1 **Ovulation.**

Ovulation is the release of an oocyte from the Ovarian follicle. Before ovulation, The Follicle stimulating hormones (FSH) and Luteinizing Hormone (LH) cause the follicle to grow and become lrger to a

2 **Differences between meiosis I and meiosis II**

|  |  |
| --- | --- |
| meiosis 1 | meiosis 2 |
| reduces chromosome number in daughter cell | equalizes chromosome number in both daughter and parent cell |
| phases are: prophase 1, metaphase1, anaphase 1 and telophase 1 | phases are: prophase 2, metaphase 2, anaphase 2, and telophase 2 |
| individual chromosomes are present in the daughter nuclei | sister chromosomes are present in the daughter nuclei |
| preceeded by interphase | no interphase takes place |

3. **Fertilization.**
The usual site of fertilization is the ampulla of the uterine tube. The fertilization process takes approximately 24 hours. It is a sequence of coordinated events which include the following stages;

i. Passage of a sperm through the corona radiata:

For sperms to pass through the corona radiata, they must have been capacitated (removal of the glycoprotein coat and seminal plasma proteins from the plasma membrane that overlies the acrosomal region of the spermatozoa)

ii. 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. as soon as the head of the sperm reaches the zona pellucida its permeability changes. and when the sperm comes in contact with the oocyte, lysosomal enzymes are released from cortical granules lining the plasma membrane of the oocyte and these prevent penetration of other sperm and make the binding sites inactive for other spermatozoa.

iii. Fusion of plasma membranes of the oocyte and sperm:

The plasma or cell membranes of the oocyte and sperm fuse and break down at the area of fusion. The head and tail of the sperm enter the cytoplasm of the oocyte, but the sperm's plasma membrane remains behind.

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

Penetration of the oocyte by a sperm activates the oocyte into completing the second meiotic division and forming a mature oocyte  and a second polar body.The nucleus of the mature ovum/oocyte is now called the female pronucleus.

v. Formation of the male pronucleus.

Within the cytoplasm of the oocyte, the nucleus of the sperm enlarges to form the male pronucleus and the tail of the sperm degenerates.

vi. The 2 pronuclei fuse into a single diploid aggregation of chromosomes, the ootid becomes a zygote.

The chromosomes in the zygote become arranged on a cleavage spindle in preparation for cleavage of the zygote.

4. **Differences between monozygotic twins and dizygotic twins**

|  |  |
| --- | --- |
| monozygotic twins | dizygotic twins |
| form from a single zygote | form from two zygotes |
| resmblance is similar | resemblance is like any other sibling |
| often called conjoined twins | not conjoined twins |
| imcidence is common | incidence is not common |
| twins are of the same sex | twins can be of any sex |