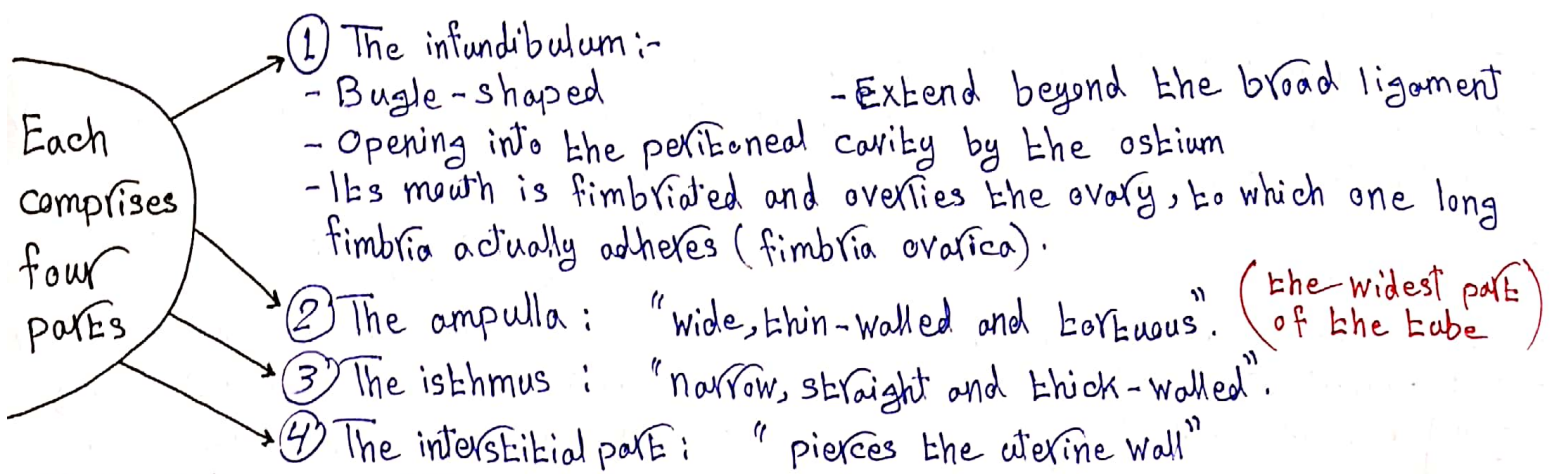
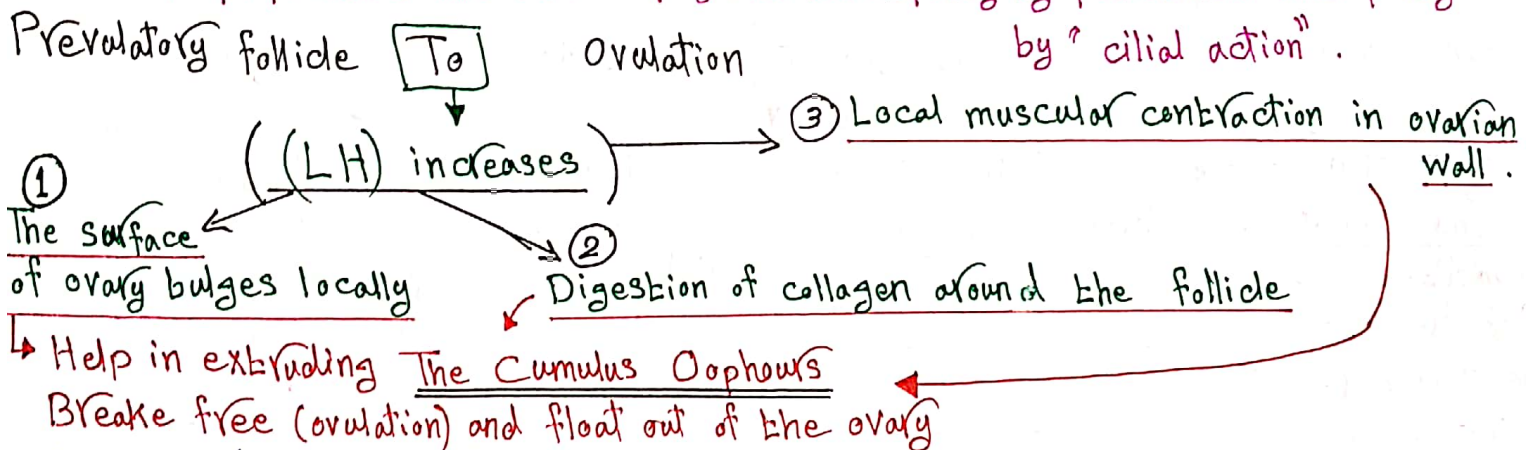


- The uterine tubes (Fallopian) "oviduct" are about 4 in (10 cm) long.
- They lie in the free edge of the broad ligaments.
- Open into the cornu of the uterus.
- They provide
 - ↳ a route for sperm to reach an ovum.
 - ↳ Transport secondary oocytes and fertilized ova (the dividing zygote) from the ovaries to the uterus.



* Structure/Histology of the oviduct:-

The mucosa is formed of columnar, mainly ciliated cells.
 The ova are propelled to the uterus along this tube, partly by "peristalsis" and partly by "ciliary action".



* Ovulation "mid cycle" :-

- From the region of cumulus oophorus the oocyte with its surrounding granulosa cells breaks free (Ovulation), leaving behind them the theca interna, externa and granulosa cells.
- Some of the granulosa cells will arrange themselves around the zona pellucida to form "Corona radiata".
- After ovulation, granulosa cells remaining in the wall of the ruptured follicle, together with cells from the theca interna, are vascularized by surrounding vessels. Under the influence of (LH), these cells develop a yellowish pigment and change into lutein cells, which form the "Corpus luteum" and secrete (estrogens and progesterone).
- ↳ Causes the uterine mucosa to enter (the progestational or secretory stage) in preparation for implantation of the embryo.
- Before ovulation, fimbriae of the uterine tube sweep over the surface of the ovary. These sweeping movements of the fimbriae and motion of the cilia on the epithelial lining carry the oocyte to the uterine tube. Once the oocyte is in the uterine tube, it is propelled by peristaltic muscular contraction of the tube and by cilia in the tubal mucosa.

- In humans, the fertilized oocyte reaches the uterine lumen in approximately 3 to 4 days.

Fertilization

- (haploid male gamete fuse with female gamete to give single diploid nucleus).
- Occurs in the ampullary region of the uterine tube.
- Spermatozoa may remain viable in the female reproductive tract for several days.
- Only 1% of sperm deposited in the vagina enter the cervix, where they may survive for many hours.
- The trip from cervix to oviduct requires a minimum of 2 to 7 hours.
- Spermatozoa are not able to fertilize the oocyte immediately upon arrival in the female genital tract but must undergo:

① Capacitation

- In the female reproductive tract.
- Lasts approximately 7 hours.
- It includes: Removal of the glycoprotein coat and seminal plasma proteins from the plasma membrane that overlie the acrosomal region of the spermatozoa.

* Only capacitated sperm can pass through the corona cells and undergo the acrosome reaction.

② Acrosome reaction

- Occurs after binding to zona pellucida.
- Includes the release of enzymes needed to penetrate the zona pellucida, including acrosin- and trypsin-like substances.

The phases of fertilization

① Penetration of the Corona Radiata

Capacitated sperm pass freely through the corona radiata. Contact with the oocyte surface, this contact results in release of:-
 From the sperm: Both binding and the acrosome reaction are mediated by the ligand ZP3, a zona protein.
 - Permeability of the zona pellucida changes when the head of the sperm comes in contact with the oocyte surface, this contact results in release of:-
 From the oocyte: lysosomal enzymes from cortical granules lining the plasma membrane of the oocyte.
 These enzymes alter properties of the zona pellucida (reaction) to prevent sperm penetration and inactivate species-specific receptor sites for spermatozoa on the zona surface.

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③ Fusion of the Oocyte and Sperm Cell membrane

Actual fusion between the oocyte membrane that covers the sperm head is accomplished at the acrosomal reaction when the plasma membrane covering the head cap disappears during the acrosome reaction.

The egg responds to entrance of the spermatozoon in three ways:-

① Cortical and zona reaction

As a result of release of cortical oocyte granules.
 (A) The oocyte membrane becomes "impenetrable" to other spermatozoa.
 (B) The zona pellucida alters its structure and composition to prevent sperm binding and penetration. (Prevent polyspermy).

② Resumption of the second meiotic division

The oocyte finishes its second meiotic division.
 - One of the daughter cells, receives hardly any cytoplasm, is known as the second polar body.
 - Its chromosomes (22 + X) arrange themselves in a vesicular nucleus (female pronucleus).

③ Metabolic activation of the egg

Activation encompasses the initial cellular and molecular events associated with early embryogenesis.

* Without fertilization, the oocyte usually degenerates 24 hours after ovulation *