Oogenesis تكوين البويضات

Oogenesis: the process of oocyte development occurs in the ovary of a female. As with sperm production, oogenesis starts with a germ cell, called an oogonium (plural: oogonia), but this cell undergoes mitosis to increase in number, eventually resulting in up to about 1-2 million cells in the embryo.

Oogenesis

The process of oogenesis starts in the fetal ovaries with the development of oogonia from primordial germ cells (PGCs). Oogonia are formed during fetal development (in the process called oocytogenesis), and divide via mitosis, much like spermatogenesis in the testis. In other words, primary oocytes reach their maximum development at 20 weeks of gestational age, when approximately seven million primary oocytes have been created; however, at birth, this number has already been reduced to approximately 1-2 million.

Oocytogenesis

Oogenesis starts with the process of developing Oogonia, which occurs via the transformation of primordial follicles into primary oocytes, a process called oocytogenesis. Oocytogenesis is complete either before or shortly after birth.

Ootidogenesis

The succeeding phase of ootidogenesis occurs when the primary oocyte develops into an Ootid. The process of meiosis achieves this. A primary oocyte is, by its biological definition, a cell whose primary function is to divide by the process of meiosis:

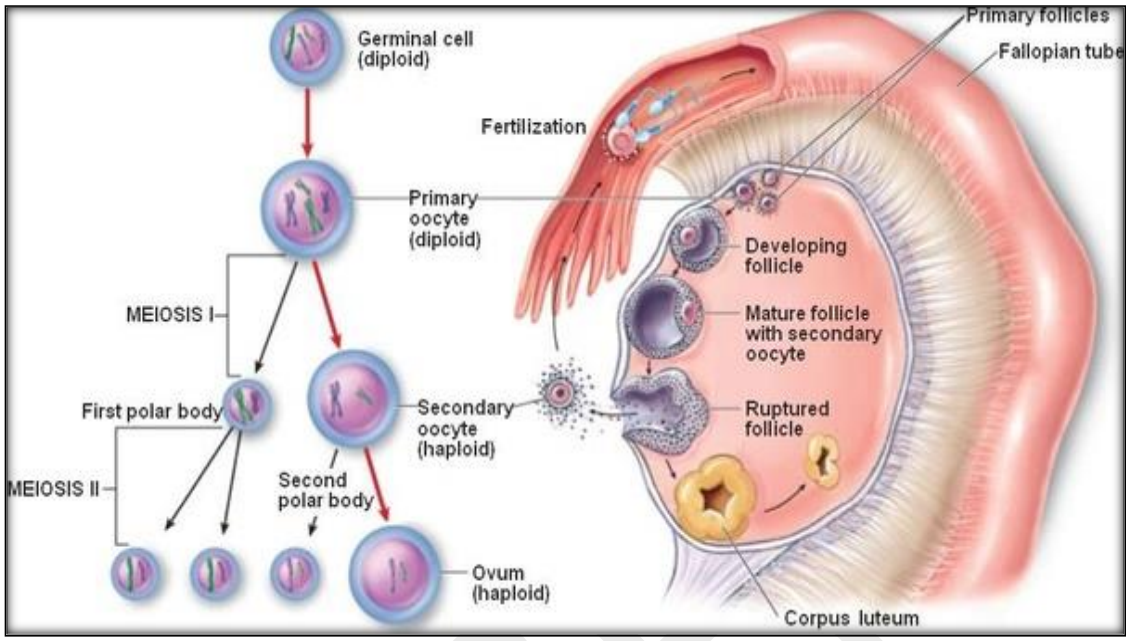
1. **Meiosis I:** during meiosis I, the primary oocyte has now developed into the secondary oocyte and the first polar body (PB 1).

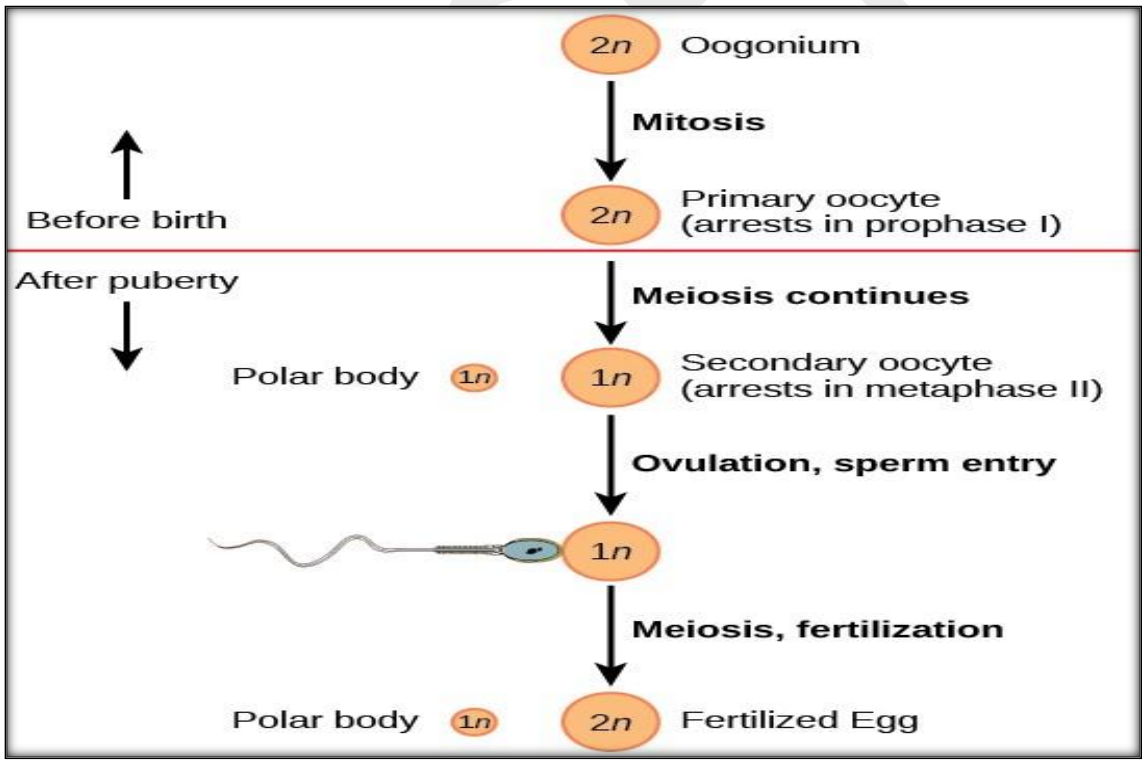
2. **Meiosis II:** when meiosis II has been completed, an Ootid and another polar body (PB 2) have now been created.

Both polar bodies degenerate at the end of meiosis II, and their function is to discard the extra haploid sets of chromosomes that have resulted as a consequence of meiosis. Meiosis of a secondary oocyte is completed only if a sperm succeeds in penetrating its barriers. Meiosis II then resumes, producing one haploid ovum that, at the instant of fertilization by a (haploid) sperm, becomes the first diploid cell of the new offspring (a zygote).

Hormonal control of oogenesis

1. At the start of the estrous cycle, some primary follicles begin to develop under the influence of elevated levels of follicle-stimulating hormone (FSH) to form secondary follicles.
2. After that, a few healthy secondary follicles remain, with the rest having been reabsorbed into the ovary. The remaining follicles are called the **dominant follicle** and are responsible for producing large amounts of estrogen during the late follicular phase.
3. After the end of the follicular phase: a luteinizing hormone (LH) surge occurs, which is triggered by the positive feedback of estrogen. This causes ovulation.
4. The empty follicle then forms a corpus hemorrhagicum and then to corpus luteum which releases the progesterone to maintain the potential pregnancy.





Process of oogenesis in the ovary