

NAME: OKOLIE WALTER CHIBUNNA

MATRIC NUMBER: 18/MHS01/267

COURSE: EMBRYOLOGY

ASSIGNMENT: Discuss ovulation, differentiate between meiosis I and meiosis II, discuss the stages involved in fertilization and differentiate between monozygotic and dizygotic twins.

OVULATION

Ovulation is the release of the secondary oocyte from the ovarian follicle. After the secondary oocyte is released, it travels down the fallopian tube where it may be fertilized by a sperm. Ovulation lasts approximately a day and it occurs in the middle of a woman's menstrual cycle about two weeks before she expects her period.

DIFFERENCES BETWEEN MEIOSIS I AND MEIOSIS II

MEIOSIS I	MEIOSIS II
Synapses, crossing over, Chiasma formation all occur.	Synapses, crossing over, chiasma formation do not occur.
Starts as diploid but ends has haploid.	Starts as haploid but ends as diploid.
Has a long duration.	Has a short duration.
Ends with 2 daughter cells.	Ends with 4 daughter cells.
Reductive division	Equational division

STAGES OF FERTILIZATION

Fertilization is the union of the sperm and the oocyte gotten from the man and woman respectively to give rise to a zygote/ootid.

Stages of fertilization:

- **Passage of sperm through corona radiata:** The sperm burrows through the cells of the corona radiata. The sperm then undergoes capacitation (removal of glycoprotein material and seminar plasma membrane) on the acrosomal region before it can pass the corona radiata.
- **Penetration of zona pellucida:** The acrosome will bind with receptors at the binding site of the zona pellucida. Acrosin will be released and this allows for passage of sperm through zona pellucida. The cortical granules of the zona pellucida send a message to the receptors at the binding site to close the binding site after a sperm passes through it in order to prevent polyspermy.
- **Fusion of plasma membrane of sperm and oocyte:** Both plasma membranes of the sperm and oocyte fuse together allowing the sperm cell move into the oocyte for fertilization.
- **Completion of meiosis II and formation of female pro nuclei:** Once the sperm enters the oocyte, meiosis II will be completed and a female pro nucleus will be formed.
- **Formation of male pro nuclei:** Upon reaching the oocyte, the sperm cell also undergoes a transformation, changing it to a male pro nucleus.
- **Formation of zygote/ootid:** The male and female pro nuclei fuse together to form a zygote/ootid.

DIFFERENCES BETWEEN MONOZYGOTIC AND DIZYGOTIC TWINS

MONOZYGOTIC TWINS (identical)	DIZYGOTIC TWINS (fraternal)
One sperm fertilized one egg	Two sperms fertilized two different oocytes
Twins are of the same sex	Twins are of different sexes
Genetically identical	Genetically unidentical
Share one placenta and amniotic sac	Different placentas and amniotic sacs