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Embryology ass

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1. discuss ovulation

Ovulation is the release of eggs from the ovaries. In women, this event occurs when the ovarian follicles rupture and release the secondary oocyte ovarian cells. After ovulation, during the luteal phase, the egg will be available to be fertilized by sperm. In addition, the uterine lining (endometrium) is thickened to be able to receive a fertilized egg. If no conception occurs, the uterine lining as well as blood will be shed during menstruation.Ovulation occurs about midway through the menstrual cycle, after the follicular phase, and is followed by the luteal phase. Note that ovulation is characterized by a sharp spike in levels of luteinizing hormone (LH) and follicle-stimulating hormone (FSH), resulting from the peak of estrogen levels during the follicular phase.

2. Difference between Mitosis and Meiosis

Mitosis: A somatic cell divides once. Cytokinesis (the division of the cytoplasm) occurs at the end of telophase.

Meiosis: A reproductive cell divides twice. Cytokinesis happens at the end of telophase I and telophase

Mitosis: Two daughter cells are produced. Each cell is diploid containing the same number of chromosomes.

Meiosis: Four daughter cells are produced. Each cell is haploid containing one-half the number of chromosomes as the original cell.

Mitosis: Tetrad formation does not occur.

Meiosis: In prophase I, pairs of homologous chromosomes line up closely together forming what is called a tetrad. A tetrad consists of four chromatids (two sets of sister chromatids).

Mitosis: Sister chromatids (duplicated chromosome comprised of two identical chromosomes connected at the centromere region) align at the metaphase plate (a plane that is equally distant from the two cell poles).

Meiosis: Tetrads (homologous chromosome pairs) align at the metaphase plate in metaphase I.

Mitosis: During anaphase, sister chromatids separate and begin migrating centromere first toward opposite poles of the cell. A separated sister chromatid becomes known as daughter chromosome and is considered a full chromosome.

Meiosis: Homologous chromosomes migrate toward opposite poles of the cell during anaphase I. Sister chromatids do not separate in anaphase I.

Mitosis: During the first mitotic stage, known as prophase, chromatin condenses into discrete chromosomes, the nuclear envelope breaks down, and spindle fibers form at opposite poles of the cell. A cell spends less time in prophase of mitosis than a cell in prophase I of meiosis.

Meiosis: Prophase I consists of five stages and lasts longer than prophase of mitosis. The five stages of meiotic prophase I are leptotene, zygotene, pachytene, diplotene, and diakinesis. These five stages do not occur in mitosis. Genetic recombination and crossing over take place during prophase I

3. Discuss the stages of fertilization

- Passage of a sperm through the corona radiata- 300 -500 dispersed capacitated fertilized sperm pass through the corona radiate surround the oocyte and zona pellucida due to enzyme action., hyaluronidase released from sperm acromose
- Penetration of the Zona Pellucida- the intact acromose of the sperm binds with the Zona pellucida, thereby coming in contact with the plasma membrane of the oocyte. As soon as the head of the sperm comes in contact with the oocyte surface, the Zona Pellucida permeability changes and lysosomal enzymes are released from cortical granules lining the plasma membrane of the oocyte. In turn, these enzymes alter properties of the Zona Pellucida to prevent sperm penetration and inactive binding sites for spermatozoa on the Zona Pellucida surface
- Fusion of the plasma membrane of the oocyte and the sperm- the initial adhesion of the sperm to the oocyte is mediated in part by the interactions of integrins on the oocyte and their ligands, distintegrins, on sperm. After adhesion, the plasma membrane of the sperm and oocyte fuse together and break down at the area of fusion.
- Completion of the second meiotic division of oocyte and sperm- penetration of oocyte by sperm activates the oocyte into completing the second meiotic division and forms a mature oocyte a mature oocyte and second polar body.
- The mature ovum is a female pronucleus

- Male nucleus formation- sperm nucleus in oocyte cytoplasm enlarges to form male pronucleus, sperm tail degenerates. DNA replications start. The pronuclei fuses to form zygote

4. Differences between the monozygotic twins and dizygotic twins

Monozygotic twins	Dizygotic twins
Gender is the same	Gender is different
Blood type are the same	Blood type are different
Bears a high risk of TTTS	Bears a low risk of TTTS
Nearly identical genetic code	Genetic code same as normal siblings
Cause is not known	Cause is from IVF, retain fertility drugs or hereditary predisposition
Developed by splitting of embryo into 2	Development from two separate simultaneously ferlilzation event
1/3 of the world's children are monozygotic	2/3 of world's children are dizygotic