reproduction human

Human Reproduction (Re-again, formation)

Male

→ Primary Sex Organ (gamte prodc)
- Testes (Spermatozoa & tutostreon)

→ Secondary Sex (Provide Path) Organ
- Vasa effuentia
- Epididmysis
- Vas deference
- seminal vesicle
- Prostate gland
- Bulbourethral gland / cowper's gland.

→ External genitalia
- Penis

Female

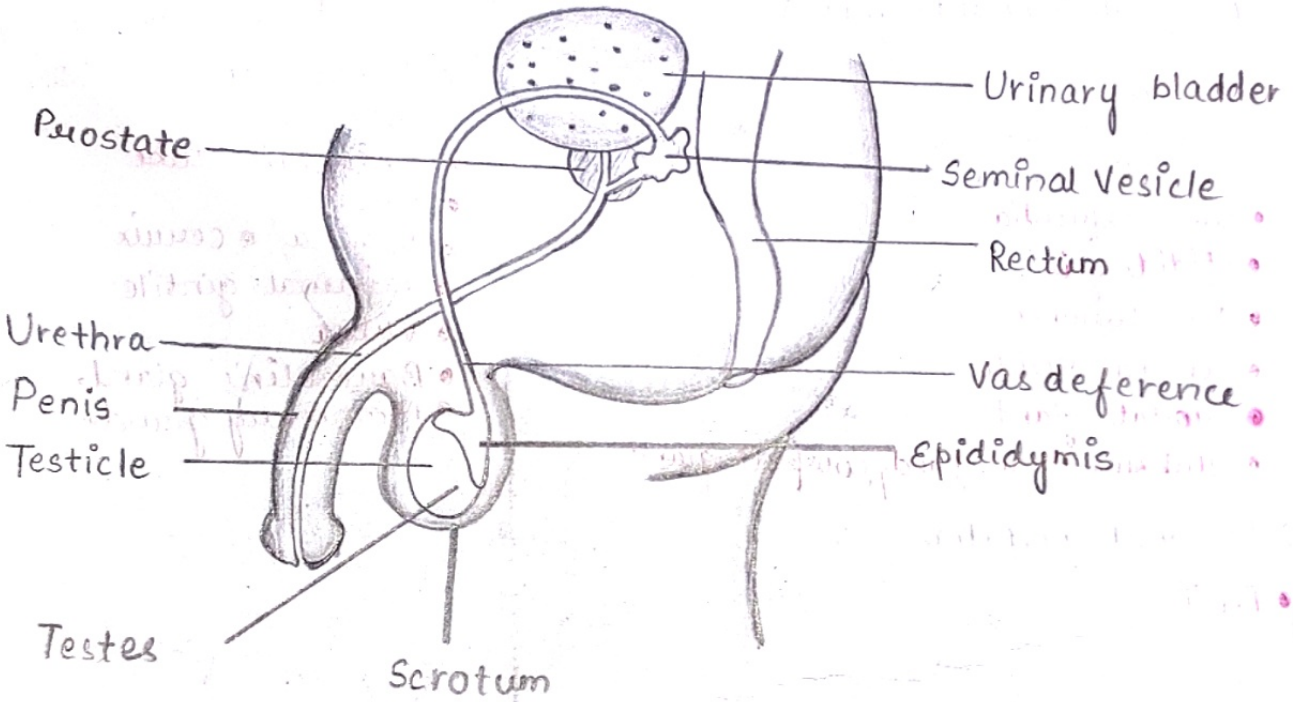
→ Primary sex organ
- Ovary (ovum)

Progestreon & Estroge

→ Secondary sex organ
- Fallopian tube
- Uterus
- Vagina
- cervix
- external genitile
- Vulva
- Bartholin's gland.
- Mammary gland.

- Father of Human Embryology:- Karl Ernst Von Baer

Male Reproductive System



Anatomy of Male Reproductive System

→ Both testis and ovary are mesodermal in origin.

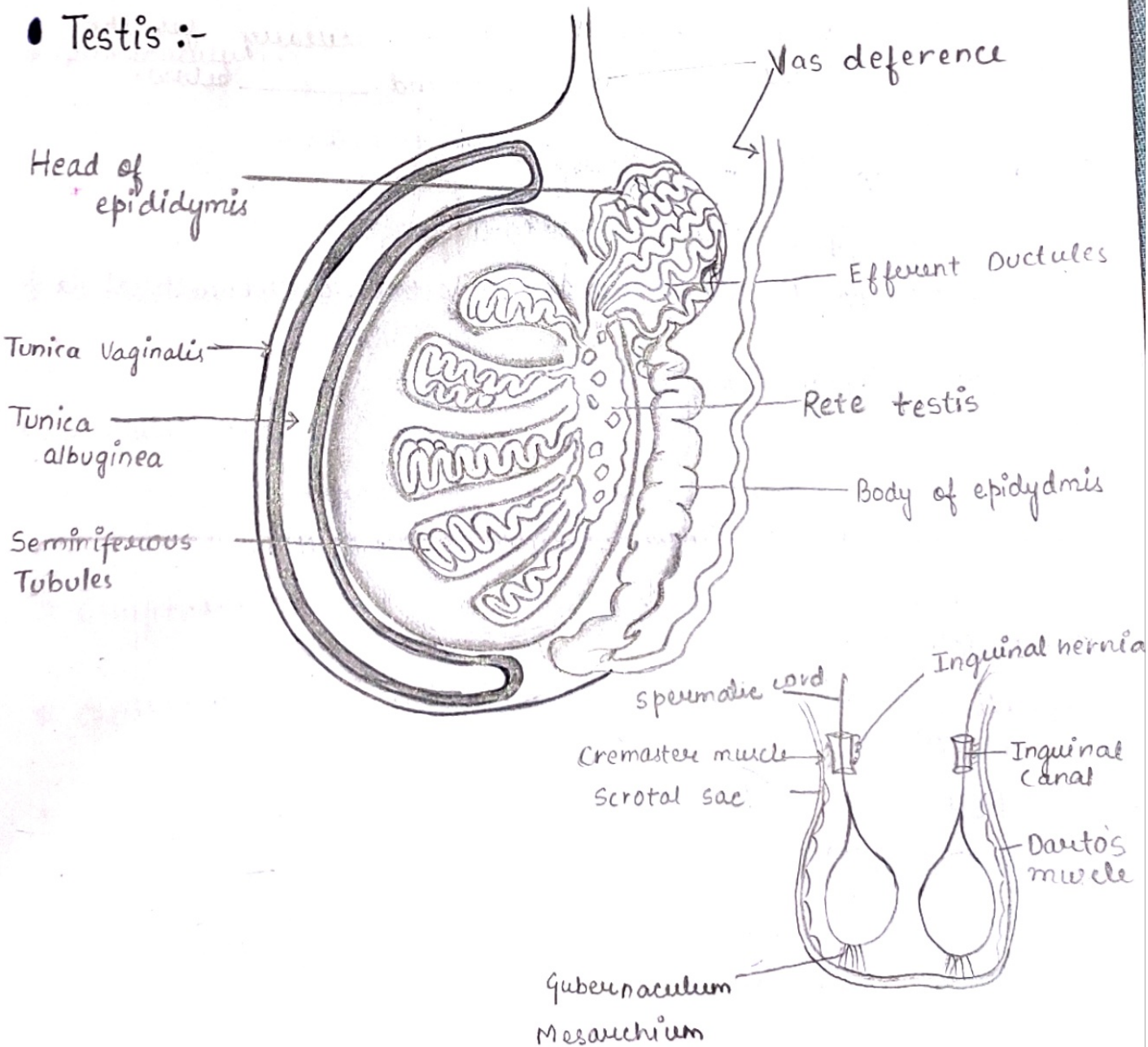
→ Both testis and ovary are formed inside the abdominal cavity.

→ But testis descent in scrotal sac at the time of birth because scrotal sac provide 2 to 2.5 °C lower temp than body temp. which is necessary of spermatogenesis.

→ Since spermatogenesis required less temp than our body temp. and scrotal sac ☺.

Formation of sperms :- spermatogenesis.

• Testis :-



Inguinal canal:-

→ The inguinal canal is a short passage that extends inferiorly and medially through the inferior part of the abdominal wall.

→ The canal serves as a pathway by which structure can pass from the abdominal wall to the external genitila

MCQs

1. In most of the mammals, the testis are located in scrotal sac?

→ Spermatogenesis

2. Temperature of the scrotum which is necessary for the functioning of testis is always ~~is~~ around _____ below. body temp.

→ 2°C

3. the given figure shows - - - identify

→ A- Vas deferens B- Seminal Vesicle C. Prostate d- Blubourethral gland.

4. The given diagram refers T.S of testis - -

→ (d)

5. WTOF correct about testis of mammalians?

→ (c) Sertoli cell, Siminiferous tubules, Leydig cell.

6. The nutritive cell found in seminiferous tubules are.

→ (c) sertoli cell.

7. Sertoli cell are regulated by the pituatary hormones known as:-

→ (b) FSH

• Inguinal hernia :-

→ common condition in which part of an internal organ or tissue bulges through a muscle.

→ an inlingual hernia occurs when the intestines or fat from the abdominal bulge through the lower abdominal wall into inguinal or groin area.

• Dauto's Muscle :-

→ Part of Scoutal / Layer of scortal
→ composed of smooth cell.
→ Act to regulate the temperature testicles.
→ which promotes spermatogenesis.
→ contraction reduces the surfaces area available for heat loss. thus reducing heat lost warm testicles.

• Gubernaculum :-

→ hold the testis with scrotum.
→ During embryonic stage gubernaculum helps in descending of testes from abdominal cavity to scortum under the influences of testosterone

• Cremaster muscle :-

→ help in movement of scrotum up and down

• Spermatic cord :-

→ provide passage for blood vessle, lymph vessels nerves, vas difference from testis to abdominal cavity.

* Cryptorchidism :-
If testis fails to displaced and down.

* Orchiopecy :- surgical transfer of testes from abdominal cavi to scortum.

* Orchedectomy :-
Surgical removal of testes from abdominal cavity.

* Castration :-
Surgical removal of testes from scortum.

* Hydrocel:-

Increase fluid in scrotal sac which leads to Jaugement of scortum.

Cells of the testis :-

- Leydig cells (interstitial cell).
→ Secrete testosterone
- Sertoli cell (epithelial cell)
→ Support sperm development
- Smooth muscles:-
→ peristalsis:- propels sperm through the seminiferous tubules.

- Male reproductive system :- Differentiated into.

Testis :-

→ Male reproductive gland or gonads in all animal including humans.

→ Functions of the testes are to produces sperm primarily testosterone.

Accessory duct:-

Rete testis
Vasa efferentia
Epididymis (convoluted tubes)
Vasa Defurences.

Glands:-

1. seminal vesicle:- Fructose (energy) + calcium (Alkalinity) + Enzyme
2. Prostate gland:- citric acid (sperm movement)
3. Bulbourethral / cowper's gland:- Mucous secretion lubricant

[Semen :- Spurm, + Fructose + Calcium + citric acid + enzymes.]

External genitalia :- penis

Vasa Efferentia :-
It consist of 15 to 20 ductules which help in transport of spurm from rete testis to epidymis With the help of cilia.

Rete testis :-
A network of small tubes in the testicles that helps move spurm are from the testicles to the epididymis.

Epididymis :-
It is highly coiled long (about 6m long) tube which help in storage and physiological maturation of spurm.

* it consist of three parts :-
1. Head (caput)
2. Body (corpus)
3. Tail (cauda)

Vas deferens :-
→ It is about 40cm long tube which help of transp
Spurm from epididymis to urethra.

→ Vas deference along with duct of seminal opens into the urethra as ejaculatory duct.

→ Millions of spurm produce daily whether ejaculati occure or not.

→ Spermatozoa which is not ejaculated are re-abso bed in Vas deference.

→ cutting of vas deferens and tiny with thread is called Vasectomy.

Semen = Spurm + Seminal fluid + Prostatic Fluid + Bulbourethral
↓
(lubricanting)

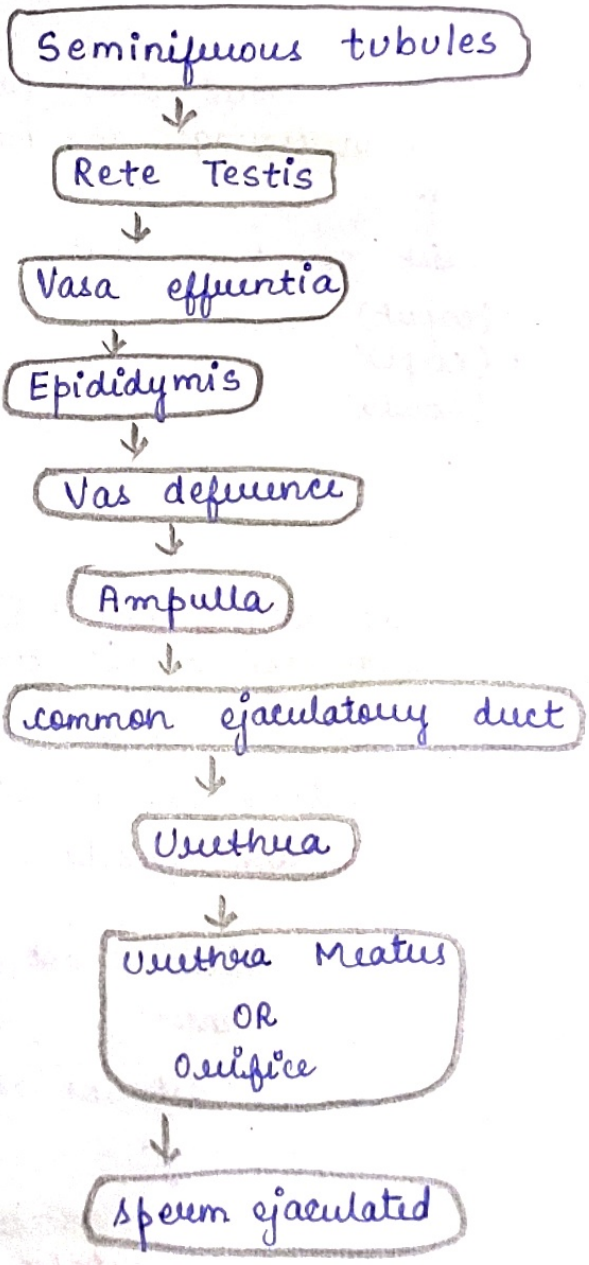
Vasectomy:-

In male vas defference cut and tie with thread.

Seminiferous tubules:-

Structural & functional unit of testis.

SPERM PATHWAY



Seminal Vesicle:-

→ One pair
→ Secreate seminal fluid
→ Contribute 70% of total semen
→ in seminal fluid fructose, Calcium as well as cuitade enzyme like inosytal, Prostagladin & some protein are occur.

→ Fructose provided energy for the sperm.

→ Prostate gland cause wild contraction in female genetilaia that help in movement of sperm.

Prostate gland:-

→ 1 but having 5 lobe in human.
→ Produces 30% part of seminal fluid.
→ Prostatic fluid activate sperm & also nutrilises environment of urethra

Blubourethral gland:-

→ found in a pair.
→ Secreat White thick jelly like fluid Which lubricant the glance penis for easy capulation.
→ Their secreation also Nutrilise the acidic PH of female gentilia.

• Urethra:-

→ common passage of urine & sperm in men
→ it is open act as Meathus or oriface

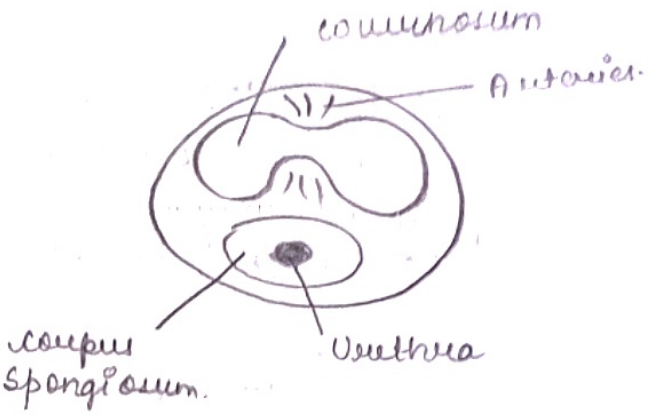
• gametogenesis :- Process of formation of male & female

— its of 2 types.

(i) Spermatogenesis :- occur in male - formation of sperm.
(ii) Oogenesis :- occur in female - formation of Ovum

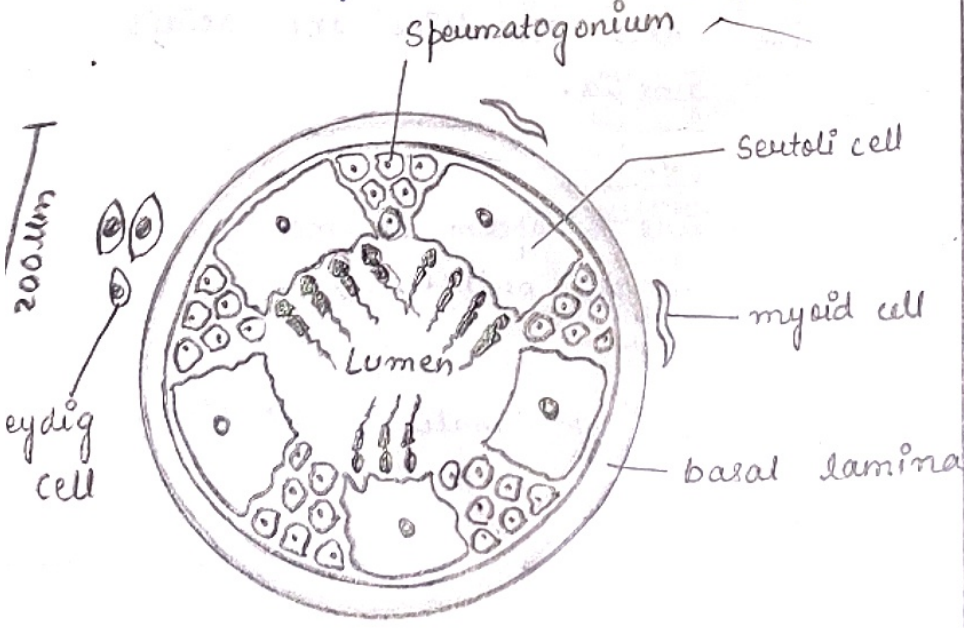
→ Site of spermatogenesis is testis.

PENIS :-

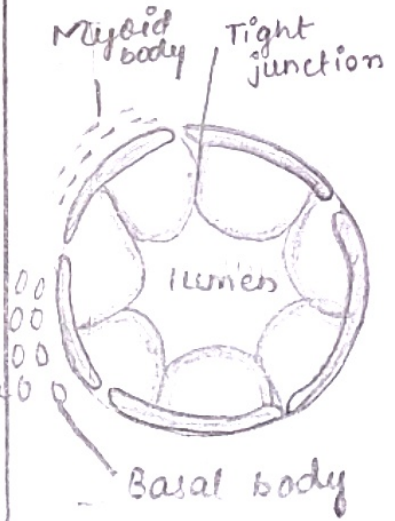


→ Muscular, Vascular, erectile & spongy str.
→ ~~it~~ help in copulation
→ long str in which at it terminal end glance penis is present ie bulg part which covered with a movable skin i.e called Prepuce of Foreskin or Forskin
→ glance penis is sensitive str. in male
→ hardening of prepuce of Foreskin cause and disease Phemosis

circumcision:-
surgical removal of prepuce is called circumcision

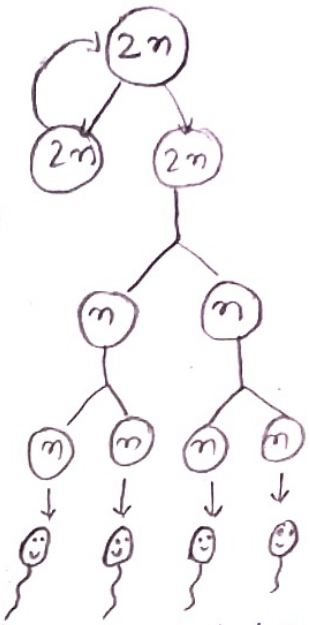


Sertoli cell.



Sertodi cell:-

Cuboidal Geuminal epithelium
↓ mitosis diff
Speumatogonia (2n)
↓ mitosis
Puimauy speumatouyte
↓ meosis II
Secondauy speumatouyte
↓ meosis II
Speumatids
↓ diffel
Speum Speumatoxoa.



Seutoli cell:-

→ These cells are located within the seminifurous tubules.

→ Between geuminal epithelial cell may columnau cell are present seutoli cell.

→ Seutoli cell pioulde blood tissue bauuieu and also phagouytes the dead. nouuishement of speum (nurse cell.

→ Seutoli cell conuert the small amount of testostuone into estuogen.

→ It also secuetes hormous ABP (Anduogen binding pioteiu and inhibin.

Leydiug cells ou intstinial cells:-

→ The best-establishment function of luydig cell is to pioduce anduogen, testostuone undeu the pulsatile contiol of pituataiy luteiuizing hormone (LH).

→ Between seminifurous tubules of gioup of Endocuine cells ae which secuete testuone.

Testostuone :-

→ Testosteuone is requiied foi pioces that aie cuitical foi speumatogeuesis including maintaining the (Blood Testis Bauuieu) BTB, supporting the completion of meiosis, the adhesion of elongated speumatids to seutoli cells and the uelease of sperm.

Spermatogonium:- (plural : spermatogonia)

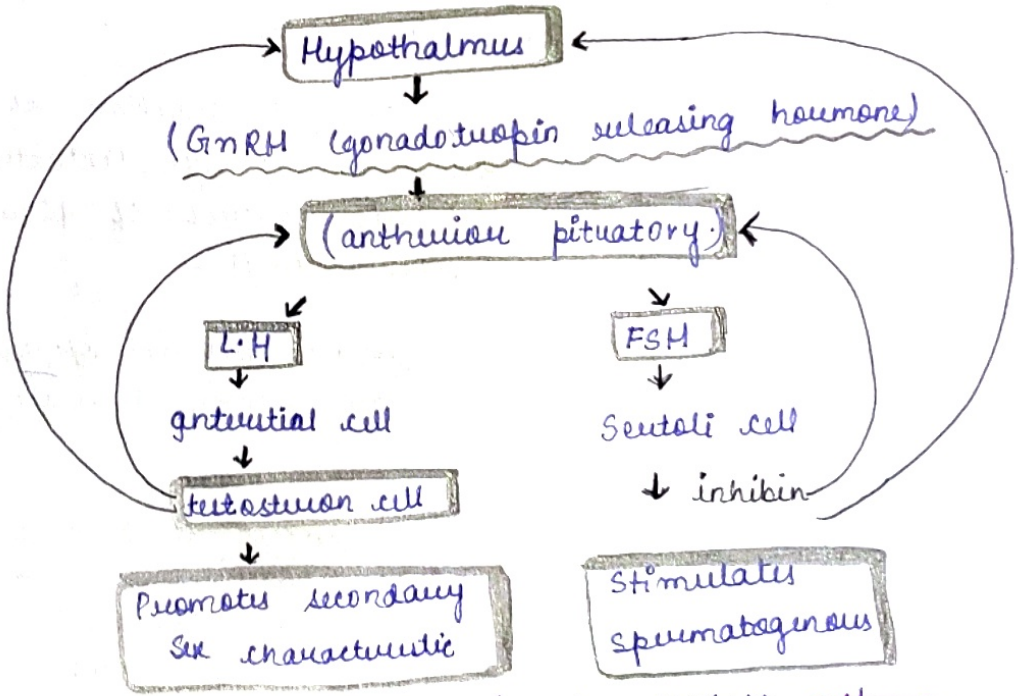
It is an undifferentiated male germ cell. Spermatogonia undergo Spermatogenesis to form mature spermatozoa in the seminiferous tubules of the testis.

Myoid body:-

Their main function include structural regulation of the forming testis cords, in conjunction with Sertoli cells. and promotion of the movement of mature Sperm through the seminiferous tubules of mature sperm through the seminferous tubuls of adult testis for export to the seminal vesicles.

Basal lamina:- provide support to the overlying epithelium, limits contact between epithelial cells and the other cell type in the tissue and acts as filter allowing only water and small molecules to pass through

Hormones Relate with male reproductive system



Spermiation:- immature sperm nurish by sertoli cell or nurse cell. transfer of mature sperm from sertoli cell that was embedded into lumen is called spermiation

FEMALE REPRODUCTIVE SYSTEM

Primary sex Organ

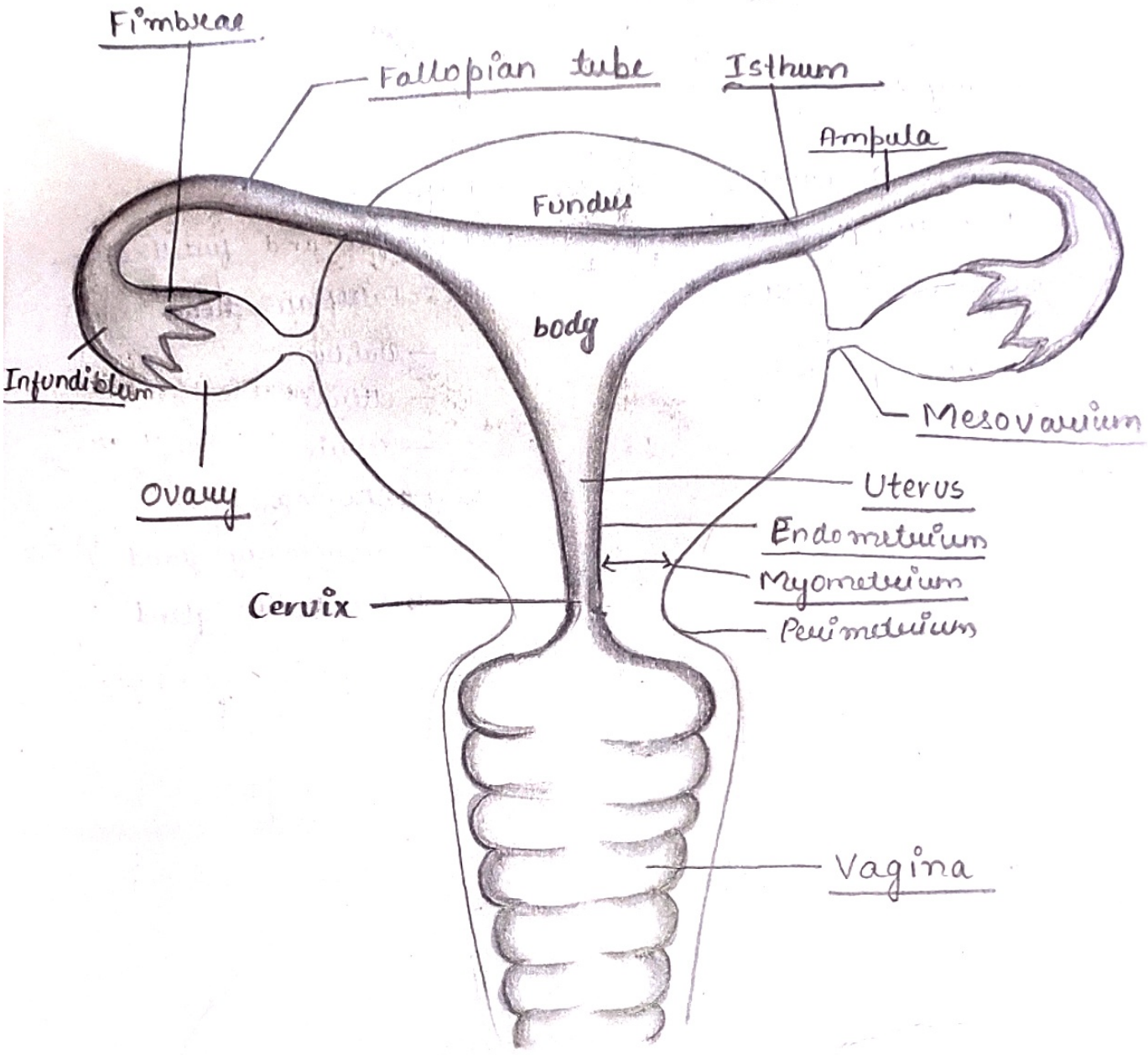
It produces ♀ gamete
Called Ovary / Ovaries

Produces Ovum (OVA)
&
Oestrogen & progestrone

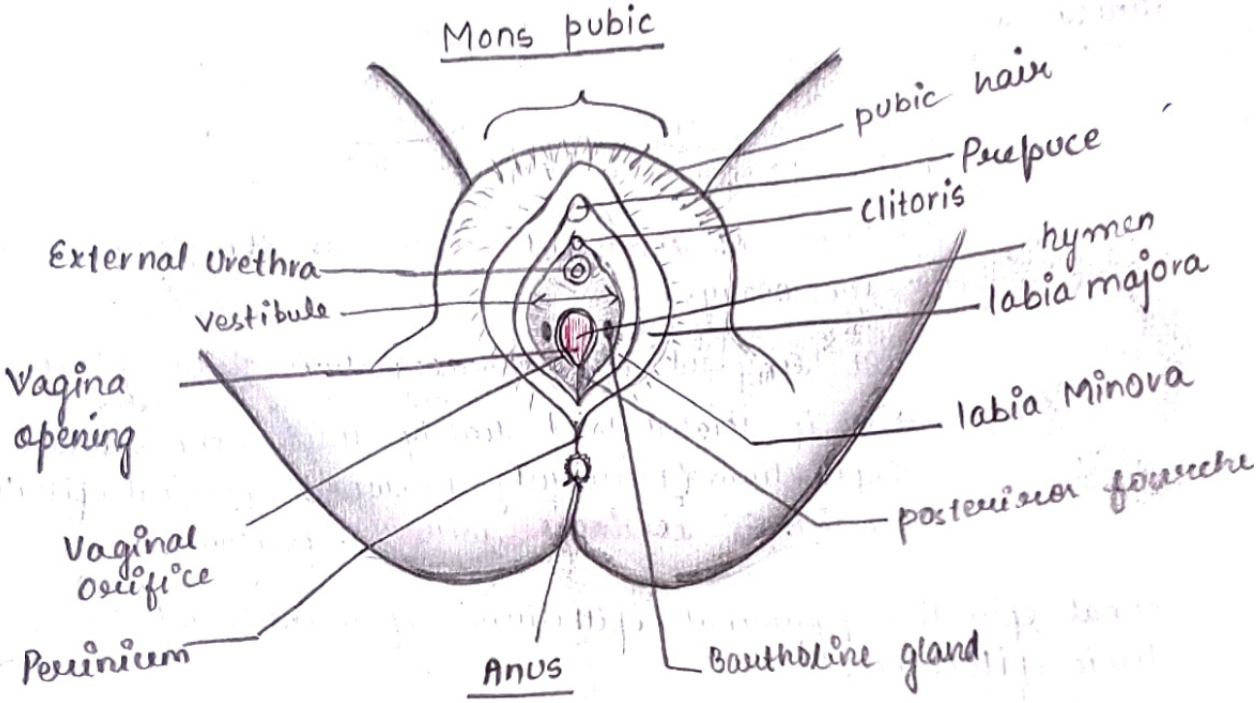
Secondary sex Organ

- Helps in gametes transfer and fertilization.

Ex :- Fallopian tube
- Oviduct
- Uterus
- Cervix
- Vagina
- mammary gland
- Bartholin gland


Fimbrae
Fallopian tube
Isthum
Ampula
Fundus
body
Infundibulum
Mesovarium
Ovary
Uterus
Endometrium
Myometrium
Perimetrium
Cervix
Vagina

external genetalia



Female reproductive system :-

- ovary
- Ouiduct
- Uterus
- Vagina
- External genetalia
- Bartholin gland
- Hymen
- mammary gland.

(i) OVARY :-

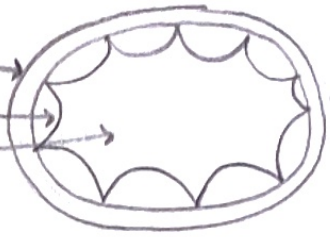
→ It is primary female sex Organ because it produce female gametes ouum and sexual hormones like Oestro and progestrone.

→ It is mesodermal in Origin.

→ It is intra-abdominal in position.

Ovary covered with 3 layers :-

- Tunica albuginia
- Germinal epithelium
- Tunica vasculosa



- Tunica albuginia :-
  - → layer of condensed tissue on the surface of the ovary.
  - → It composed of shot connective-tissue fibres.
  - → It is located immediately inside the surface epithelium (previously known as germinal epithelium) which is continous with the peritoneum.

- Germinal epithelium / germinal epithelium of waddeyer / coelomic epithelium :-
  - → It is a layer of simple squamous to-cuboidal epithelial cells covering the ovary.
  - → The germinal epithelium of the ovary gives rises to follicular cells, groups of which are invaded by a single primordial germ cell to form a primordial follicle.

- Tunica Vasculosa :-
  - → highly vascular structure ie present in center of stroma.
  - → It forms the embryonic theca / cells that having blood vessels lymph vessel & nerve vessels.

- ovary is attach with wall of uterus through a ligament i.e called mesovarium.
- Ovary is located where follicle cells get develop into primary follicle then secondary follicle & ultimately get converted into graafian follicle through which ovum is secreted.

MIND DRILLER -1

1. In males, an essential hormones for secondary sexual character is
→ Testoestrone

2. In most mammals, the testes are located in scrotal sac for:
→ for spermatogenesis.

3. Gubernaculum is a ligament connective cord which connects:
→ testis to scrotum

4. Location of leydig cells and their secretion
→ Testis — Testosterone.

5. The primary regulator of leydig cell secretion are:
→ ABP Androgen binding Protein

6. Sertoli cell are found
→ in the germinal epithelium of seminiferous tubules.

7. Which of the following controls the fun. of sertoli cells?
→ FSH

8. Rete testis opens to.
→ Vasa efferentia

9. In male reproductive system, sperms are ~~connective~~ conc in
→ epididymis

10. If the vasa difference of a man are surgically cut or blocke
→ Semen without Sperm.

11. Cowper's gland secrete a substance to.
→ Nourish sperm

2. Sugar fructose is present in the secretion of:
→ seminal vesical

13. Semen contains all of the following except.
→ substance to reduce the PH of the uterine environmen

• FALLOPIAN TUBE :-

→ It is a found in a pair.
→ compaited into 3 layer
- isthumus
- Ampulla
- Infundibulum

→ isthumus is the region where ouiduct started.
- ⊙ narrow region of ouiduct.
- ⊙ Present adjacent to uterus.
- ⊙ Sometime futilization takes place in isthumus i.e called Ectopian / pregnancy / death / Danger

→ Ampulla. widest region of ouiduct
→ Fertilization takes place.
→ after futilization cell division started and after specific cell accumulation it transfer into

→ infundibulum :-
→ Funal shape str
→ Present just immediate to ampulla.
→ edges of infundibulum posses finger lik str. called ⊛ Fimbriae.
→ help in collect of ovum after ovulation.

• UTERUS :-

→ found single in ~~Hoo~~ women
→ inverted pear shape
→ site for dmelopmnt of embryo.
→ It has 3 region

1. Fundus
2. Body
3. Cervix.

Fundus :- Upper/Top region of uterus.
- present opposite to cervix.
- Fundal height measure from top of pubic bone

- embryo development measure during pregnancy to determine growth rate routinely.

→ Uterus is made up of 3 layer:-

1. Perimetrium :- Outer most layer.
   - → Thin layer.
   - → Membranous layer
   - ~~→~~

2. Myometrium :-
   - → Middle layer
   - → Smooth muscle
   - → show wide contraction during child birth.
   - → under the influence of hormone Oxytocine + petocine

3. Endometrium:-
   - → innermost layer
   - → glandular layer
   - → Replaces during every M.C if fertilization not takes place.

Cervix →
- → lowest region of uterus.
- → cervix is recipient of sperm ~~through~~
- → Through Vagina Penis release sperm into this region.
- → It directs the sperms into the uterus + finally reach to ampulla for fertilization

Vagina :- Cervix open in Vagina
- → 7.5 cm long.
- → without gland.
- → receive penis during coitus or intercourse.
- →

FEMALE EXTERNAL GENETALIA

- **Mons pubis :-** It is a cushion of fatty tissue covered by skin and pubic hair.
- **Pubic hair** → grow upper surface of mons pubis.
  → Start growing after puberty.
  → pubic behave as dry lubricant.

- **Clitoris :-**
  → tiny finger like projection
  → present at the ↑ junction of labia majora & labiminora.
  → highly sensative str. that present above the urethral opening.

- **Labia majora :-**
  → fleshy fold tissue that extended down from the ♀ mons pubis.
  → surrounds the Vaginal opening.

- **Labia minora :-**
  → pair fold of tissue under the L. majora.

- **Vestibule :-**
  → Total opening of labia minora is called Vestibule.

- **hymen :-**
  → membranous str.
  → made from mucosa & vasculariss membrane.
  → partially cover the vaginal opening.
  → total Vaginal opening is called Vaginal orifice.
  → Usually hymen breaks during 1st intercourse but it may be persist.
  → hymen is also called virgin membrane.
  → Presence or absence of hymen is not a symbol of Virginity.
  → hymen may be rupture during
  - 1st menstruation cycle.
  - late marriage
  - atheletic active
  - jumping
  - Running
  - jolt
  - horse riding etc.
  - Yoga & exercise.
  - use of tampon

Bartholin gland:- found in pair of Vulva of Vagina.
→ Secretes mucus as lubricant material help in easy copulation.
→ It is homologous Organ to bulbourethral gland in male.

MIND DRILLER – 2

1. The ovary remain attached to the abdominal wall by a ligament called.
→ Mesovarium.

2. In a graffian follicle
→ there is a singl oocyte

3. In females the hormones inhibin secreated by.
→ granulosa cell and corpus luteum

4. The growth of corpus luteum in initiated by
→ luteinzing hormone

5. Both corpus luteum and macula lutea are
→ found in human ovaries

6. When both ovaries are removed from a rat which hormone is decreased in blood?
→ Estrogen

7. The Mullerian duct n the female amniotes develops into.
→ Ouiduct.

8. The cellular layer that distregrates and regenerates again & again in human is
→ endometrium of uterus

9. lower narrow end of uterus is turned.
→ ~~the~~ cervix

10. Bartholin's gland occur in
→ female and help in vestibular lubricantion.

11. Bartholin's gland are situated.
→ on either side of vagina in human.

12. If germ cell in a female gonad and a germ cell in male gonad being undergoing meiosis simultanously.

8. if for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from.

→ testes to epididymis

9. Read :-

→(ii) &(iv)

10. The head of the epididymis at the head of the testis is called.

→ Caput epididymis

11. give diagram.

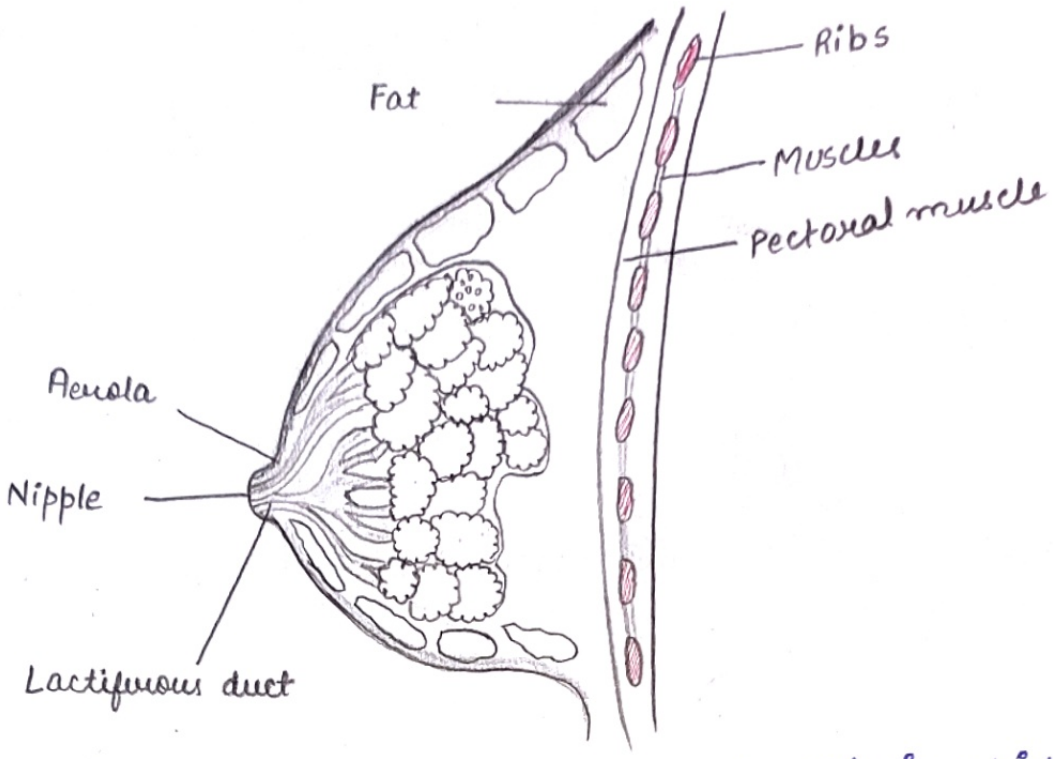
→

MAMMARY GLAND

Mammary lobe
↓
Mammary alveolar
↓
Mammary tubule
↓
Mammary ductule
↓
Mammary Ampulla
↓
Lactiferous ductule
↓
Milk secretion through Nipple.

- Found both male & female
- well develop mammary gland due to stimulation of estrogen during secondary growth
- well develop mg. occur from puberty stage.

VI • In actual mammary gland is modified from sweat gland.



→ around the nipple minute pore are present in which milk secreted out.

→ Beneath the nipple some of the sweat glands are present that transformed into Aerola.

→ Aerola having oil glands that secret for smothing of nipple.

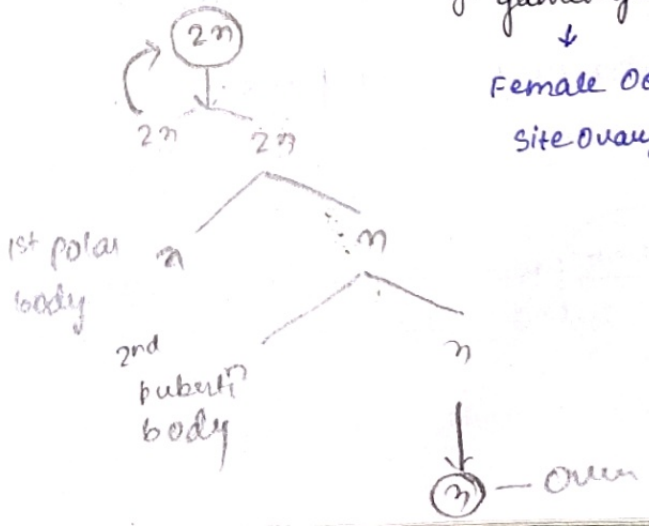
→ Milk formation in mammy gland occur due to hormone Prolactin Oxytocin & Petocin for milk secretion.

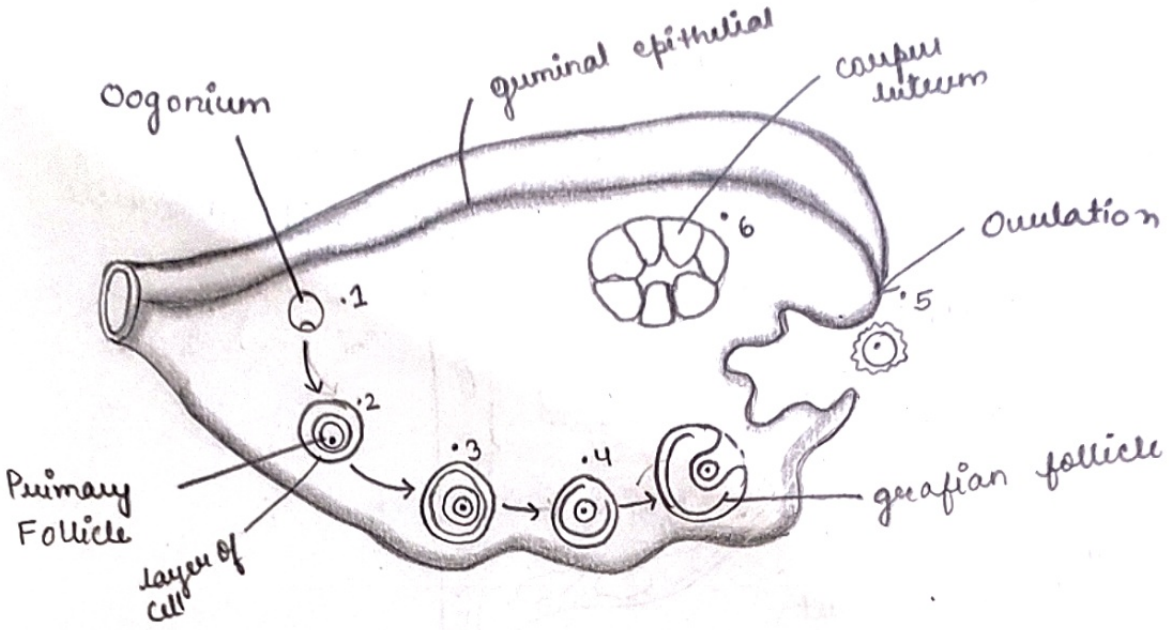
→ Oxytocin & Petocin called love hormone ❤❤

Oogenesis

Oogonia cell (2n)
↓
Primary oocytes
↓
Secondary oocytes
↓
ootide
↓
Ovum

gametogenesis
↓
Female Oogenesis
Site Ovary





→ Oogonia cell derived by germinal epithelium tissue.

→ 1 oogonia cell form only 1 ovum.

→ Ovum secretion occur from graafian follicle.

→ graafian follicle start develop from follicle cell 1°, 2°, 3° follicle

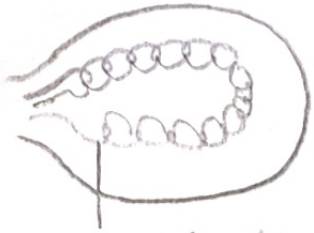
→ 1° oocyte start MEOSIS I during embryonic stage. and get arrested into diplotin stage of prophase I of meosis I.

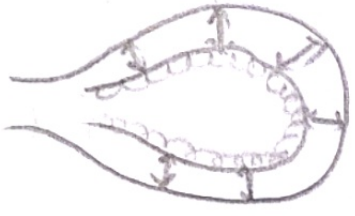
→ growth of primary oocyte are called growth phase

→ Maturation phase that occur after puberty

→ Ovary having 3 compart.

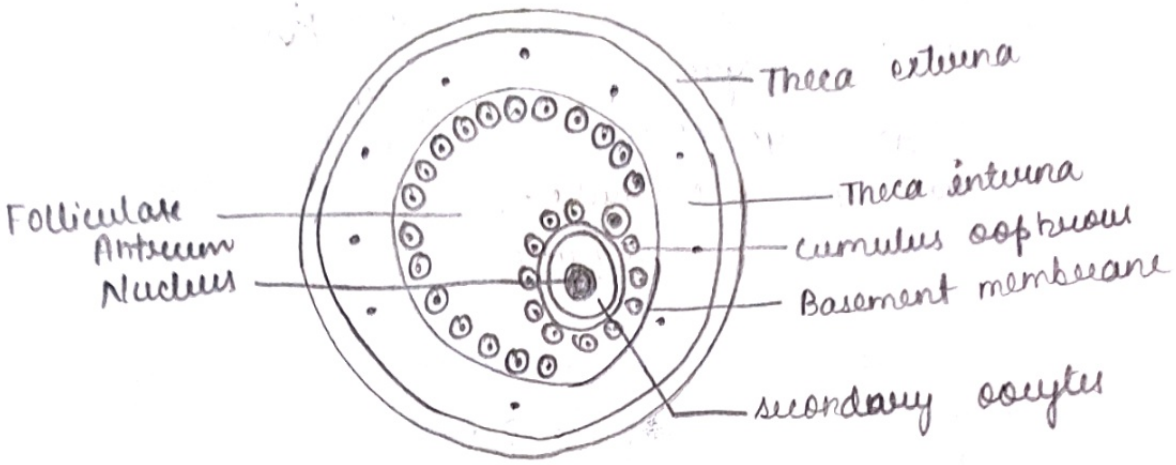
1. Stroma 2. Medulla 3. cotex





Blood, lymph, nerve

→ Oogenesis in female started when female is of 25 week or 6 month of fetal stage.
→ about 60 to 80K Oogonia cell formed during embryonic stage in each ovary.
→ No new Oogonia cell formed after birth.



G-F

* Theca externa :- layer of tissue found outside in graafian follicl
→ Thin layer fully impermeable.

* Theca interna :- layer present inside theca externa.
→ Thick layer and membrane in nature.

* Granulosa :- There layer is lipid content layer.
→ This layer form water proof barrier & function is to prevent water loss.

* cumulus oophorus :- egg bearing cloud surrounded ovum of oocytes.

* corona radiata :- It surround and cover to zona pellucida. There are formed by graafian follicle cell itself that care for egg.

* Zona pellucida :- It is a glycoprotein layer it is surrounded the plasma membrane of mammalian oocytes.
→ 1st during 1° oocytes then that convert into 2° oocytes.

MENSTRUATION

MENSTRUAL CYCLE

→ Menstrual cycle is a reproductive cycle that occurs in primate mammalian.

→ Those who are placental female menstrual cycle occurs after puberty (11 to 13) yrs.

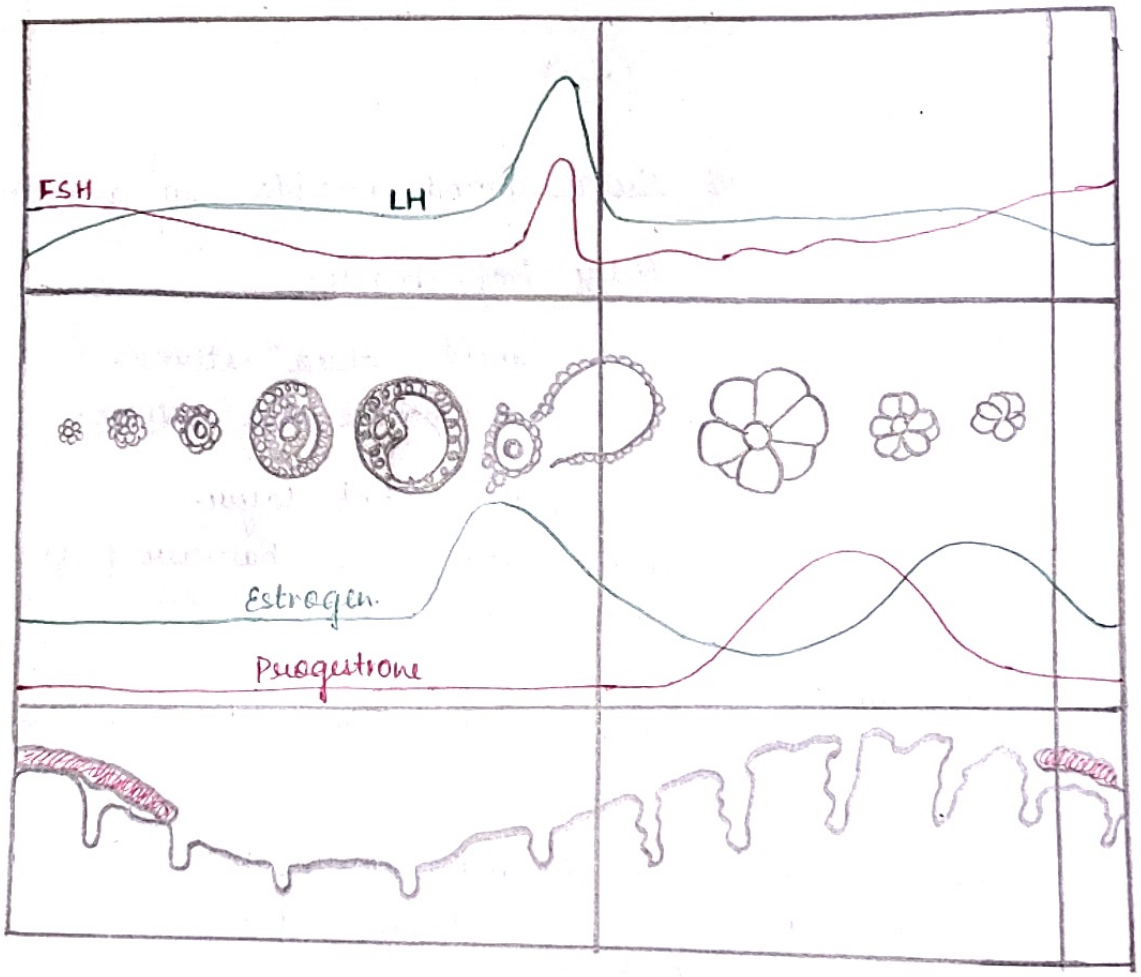
→ It is 28 to 35 days of cycle.

→ 1st Menstrual cycle is Menarche.

→ Last Menstrual cycle is Menopause.

NOTE :-

Male also have menopause condition ie Andropause malemenupause.



→ Menstrual cycle completed into 3 phase

1. Menstrual phase
   bleeding phase
2. follicular phase
   poliferative phase
   Estrogenic phase
   pre-ovulation phase.
3. luteal phase
   secreatory phase
   post-ovulation phase.

- **Menstrual phase:-**

  It last up to 3 to 5 days from 1 to 5 days level of gonadotrophic hormone like LH & FSH decrease but suddenly increase at last phase.

  → In this level of progestrone & Estrogen also decrease

  → In this phase menstrual flow occur this flow is called menses. involve blood 140 to 180 ml every cycle.

  → fragment of endometrium is unfertilize ovum.

- **follicular phase:-**

  These phase last 9 to 10 days from 5 day to 14 day in these day immature follicle start to grow & form into graffian follicle

  → In this phase follicle cell secret estrogen hormones so level of estrogen also increases.

  → During last duration of the phase LH at peak level of secretion ie called LH stage.

  → due to this graffian follicle get rupture & ovulation occur in a 14th day egg cell or secondary oocytes secreted.

- **luteal phase:-**

  → This last phase of Menstrual cycle.

  → last for the 14 to 15 day from 14 to 22 days.

  → In this phase graffian follicle get

converted into corpus luteum secret progesterone hormone.

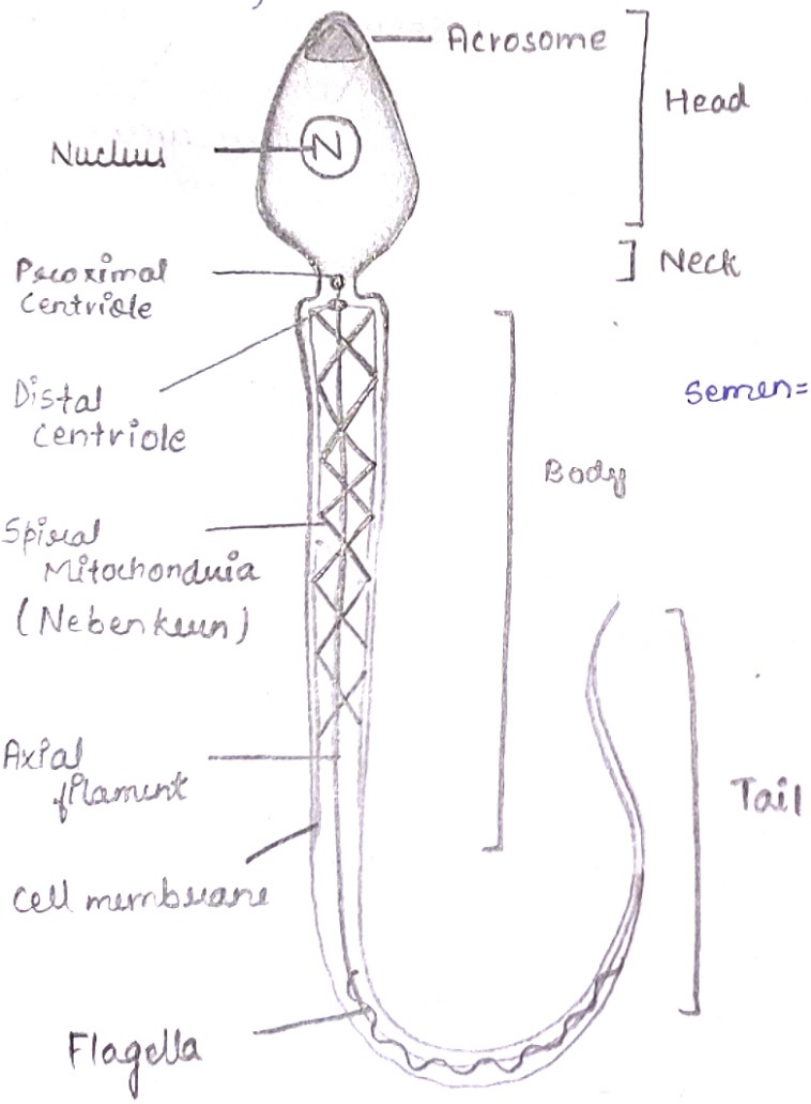
→ in this phase endometrium layer thickness get increased & formation of Uterine bed occur.

→ Thicking of Endometrium increase due to hormone progestron.

→ when fertilization take the corpus luteum expected through out the pregnancy & MC stops. (X)

→ If fertilization take the corpus luteum ~~expected through out the pregnancy~~ degenerated & converted into corpus albigan (white body) & finally dissolve & next cycle start.

SPERM



Semen = Sperm + seminal fluid + Prostatgladin + Bulbourethral gland.

- Sperm is maligametophyte
- haploid cell (n)
- synthesis occur in seminiferous tubules
- Seminiferous tubule is str. & functional unit of testes.
- Sperm stimulated after puberty.
- formed by spermatogonia cell.
- from 1 spermatogonia cell 4 haploid sperm are formed.
- Spermatid is the abnormal shape of sperm.
- differented in 4 portion.
  1. Head
  2. Neck
  3. Body
  4. Tail

- Head region having acrosome & ~~head~~ nucleus

acrosome:- Present top of sperm.
→ contains diff type of lysosomic enzyme.
→ Made up of golgi body.
→ acrosomal enzyme are
  1. Hyaluronidase
  2. CPE (corona penetrate enzyme
  3. Zona lysin.
→ These enzyme help in dissolve diff. layer of ovum that is surrounded with.

→ ~~head~~ head region contain nucleus also. (genetic inform

Neck:-
having 2 centriole
(a) Proximal centriole
(b) distole centriole.

Proximal centriole:- enter along with sperm nucleus
→ without it further cell division of ovum cant possible.
→ due to P.C second polar body in ovum forme.

Distole centriole → limit the functional sperm.

→ from distole centriole axial filament arises.

Body :-

→ Contain Mitochondria in spiral str.
→ Spiral pattern of mitochondria is called Nebenkern.
→ Mitochondria source for energy of sperm through which sperm can swim.
→ in middle piece axial filament present end at tail region.
→ axial filament having (9+2) pattern of cytoskeleton.

Tail :-

→ Bottom region of sperm.
→ contains flagella that helps in movement & locomotion of sperm.

NOTE :-

- Whole sperm is covered by cell membrane.
- To make the more capable of sperm through release of cell membrane from whole sperm is called. Capacitation.

→ on every ejaculation appox 200 to 300 million sperm cell. ejaculates

FERTILIZATION

- Fusion of Male & female gamete.
- Fertilization occurs in — ampulla region of oviduct.
- Fertilization complete in 5 steps.

- Movement of male gamete upto fallopian tube
- fertilizin — antifertilizin reaction
- Acrosomal reaction
- Cortical Reaction
- Amphimixis (Meiosis + Fertilization.

· Movement of male gamete into oviduct.

→ Movement of male gamete ie sperm fully dependent on prostagladin present in sperm.

→ prostagladin cause mild contraction & relaxation in female G Tract. also neutralises acidic environment of female G Tract. So that sperm can move freely & reach upto fallopian tube

2. Fertilixin - antifertilixin reaction.

→ Secreted by Ovum
→ type of glycoprotein
→ antifertilixin secreated by sperm.
→ ,, acidic amino acid.

3. Acrosomal Rec^{n}.

→ It takes place 4 to 5 hours to process this reaction

→ Through AR diff type of enzymes are secreted & act on Ovum surrounding 1. Hyaluronidase.

:- dissolve the ground mass, mucus that present around ovum.

2. CPE :-
dissolve corona radiata layer

3. Zona lysin:-
It dissolve zona pellucida layer.

→ after penetrating of zona pellucida only 1 sperm enter into ovum & it neck region block the entry of another sperm

→ human is Monospermic.

4. Cortical reaction:-

→ cortical granules coverthe ovum after entry of one sperm head.

→ so corona radiata layer become thick & strong that prevent entry

5. Amphimixis :-

→ fow fertilization firstly meosis cell division takes place then fertilization occurs.

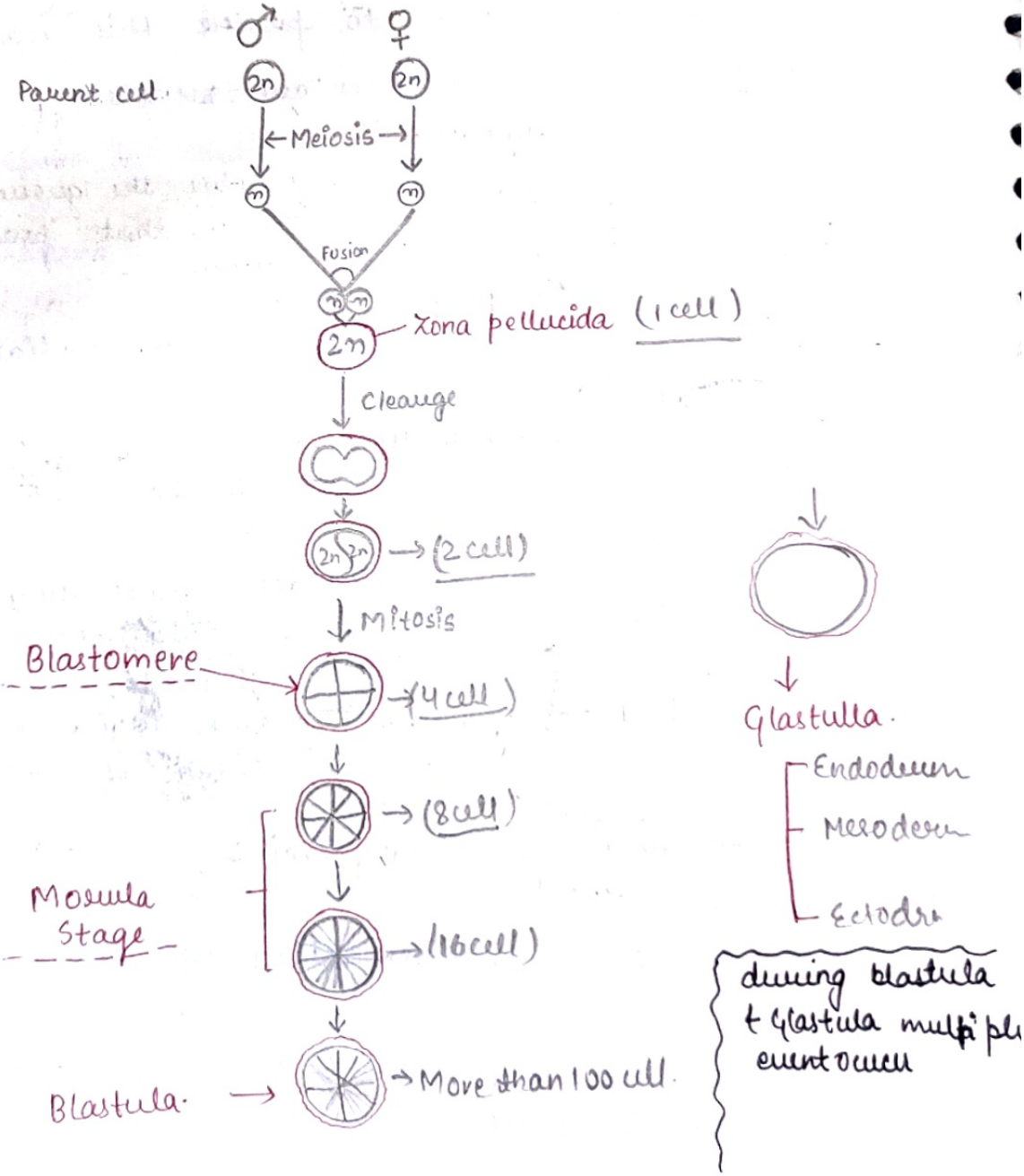
NOTE :-

Human egg is alicithal (Non yolk) & Non cleidoic i.e without shell.

→ egg of birds & reptile are cleidoic ie shell is present

→ shell is made up of $CaCO_3$ ie secreted by oviduct.

FERTILIZATION — IMPLANTATION



• Events occur b|w glastulla & Blastulla

Blastula ⟶ Gastula

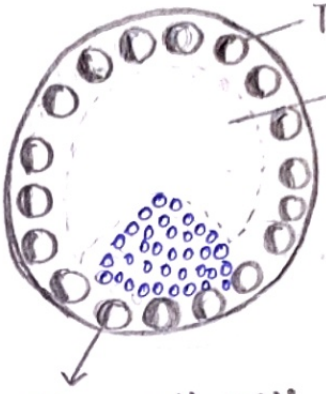
1

Cell get Rearrange

More than 100 cell

• Blastula

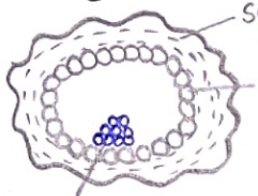
2.



Inner cell mass or • Embryoblast cell • Blastocyst

• This develop & moves into uterus for implantation ie Zona pellucida get dissolve due to enzyme release by trophoblast & Embryoblast cell.

3.

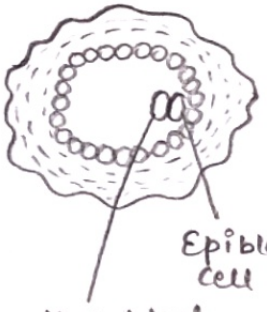


Trophoblast development

• Embryoblast term

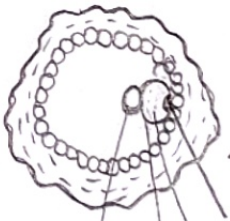
Embryoblast cell development

4.



Epiblast cell development

5



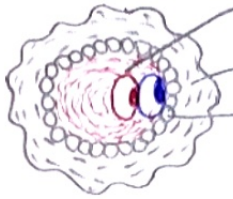
Hypoblast development

6

P.T.O

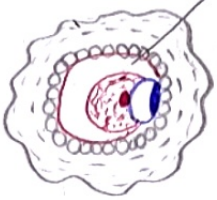
7.

• yolk sac development →



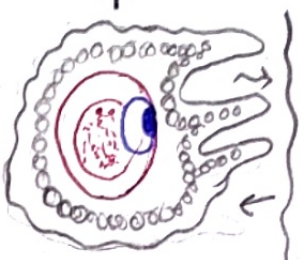
8.

• Extra embryonic mesodermal development →



9.

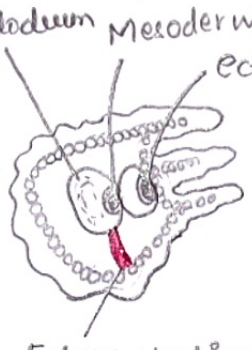
• chorionic villi development →



only nutrients from mother blood transport through chronic villi

10.

Epiblast get divided to form Embryo.



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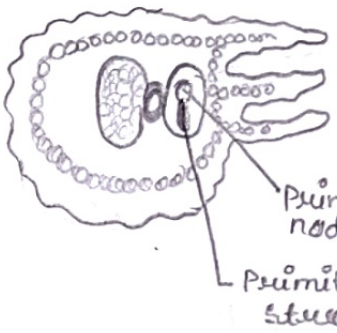

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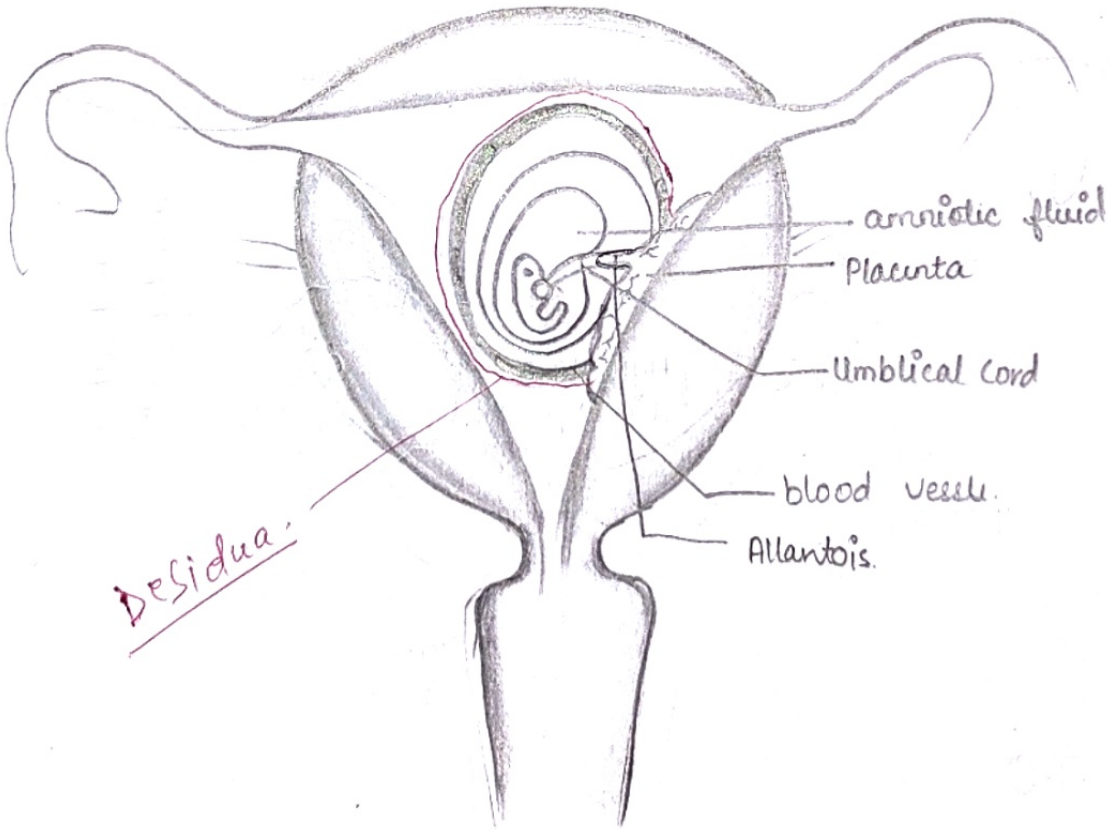


- After trophoblast formation it moves for implantation process.
- Before implantation Zona pellucid get dissolve due to specific enzyme ie secreted through emplanting body, releases HCG hormones.
- Pregnancy ~~negcognito~~ test occure due to HCG that is detect in urine of pregnant women.
- 1st three /3 month progestrone & estrogen level maintain by implanted body.
- HCG release after 1 week of fertilization.
- In human four diff type of tissue is present.
  1) epithelial
  2) connective
  3) Muscular
  4) Nervous
- epithelial tissue i.e form by all 3 types of germ layer Ecto, Endo, Meso
- Connective tissue is found by Mesoderm.
- Muscular tissue is also formed by mesoderm.
- Nervous tissue is formed, endodermal layer.

ORGANOGENESIS

Process of formation Organ during pregnancy.

- at the end of 1month heart develop at is the shine of pregnancy.
- at the End of second month limb and digit found.
- at the end of 3rd month major Organ like ~~tooth~~ ~~limbs &~~ lymph & Node as well as external genitalia. this development continue till 4 months.
- at the end of 5 month hair grows on head and first movement of baby can experience by Mother.
- at the end of 6 month body is cover with fin hair, eye lids get separated, eye lashes. continue till 7month.

- From 7 to 8 month foetus are full develop.
- From 8 to 9 moth preparation of parturation.

Amminocentesis or ultrasound is technique through which chromosomal abnormalities identify with the help of amminotic fluid.

- Todays it is illegal to use for sex determination.

PARTURATION

- Human gastration period is 9 month.
- It occur fetal ejection reflex.
- that is given placenta & fully develop feates
- at the time of normal dilivery oxytocin hormon secreted by our pitutary gland.
- Oxytocin cause wide contract & relax during dilivery through smooth muscle of myometerium
- & child birth occur.
- after pregnancy relaxin is produced by ovary which relax the muscle of pelvic region.
- during childbirth various other object come out that develop during gastation

* Water's * after birth
* extra embryonic membrane
* Cholestrum.

Water's :-

- Waters are nothing but ammoiotic fluid that present in ammion & this fluid embryo get develop.
- at the time of child birth it comes out forcly due to Rupturing of amino acid cayones.

extra embryonic membrane :-

- after few hours of child birth from structure inside uterus during pregnancy come out through birth cannal this is called after birth.

Birth canal equal to cervical cannal + Vagina.

- include placenta, Ambilical cord, allentois & desidua etc.

Placenta:-

is foum by chorionic villi and and uterine tissue. Placenta is attached with embryon with the help of Umbilical cord.

Umbilical cord:-

highly Vascular str that help in in transportation of Nutrients gases Nitrogenous base, hormons & Antibody IgG.

allontois:- at the top of umbilical cord a membrane structure is present that collect waste product of embryo.

- Desidua is a diffuntiated layer that cover the Placenta inside uterus in provide

- Placenta work and endoline layer since it secrete sexual hormone like HCG HPL – Human Placental lact. and Progesterone and Estrogen.

~~Cholestrum~~ to **Colostrum:-** it is yellow concentrated Milk ie secreated by Mother after child birth cholestrual conduct Colostrum which is highly Rich in Nutrients and provide Immunity to the child.

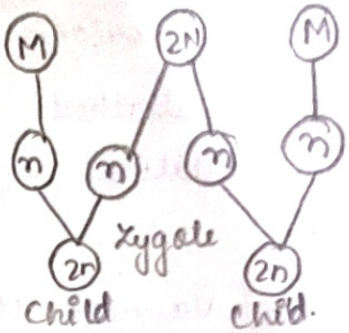
 # TWINS:-

Formation of 2 or more child by same parents in same pregnancy.

- Twins are of 3 types
- unidentical twins
- Identical twins
- Siamese twins

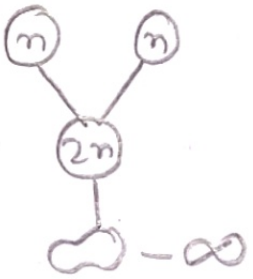
Unridentical twins :-

→ also called Fattuenal twins.
→ Due to release of 2 ova in menstrual cycle.
→ Sexes may be same / diff.
→ Genetically diffuent.
→ Called Dixygotic.



• Identical twins :-

→ Called Matuenal twins.
→ Monoxygotic twins.
→ Due to sepuation of xygote during cluuge.
→ Same sex.
→ Identical.
→ genetically same.
→ Indentical by fingupuint.



• Simease twins :-

→ 2 head single body
→ 1 head 2 body
→ 2 head 2 body

→ Due to incomplete sepuation of cluuge.