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OLATUNDE

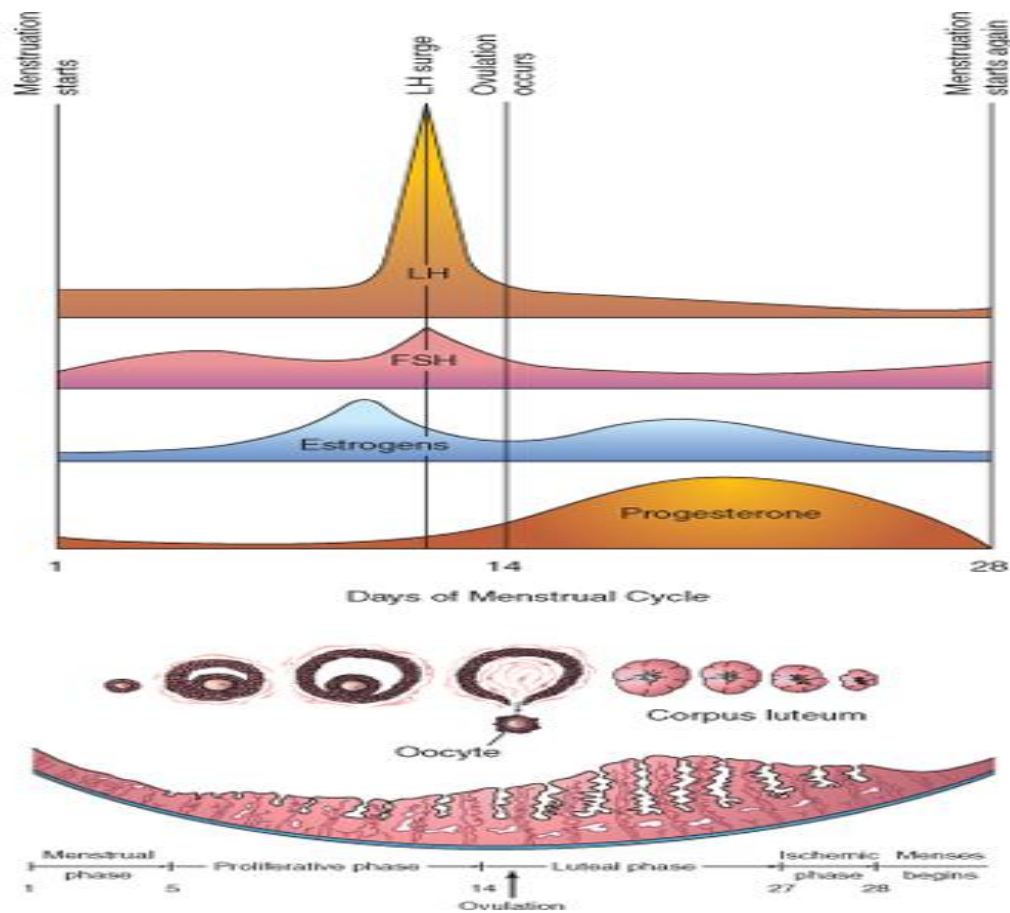
MATRIC NUMBER:
18/MS01/049

COURSE: EMBRYOLOGY

OVULATION

This is the release of a secondary oocyte from the ovarian follicle. The influence of FSH and LH makes the secondary follicle grow into 25mm in diameter in a few days to ovulation. The LH makes the primary oocyte to complete meiosis 1 and enter preovulatory mature vesicular stage.

Meiosis 2 also begins but the process is arrested at metaphase approximately 3 hours before ovulation. The surface of the ovary begins to bulge and a stigma appears at the apex

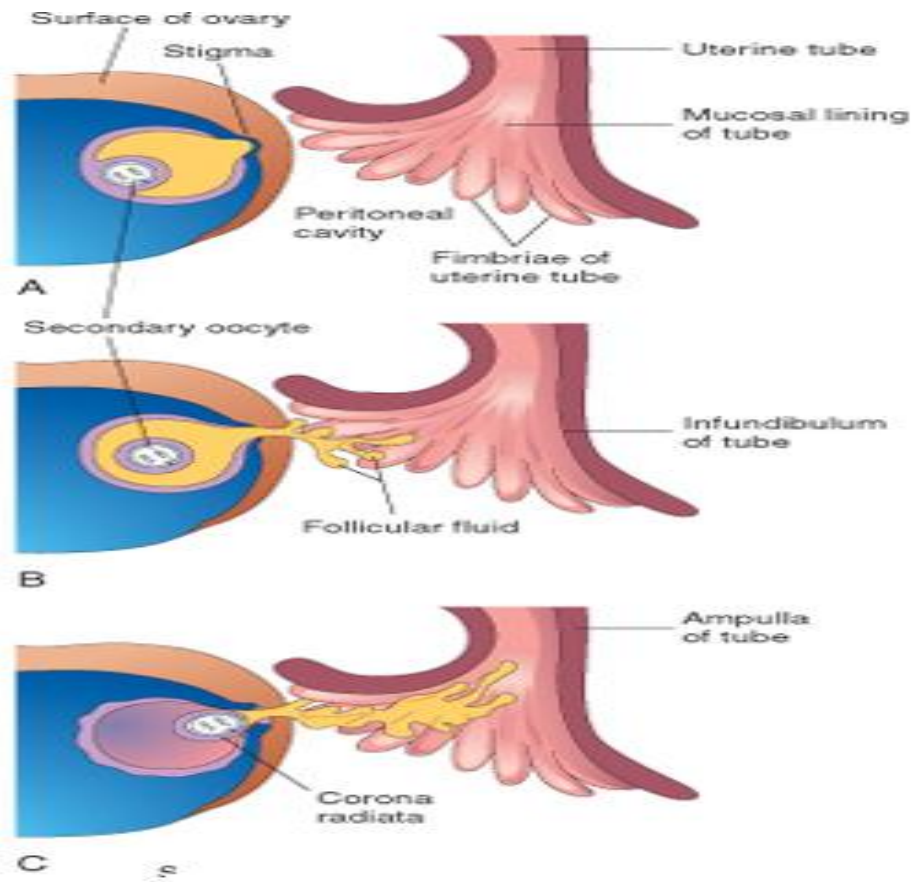


For the oocyte to be released, 2 events which are caused by the LH surge;

1. It increases collagenase activity, resulting in digestion of collagen fibers surrounding the follicle.
2. Prostaglandin levels also increase in response to the LH surge and cause local muscular contractions in the ovarian wall

Those contractions extrude the oocyte, which together with its surrounding follicular cells from the region of the cumulus oophorus, this causes ovulation in which oocyte floats out of the ovary.

Some of the cumulus oophorus cells then rearrange themselves around the zona pellucida to form the corona radiata.



CLINICAL CORRELATES

Anovulation is the failure to ovulate due to the low concentration of gonadotropins. Administration of an agent to stimulate gonadotropin release and ovulation can be used. Use of such drugs lead to multiple ovulations, the risk of pregnancy is 10 times higher than other women.

MEIOSIS 1	MEIOSIS 2
Starts as diploid, ends as haploid	Starts and ends as haploid
Ends with 2 daughter cells	Ends with 4 daughter cells
Crossing over happens	Crossing over doesn't happen
Reductive division	Equational division
Homologous chromosome pairs separate	Sister chromatids separate
Equatorial plane is centred	Equatorial plane is rotated 90 degrees
Complicated division process	Simple division process

FERTILIZATION

This is known as the union of the male gametocyte (sperm) and the female gametocyte (oocyte) which takes place in the ampulla of the uterine tube. The whole process takes 24 hours to be completed. The following are the steps involved;

Passage of sperm through the corona radiate

Capacitation must occur before sperm cells can pass through the corona radiate which is the removal of the glycoprotein coat and seminal plasma proteins from the plasma membrane that overlies the acrosomal region of the sperm cell.

Penetration of the zona pellucida

The zona is a glycoprotein shell surrounding the egg that facilitates and maintains sperm binding and induces the acrosome reaction. Acrosin released by the sperm allows the zona pellucida to be penetrated which allows the sperm to come in contact with the plasma membrane of the oocyte. Lysosomal enzymes are released from the sperm when the sperm cell comes in contact with the oocyte surface which prevents any other sperm from penetrating the oocyte.

Fusion of plasma membranes of the oocyte and sperm

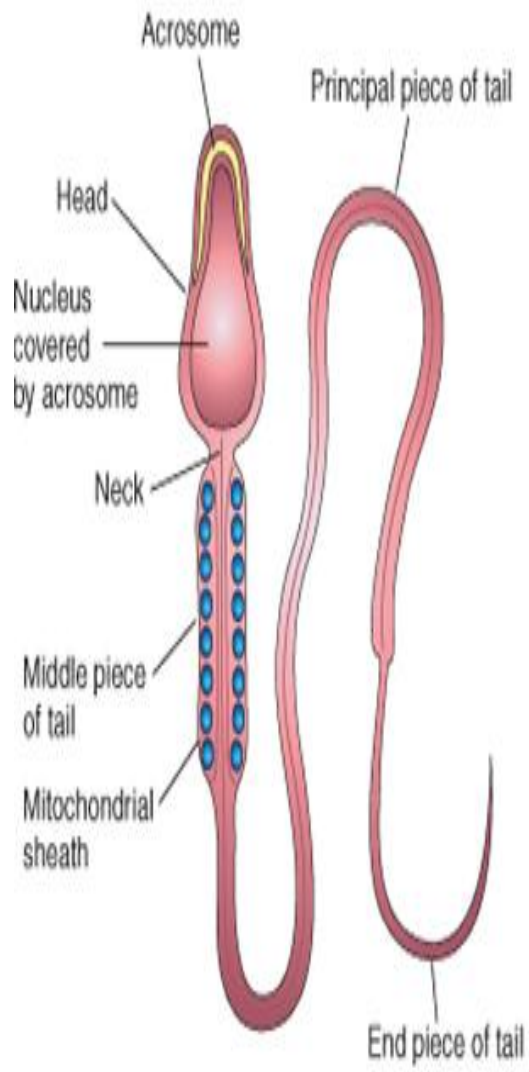
Both plasma of the oocyte and sperm fuse and break down at site of fusion. The head and tail of the sperm enters the cytoplasm of the egg.

Completion of the second meiotic division of oocyte and formation of female pronucleus

By the penetrating of the sperm cell into the oocyte, the second meiotic division of the oocyte is completed forming a mature oocyte and second polar body. It is now called a female pronucleus.

Formation of the male pronucleus

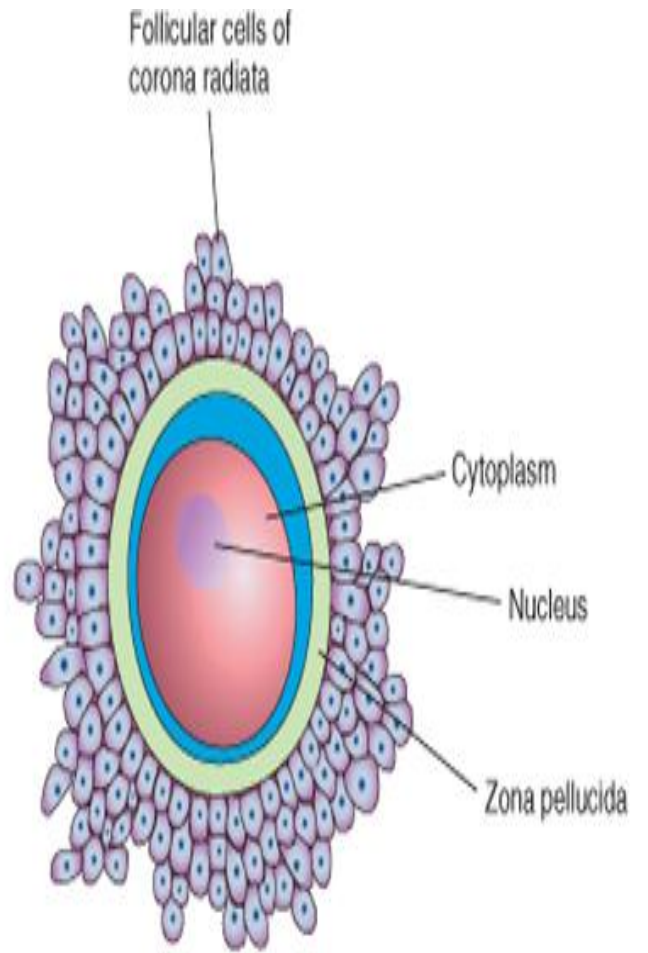
The sperm cell enlarges inside the cytoplasm of the oocyte to form the male pronucleus



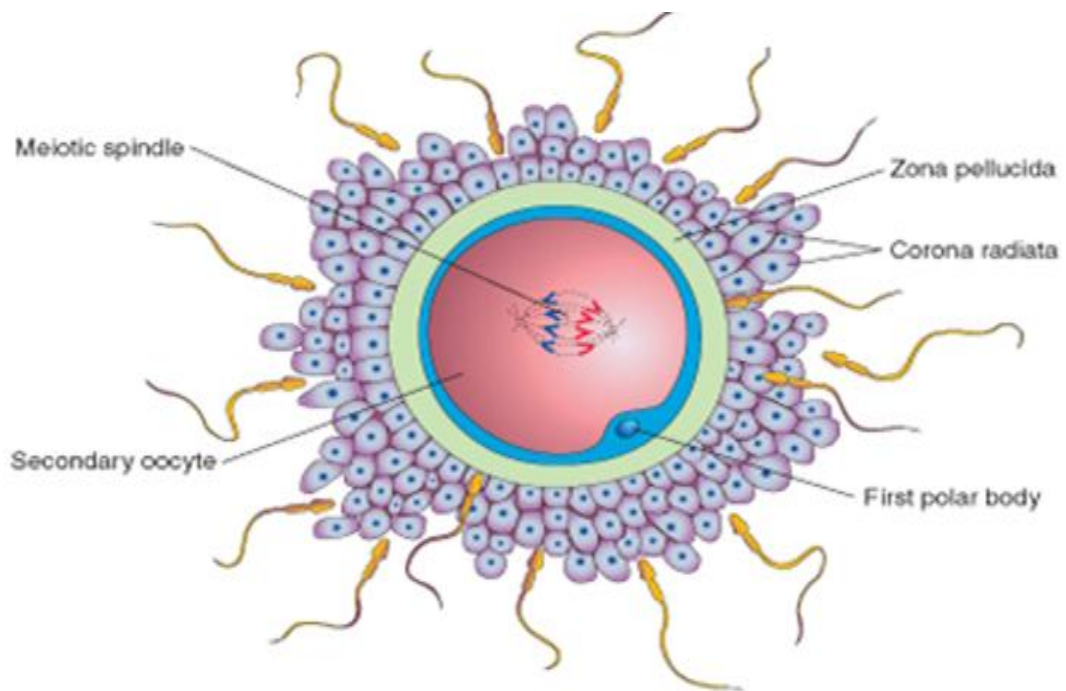
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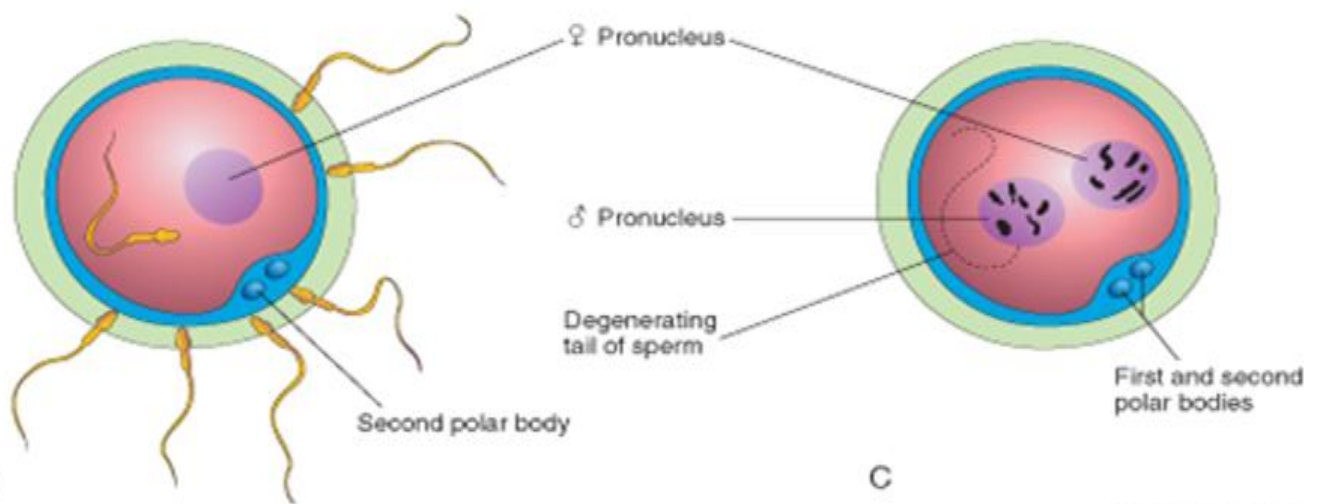
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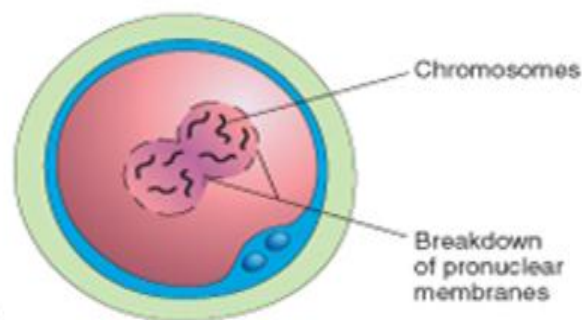


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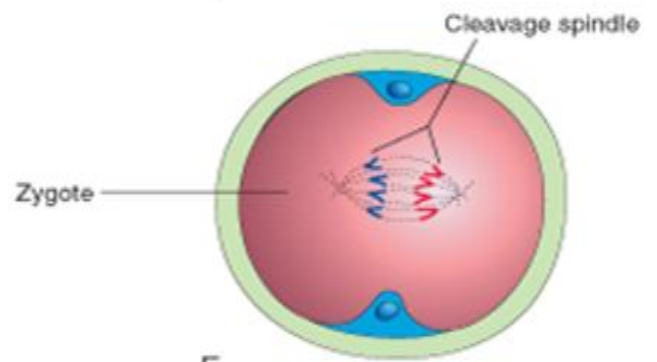


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E

MONOZYGOTIC	DIZYGOTIC
Are of the same sex	Same or different sex
Genetically identical	Genetically not identical
Form one zygote	Form two zygotes
Resemblance is similar	Resemblance is like two siblings
Incidence is common	Incidence is less common
Often called conjoined twins	Not seen as conjoined twins