prostate and Cowper's glands and passes through the penis.



- They include
 - A pair of seminal vesicles.
 - A prostate gland.
 - A pair of Cowper's (bulbo-urethral) glands.
- Their collective secretion is called **seminal plasma**. It is rich in fructose, Ca and enzymes.

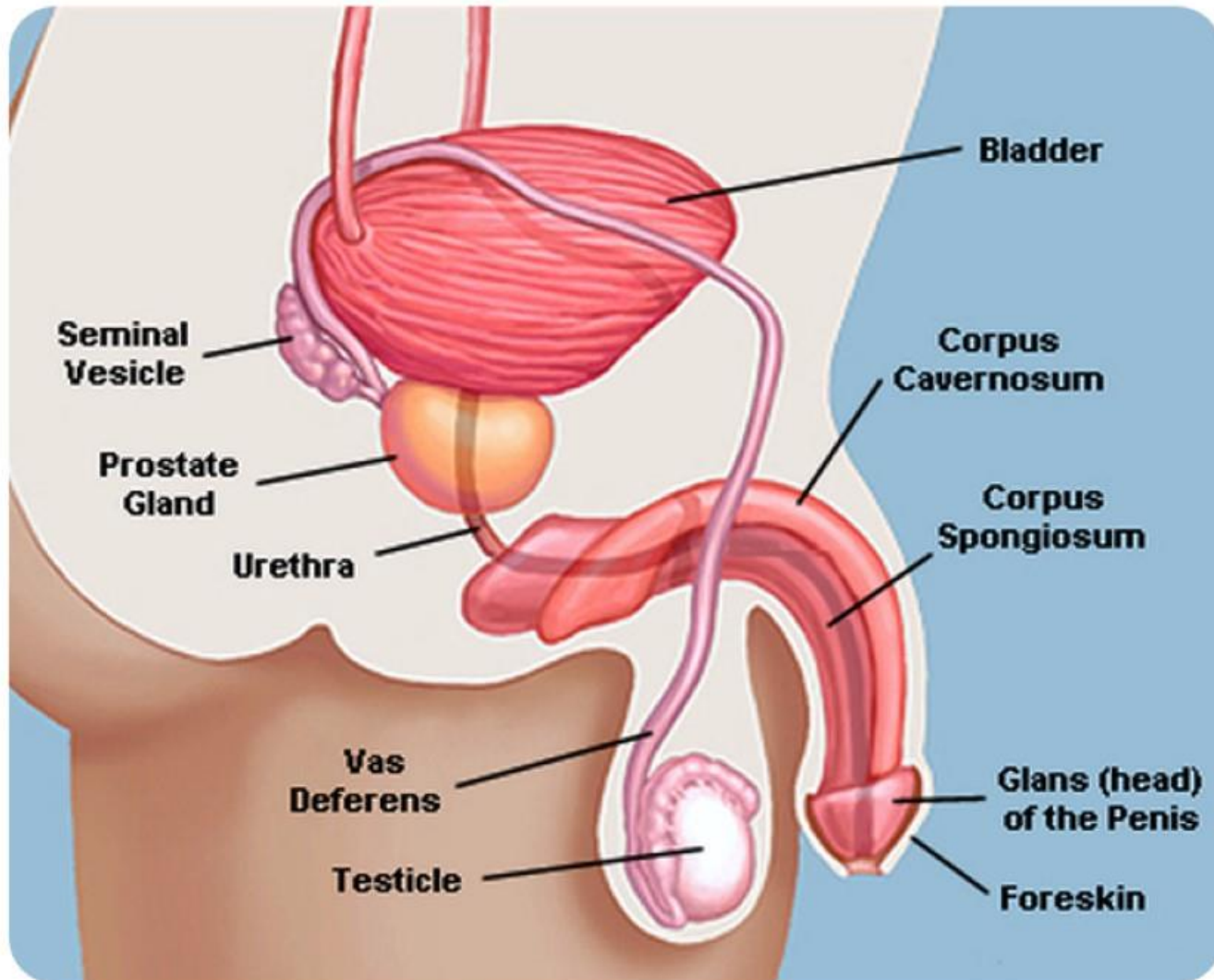
Seminal plasma + Sperms → Semen



Functions of seminal plasma:

- ❑ Helps for transporting sperms.
- ❑ Supplies nutrients to sperms.
- ❑ Provides alkalinity to counteract acidity of uterus.
- ❑ Secretions of Cowper's glands lubricate the penis.

Secretions of epididymis, vas deferens, seminal vesicle & prostate help for maturation and motility of sperms.



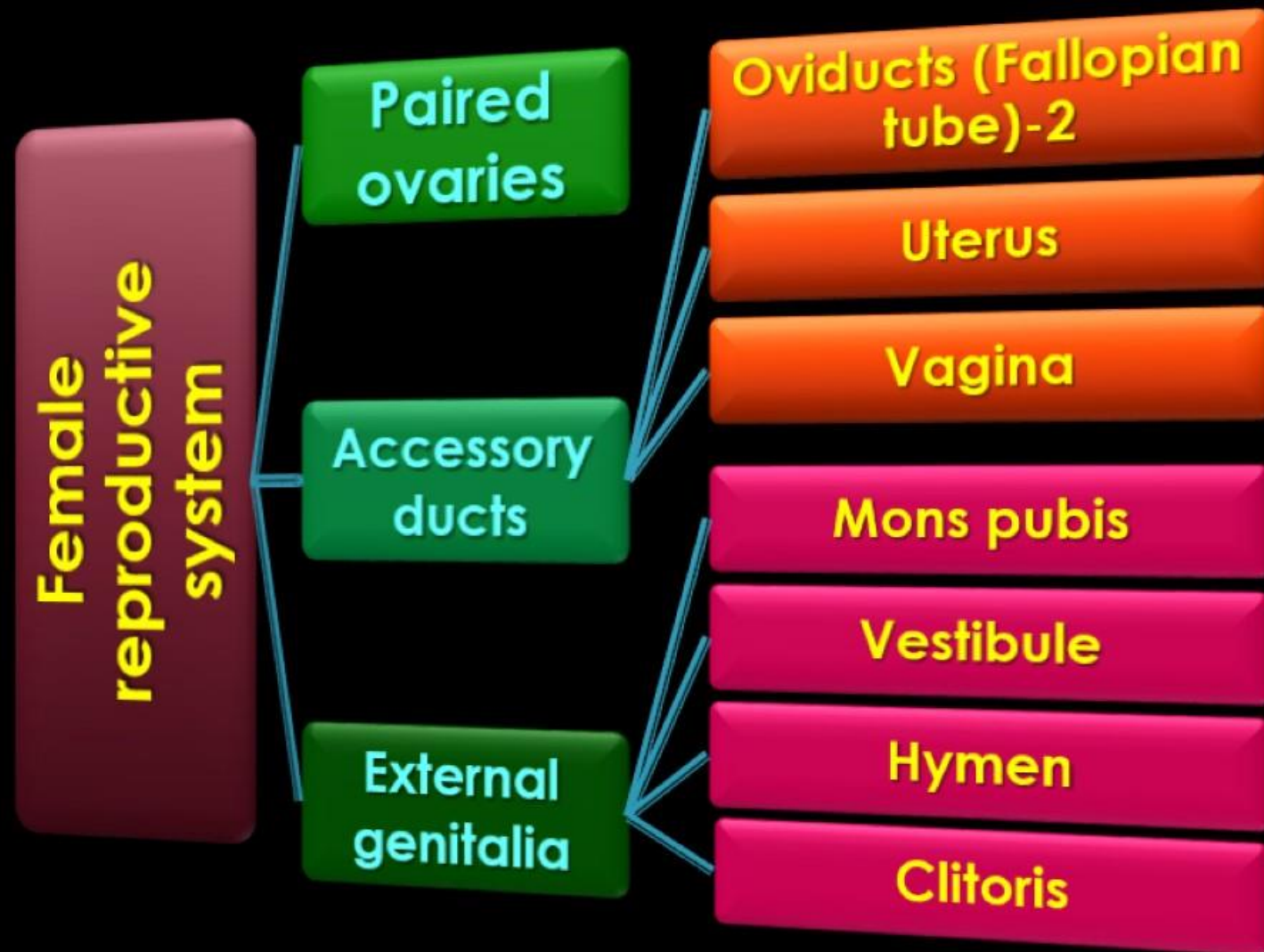
- It is a copulatory organ.
- It is made up of special **erectile spongy tissues**.
- When spongy tissue is filled with blood, the penis erects. It facilitates **insemination**.
- The cone-shaped tip of the penis is called **glans penis**. It is covered by **prepuce (foreskin)**.



FEMALE

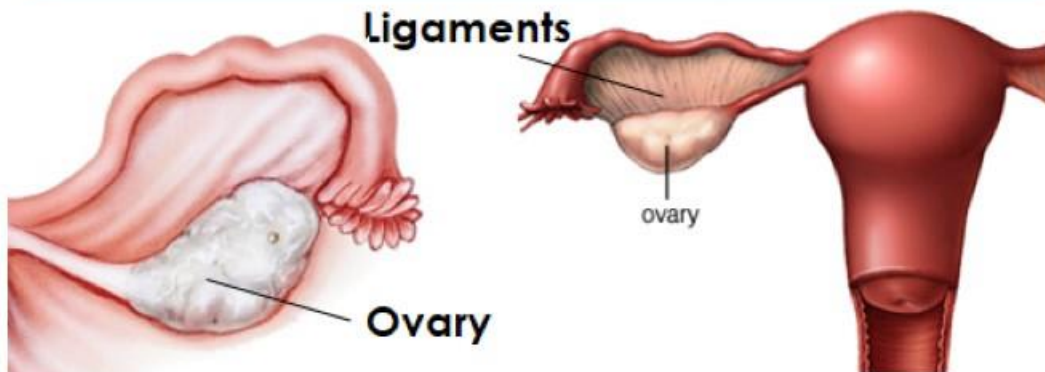
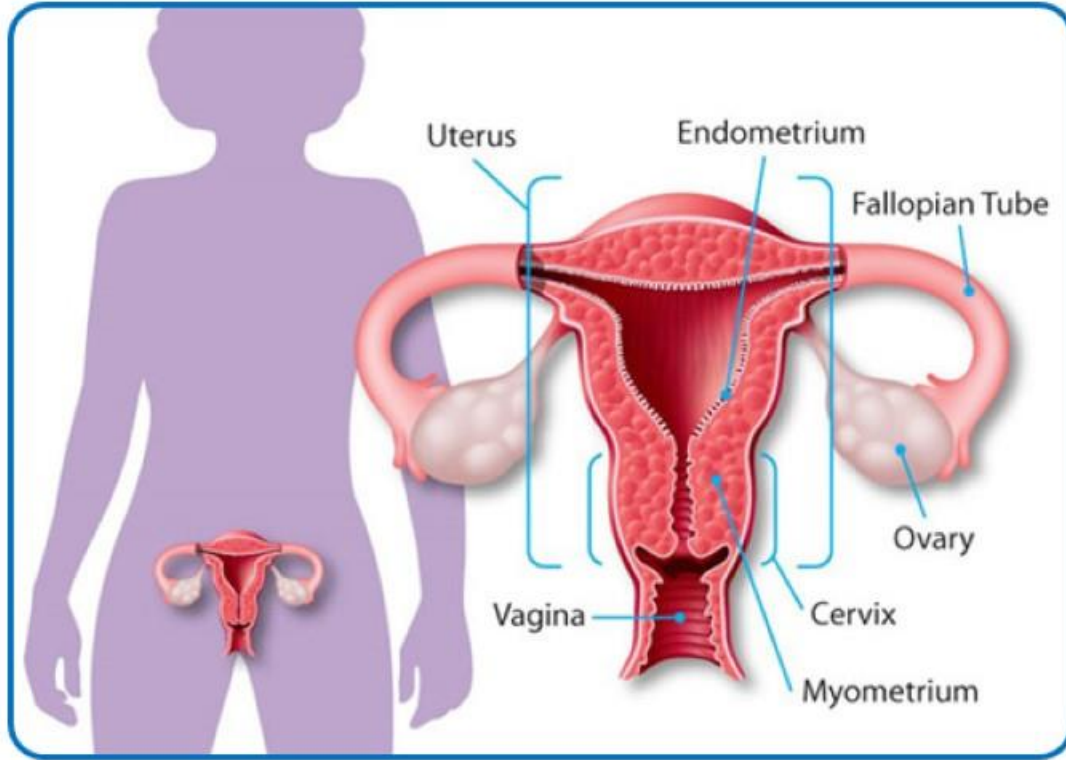
REPRODUCTIVE SYSTEM

FEMALE REPRODUCTIVE HEALTH



FEMALE REPRODUCTIVE SYSTEM

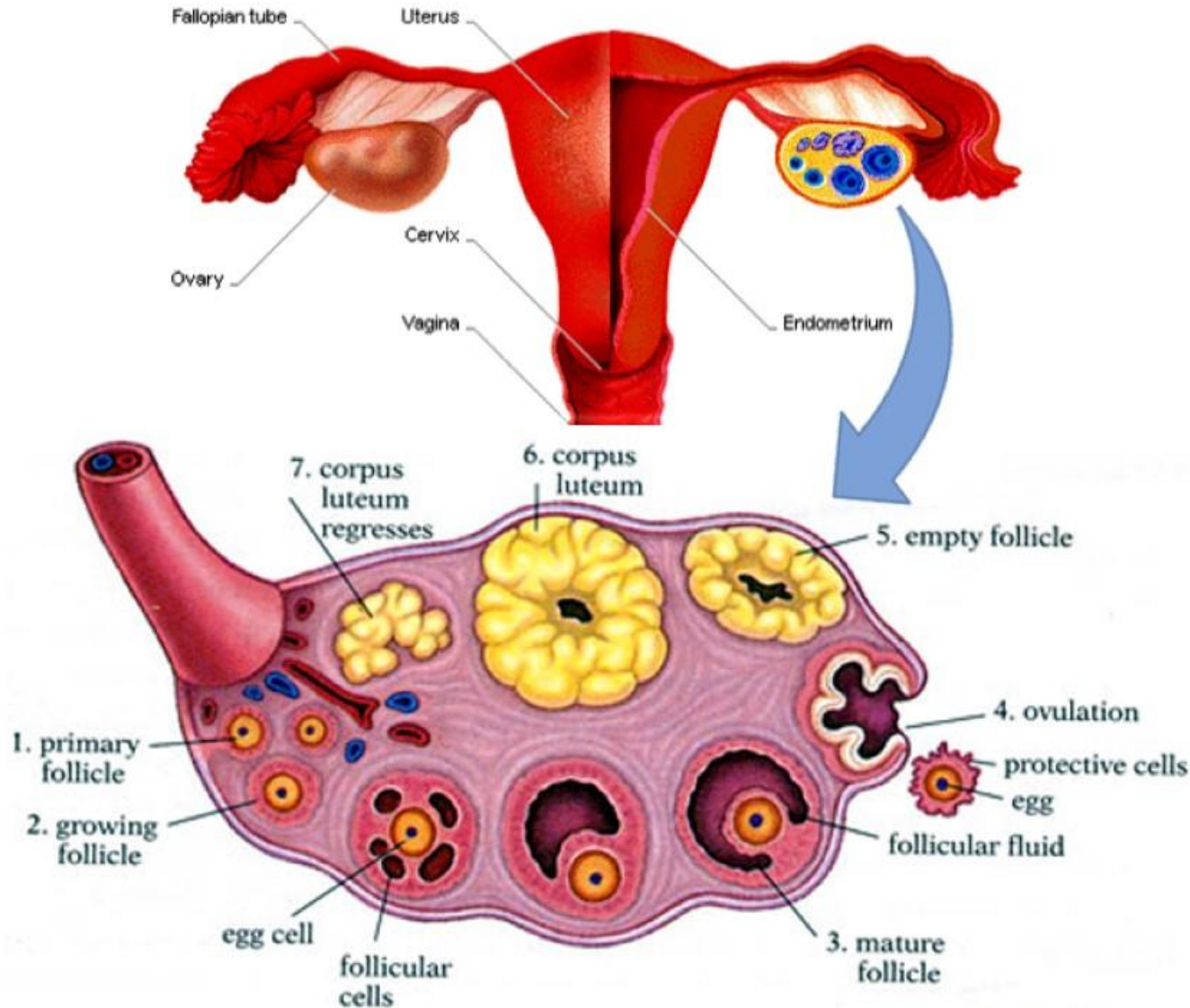
1. PAIRED OVARIES



- Primary sex organs which produce ova (female gamete) & steroid ovarian hormones (estrogen & progesterone).
- Each ovary is about 2-4 cm in length.
- They are located on both side of the lower abdomen and connected to the pelvic wall and uterus by ligaments.

FEMALE REPRODUCTIVE SYSTEM

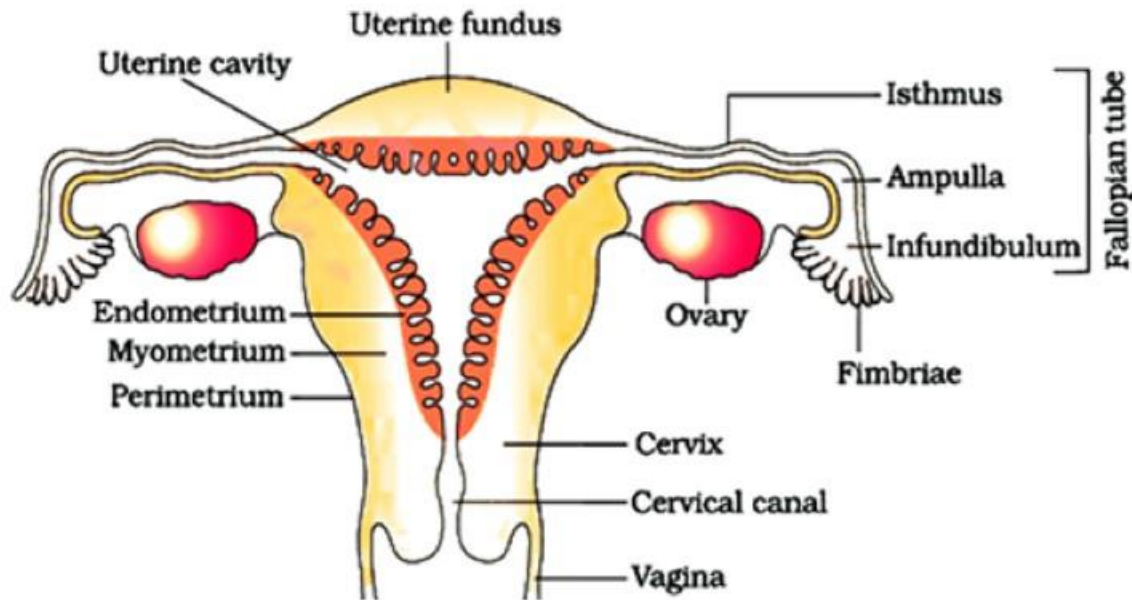
1. PAIRED OVARIES



- Each ovary is covered by a thin epithelium which encloses the **ovarian stroma**.
- The stroma has outer **cortex** and inner **medulla**.
- Ovary contains groups of cells (**Ovarian or Graafian follicles**).
- Each follicle carries a centrally placed **ovum**.

FEMALE REPRODUCTIVE SYSTEM

2. ACCESSORY DUCTS (DUCT SYSTEM)



ACCESSORY DUCTS

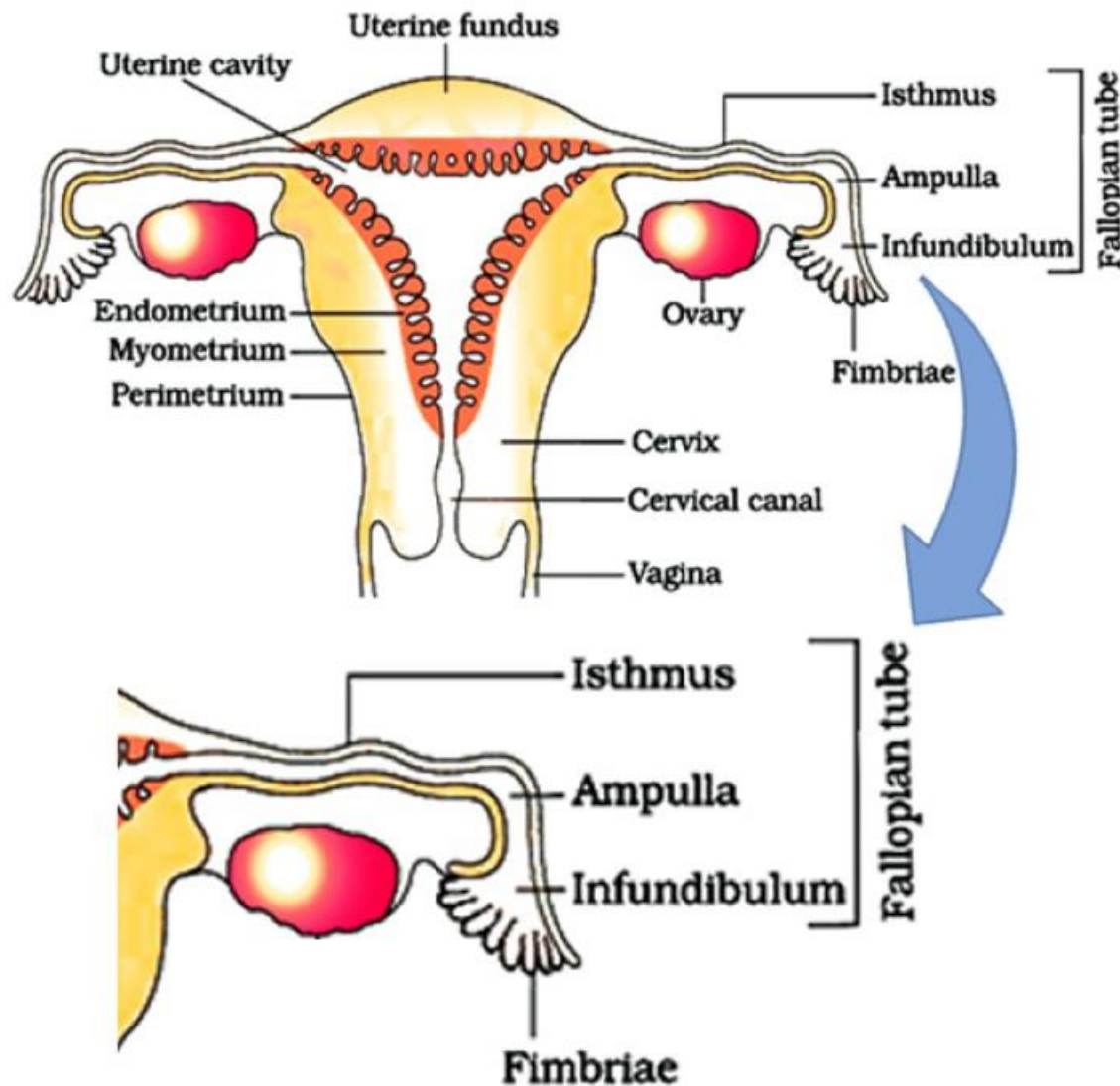
2 OVIDUCTS
(FALLOPIAN TUBES)

UTERUS (WOMB)

VAGINA

FEMALE REPRODUCTIVE SYSTEM

2. ACCESSORY DUCTS (DUCT SYSTEM)

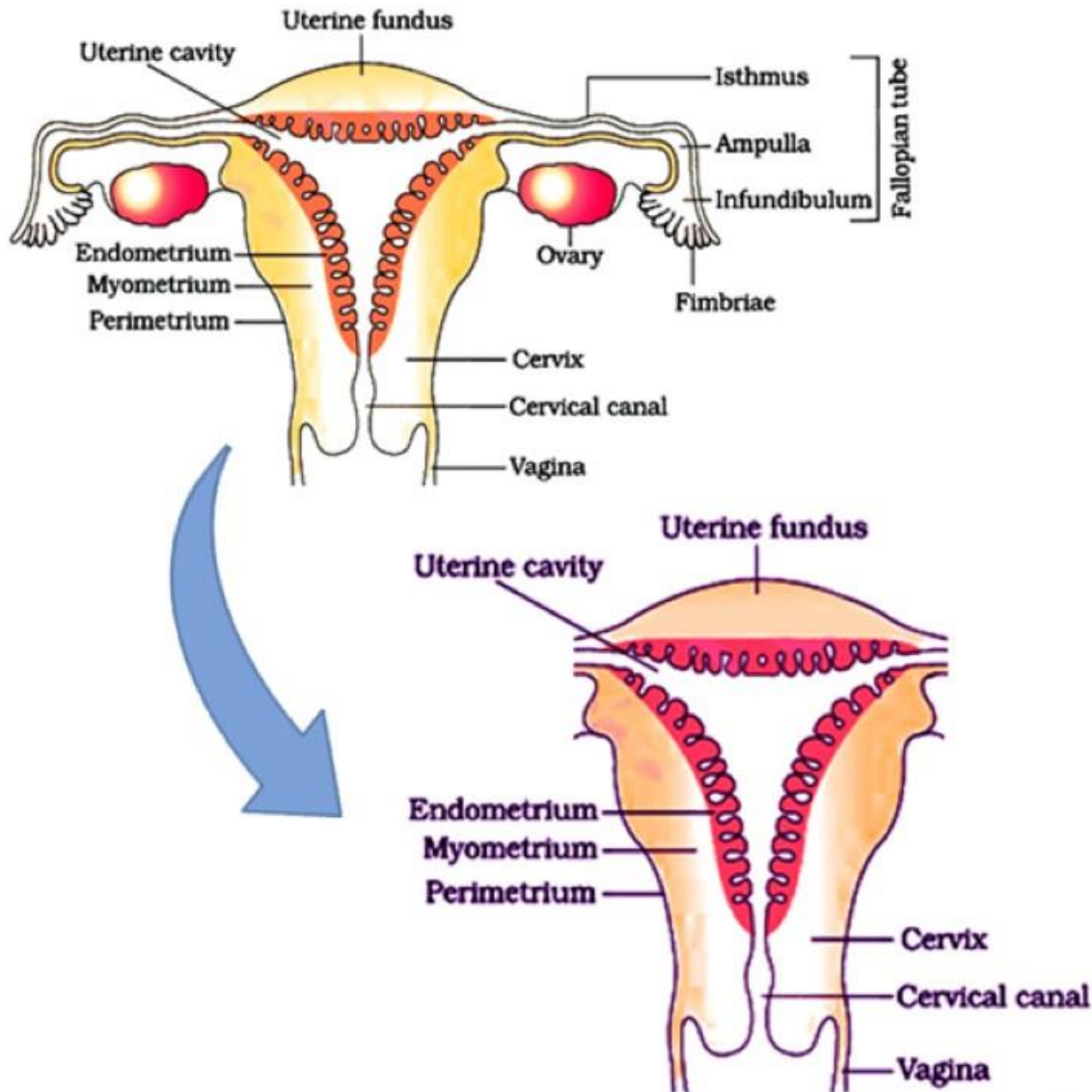


A. Oviducts (Fallopian tubes)

- Each oviduct is **10-12 cm long**.
- It has 3 parts: **Infundibulum**, **Ampulla** & **Isthmus**.
 - ❖ **Infundibulum**: Funnel-shaped opening with many finger-like **fimbriae**. It helps to collect the ovum.
 - ❖ **Ampulla**: Wider part.
 - ❖ **Isthmus**: Narrow part. It joins the uterus.
- The **ciliated epithelium** lined the lumen of oviduct drives the ovum towards the uterus.

FEMALE REPRODUCTIVE SYSTEM

2. ACCESSORY DUCTS (DUCT SYSTEM)

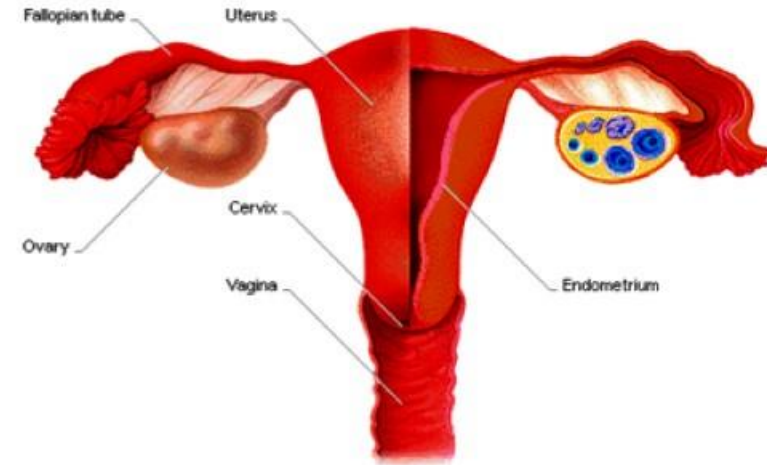
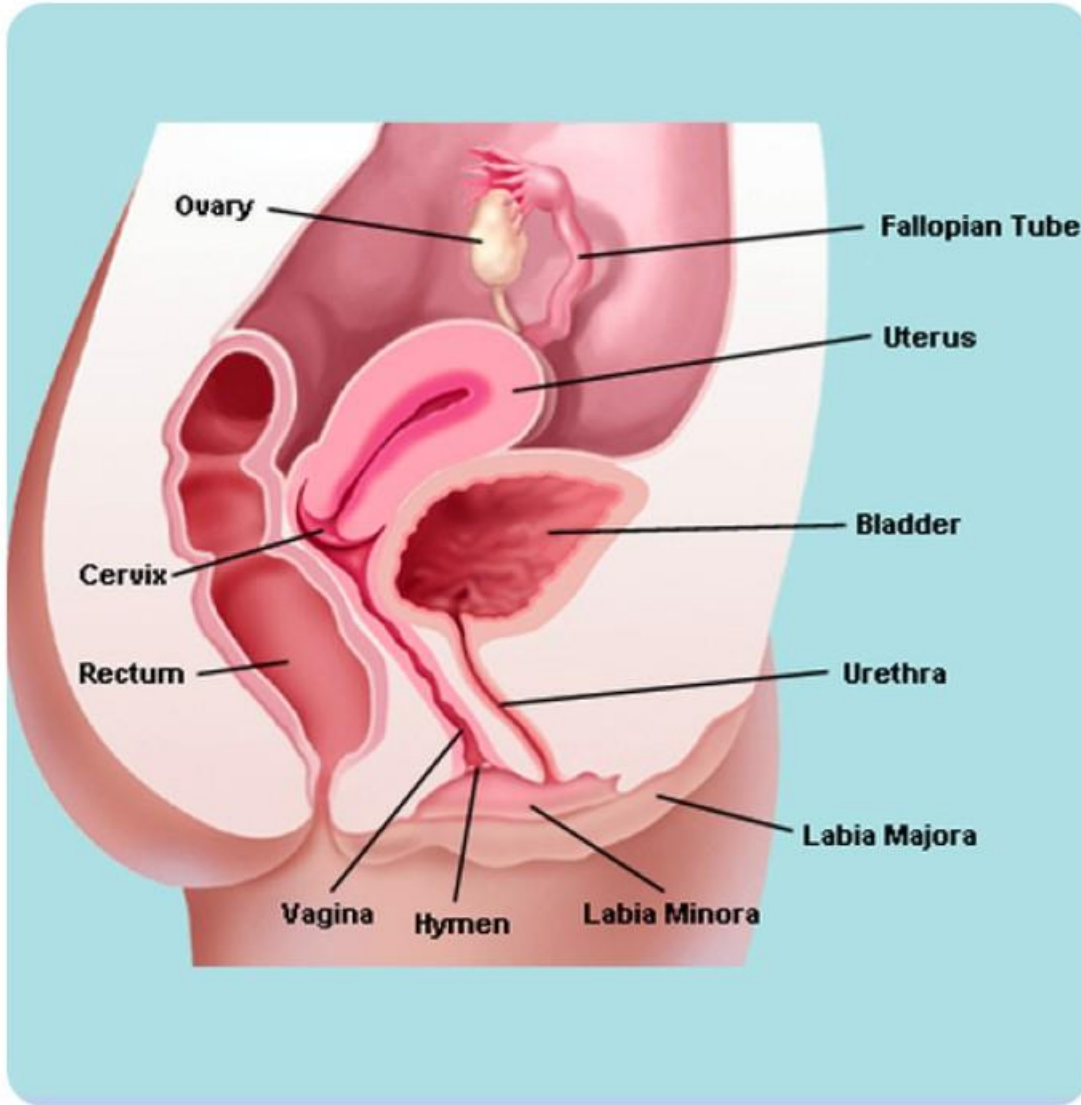


B. Uterus (womb)

- It is inverted pear shaped.
- It is supported by ligaments attached to the pelvic wall.
- Uterus has 3 parts: Upper **fundus**, middle **body** and terminal **cervix**.
- Cervix opens to vagina.
- The uterine wall has 3 layers:
 - **Perimetrium**: External thin membrane.
 - **Myometrium**: Middle thick layer of smooth muscle.
 - **Endometrium**: Inner glandular & vascular.

FEMALE REPRODUCTIVE SYSTEM

2. ACCESSORY DUCTS (DUCT SYSTEM)

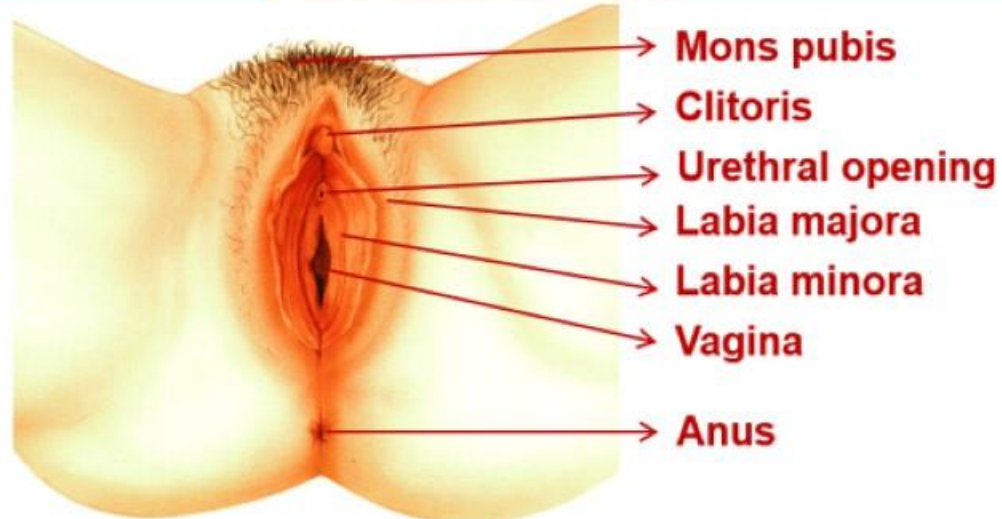
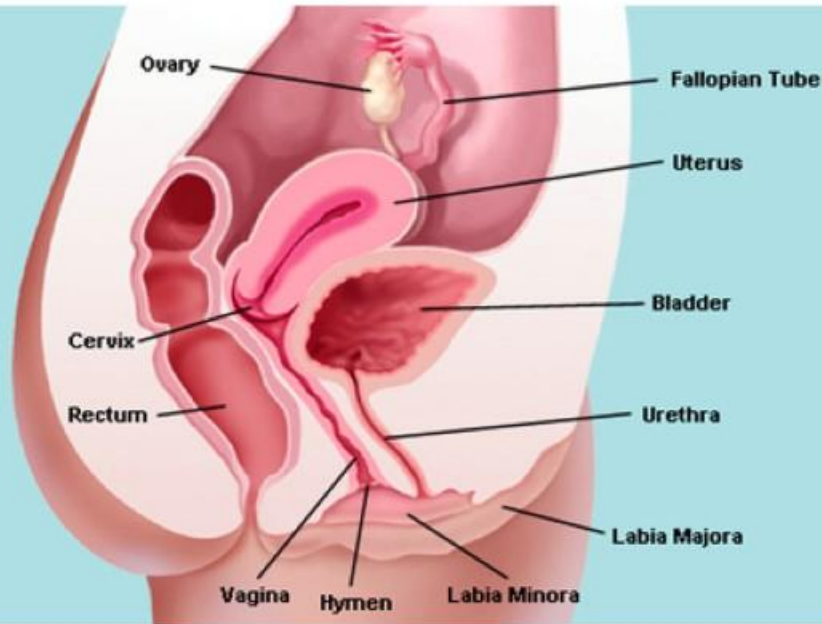


C. Vagina

- It opens to exterior between **urethra** and **anus**.
- The lumen of vagina is lined by a glycogen-rich mucous membrane consisting of **sensitive papillae** and **Bartholin's glands**.
- The secretions of Bartholin's glands lubricate penis during sexual act.

FEMALE REPRODUCTIVE SYSTEM

3. EXTERNAL GENITALIA (VULVA/PUDENDUM)



- Consist of **Mons pubis, vestibule, hymen & clitoris.**

A. Mons pubis

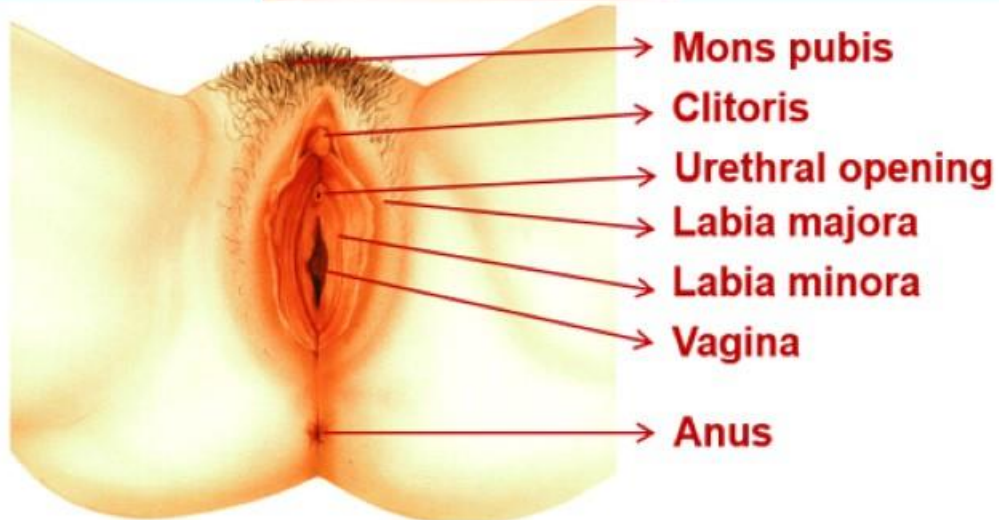
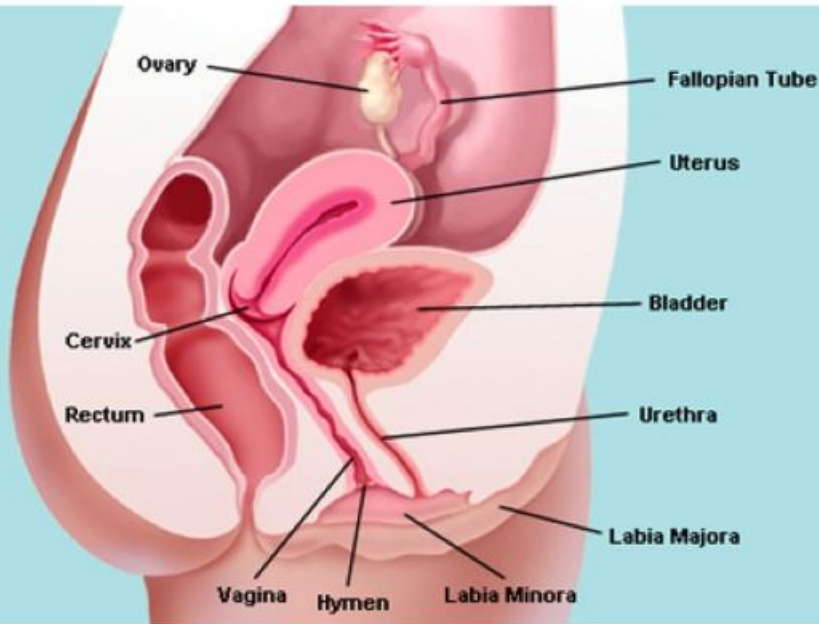
- A cushion of fatty tissue covered by pubic hair.

B. Vestibule

- A median channel. It includes
 - **Labia majora:** Large, fleshy, fatty and hairy outer folds. Surrounds vaginal opening.
 - **Labia minora:** Small, thin and hairless inner folds.

FEMALE REPRODUCTIVE SYSTEM

3. EXTERNAL GENITALIA (VULVA/PUDENDUM)



C. Hymen (Maiden head)

- A membrane which partially cover the vaginal opening. It is often torn during the first coitus.

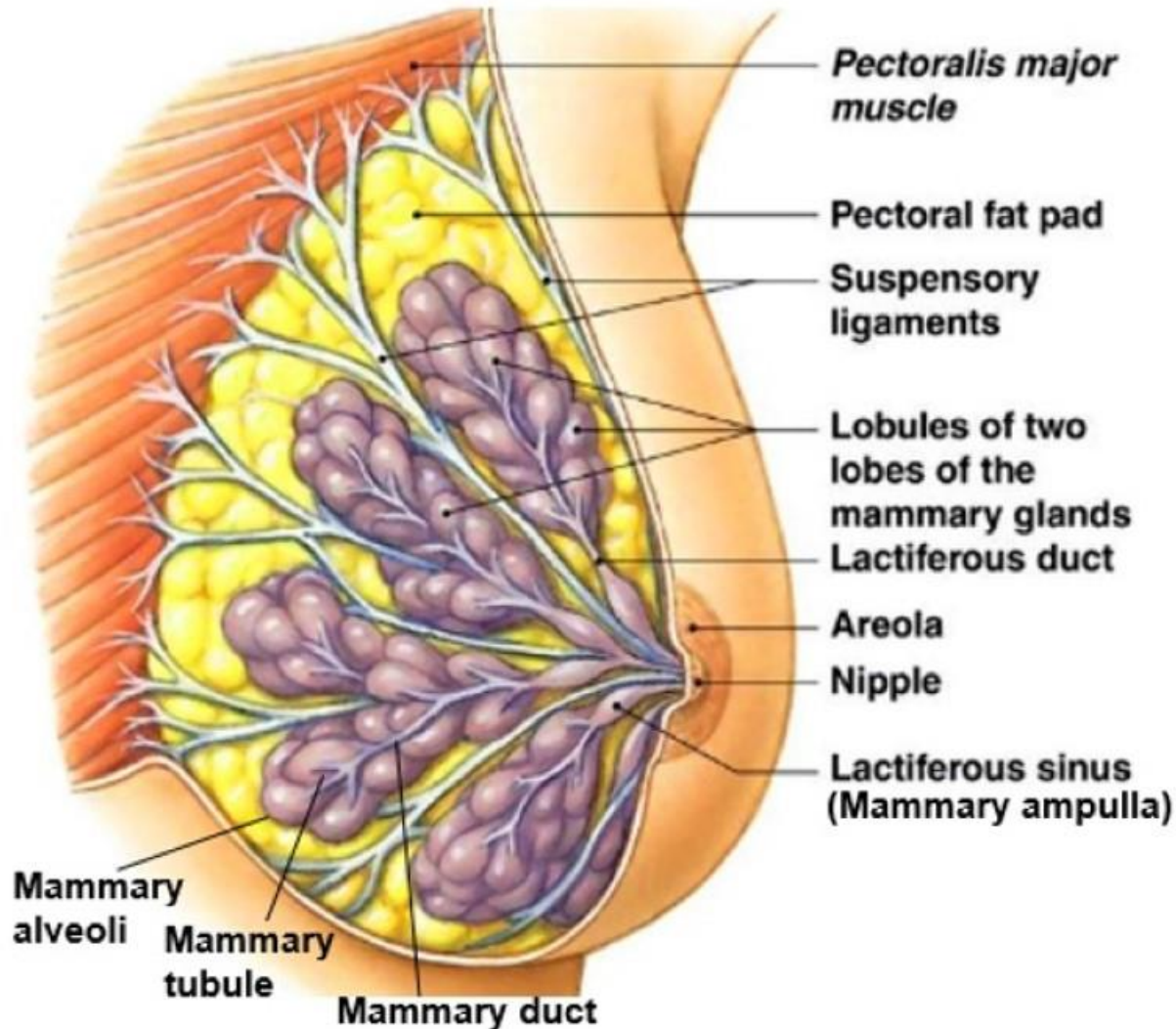
Hymen may also be broken by a sudden fall or jolt, insertion of a vaginal tampon, active participation in some sports items etc. In some women, hymen persists even after coitus. So the hymen is not a reliable indicator of virginity.

D. Clitoris

- A highly sensitive organ lying just in front of the urethral opening.

FEMALE REPRODUCTIVE SYSTEM

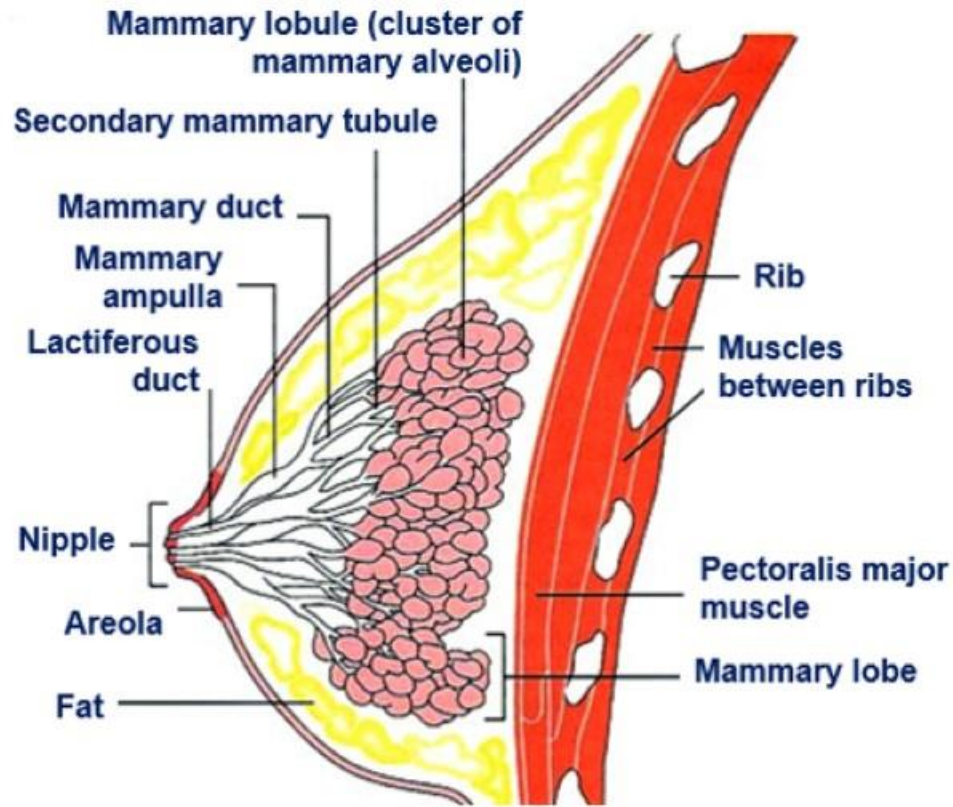
MAMMARY GLANDS (BREASTS)



- A pair of mammary glands contains **glandular tissue & fat**.
- Glandular tissue of each breast has **15-20 mammary lobes** containing clusters of cells (**mammary alveoli**).
- The cells of alveoli secrete milk. It is stored in the cavities (lumen) of alveoli.

FEMALE REPRODUCTIVE SYSTEM

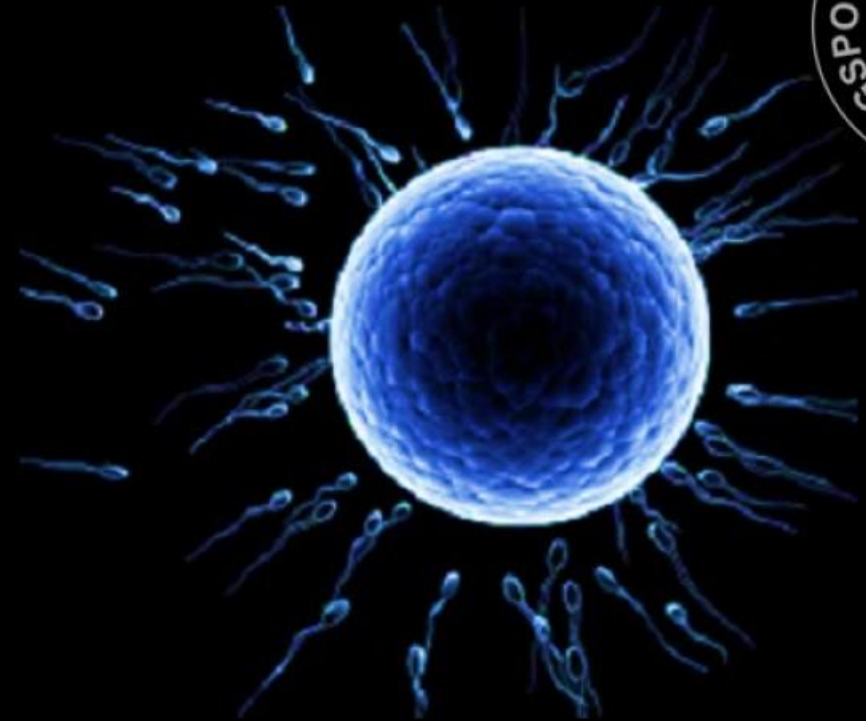
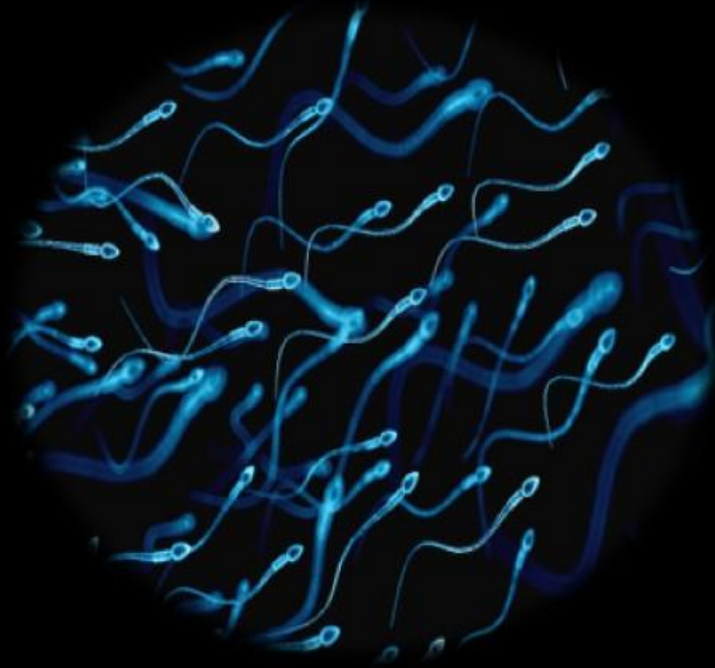
MAMMARY GLANDS (BREASTS)



- The alveoli open into **mammary tubules**.
- The tubules of each lobe join to form a **mammary duct**.
- Several mammary ducts join to form a wider **mammary ampulla** which is connected to **lactiferous duct** through which milk is sucked out.

Sequence of milk conduction





GAMETOGENESIS

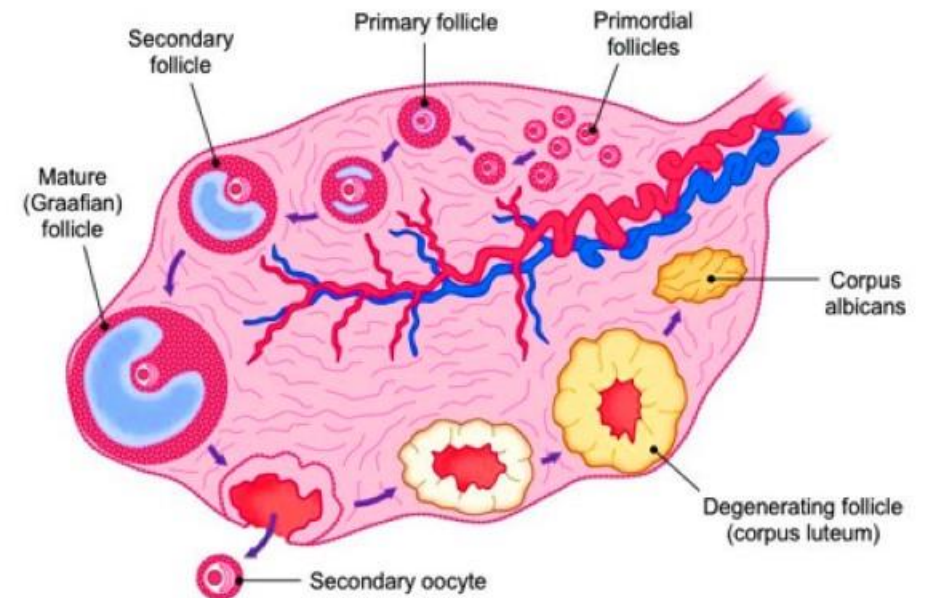
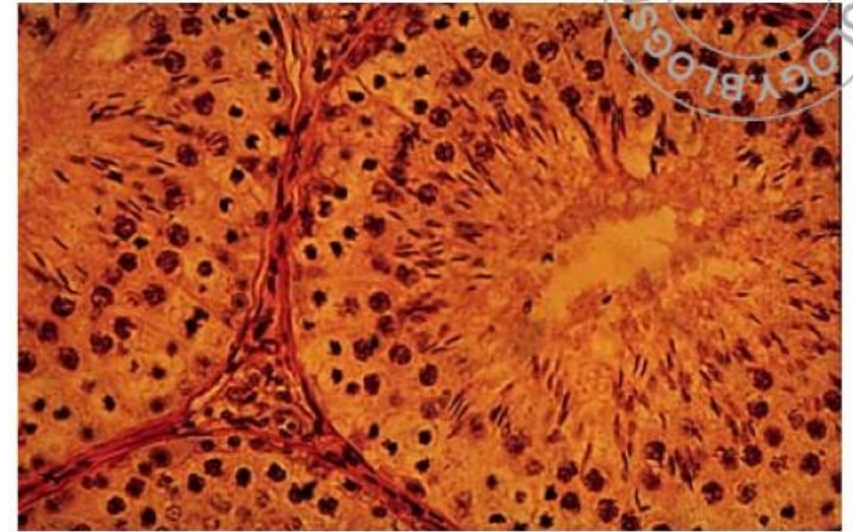
GAMETOGENESIS

It is the formation of gametes in the gonads.

TYPES OF GAMETOGENESIS

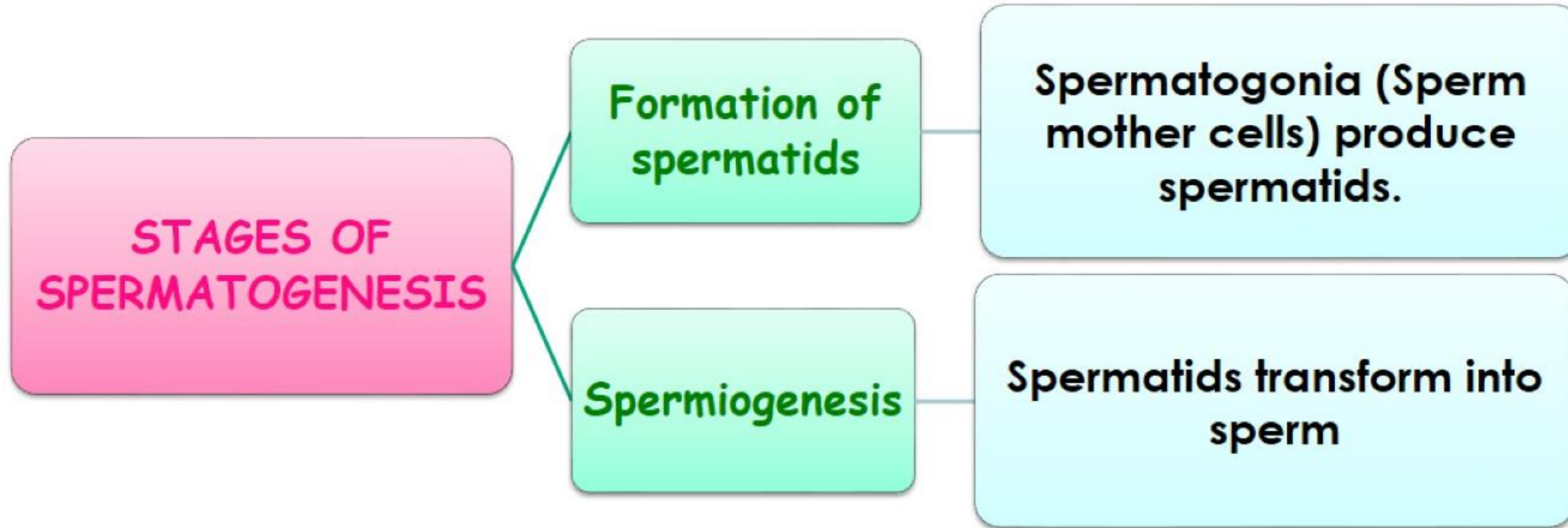
SPERMATOGENESIS
(Formation of sperms)

OOGENESIS
(Formation of ovum)



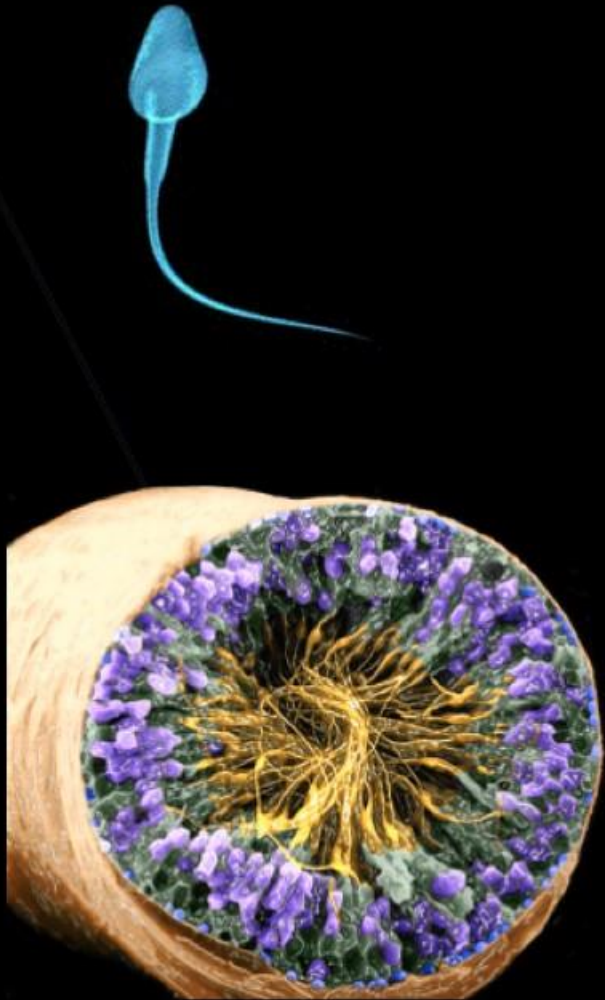


It is the process of formation of sperms (spermatozoa) in seminiferous tubules of testis.

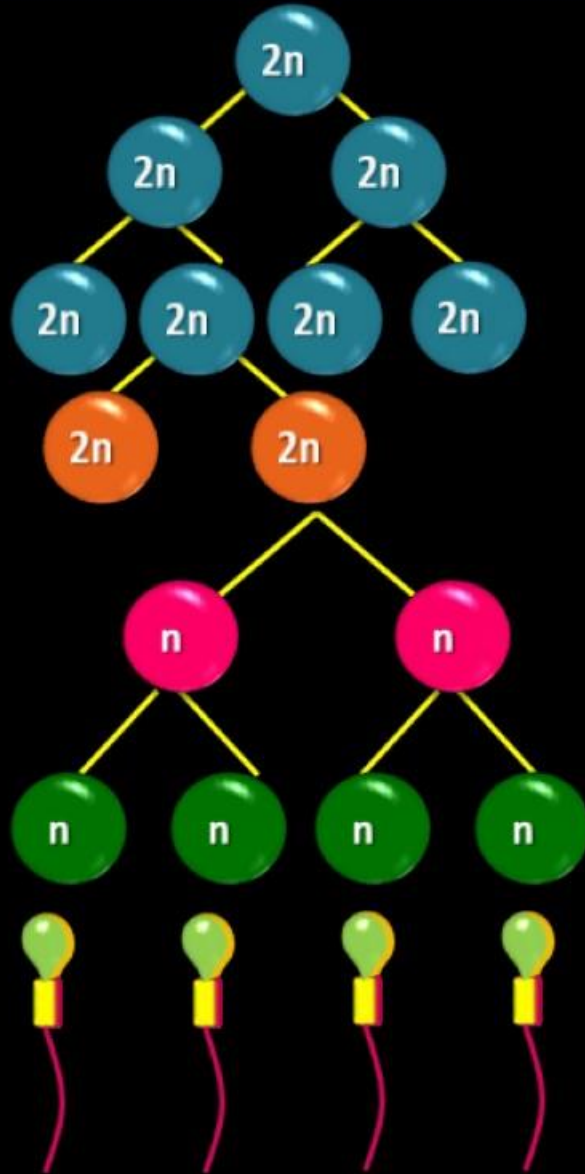


GAMETOGENESIS

1. SPERMATOGENESIS



Seminiferous tubule: Cross section



bankofbiology.com

Spermatogonia ($2n$)

Mitosis

Primary spermatocytes ($2n$)

Meiosis I

Secondary spermatocytes (n)

Meiosis II

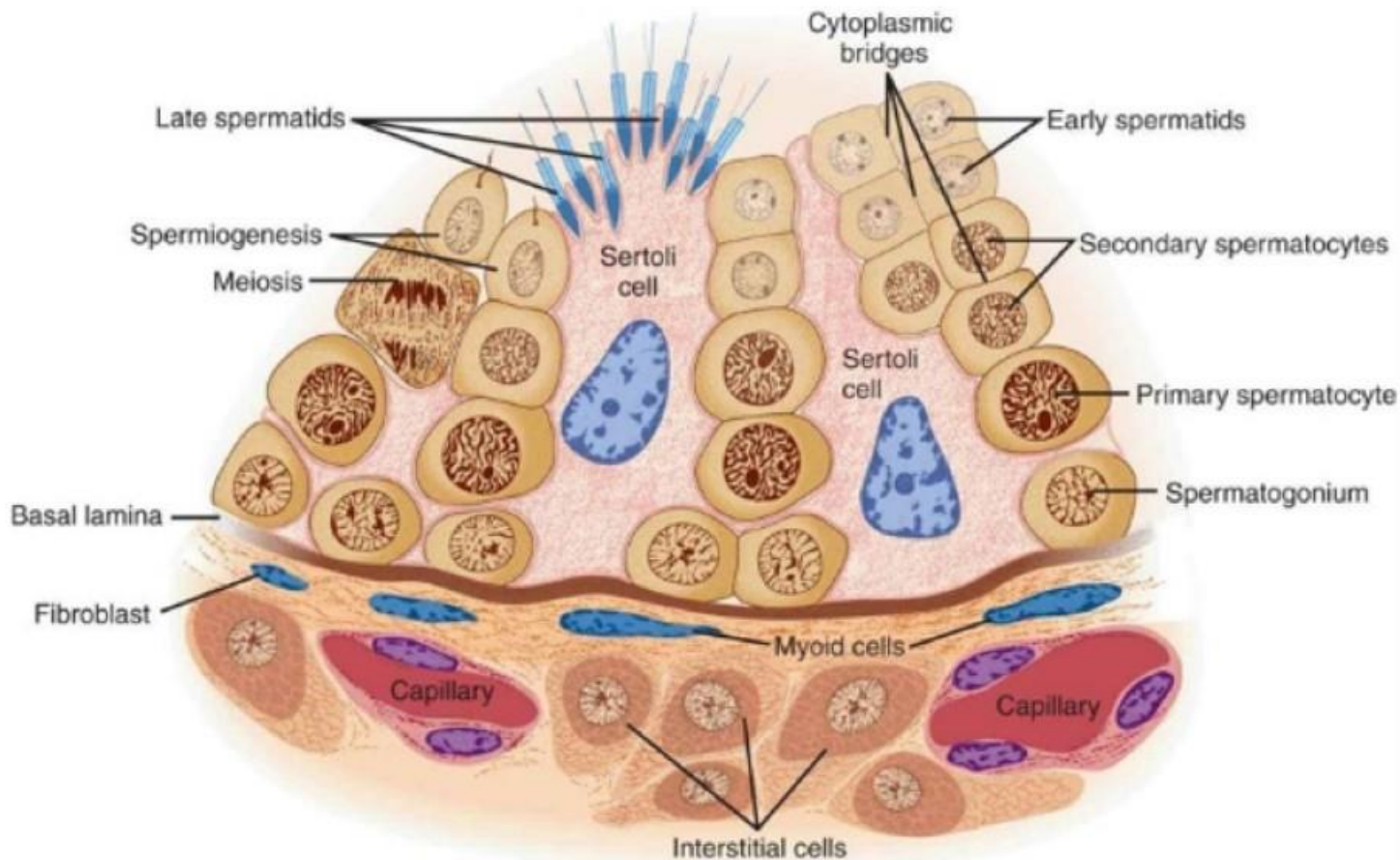
Spermatids (n)

Spermiogenesis

Spermatozoa (n)

GAMETOGENESIS

1. SPERMATOGENESIS



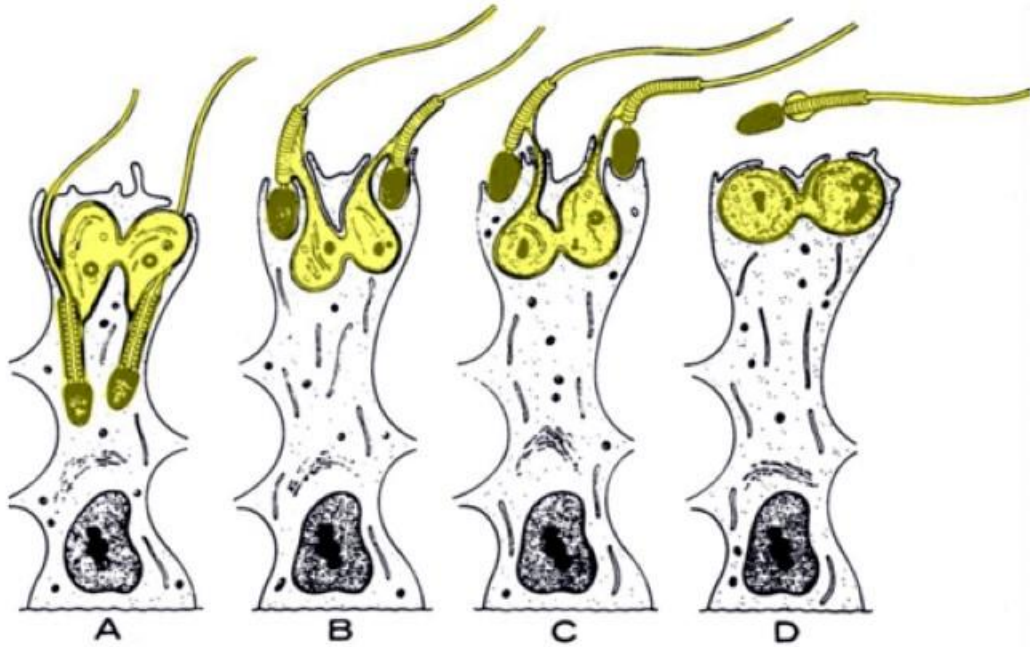
A portion of Seminiferous tubule

**A primary spermatocyte →
2 sec. spermatocytes (n).**

**A sec. spermatocyte →
2 spermatids (n).**

Thus

**A primary spermatocyte
↓
4 spermatids/4 sperms**

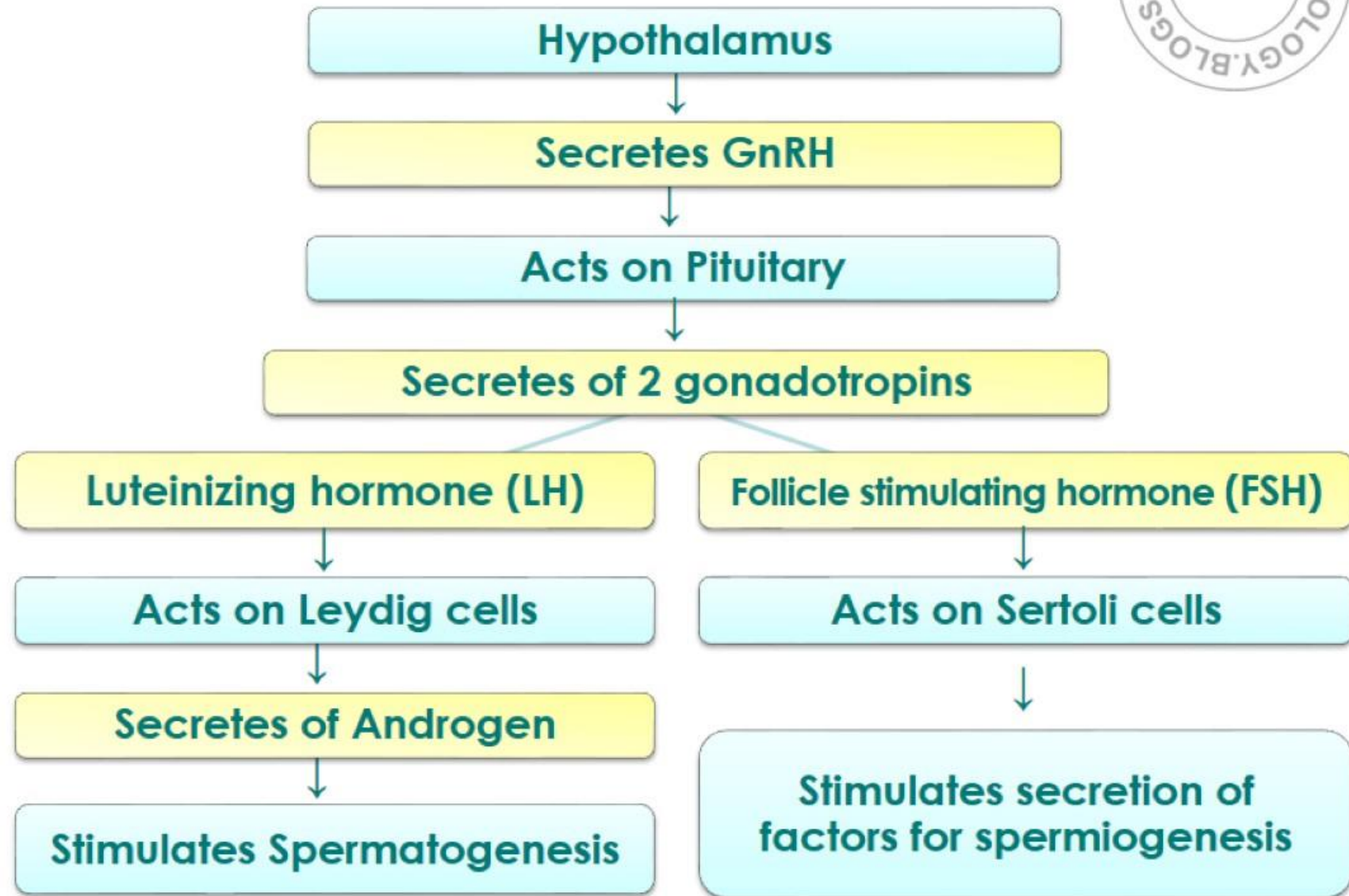


SPERMATION

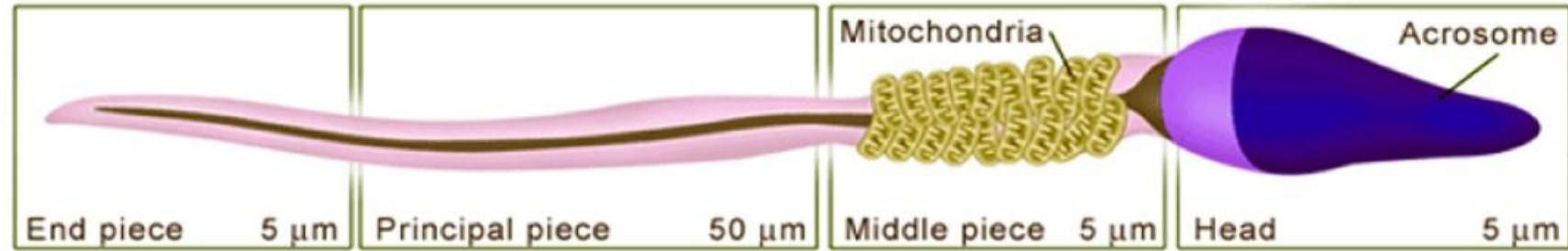
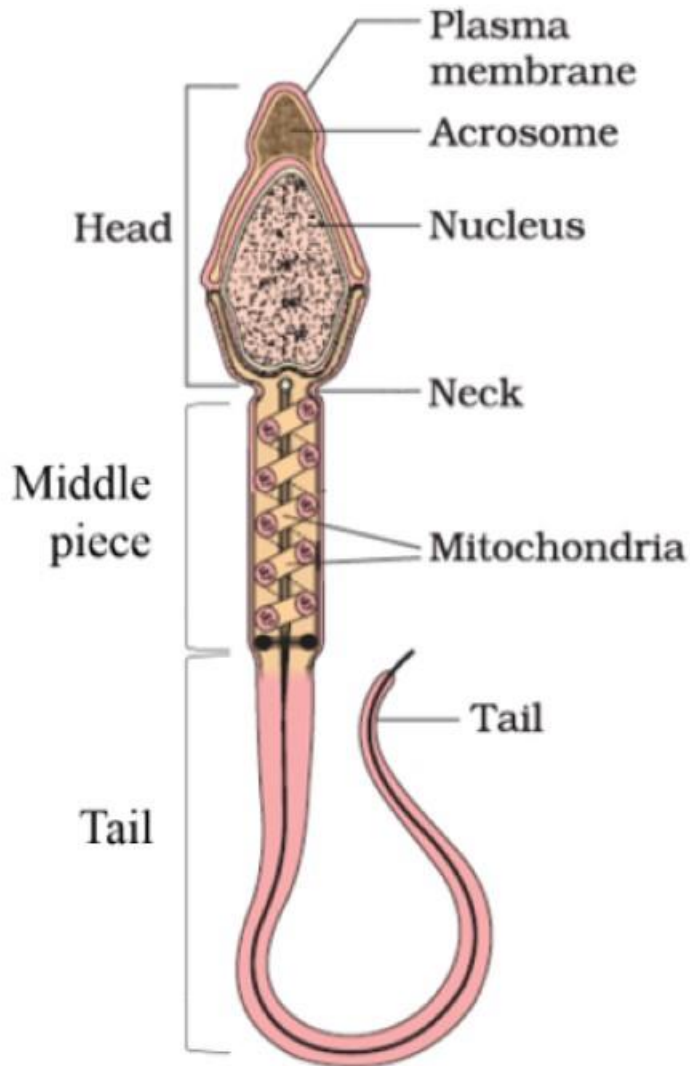


- After spermiogenesis, sperm heads are embedded in the Sertoli cells to get nourishment. Then they are released to lumen of seminiferous tubules. It is called **spermiation**.

Role of Hormones in Spermatogenesis



Structure of spermatozoa (Sperm)



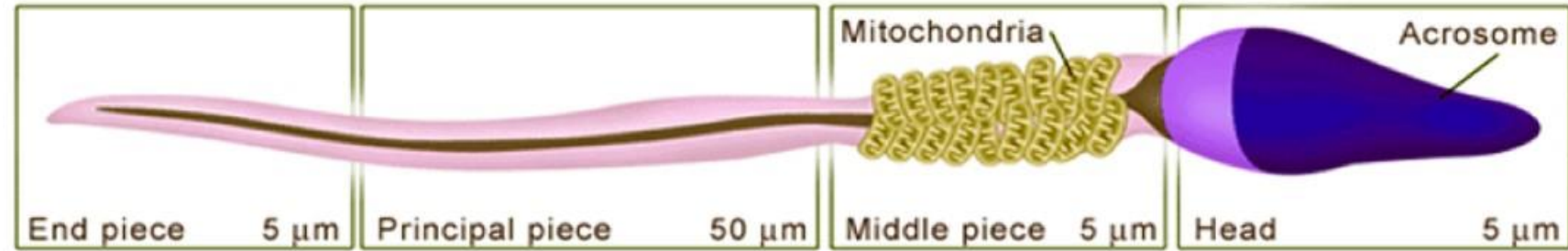
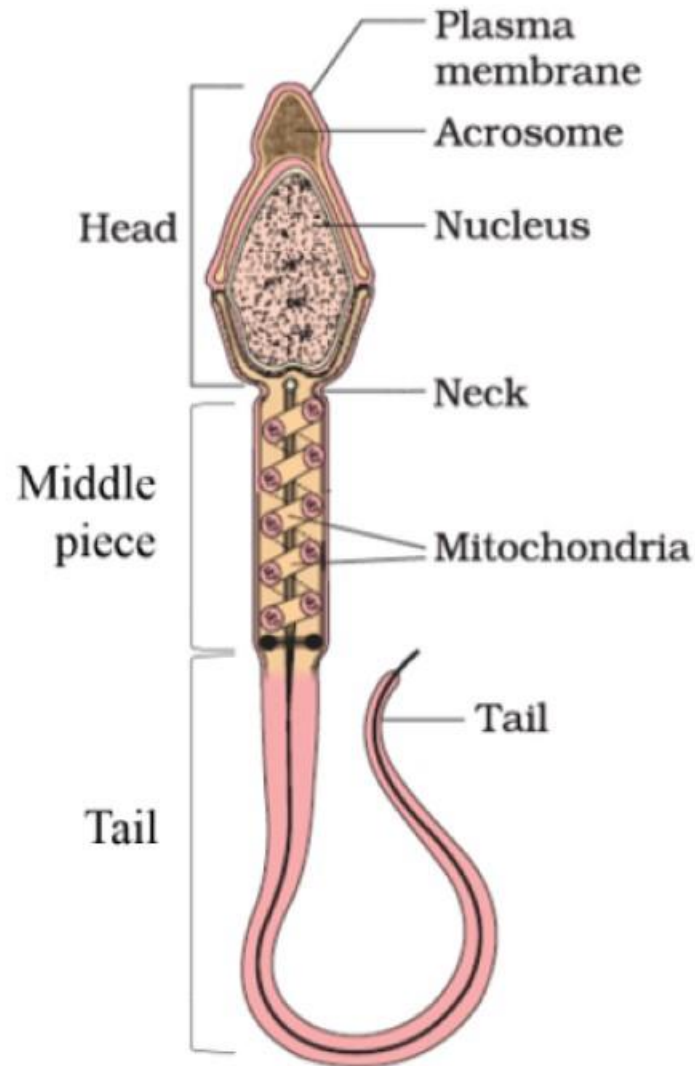
- ❑ A mature sperm is about **60 μ (0.06 mm) long.**
- ❑ Sperm is enveloped by a plasma membrane.
- ❑ A sperm has 3 regions:
 - ❑ Head
 - ❑ Middle piece
 - ❑ Tail

GAMETOGENESIS

1. SPERMATOGENESIS



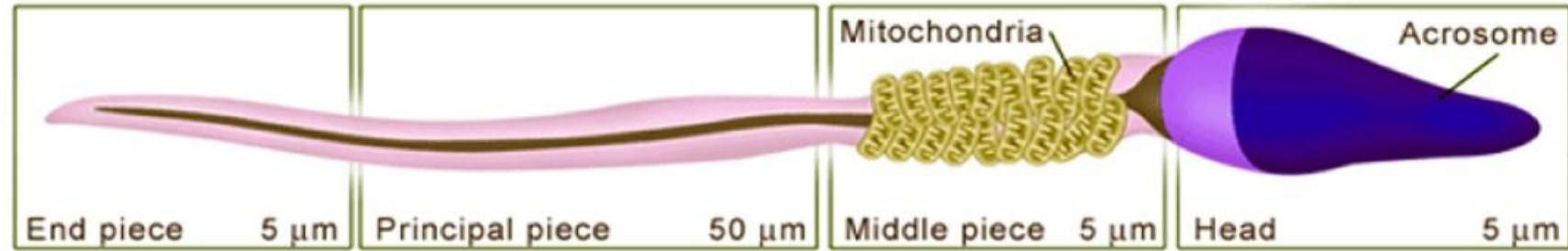
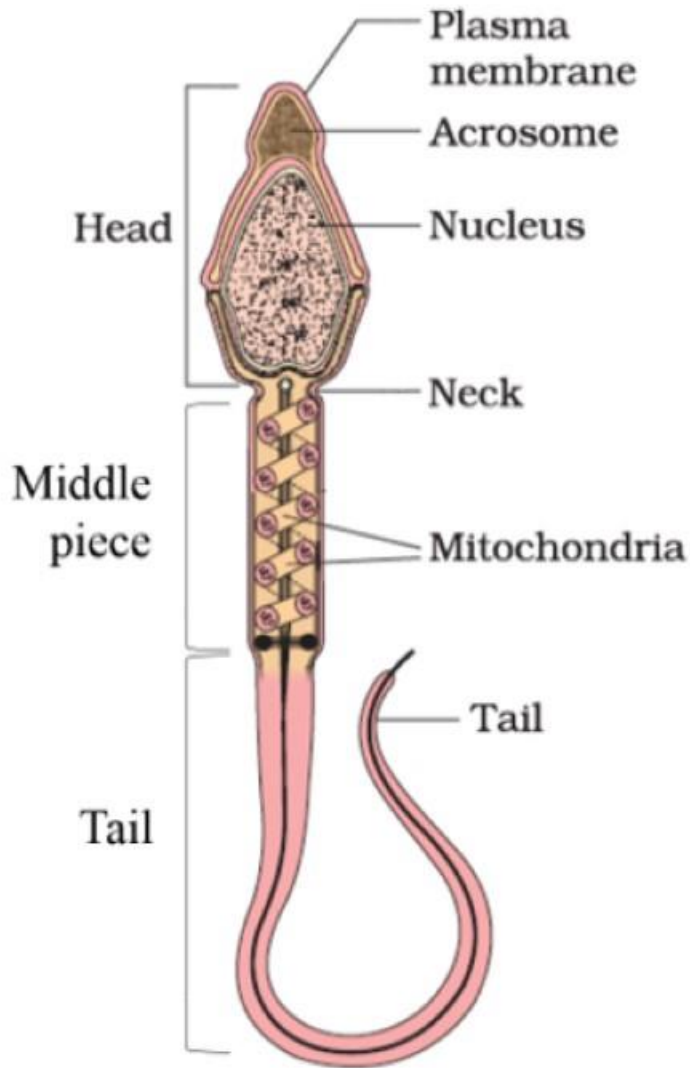
Structure of spermatozoa (Sperm)



Head

- ❑ Oval shaped.
- ❑ Formed of **nucleus & acrosome**.
- ❑ Acrosome is formed from **Golgi complex**. It contains **lytic enzymes**.
- ❑ Behind the head is a neck.

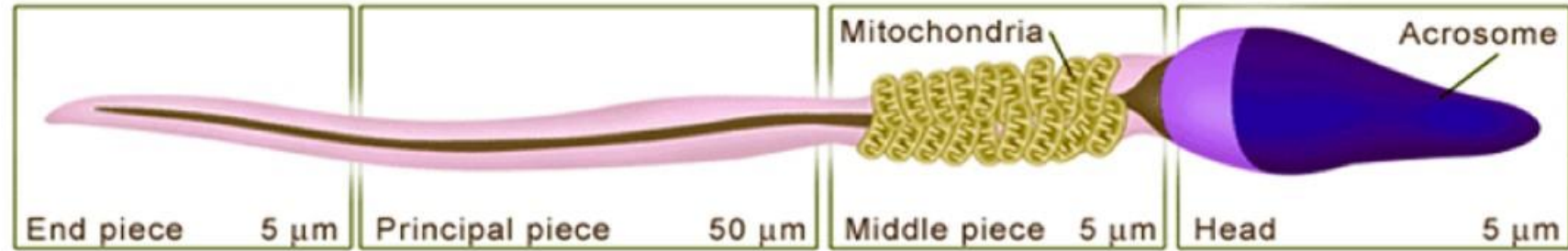
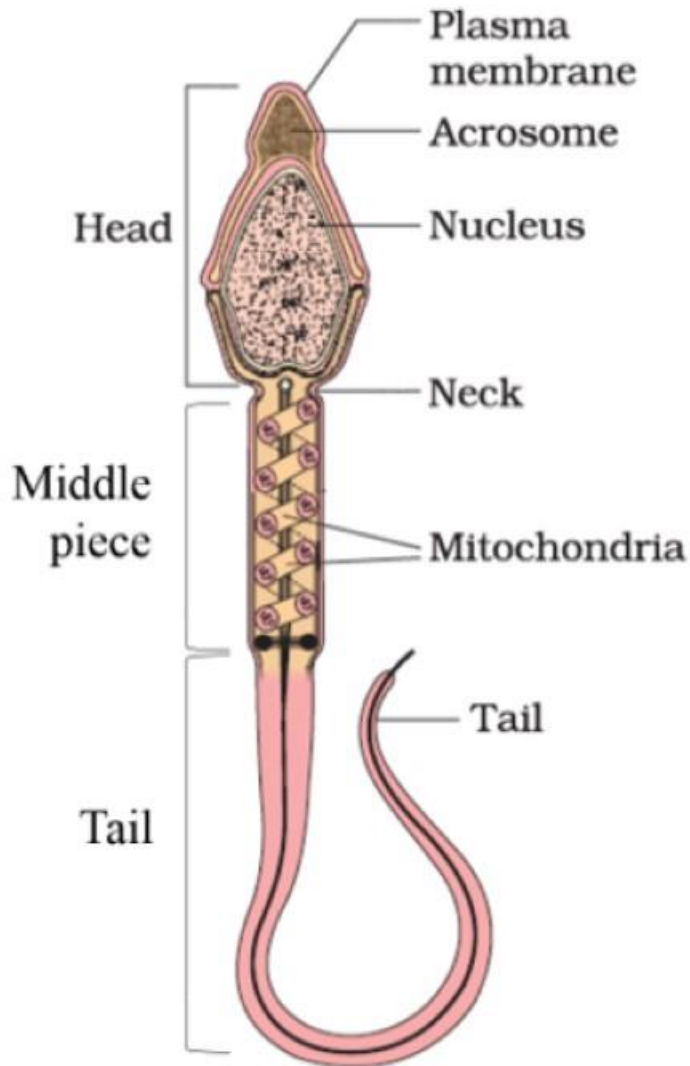
Structure of spermatozoa (Sperm)



Middle piece

- ❑ Composed of **axial filament** surrounded by **mitochondria & cytoplasm**.
- ❑ Mitochondria produce **energy** for the **sperm motility**.

Structure of spermatozoa (Sperm)

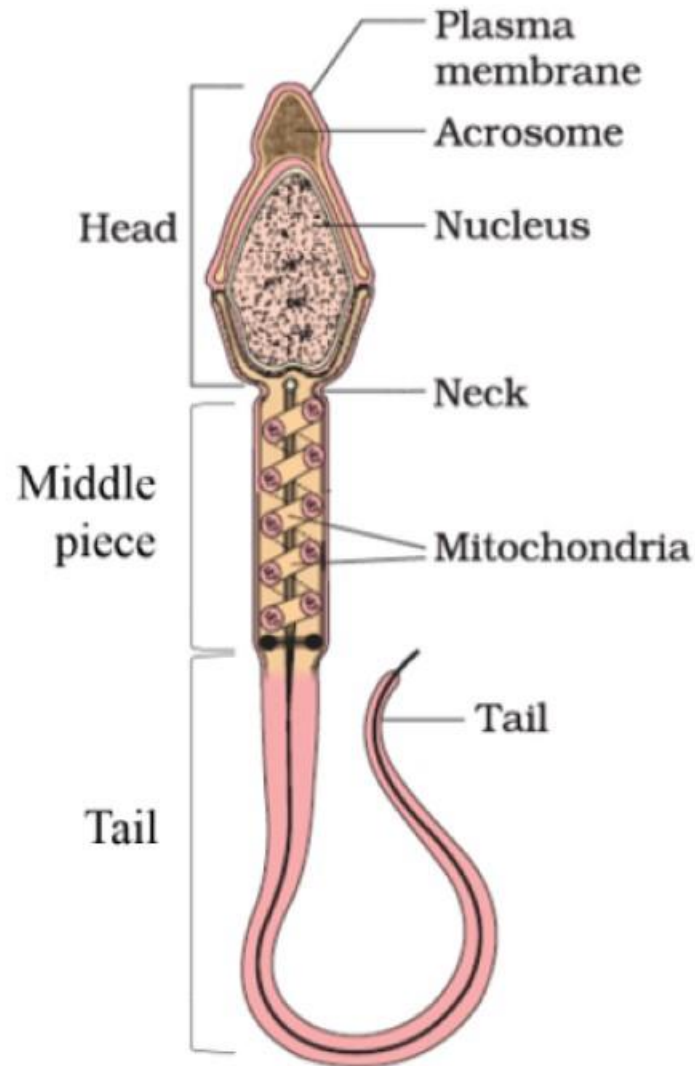


Tail

- ❑ Consists of a **central axial filament**.
- ❑ The sperm moves in fluid medium and female genital tract by the undulating movement of the tail.

GAMETOGENESIS

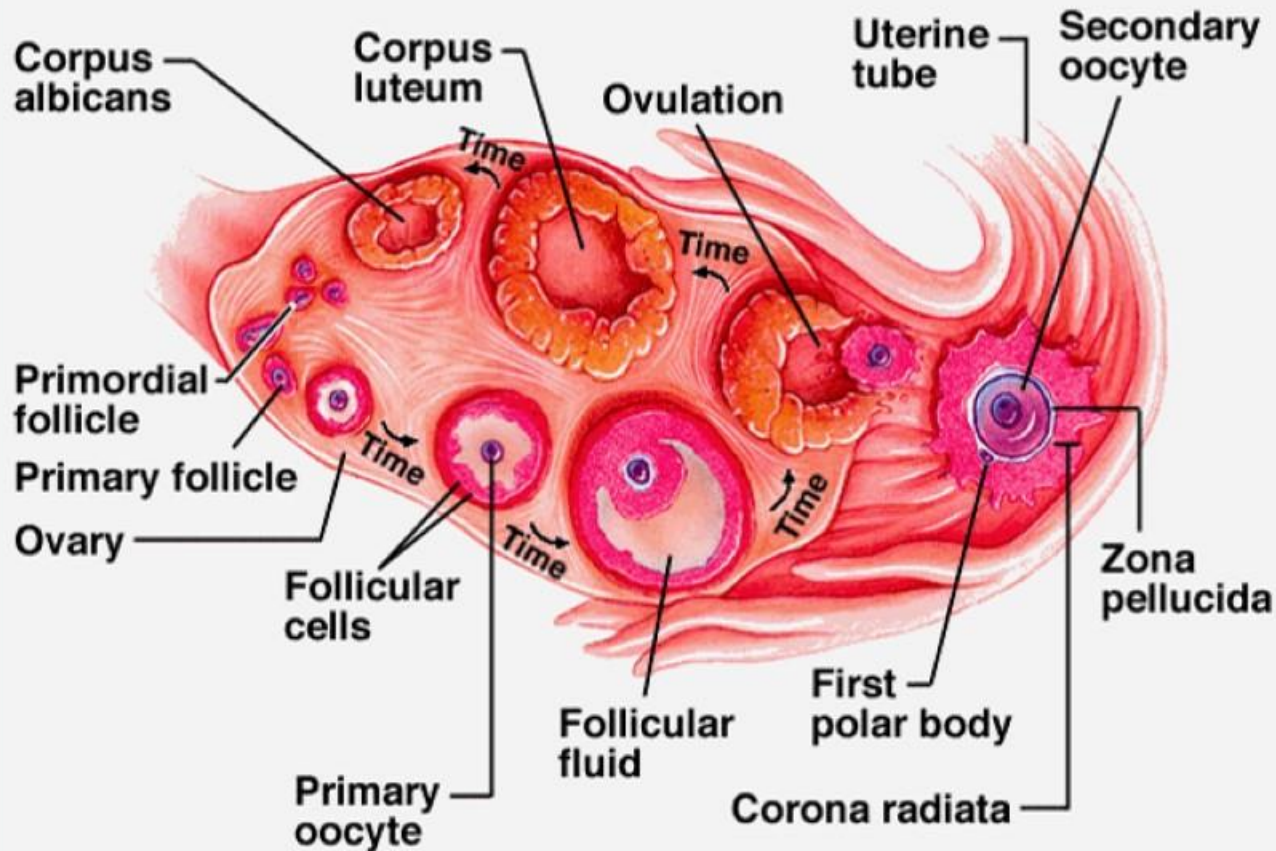
1. SPERMATOGENESIS



- ✓ The human male ejaculates about **200-300 million sperms** during a coitus.
- ✓ For normal fertility, at least **60% sperms** must have normal shape and size. **40%** of them must show vigorous motility.

GAMETOGENESIS

2. OOGENESIS



- It is the formation & maturation of **ovum**.

- It takes place in **Graafian follicles**.

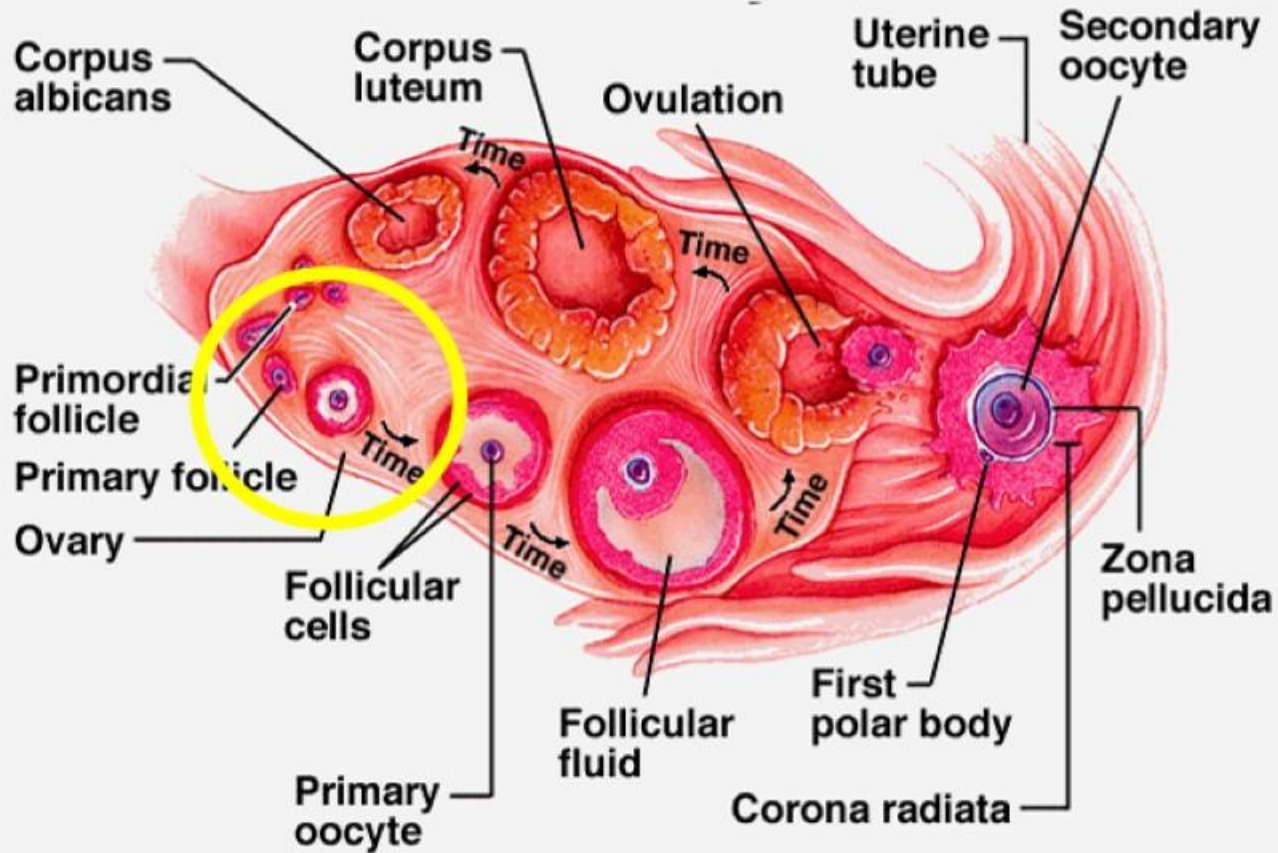
- Oogenesis is initiated in embryonic stage when millions of **egg mother cells (oogonia)** are formed within ovary.

- No more oogonia are formed and added after birth.

- Oogonia multiply to form **primary oocytes**. They enter **prophase-I** of the meiosis and get temporarily arrested at that stage.

GAMETOGENESIS

2. OOGENESIS



- Each primary oocyte gets surrounded by a layer of **granulosa cells** to form **primary follicle**.
- Many primary follicles degenerate during the phase from birth to puberty. Therefore, at puberty, only **60,000-80,000** primary follicles are left in each ovary.

Development of ovarian follicle

Primary
follicle



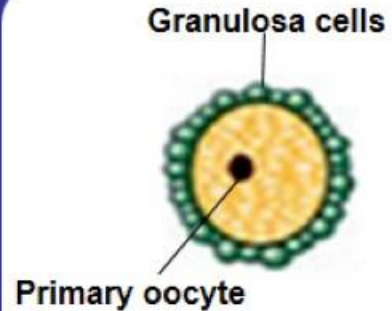
Secondary
follicle



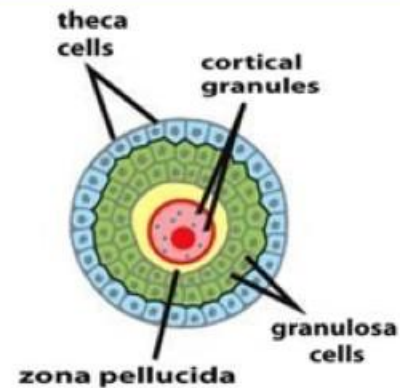
Tertiary
follicle



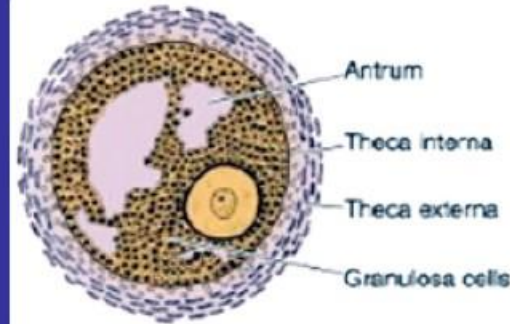
Graafian
follicle



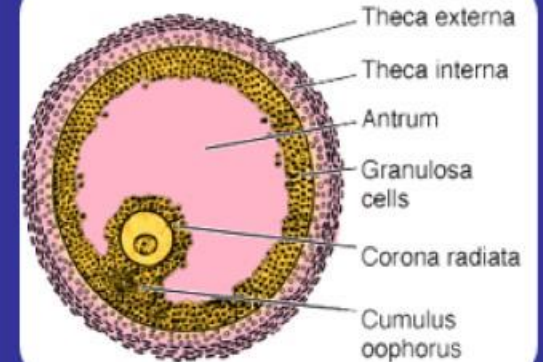
A layer of granulosa cells surrounding a primary oocyte.



More layers of granulosa cells and a new theca surrounding a primary oocyte.



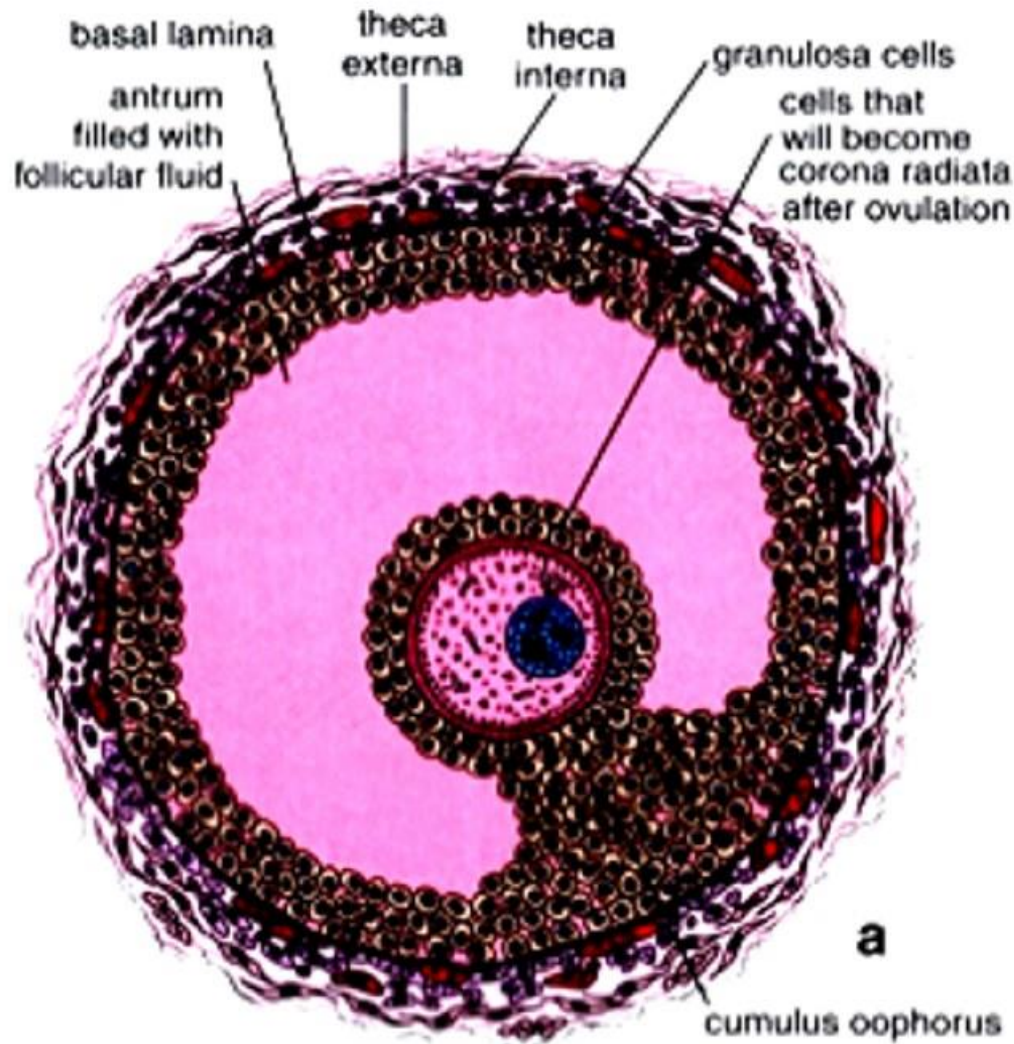
Fluid filled cavity (antrum) develops. Theca layer forms inner theca interna & outer theca externa.



Fully matured follicle

GAMETOGENESIS

2. OOGENESIS

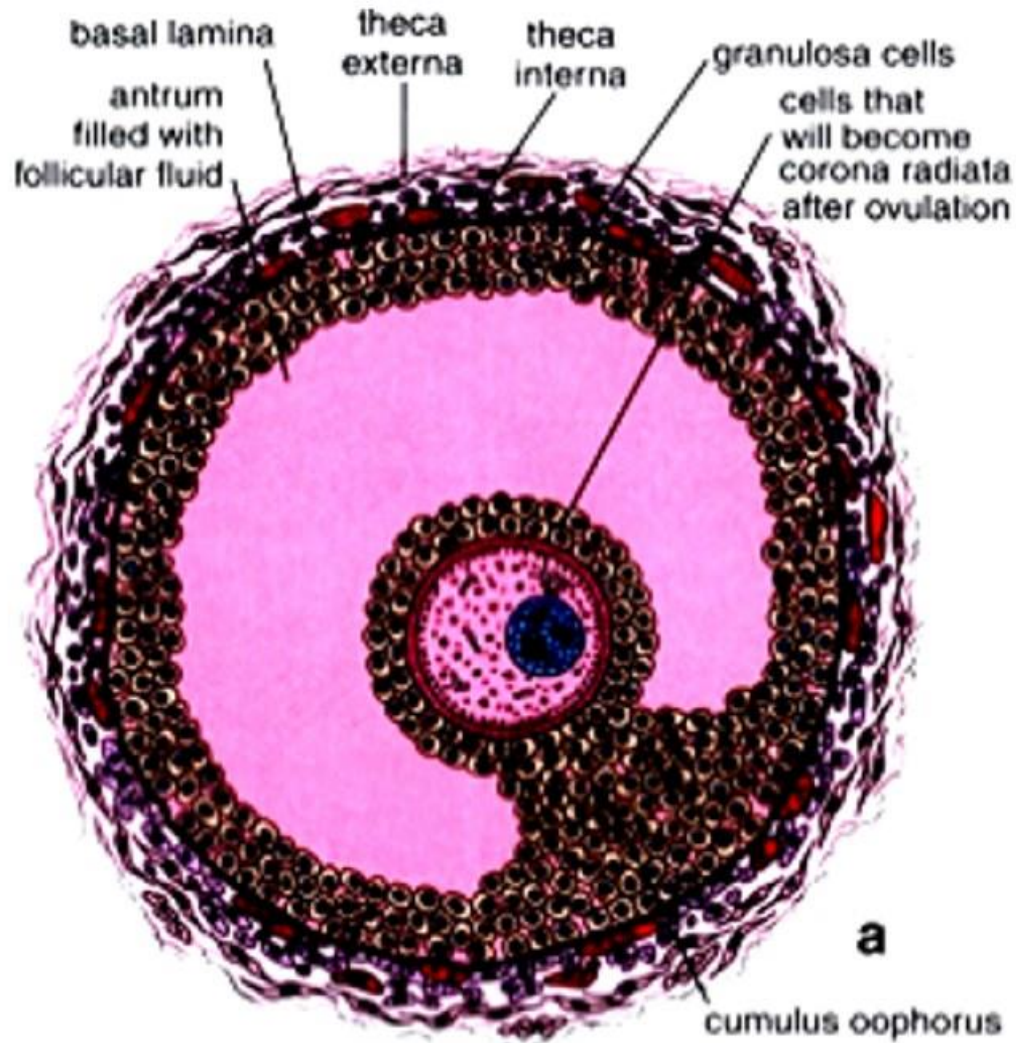


MATURE GRAAFIAN FOLLICLE

- The primary oocyte in tertiary follicle grows and undergoes first unequal meiotic division to form a large **haploid secondary oocyte** and a tiny **first polar body**.
- So, secondary oocyte retains the nutrient rich cytoplasm of the primary oocyte.
- It is unknown that whether the first polar body divides further or degenerates.

GAMETOGENESIS

2. OOGENESIS



MATURE GRAAFIAN FOLLICLE

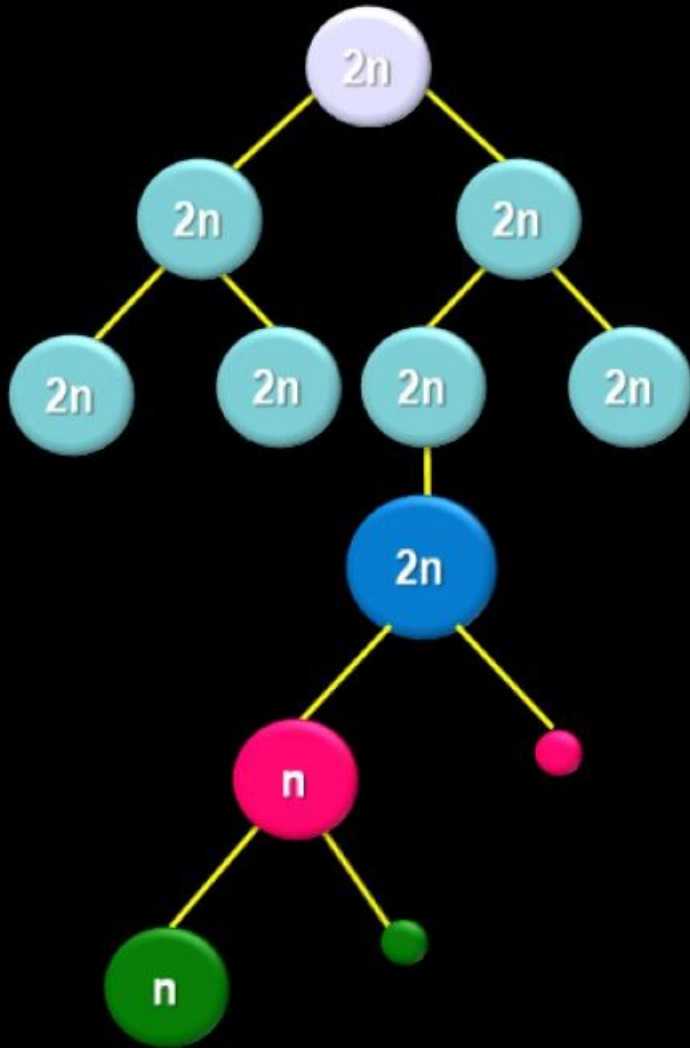
- The tertiary follicle further changes into the **mature follicle (Graafian follicle)**.

- Secondary oocyte forms a new membrane (**zona pellucida**).

- Graafian follicle now ruptures to release the **secondary oocyte (ovum)** from the ovary. This is called **ovulation**.

GAMETOGENESIS

2. OOGENESIS: STEPS



Oogonia ($2n$) (Diploid, 46 chromosomes)

Mitosis (embryonic stage)

Primary oocyte ($2n$)

Grow in size

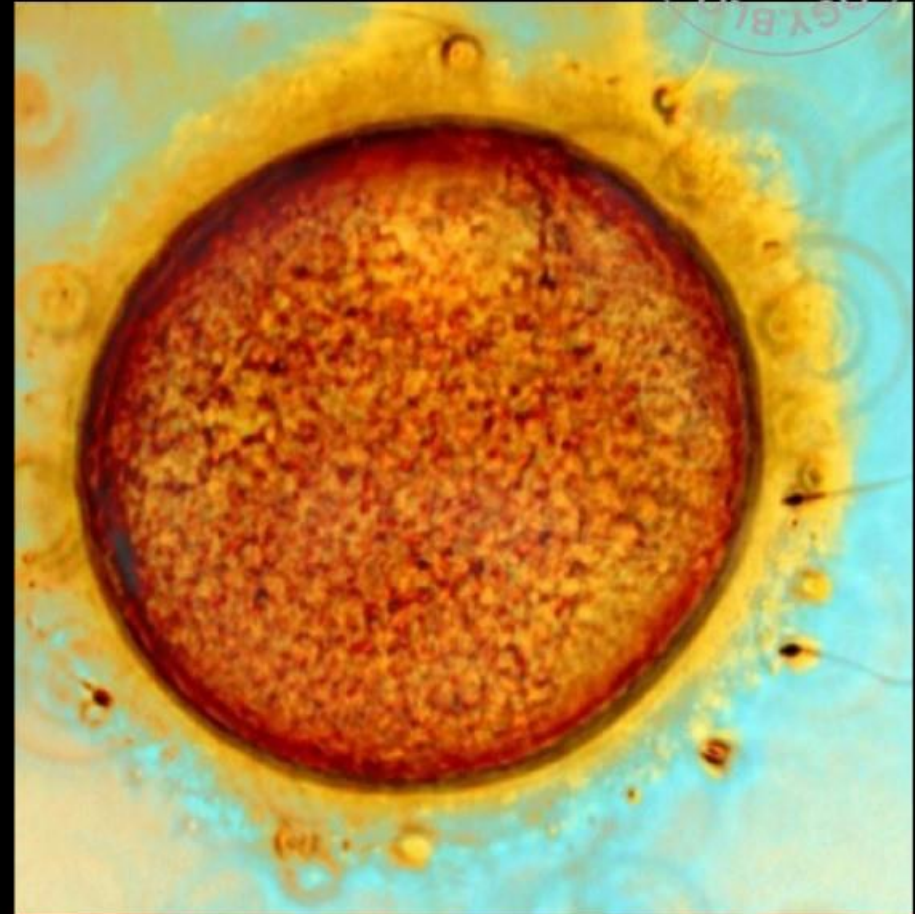
Primary oocyte ($2n$)

Meiosis I ↓ (prior to ovulation)

Secondary oocytes (n) & first polar body (n)

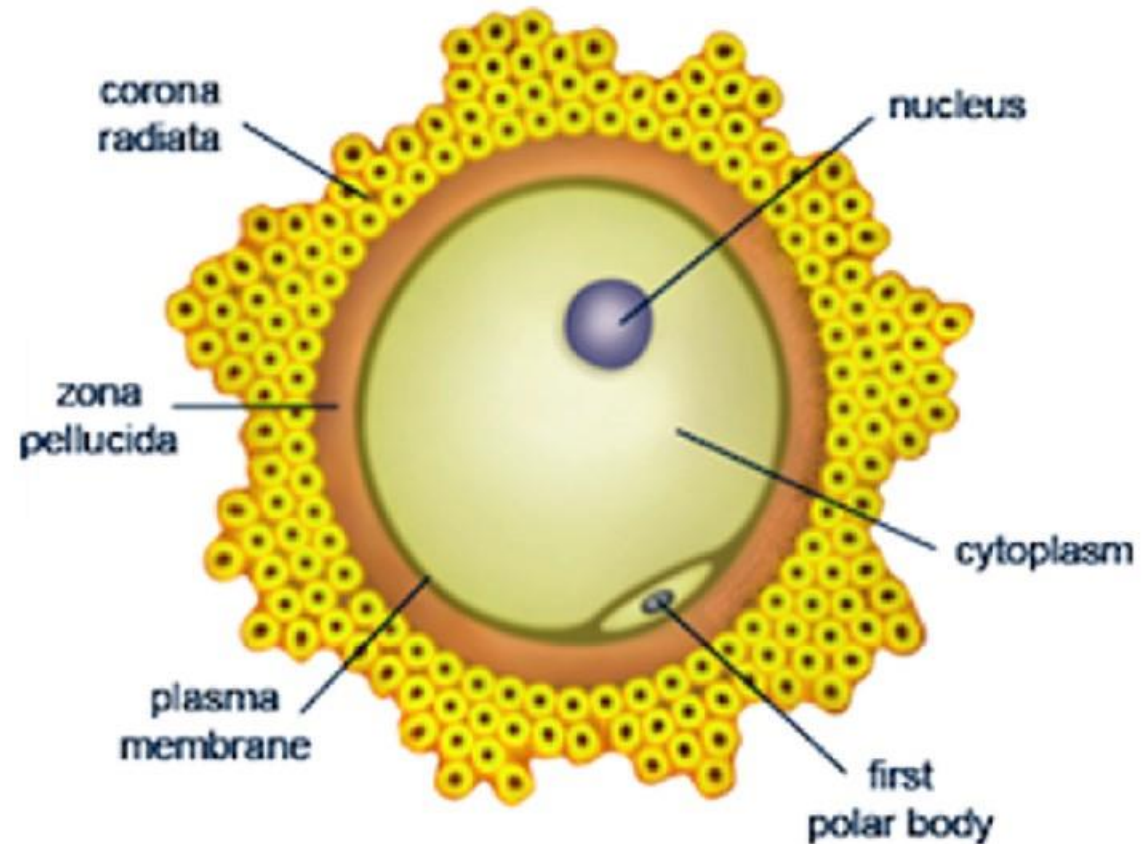
Meiosis II ↓ (During fertilization)

Ootid (ovum- n) & second polar body (n)



Ovum

- Spherical and **non-motile**.
- **Size:** About **0.2 mm** in diameter.
- Ovum has 3 membranes:
 - ❖ **Plasma membrane (Oolemma):** Innermost layer.
 - ❖ **Zona pellucida:** Outer to the plasma membrane.
 - ❖ **Corona radiata:** Outer layer formed of **follicle cells**.



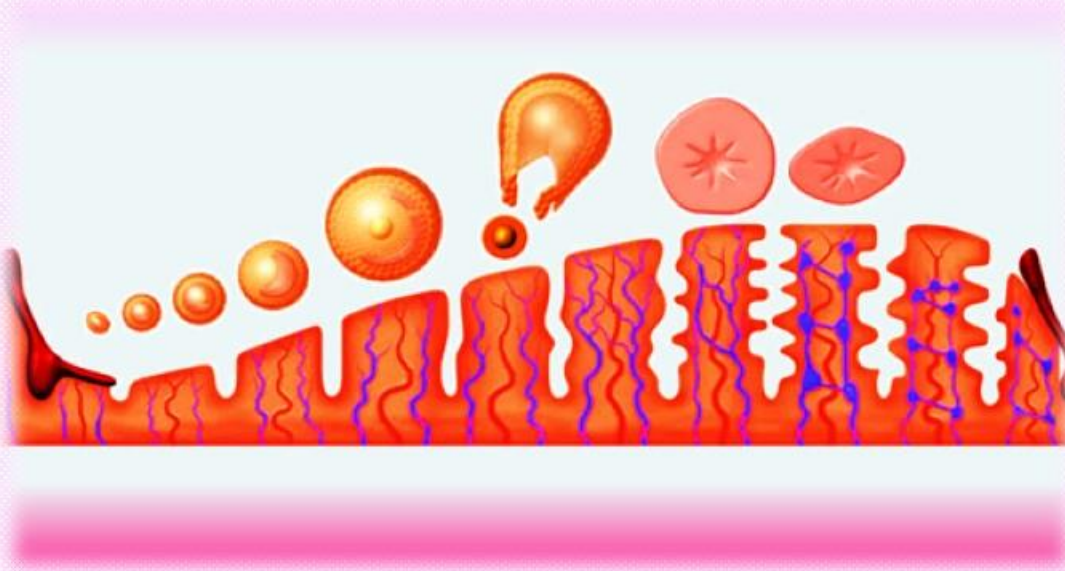
GAMETOGENESIS

Spermatogenesis v/s Oogenesis



Spermatogenesis	Oogenesis
Occurs in testis.	Occurs in ovary.
Limited growth phase.	Elaborated growth phase.
Each primary spermatocyte gives 4 sperms.	Each primary oocyte gives only one ovum.
No polar body formation.	Polar bodies are formed.
Begins at puberty and extends up to senility.	Begins at embryonic stage but suspends up to the puberty. It ceases around the age of 50.





MENSTRUAL CYCLE

MENSTRUAL CYCLE (REPRODUCTIVE CYCLE)



It is the cyclic events starting from one **menstruation** till the next during **reproductive period** (puberty to menopause) of a woman's life.

MENSTRUAL CYCLE (REPRODUCTIVE CYCLE)



**Duration of Menstrual
cycle is
28 or 29 days.**



MENSTRUAL CYCLE (REPRODUCTIVE CYCLE)



Menstrual cycle is also seen in other **primates**.



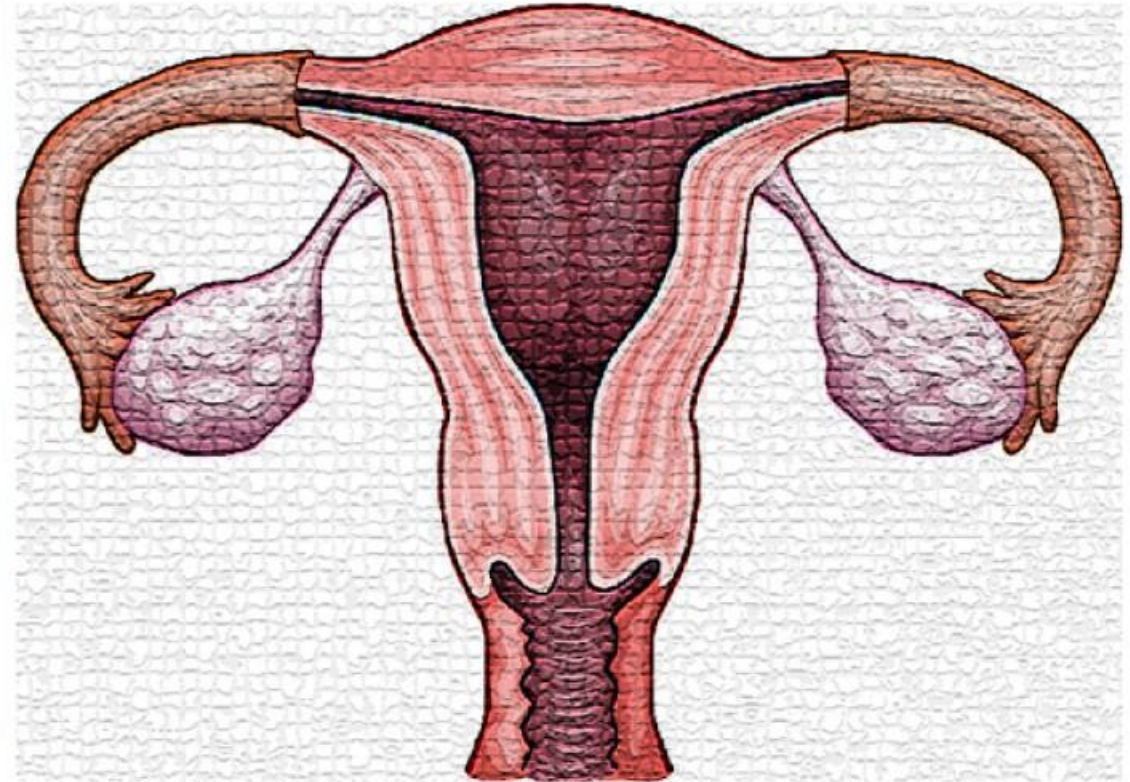
MENSTRUAL CYCLE (REPRODUCTIVE CYCLE)



Events of Menstrual cycle

Ovarian cycle:
Changes in ovary

Uterine cycle:
Changes in uterus,
oviduct and vagina



MENSTRUAL CYCLE (REPRODUCTIVE CYCLE)

Phases of Menstrual Cycle

Menstrual phase:

1-5th day

Follicular (Proliferative) phase:

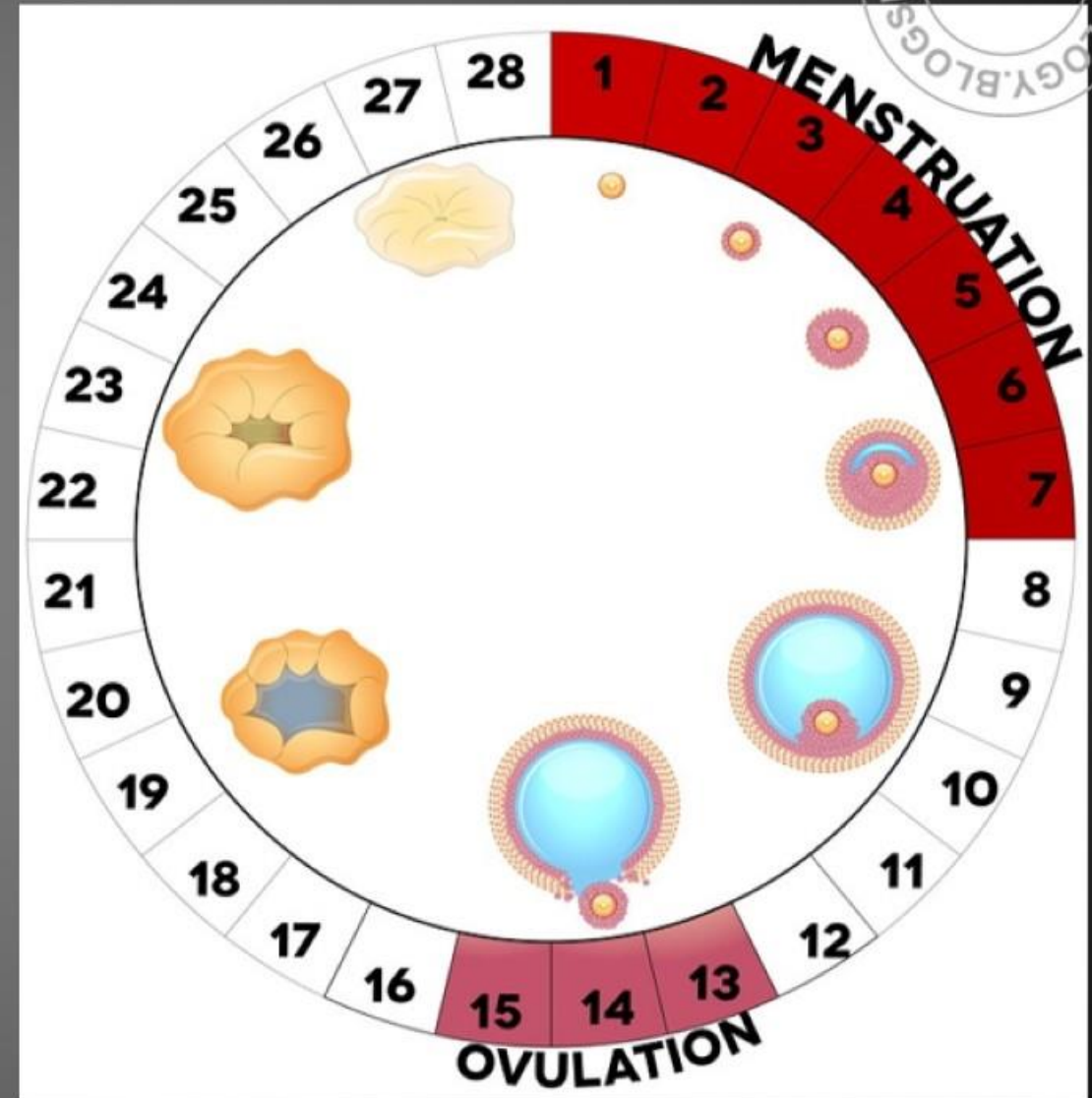
5-13th day

Ovulatory phase:

14th day

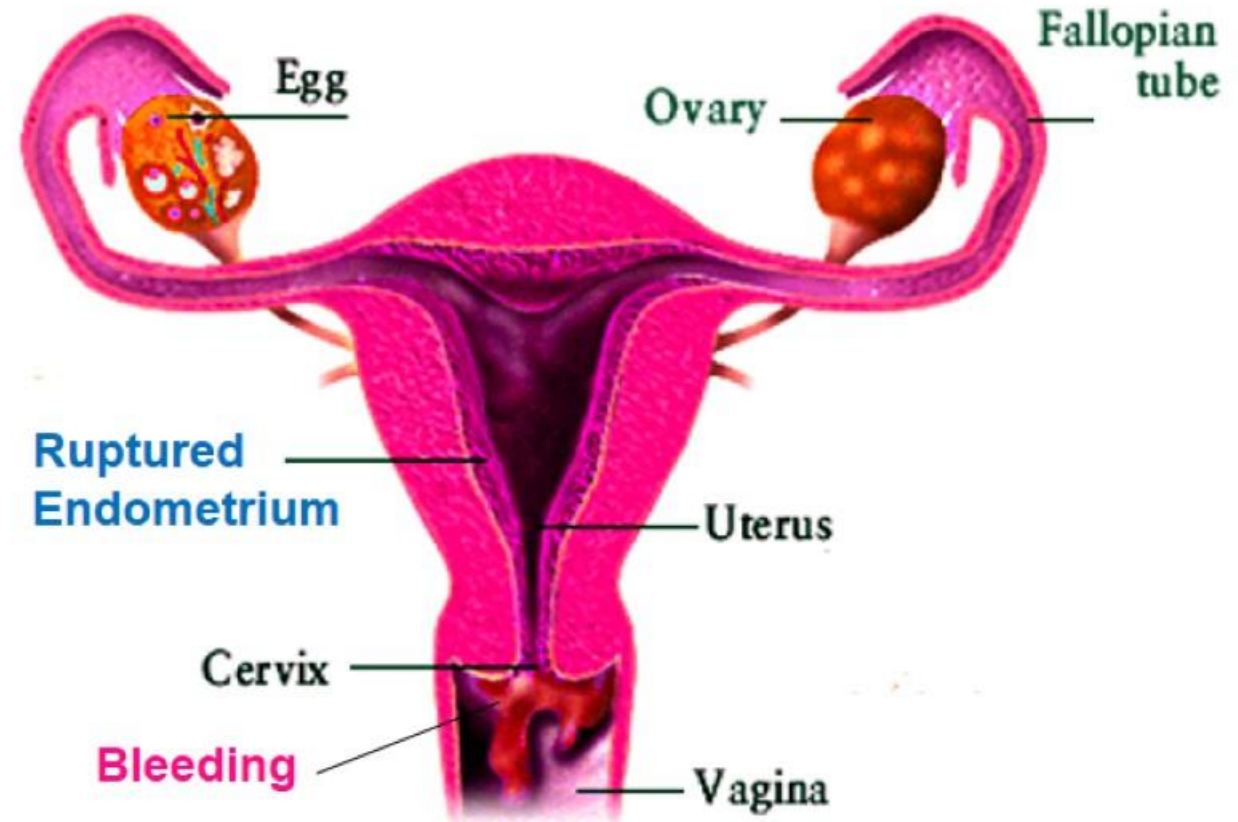
Secretory (Luteal) phase:

15-28th day



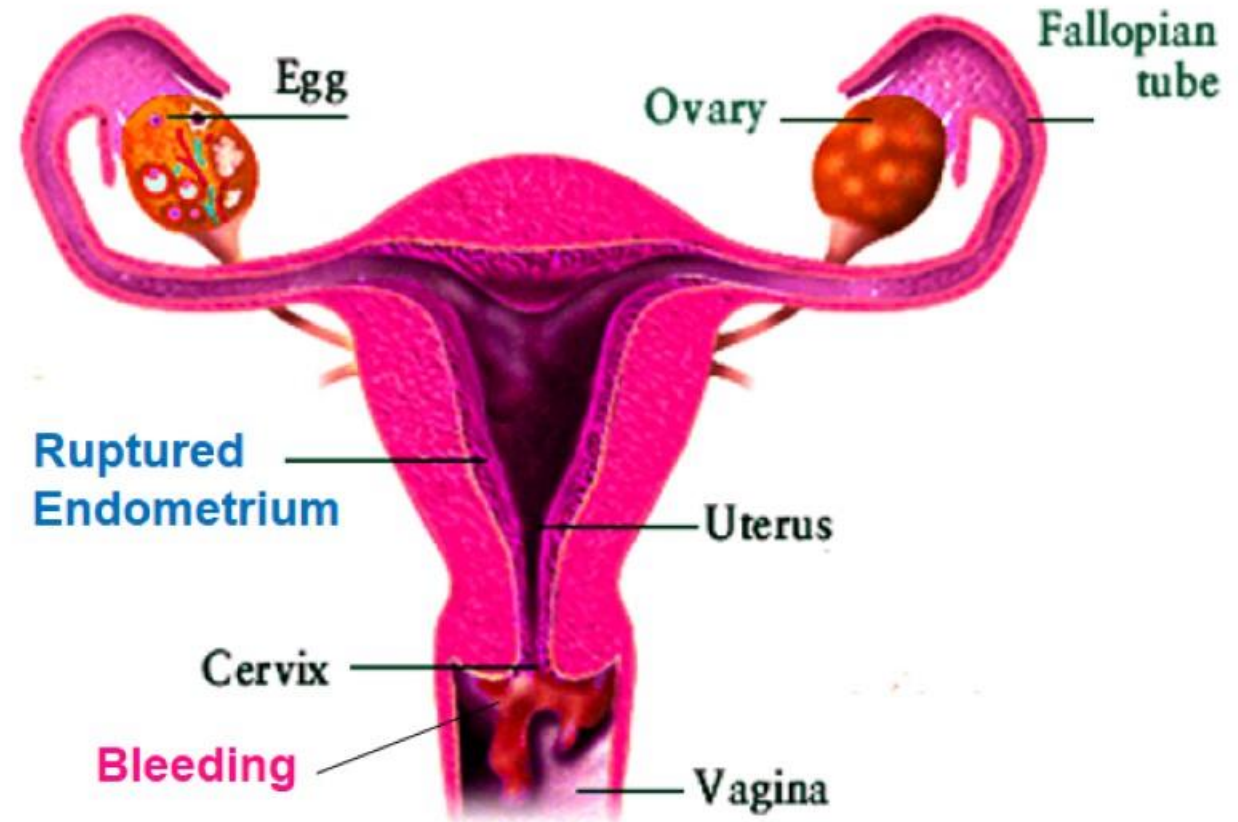
1-5th
day

- The cycle starts with **menstrual flow (bleeding)**.
- It lasts for **3-5 days**.



1-5th
day

- Menstruation occurs if the released ovum is not fertilized. It results in **breakdown of endometrial lining and uterine blood vessels** that comes out through vagina.



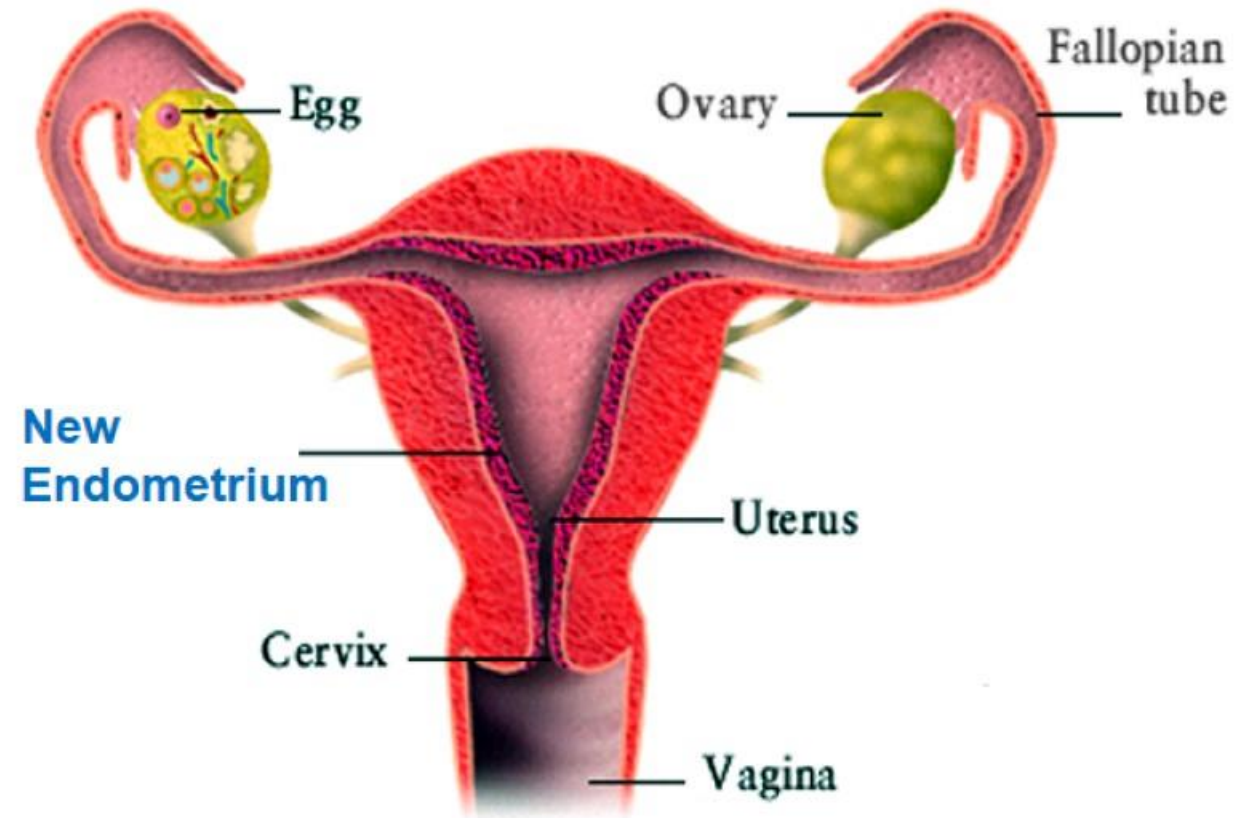
1-5th
day

- Lack of menstruation indicates **pregnancy**.
- It may also be caused due to **stress, poor health etc.**



**5-13th
day**

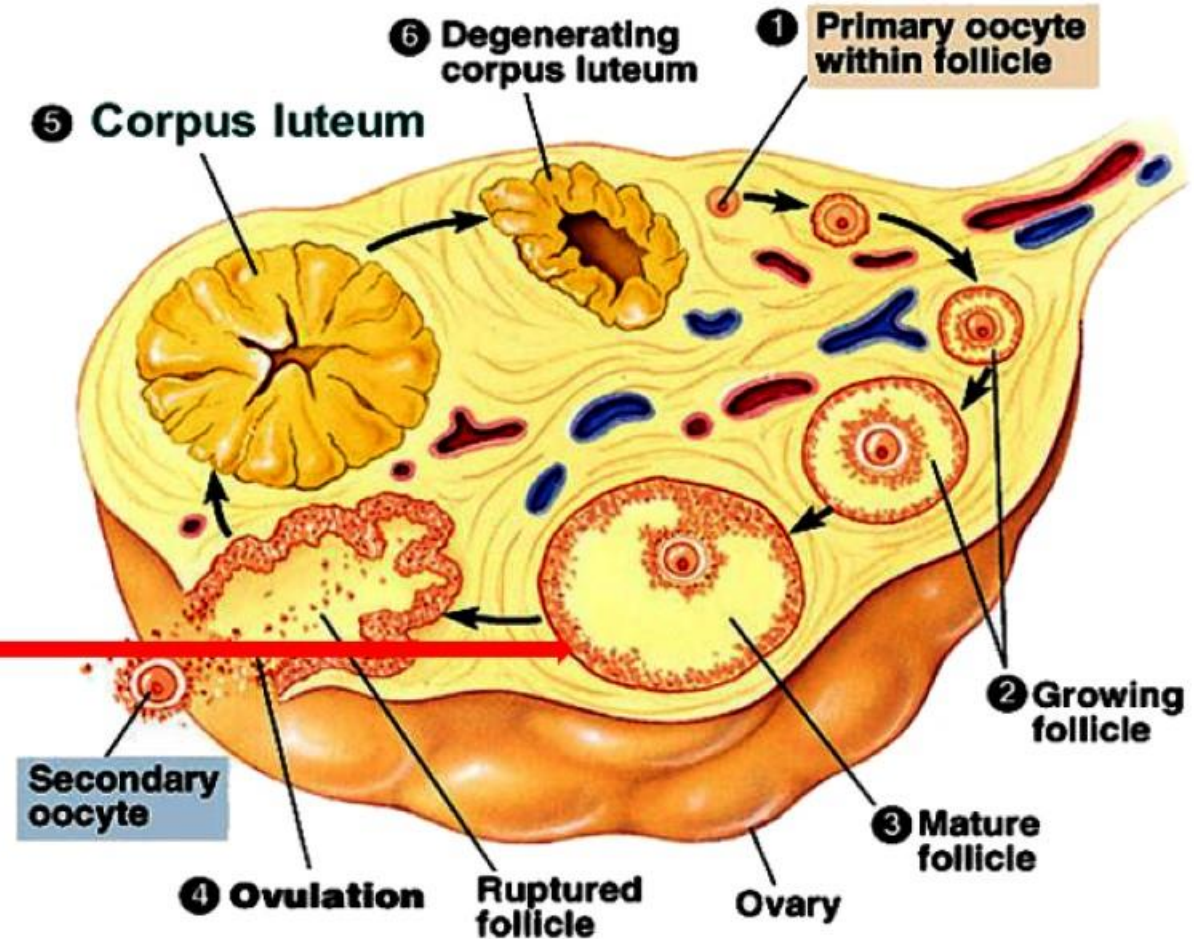
- It starts from **5th day** after menstruation and completed within **8-12 days**.
- In this phase, action of **gonadotropins (FSH & LH)** from pituitary occurs.



5-13th
day

FSH stimulates

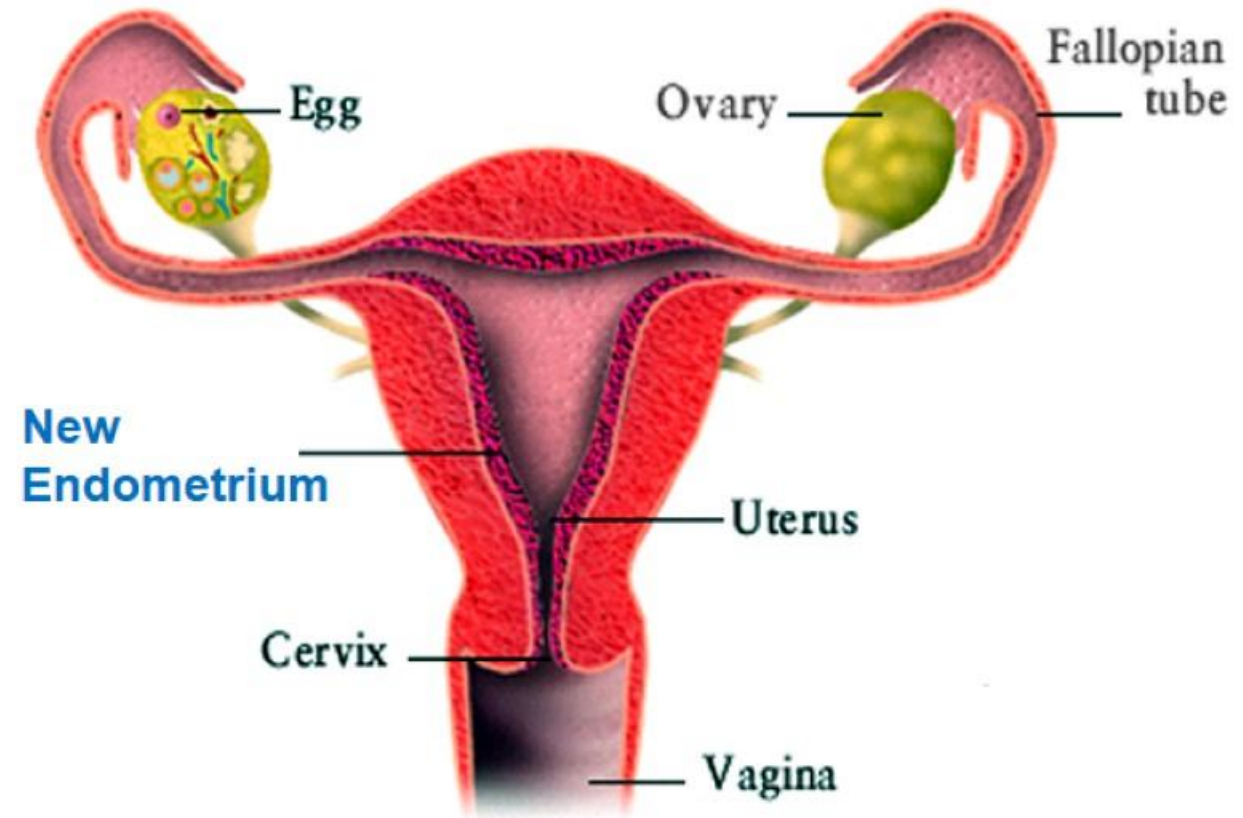
- Development of primary follicles into **Graafian follicles**.
- Secretion of **oestrogens** by **Graafian follicles**.



5-13th
day

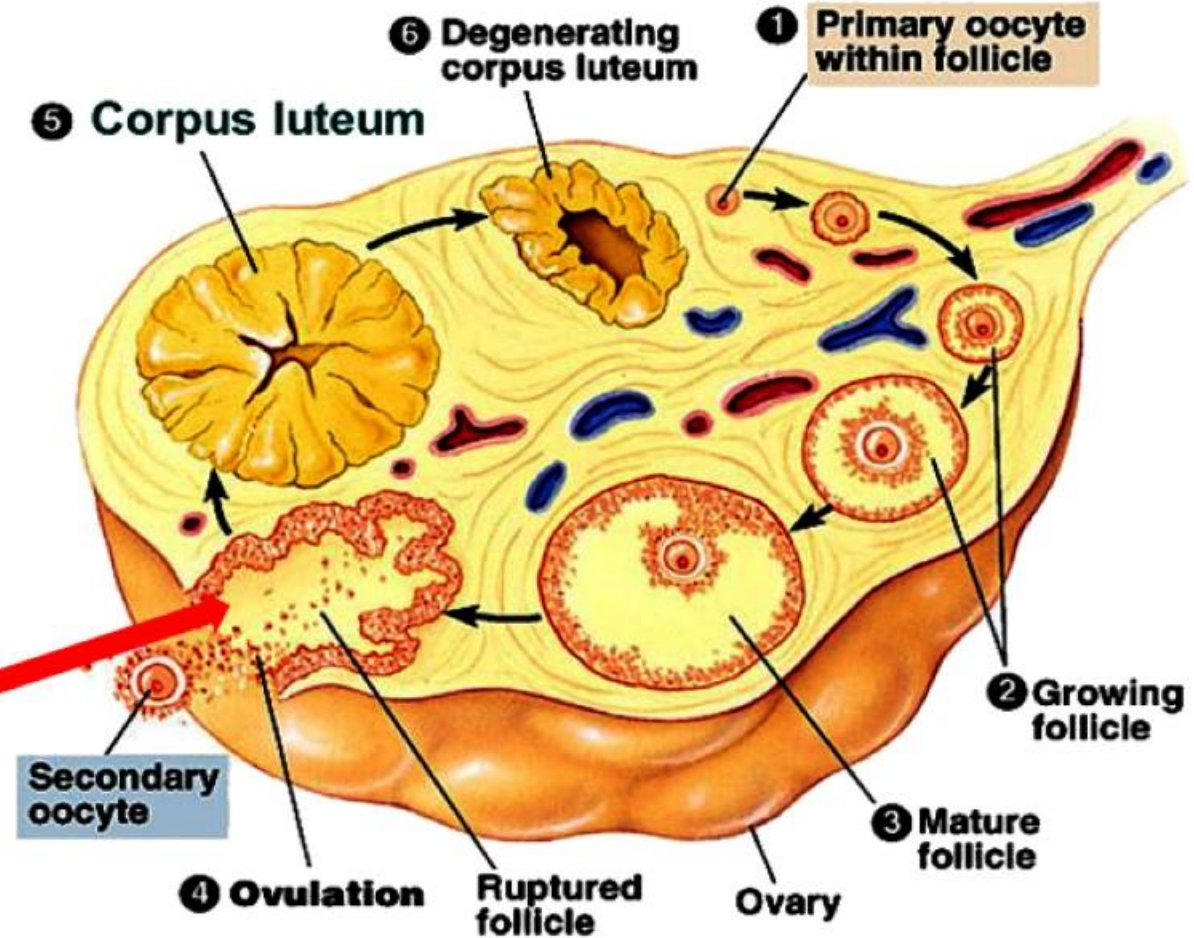
Oestrogens stimulate

- Proliferation of **ruptured uterine endometrium** and mucus lining of **oviduct & vagina**.
- Development of secondary sexual characters.
- Suppression of FSH secretion.
- Secretion of **LH (Luteinizing hormone)**.



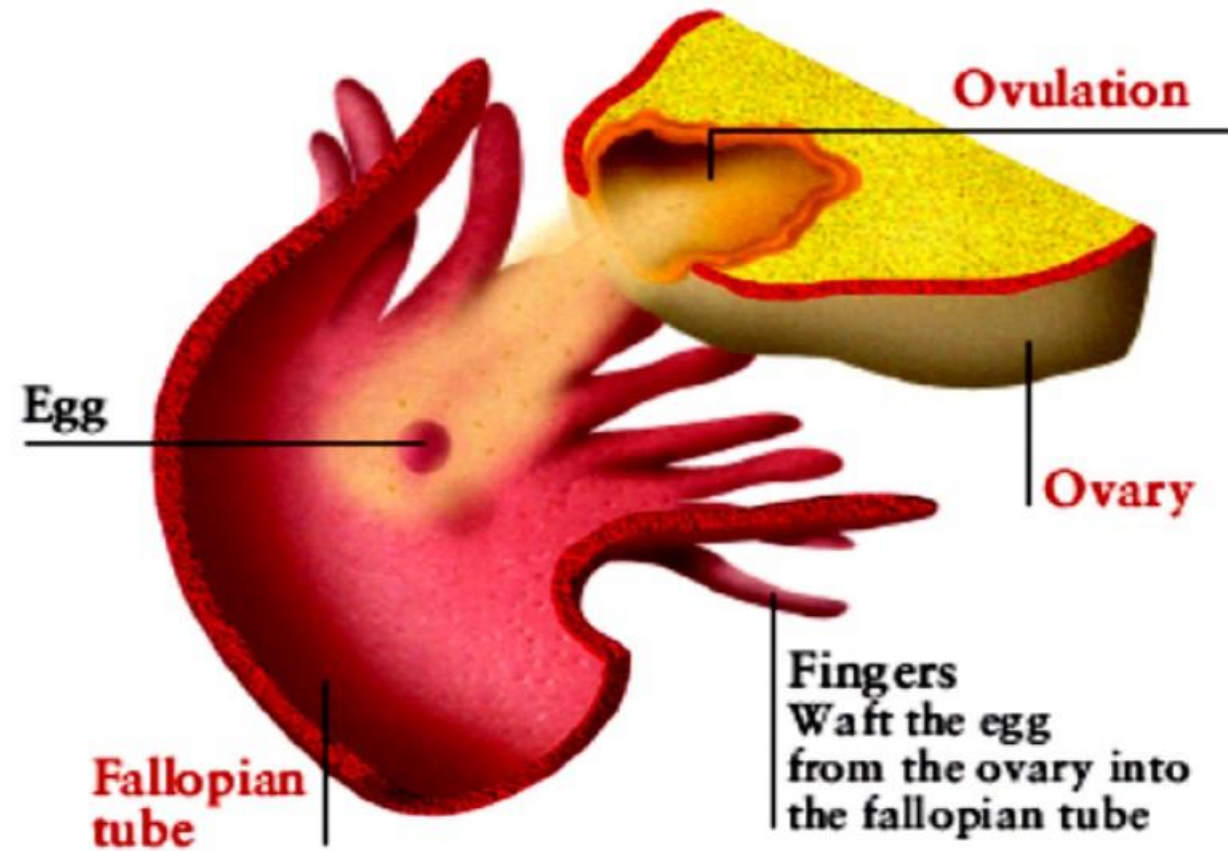
14th
day

- LH & FSH attain a peak level in the middle of cycle.
- Rapid secretion of LH (LH surge) induces rupture of Graafian follicle and thereby ovulation (on 14th day).



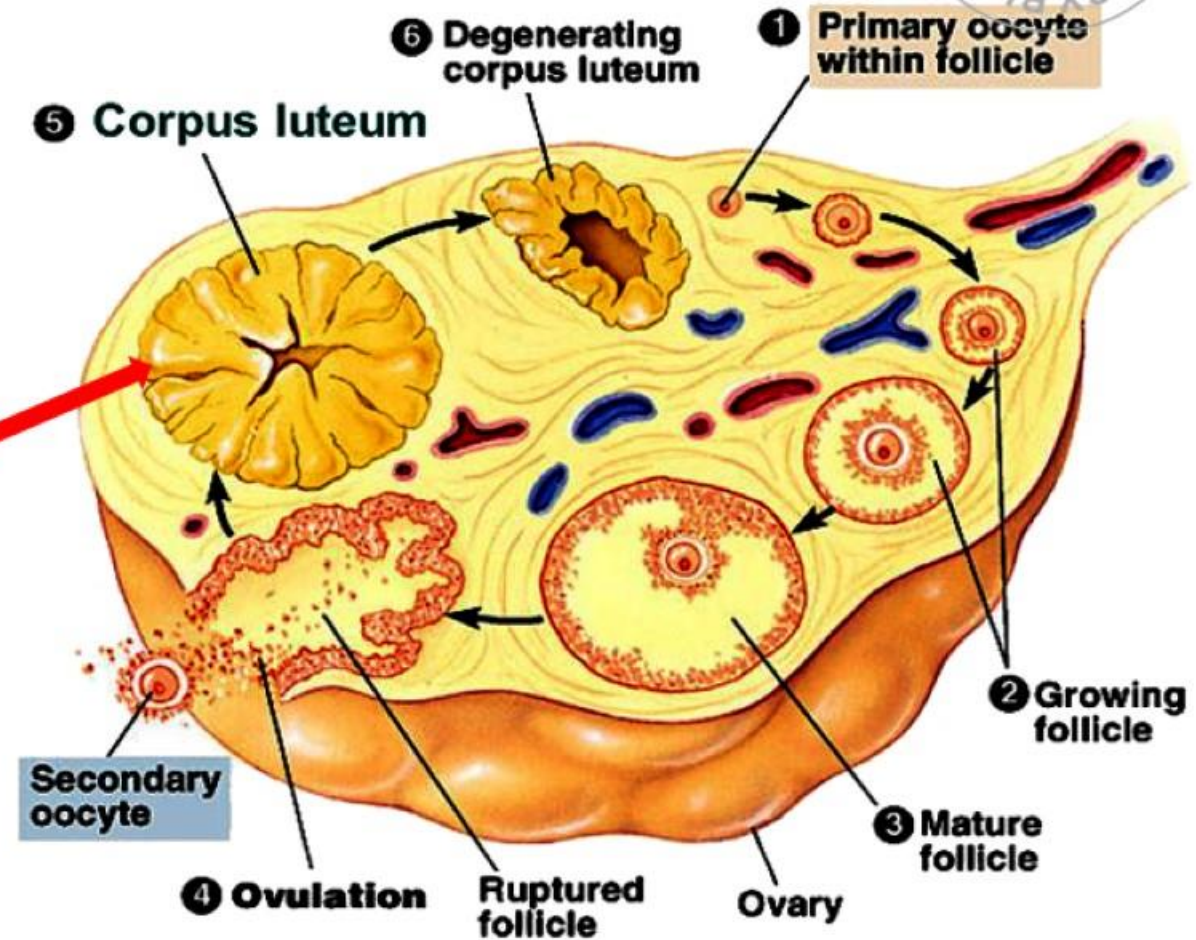
14th
day

- LH & FSH attain a peak level in the middle of cycle.
- Rapid secretion of LH (LH surge) induces rupture of Graafian follicle and thereby ovulation (on 14th day).



14-28th
day

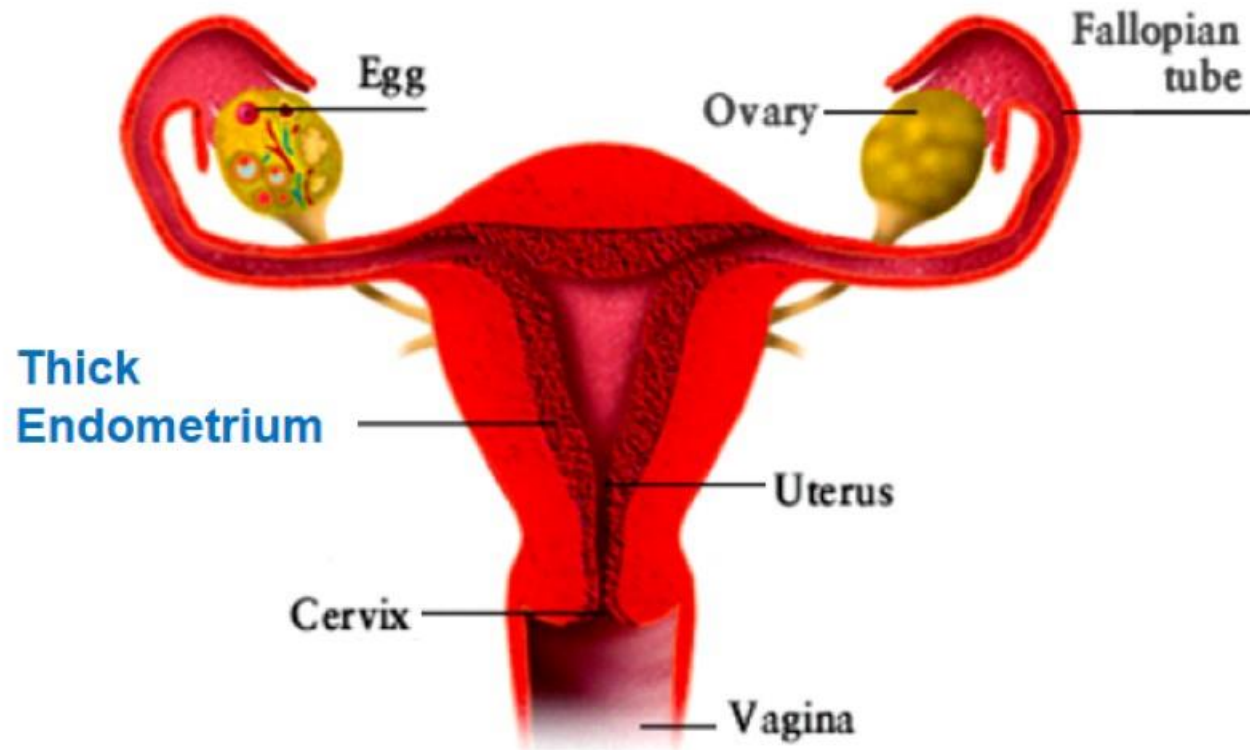
- After ovulation, **Graafian follicle** is transformed into a yellow endocrine mass called **Corpus luteum**.
- Corpus luteum secretes **progesterone**.



14-28th
day

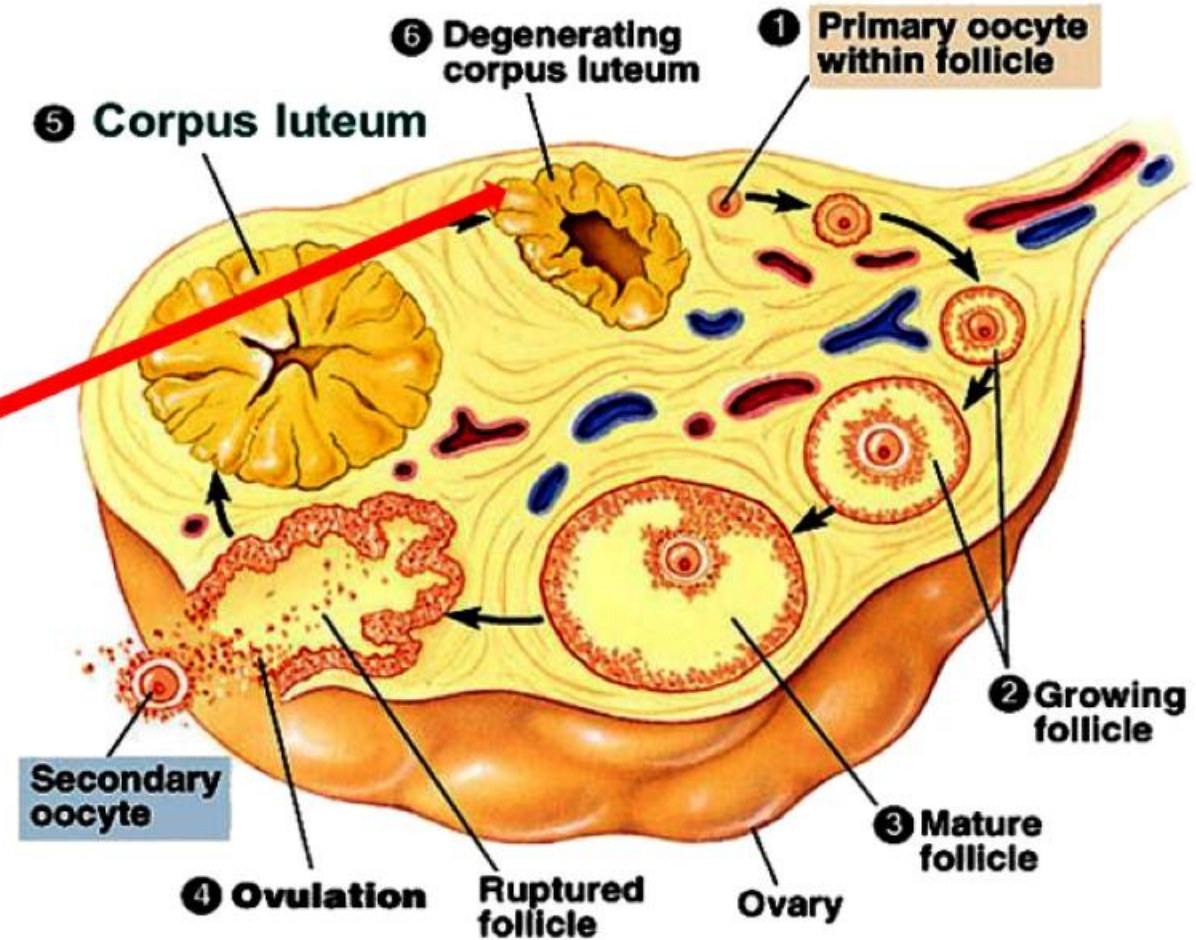
Functions of progesterone:

- ✓ Makes the endometrium **maximum vascular, thick and soft**. Thus the uterus gets ready for implantation.
- ✓ Inhibits the **FSH secretion** to prevent development of a second ovarian follicle.



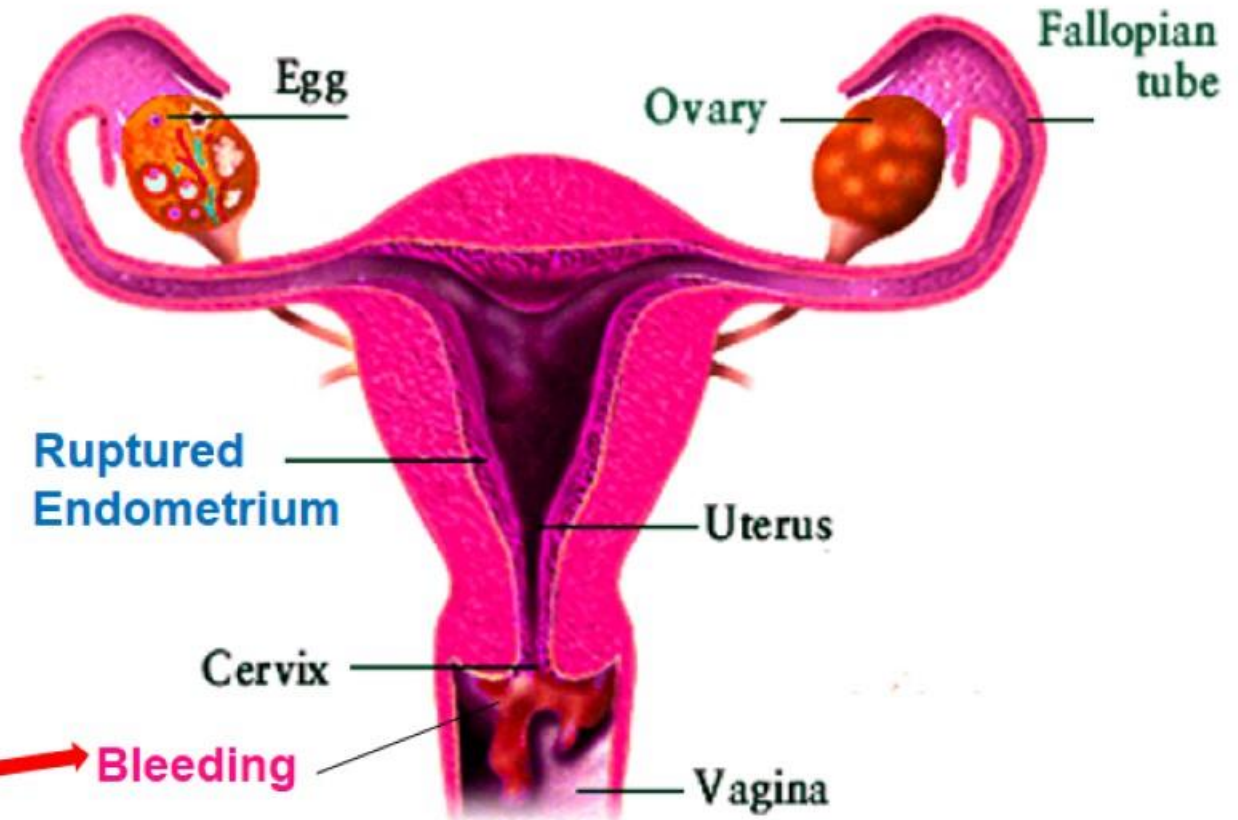
**14-28th
day**

- If fertilization does not occur, corpus luteum degenerates.
- It causes disintegration of endometrium. It leads to next **menstruation** and new cycle.



14-28th
day

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- It causes disintegration of endometrium. It leads to next **menstruation** and new cycle.



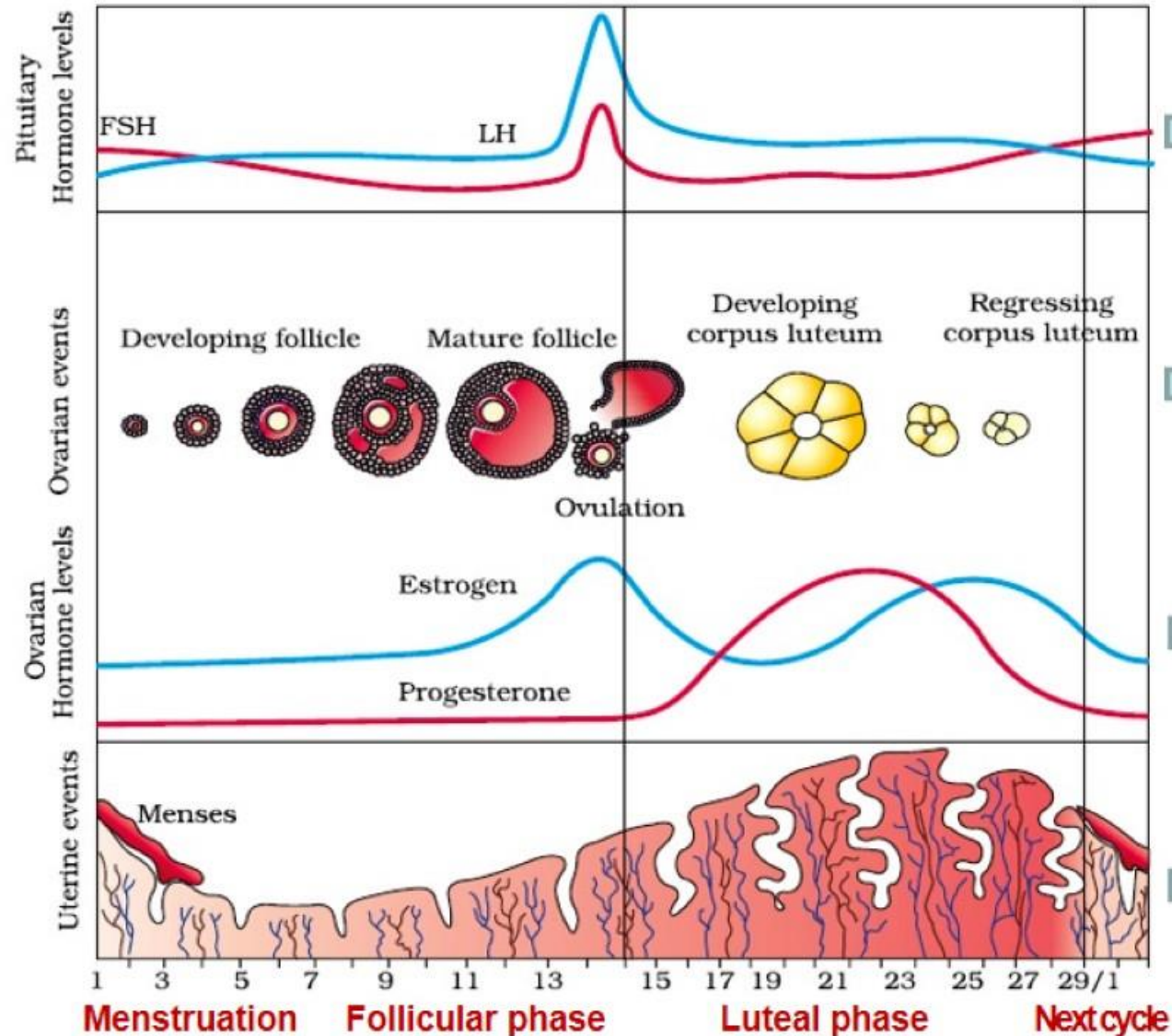
**14-28th
day**

- During pregnancy, all events of menstrual cycle stop and there is no menstruation.



MENSTRUAL CYCLE

Overall changes



**Change in Pituitary hormone
(FSH & LH) levels**

Changes in Ovary (Ovarian events)

**Change in Ovarian hormone
(Estrogen & Progesterone) levels**

Changes in uterus (Uterine events)

MENSTRUAL CYCLE



Menarche: The first menstruation during puberty.

Menopause: Stopping of menstrual cycle (at about 50 yrs of age).

Reproductive Phases of Human Life

Menarche
11-12 years

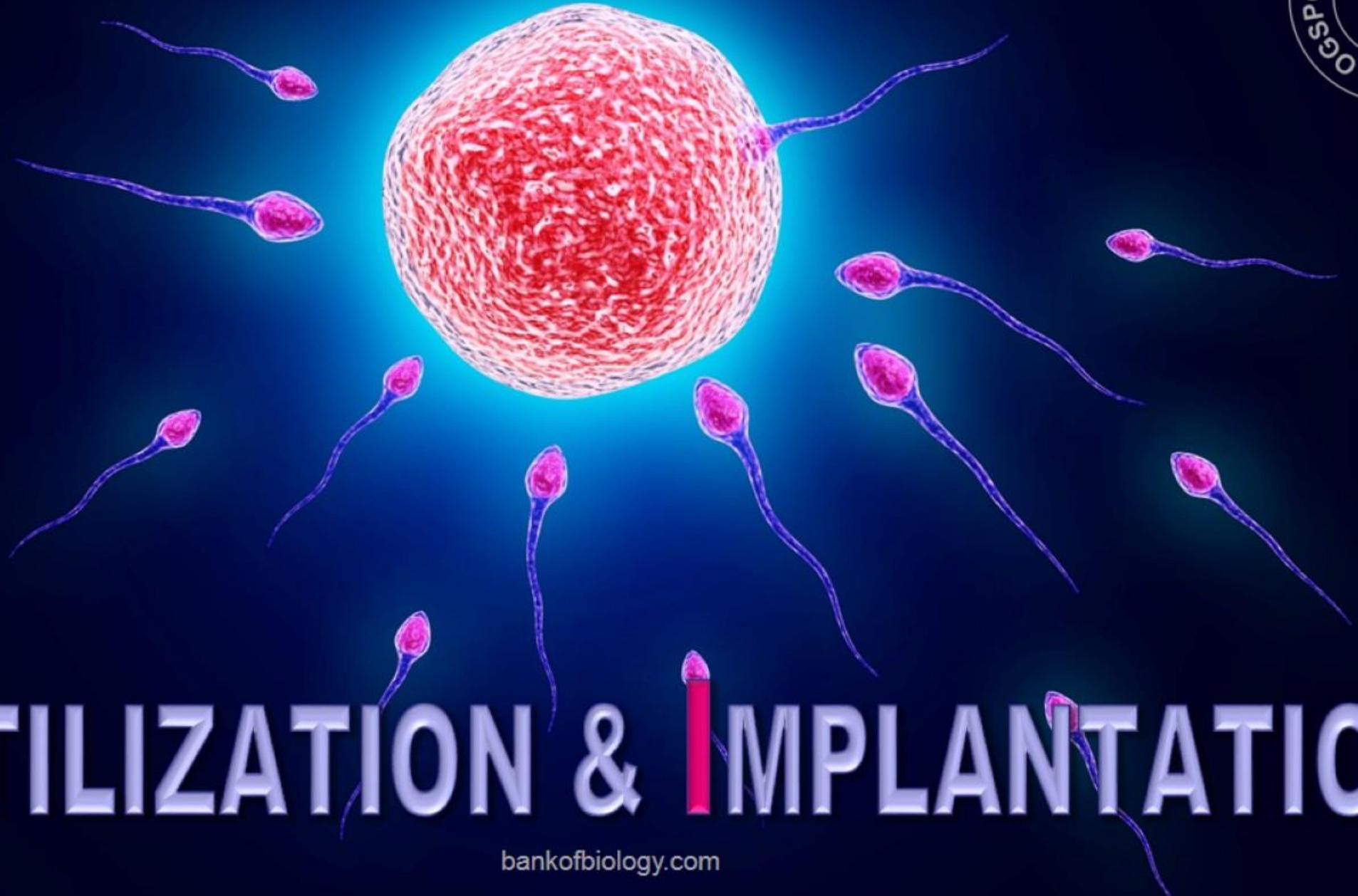


Menstruation
12-50 years



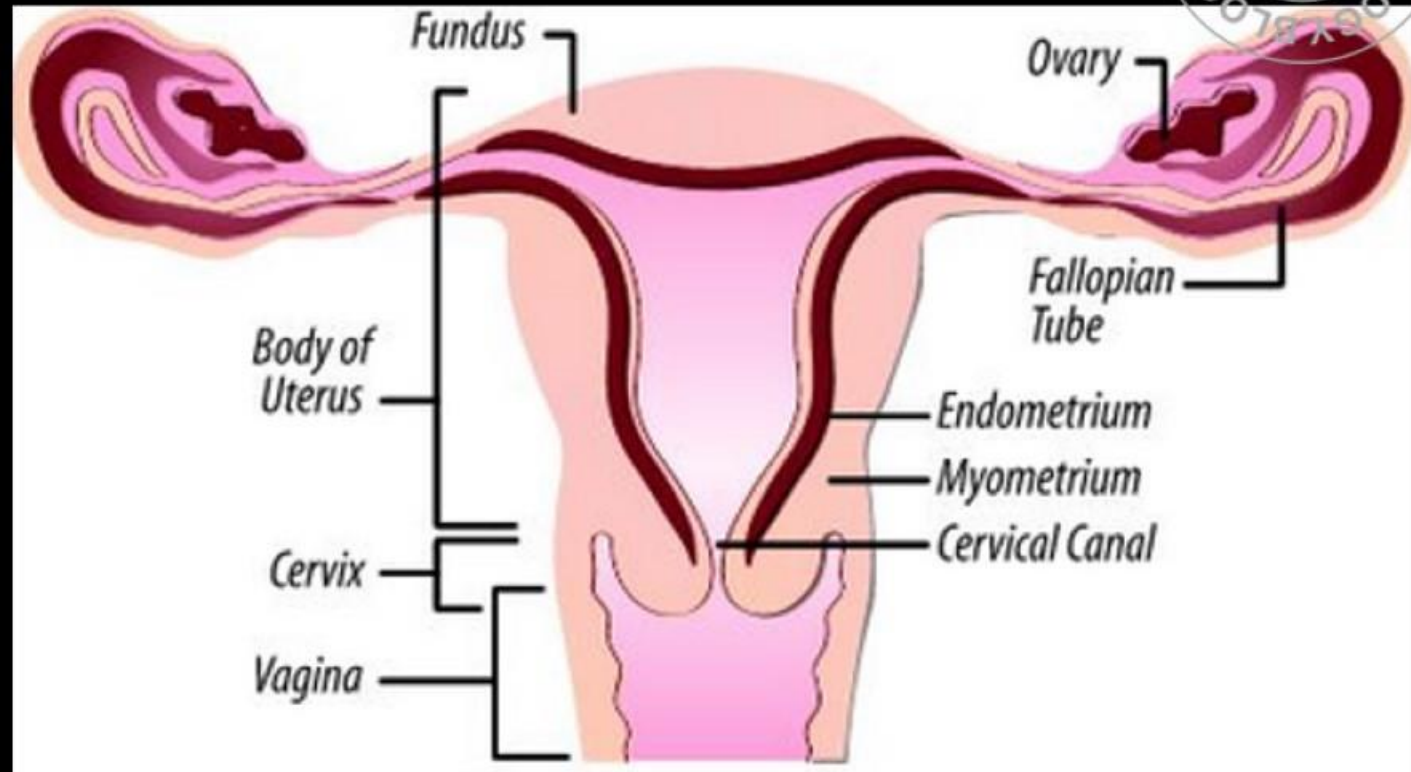
Menopause
50 years - death





FERTILIZATION & IMPLANTATION

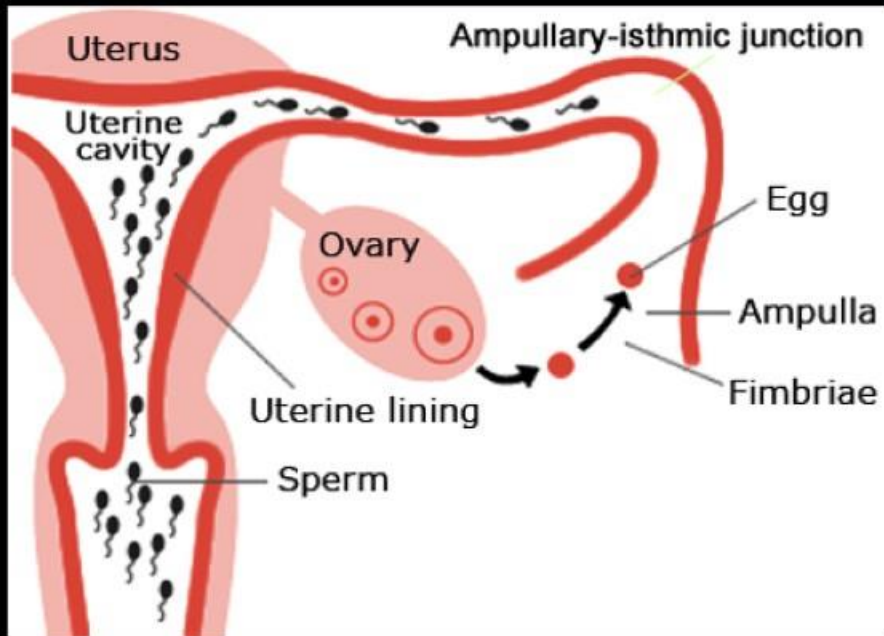
FERTILIZATION AND IMPLANTATION



During copulation, semen is released by the penis into the vagina. It is called **insemination**.

FERTILIZATION AND IMPLANTATION

- Fusion of sperm with ovum is called **fertilization**.
- It occurs in **ampullary region** of fallopian tube.



Sperms

Vagina

Cervical canal

Uterus

Isthmus



Ampullary region

Ovum (from ovary)

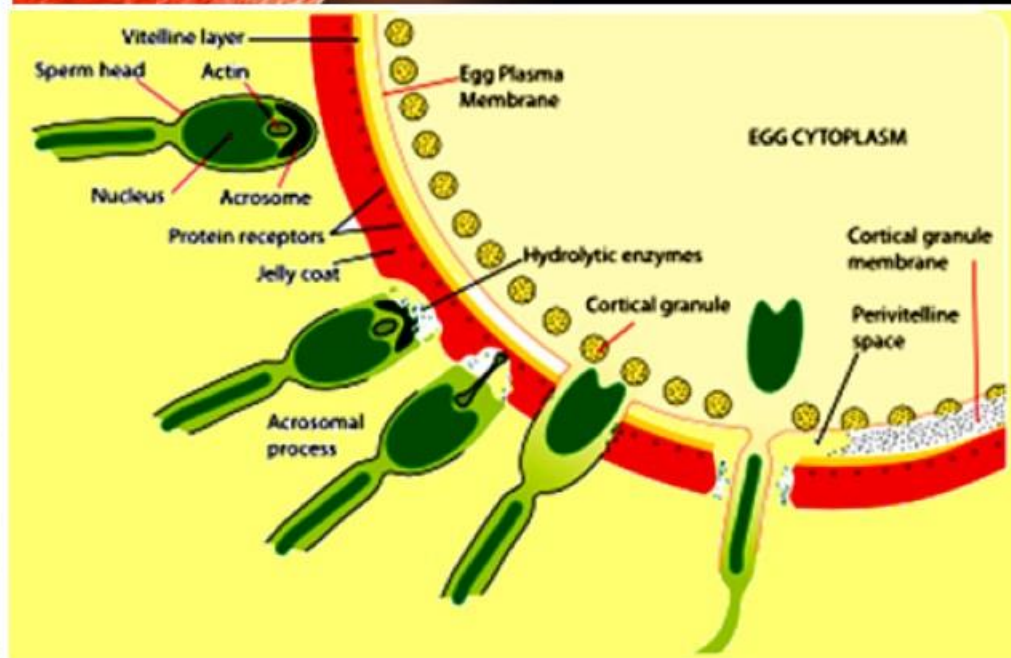
Fimbriae

Infundibulum

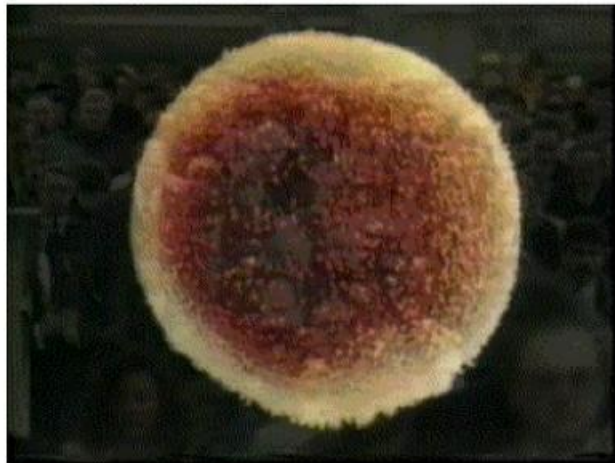
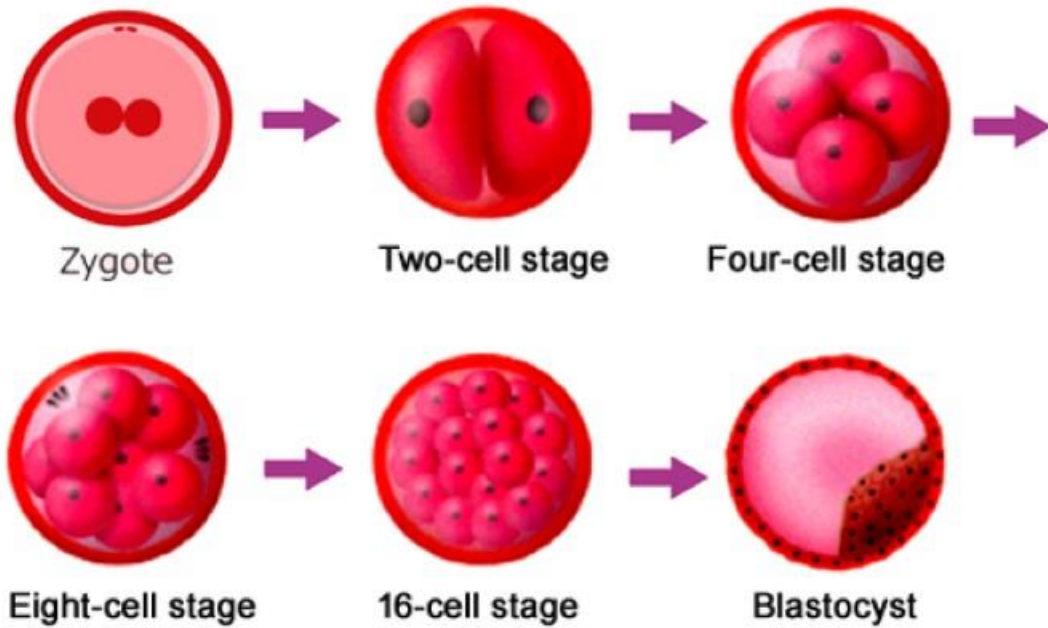
Ampulla

FERTILIZATION AND IMPLANTATION

- Fertilization happens only if ovum & sperms are transported simultaneously. So all copulations do not lead to fertilization & pregnancy.
- A sperm contacts with **zona pellucida**. It induces changes in the membrane that block the entry of additional sperms.
- The secretions of the **acrosome** help sperm to enter the egg cytoplasm via zona pellucida and plasma membrane. This causes second meiotic division of the secondary oocyte to form an **ovum (ootid)** and **second polar body**.
- The haploid nuclei of the sperm and ovum fuse together to form a **diploid zygote**.

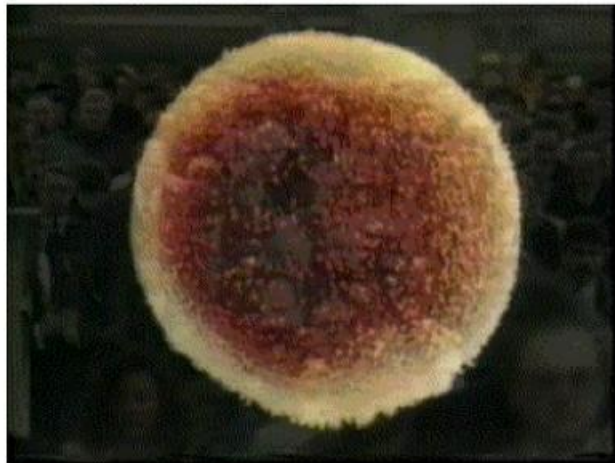
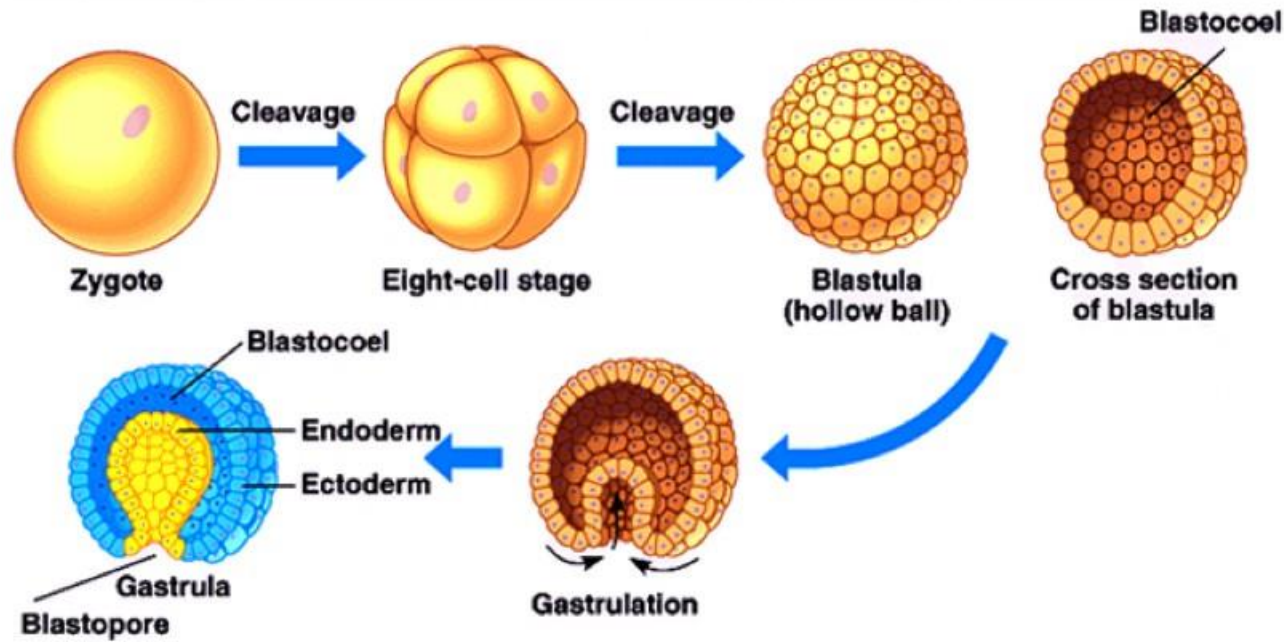


FERTILIZATION AND IMPLANTATION



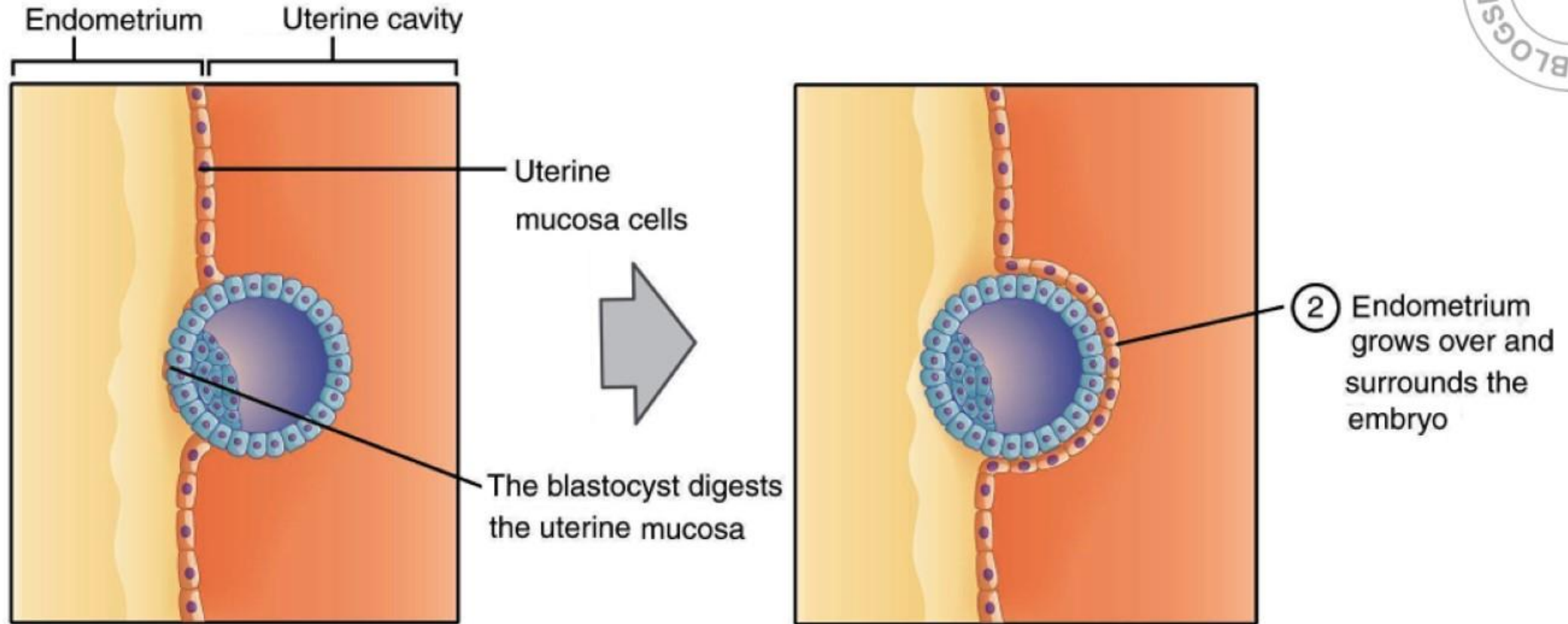
- Zygote undergoes mitotic division (**cleavage**) starts as it moves through the isthmus towards the uterus and forms 2, 4, 8, 16 daughter cells called **blastomeres**.
- The embryo with 8-16 blastomeres is called a **morula**.
- Morula continues to divide and transforms into **blastocyst**.

FERTILIZATION AND IMPLANTATION



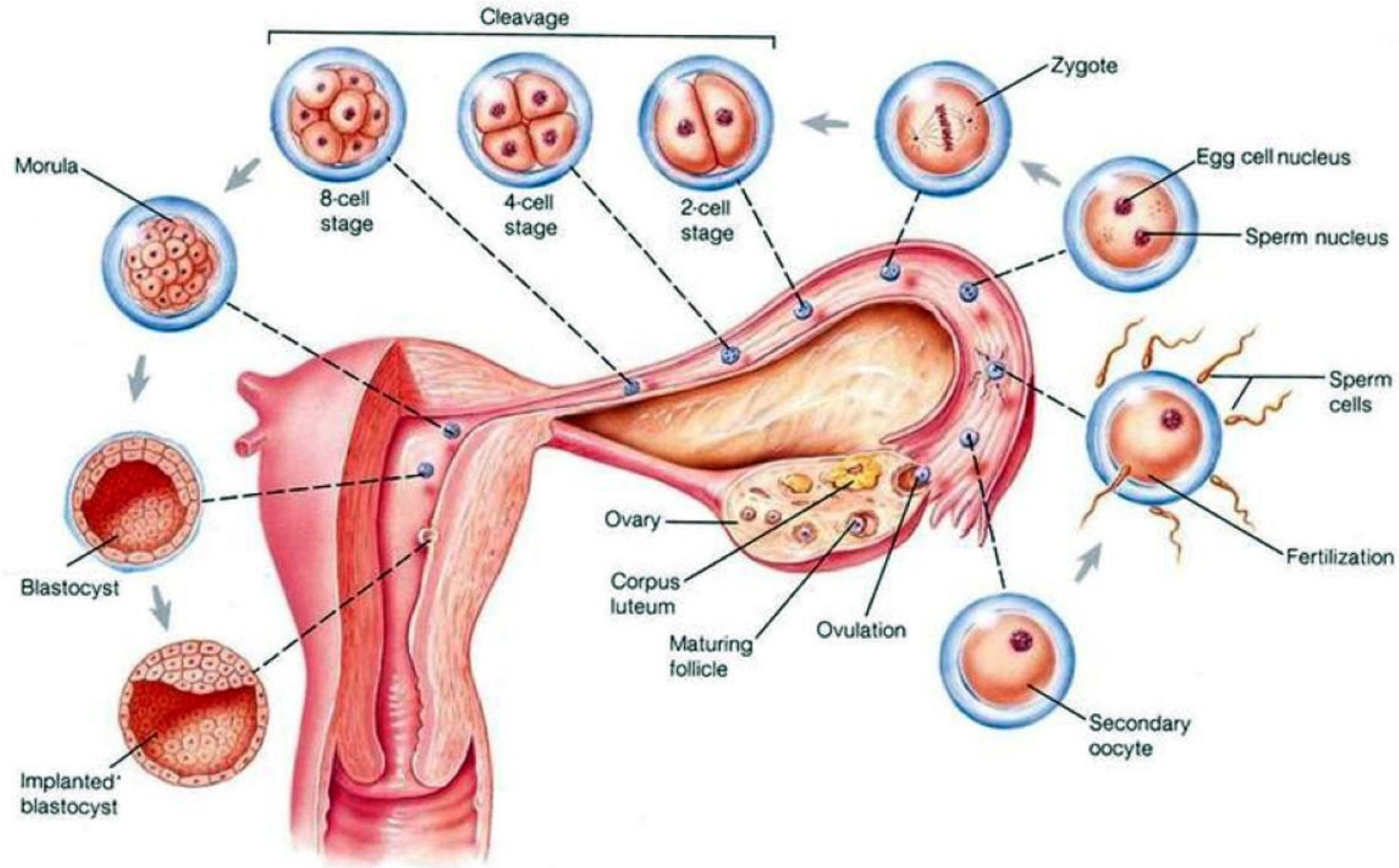
- In blastocyst, the blastomeres are arranged into an outer layer (**trophoblast**) and an **inner cell mass** attached to trophoblast.
- The trophoblast layer gives nourishment to inner cell mass. Also it gets attached to endometrium.
- The inner cell mass gets differentiated to **3 germ layers** (**outer ectoderm**, **middle mesoderm** & **inner endoderm**). This 3-layered structure (**gastrula**) forms the embryo.

FERTILIZATION AND IMPLANTATION



- After attachment, uterine cells divide rapidly and cover the blastocyst.
- As a result, the blastocyst becomes embedded in the endometrium. This is called **implantation**.

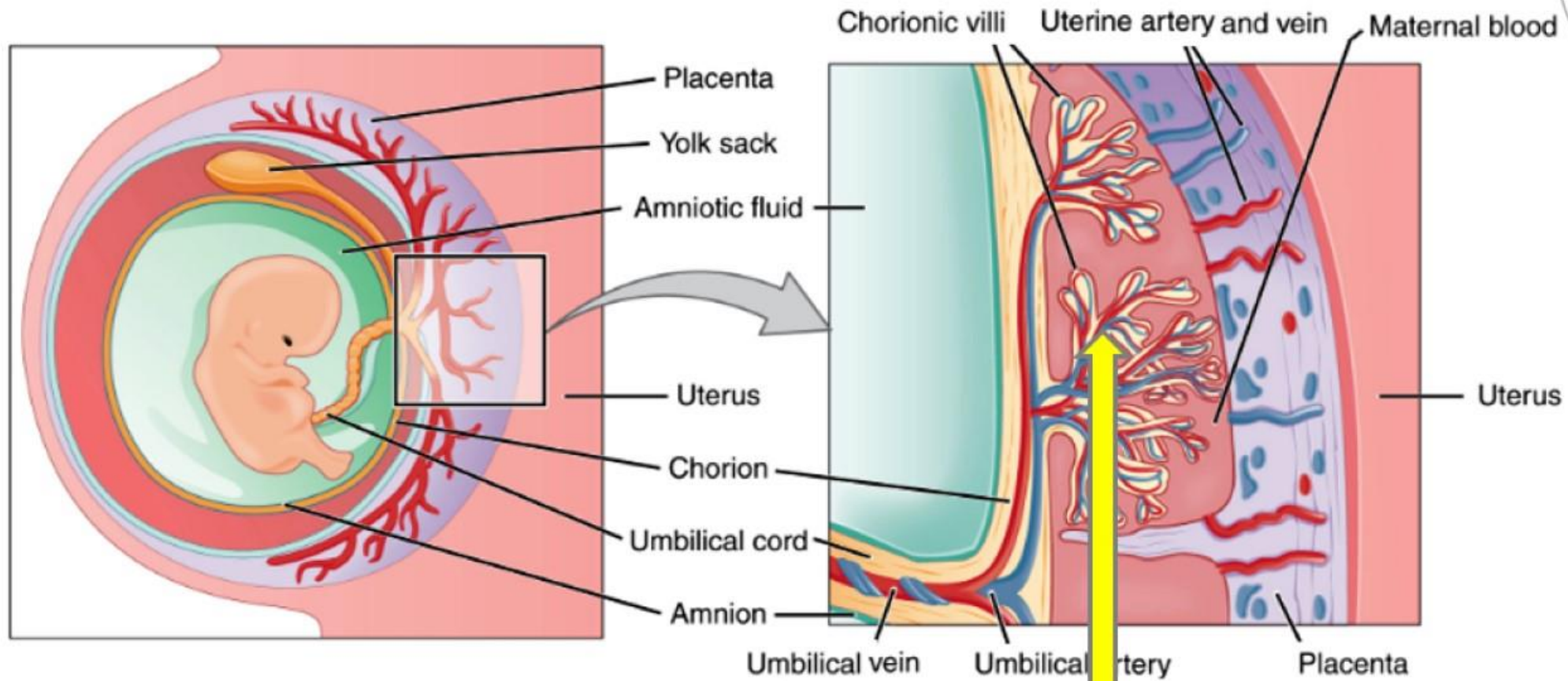
FERTILIZATION AND IMPLANTATION: AT A GLANCE





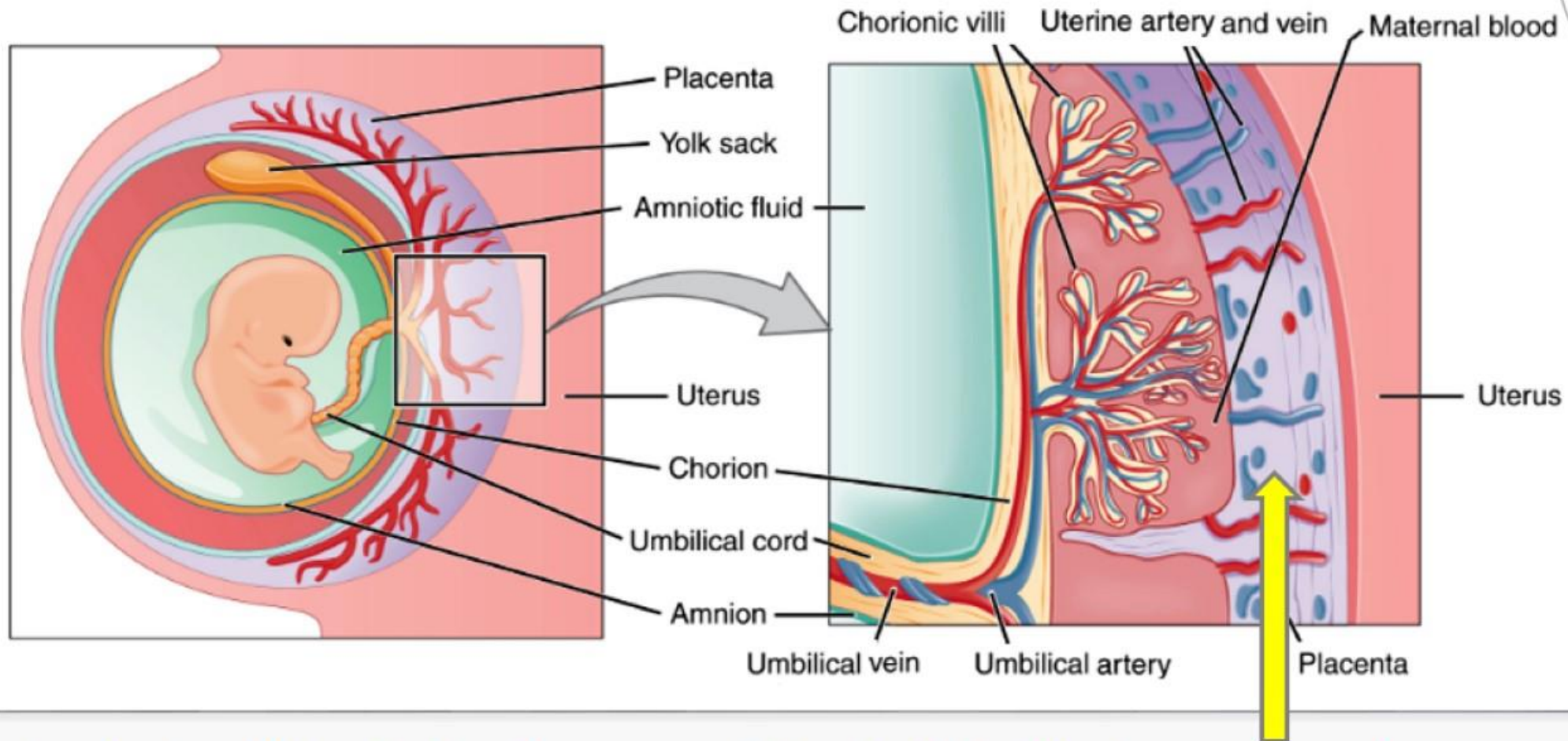
PREGNANCY AND EMBRYONIC DEVELOPMENT

PREGNANCY AND EMBRYONIC DEVELOPMENT



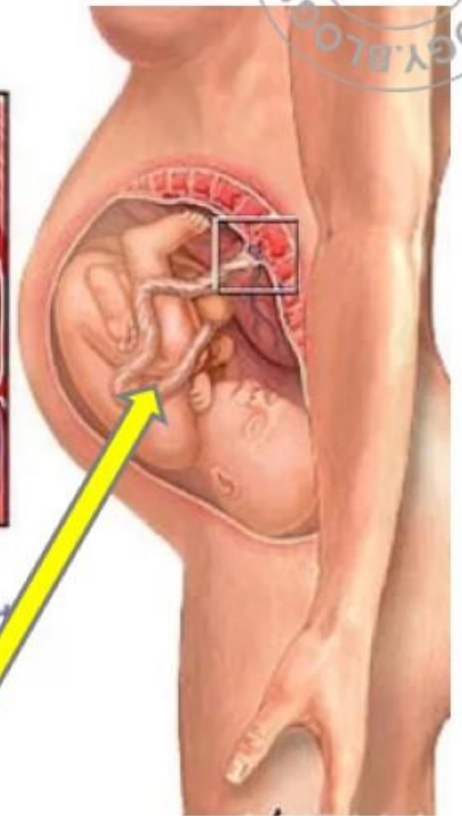
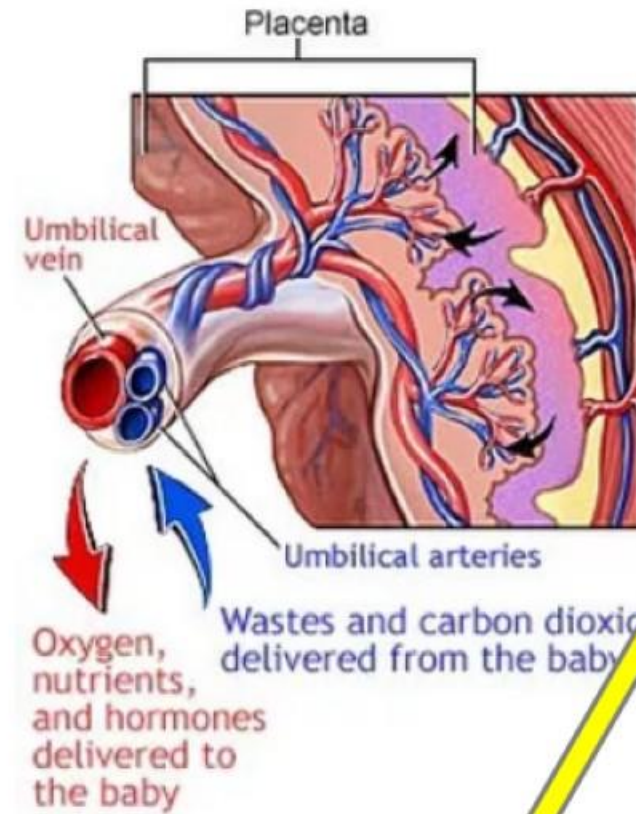
- After implantation, finger-like projections (**chorionic villi**) appear on trophoblast.
- They are surrounded by uterine tissue and maternal blood.

PREGNANCY AND EMBRYONIC DEVELOPMENT



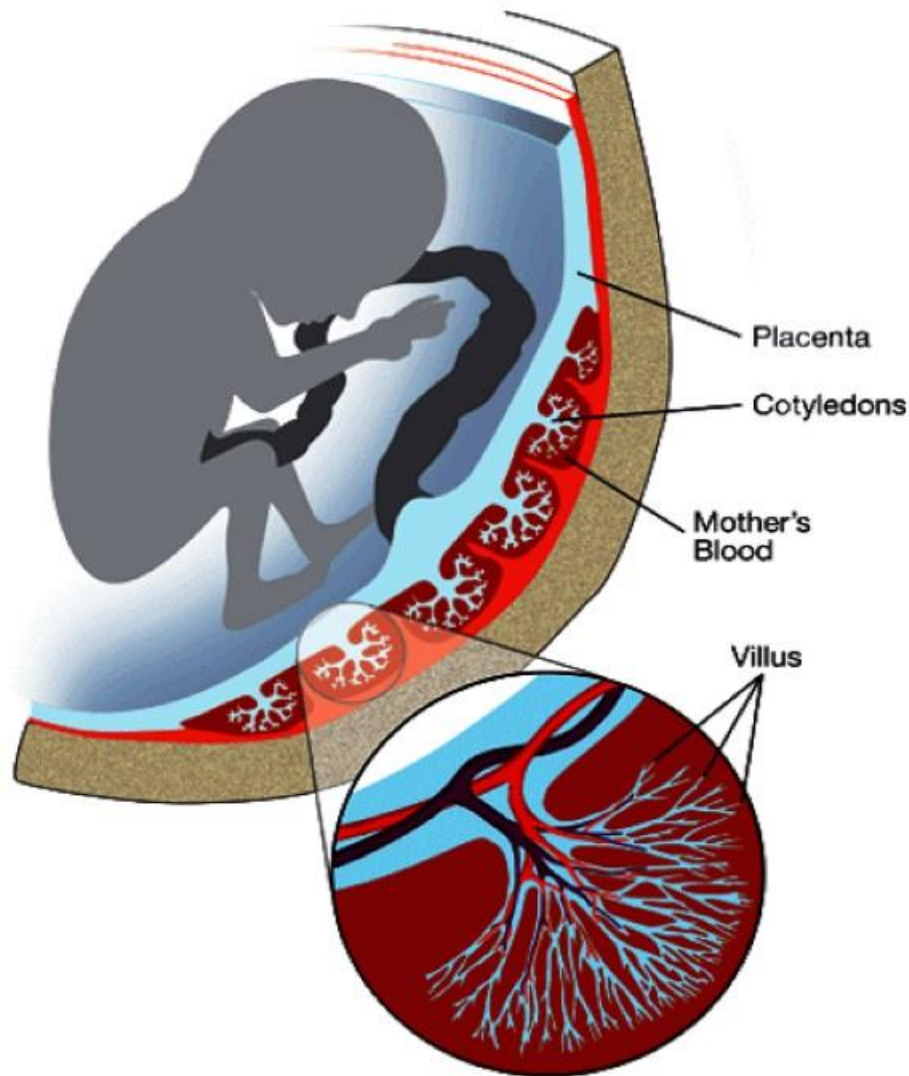
- The chorionic villi & uterine tissue are interdigitated to form **placenta**.
- Placenta is a structural and functional unit b/w embryo (foetus) & maternal body.

PREGNANCY AND EMBRYONIC DEVELOPMENT



- Placenta is connected to the embryo by an **umbilical cord**. It transports substances to and from the embryo.

PREGNANCY AND EMBRYONIC DEVELOPMENT



Functions of placenta

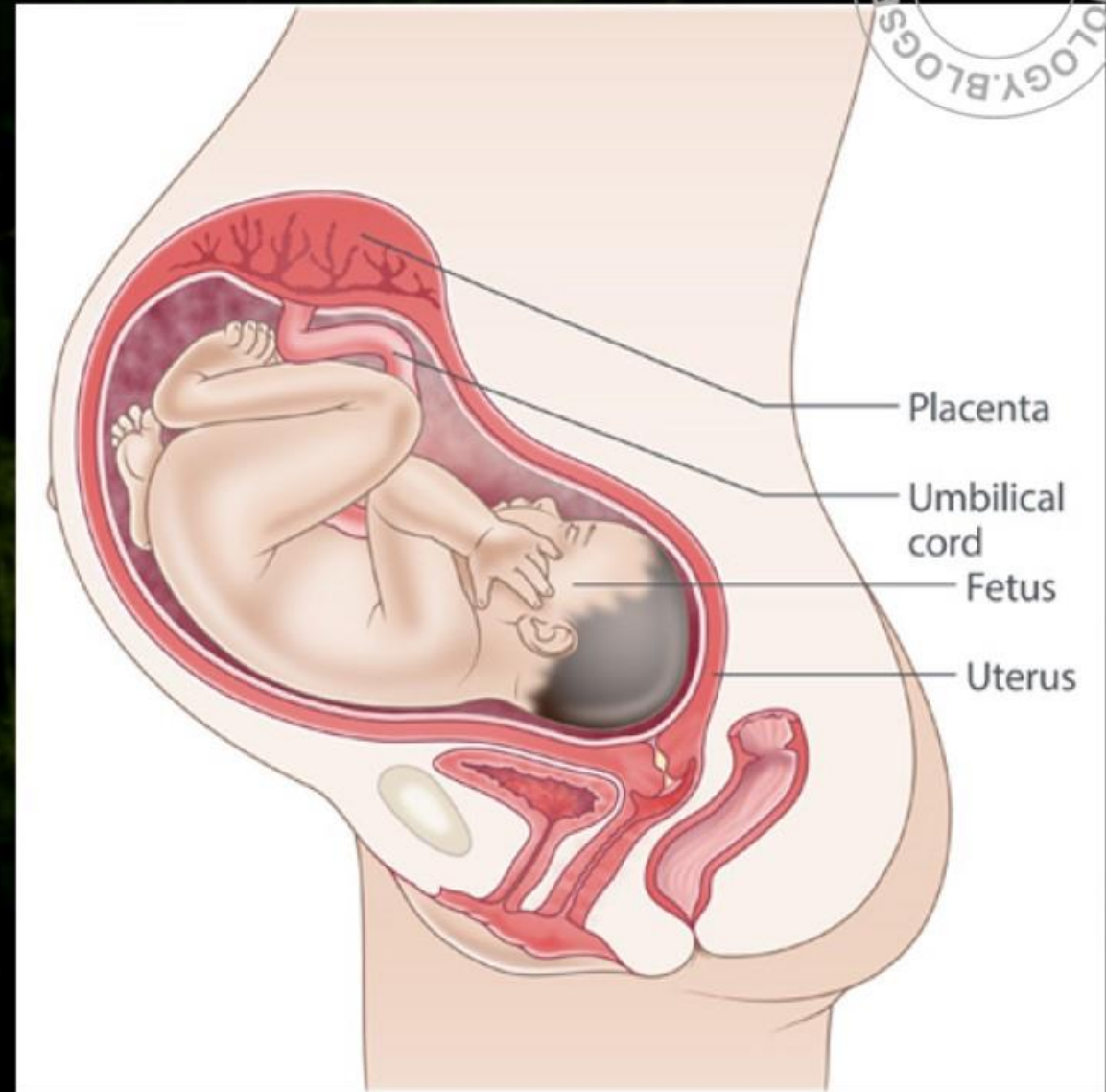
1. Acts as **barrier** between the foetus & mother.
2. Supply **O₂, nutrients** etc. from mother to foetus.
3. Remove **CO₂ & excretory wastes** from foetus.
4. Acts as an **endocrine gland**. It secretes **Human chorionic gonadotropin (hCG), human placental lactogen (hPL), oestrogens, progesterone & relaxin**.

Relaxin is also secreted by ovary.

PREGNANCY AND EMBRYONIC DEVELOPMENT



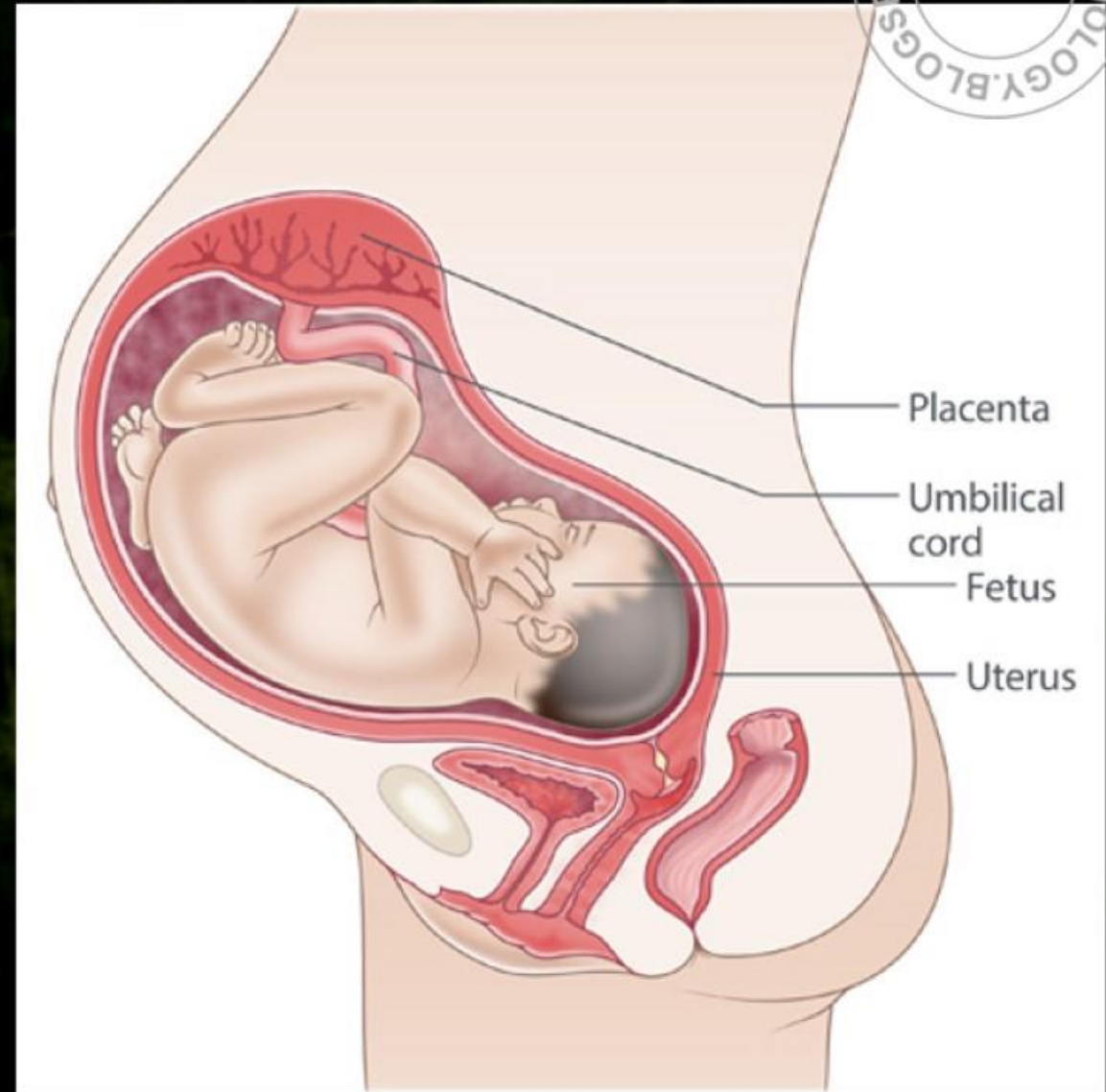
- During pregnancy, **estrogens, progestogens, cortisol, prolactin, thyroxine** etc. are also increased in maternal blood.
- They support the fetal growth, metabolic changes in the mother and maintain pregnancy.



PREGNANCY AND EMBRYONIC DEVELOPMENT



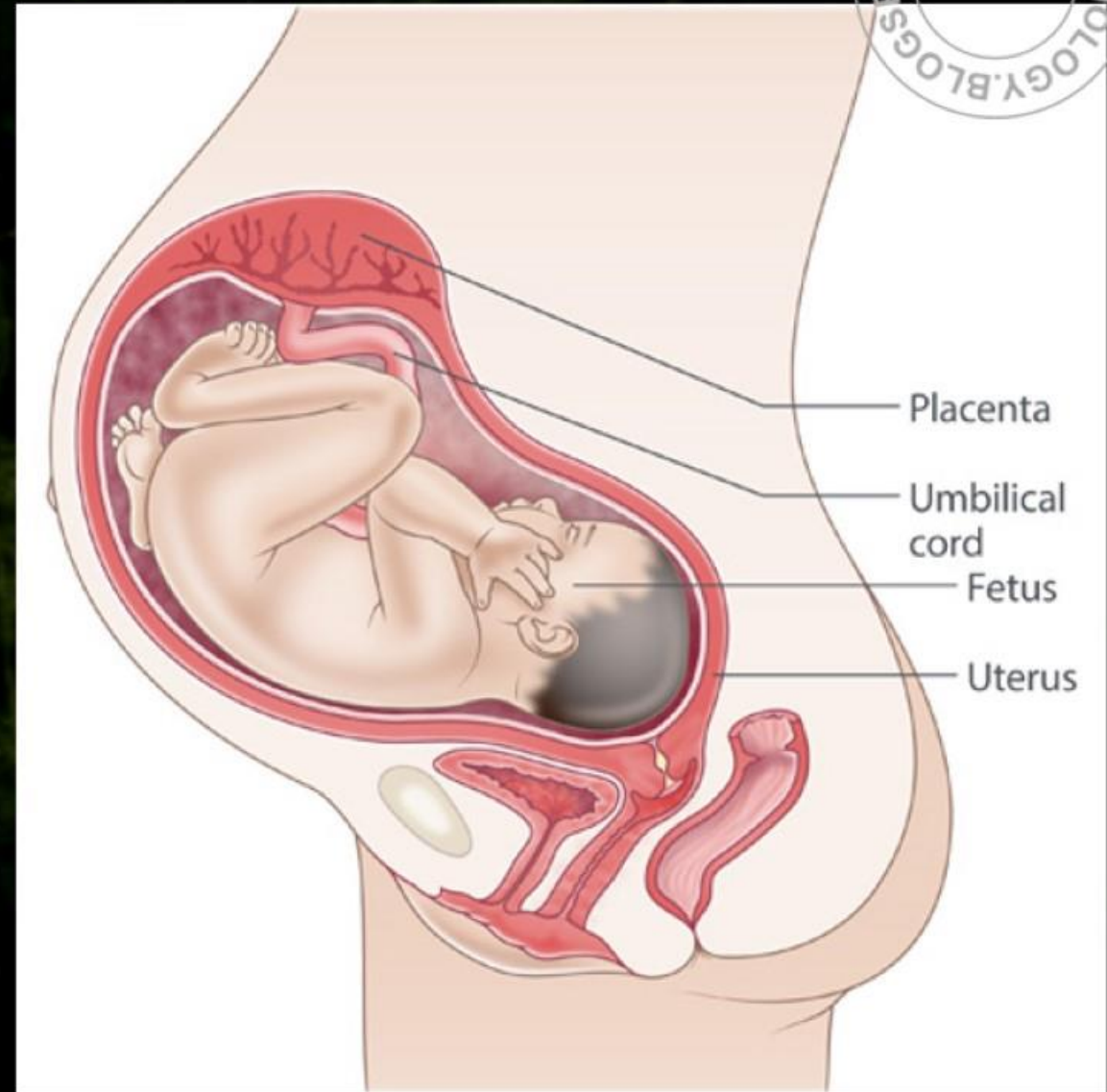
- The germ layers give rise to all tissues (organs).
- The stem cells in inner cell mass have the potency to give rise to all the tissues and organs.



PREGNANCY AND EMBRYONIC DEVELOPMENT



- Human pregnancy (**gestation period**) lasts 9 months.
- For cats: 2 months.
Dogs: 2 months.
Elephants: 21 months.



PREGNANCY AND EMBRYONIC DEVELOPMENT



Changes in embryo during pregnancy

- **After one month:** Heart is formed.
- **End of second month:** Limbs and digits are developed.
- **End of 12 weeks (first trimester):** Major organs (limbs, external genital organs etc.) are well developed.
- **During 5th month:** First movement of foetus and appearance of hair on the head.
- **End of 24 weeks (second trimester):** Body is covered with fine hair, eyelids separate and eyelashes are formed.
- **End of 9 months:** Ready for delivery.





PARTURITION & LACTATION

PARTURITION AND LACTATION



Parturition (labour)

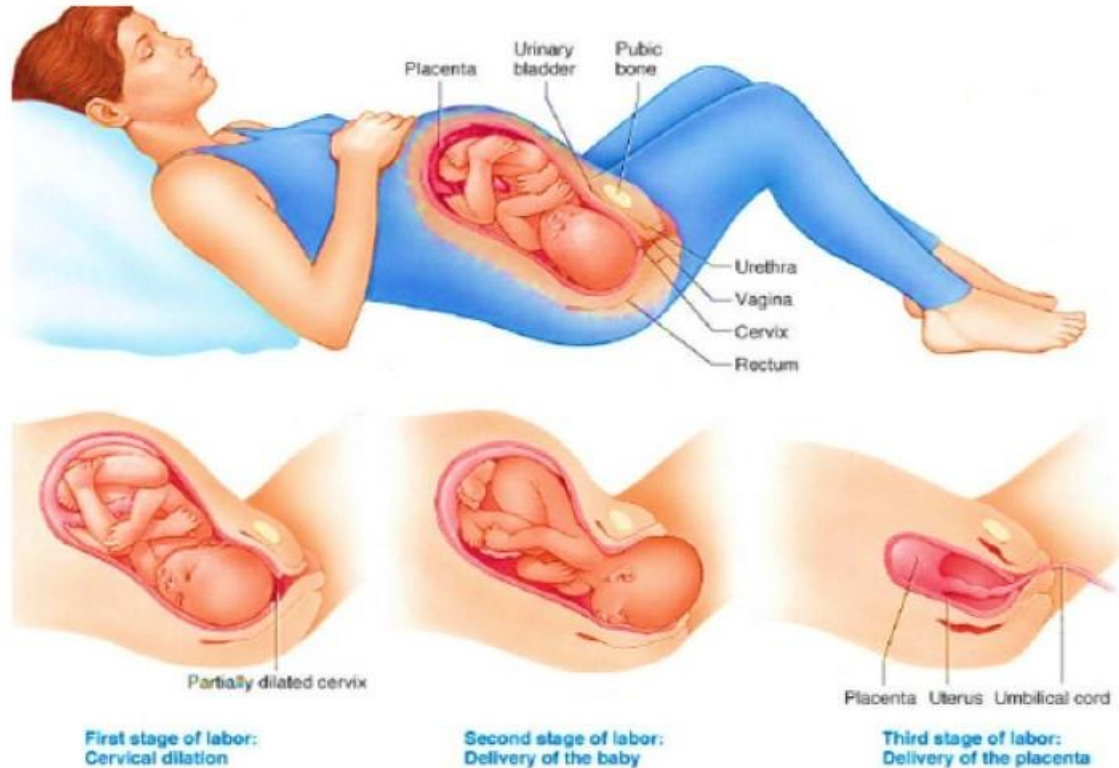
- Process of giving birth to young ones.
- It is induced by **neuroendocrine mechanism**.
- The signals from the foetus and placenta induce mild uterine contractions (**fetal ejection reflex**). This causes the release of **oxytocin** from maternal pituitary.



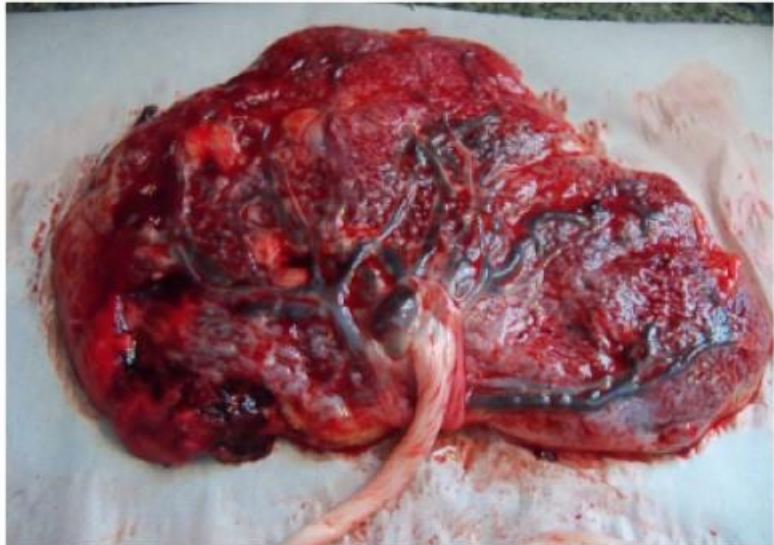
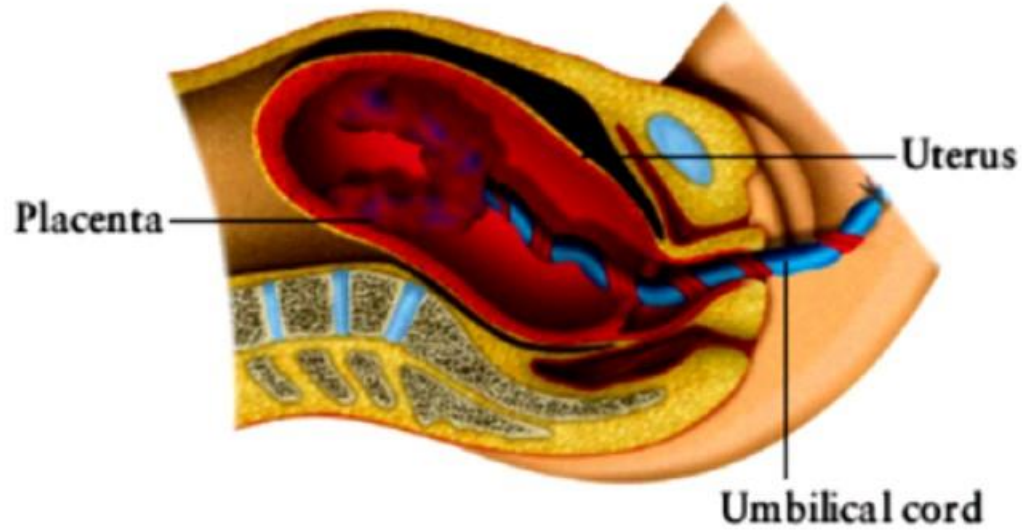
PARTURITION AND LACTATION

Parturition (labour)

- Oxytocin causes stronger uterine muscle contractions which in turn stimulate further secretion of oxytocin.
- This process is continued leading to expulsion of the baby out of the uterus through the birth canal.



PARTURITION AND LACTATION



- After parturition, the umbilical cord is cut off.
- The placenta & remnants of umbilical cord are expelled from the maternal body after parturition. It is called **"after birth"**.

PARTURITION AND LACTATION



- The mammary glands produce milk towards the end of pregnancy. It is called **lactation**.
- The yellowish milk produced during the initial few days of lactation is called **colostrum**. It contains several antibodies essential to develop resistance for the new born babies.