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**MATRIC NUMBER: 18/MHS01/002**

**OVULATION**

This is the release of a secondary oocyte from the ovarian follicle. Few days before ovulation, under the influence of follicle stimulating hormone(FSH) AND luteinizing hormone(LH), the secondary follicle grows rapidly to a diameter of about 25mm to become mature vesicular/ mature secondary or Graafian follicle.

Meiosis II is initiated but secondary oocyte is arrested at metaphase approximately 3hours before ovulation. After sometime, the surface of the ovary begins to bulge locally and at the apex, an avascular spot, the stigma appears. For the oocyte to be released, 2 events occur which are caused by LH surge.

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

**DIFFERENTIATE BETWEEN MEIOSIS 1 AND MEIOSIS 2**

MEIOSIS 1 MEIOSIS 2

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| --- | --- |
| 1. Meiosis 1 is reduction | Meiosis 2 is division |
| 1. Synapsis or pairing, crossing over and chiasma formation occurs in meiosis 1 | Synapsis or pairing, crossing over and chiasma formation do not occur |
| 1. In anaphase 1 centromere do not split | Centromeres split |
| 1. A diploid cell gives two haploid cells | Two haploid cells divide to give four haploid cells |
| 1. In meiosis 1, homologous chromosomes separate | In meiosis 2, sister chromatids separate |
| 1. Long duration | Short duration |
| 1. Equatorial plane is centered | Equatorial plane is rotated 90 degree |
| 1. Ends with 2 daughter cells | Ends with 4 daughter cells |

**DISCUSS THE STAGES INVOLVED IN FERTILIZATION**

The following are the stages involved in fertilization:

* PASSAGE OF THE SPERM THROUGH THE CORONA RADIATA:

For sperm to pass through the corona radiate, they must have been capacitated i.e the removal of the glycoprotein coat and seminal plasma proteins from the plasma membrane that overlies the acrosomal region of the spermatozoa.

* PENETRATION OF ZONA PELLUCIDA:

The intact acrosome from the sperm will bind with the zona glycoprotein on zona pellucida and then release acrosine which allows sperm to penetrate the zona pellucida

* FUSION OF PLASMA MEMBRANE OF THE OOCYTE AND SPERM:

The plasma membrane 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,the sperm’s plasma membrane remains behind.

* COMPLETION OF THE SECOND MEIOTIC DIVISION OF OOCYTE AND FORMATION OF FEMALE PRONUCLEUS:

As soon as the sperm enters the region of the cytoplasm of the oocyte, second meiotic division is completed forming a mature oocyte and a second polar body. The nucleus of the mature oocyte is called the FEMALE PRONUCLEUS.

* FORMATION OF MALE PRONUCLEUS:

The sperm nucleus enlarges to form the male pro nucleus and the tail of the sperm degenerates

* THE TWO 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.

**DIFFERENTIATE BETWEEN MONOZYGOTIC AND DIZYGOTIC TWINS**

MONZYGOTIC DIZYGOTIC

|  |  |
| --- | --- |
| 1. Monozygotic twins are genetically identical | Dizygotic twins are genetically not identical |
| 1. Form from single zygote | Form from two zygote |
| 1. They are of the same sex | They are of different sex |
| 1. Incidence is more common | Incidence is less common |
| 1. Resemblance is similar | Resemblance is just like any other two siblings |
| 1. Mostly diamniotic, monochorionic, with single placenta | Have two amnions, two chorions, and two placentas |
| 1. They are seen as conjoined twins | Not seen as conjoined twins |