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1 discuss ovulation

Ovulation is the release of an oocyte from the ovarian follicle, a few days before ovulation under the influence of follicle stimulating hormone and luteinizing hormone the secondary follicle grows rapidly to become a mature vesicular/mature secondary or graafian follicle. During the final development of the mature vesicular follicle there is an abrupt increase in luteinizing that causes the primary oocyte to complete meiosis 1 and the follicle to enter the preovulatory mature vesicular stage. meiosis 2 is also initiate but the secondary oocyte is arrested in metaphase like three hours before ovulation, during this period there is bulge that appears locally at the apex, an avascular spot the stigma appears. So for the ovulation to occur two events occur which is caused by the LH surge which increases collagenase activity, resulting in digestion of collagen fibers surrounding the follicle and prostaglandin levels also increases in responses to the LH surge and cause local muscular contractions in the ovarian wall, then this contractions extrude the oocyte, which together with its surrounding follicular cells from the region of the cumulus oophorus which causes oocyte to float out of the ovary. Some of the cumulus oophorus cells then rearrange themselves around the zona pellucida to form the corona radius.

2. differentiate between meiosis 1 and meiosis 2

* In meiosis 1, homologous chromosomes separate, while in meiosis 2 sister chromatids separate
* Meiosis 2 produces 4 haploid daughter cells, whereas meiosis 1 produces 2 diploid daughter cells
* Genetic recombination (crossing over) only occurs in meiosis 1

3. discuss the stages involved in fertilization

* Passage of a sperm through the corona radiata: the first stage of fertilization is the passing of the sperm through the corona radiata so 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) because only capacitated sperm can pass through the corona radiata freely
* Penetration of the zona pellucida: after the capacitation of sperm and entering of the sperm through the corona radiata there is a 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, the intact acrosome of the sperm binds with a zona glycoprotein on the zona pellucida Then there is a release of acrosomal enzymes (acrosin) that allows sperm to penetrate the zona pellucida, thereby coming in contact with the plasma membrane of the oocyte, as soon as the head of a sperm comes in contact with the oocyte surface, the permeability of the zona pellucida changes When a sperm comes in contact with the oocyte surface, lysosomal enzymes are released from cortical granules lining the plasma membrane of the oocyte which alter the properties of zona pellucida to prevent sperm penetration and inactivate binding sites for spermatozoa on the zona pellucida surface

Note: only one sperm seems to be able to penetrate the oocyte

* 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
* Completion of the second meiotic division of oocyte and formation of female pronucleus: when the oocyte was penetrated by a sperm the completing the second meiotic division was activated and forming a mature oocyte and a second polar body the nucleus of the mature ovum/oocyte is now called the female pronucleus
* 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 so since all sperm mitochondria degenerate, all mitochondria within the zygote are of maternal origin Morphologically, the male and female pronuclei are indistinguishable The oocyte now contains 2 pronuclei, each having haploid number of chromosomes(23) The oocyte containing two haploid pronuclei is called an ootid
* 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. differentiate between monozygotic twins and dizygotic twins

1. Dizygotic are twins which result from the fertilization of 2 different eggs with 2 different sperms. Dizygotic twin pairs can be girl/girl, boy/boy, or girls/boy. Other words for dizygotic twins are also fraternal or non-identical twins. They normally don’t look 100% alike and sometimes have appearances similar to each other in the same way non-twin siblings have while Monozygotic twins result from the fertilization of one egg and one sperm. The fertilized embryo then splits within days after fertilization resulting in two individuals which usually share the same chromosomes. Monozygotic twins are also known as identical or maternal twins. Mostly they have very similar appearances. My sister and I are identical twins and have been known to confuse people for last 16 years.