

Al-Qadsea University/Biotechnology College-Medical
Embryology-second stage- second lap.
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Gametogenesis

The Gametogenesis is a biological process by which the cell division and differentiation to form mature gametes. Depending on the biological life cycle of the organism, gametogenesis occurs by mitotic division of gametogenous cells or by meiotic division of gametocytes into various gametes.

Mitosis

Mitosis is a part of the cell cycle in which chromosomes in a cell nucleus are separated into two identical sets of chromosomes, each in its own nucleus. In general, mitosis (division of the nucleus) ,the divides occur in the cytoplasm, organelles and cell membrane into two new cells containing roughly equal shares of these cellular components.

Meiosis

Meiosis is a specialized type of cell division which reduces the chromosome number by half. This process occurs in all sexually reproducing single-celled and multi-celled eukaryotes, including animals, plants, and fungi.

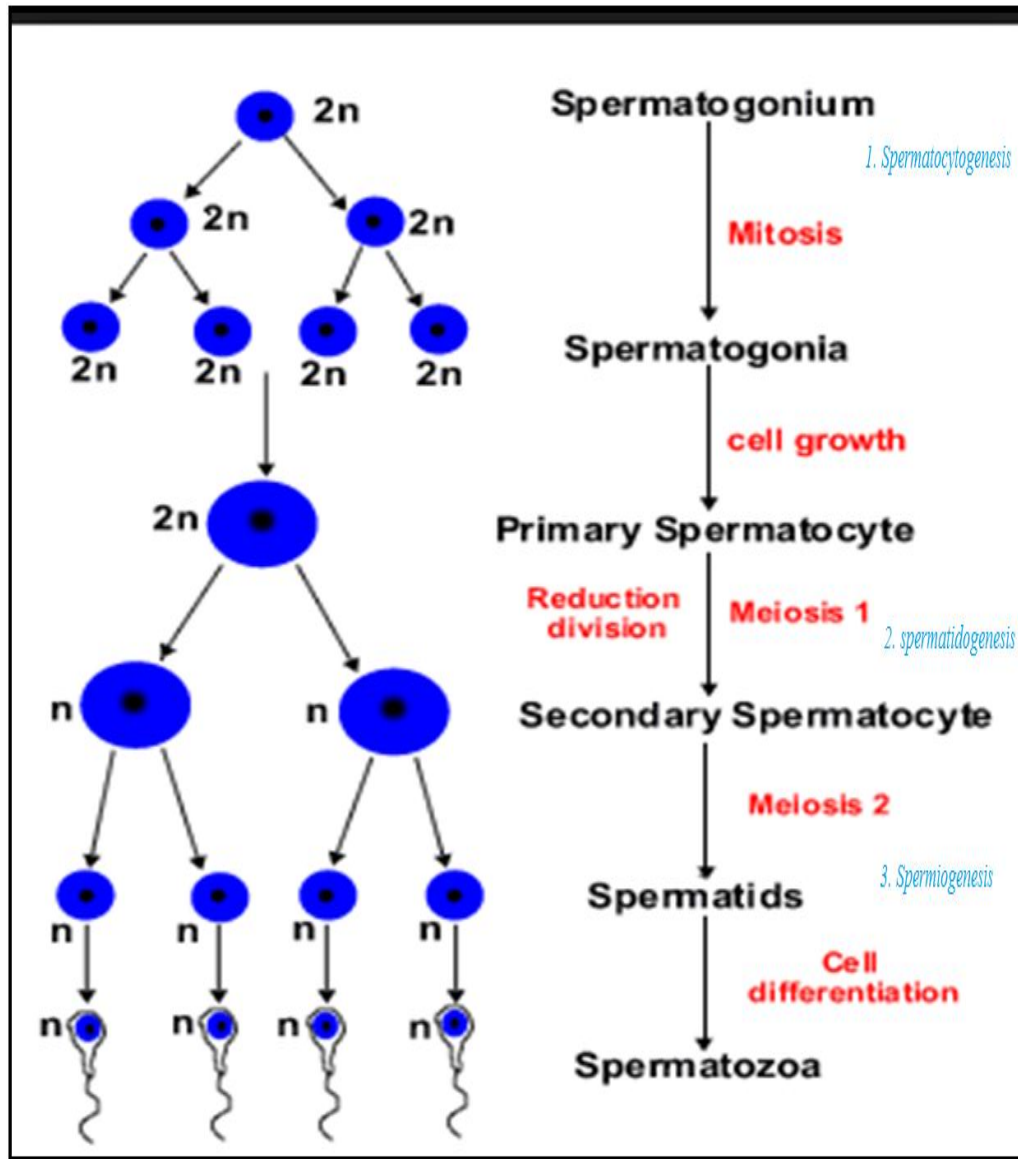
A. Spermatogenesis

The spermatogenesis in mammals it occurs in the seminiferous tubules of the male testes. It starts at puberty and usually continues uninterrupted until death, although a slight decrease can be discerned in the quantity of produced sperm with increase in age.

In humans, the entire process of spermatogenesis takes 74 days. The testes produce 200 to 300 million spermatozoa daily. However, only about half or 100 million of these become viable sperm.

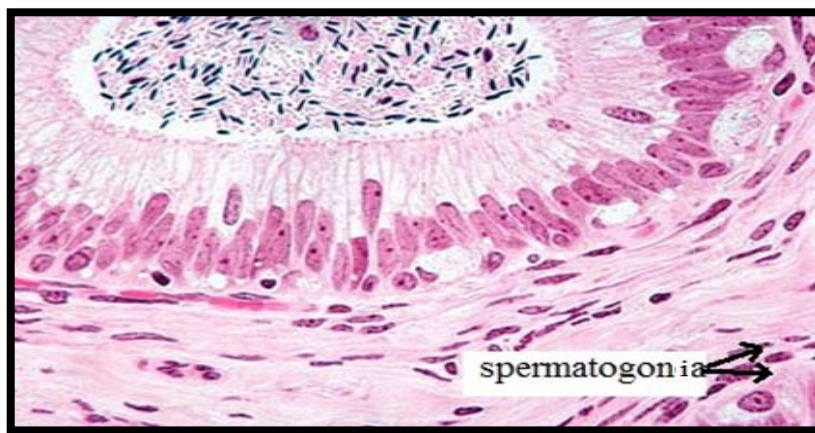
Stage of the Spermatogenesis

1. Spermatocytogenesis
2. Spermatidogenesis
3. Spermiogenesis



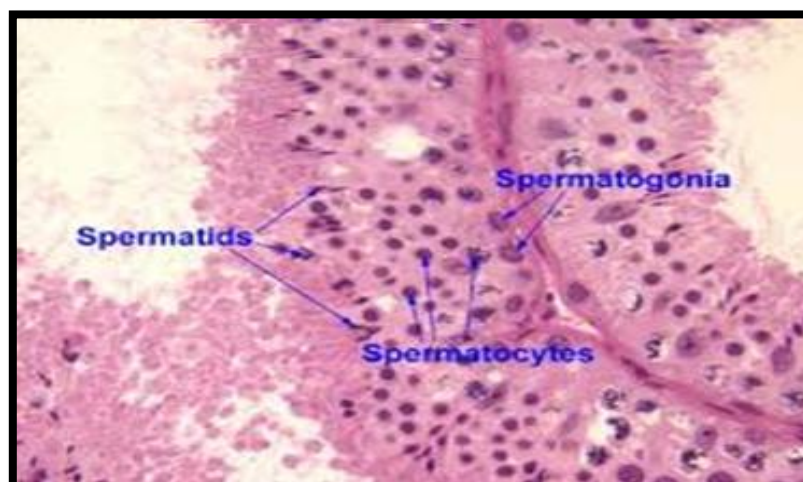
1. Spermatocytogenesis

Spermatocytogenesis is the male form of gametocytogenesis and results in the formation of spermatocytes possessing half the normal complement of genetic material. which resides in the basal compartment of the seminiferous tubules, producing two cells called primary spermatocytes which moves into the luminal compartment of the seminiferous tubules and duplicates its DNA and subsequently undergoes *meiosis I* to produce two cells called secondary spermatocytes.



2. Spermatidogenesis

The spermatidogenesis is the creation of spermatids from secondary spermatocytes. Secondary spermatocytes produced earlier rapidly enter meiosis II and divide to produce spermatids.



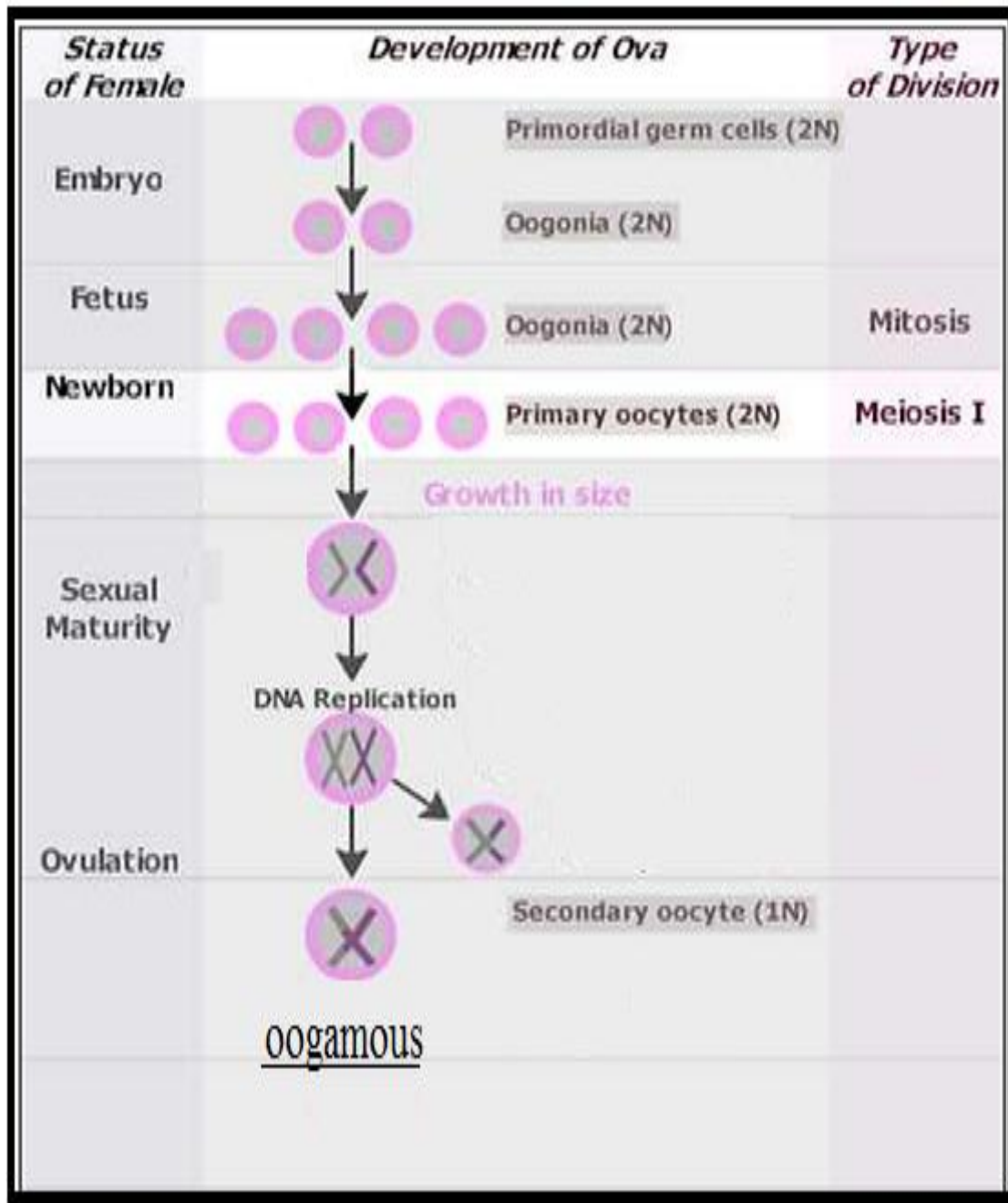
3. Spermiogenesis

The spermatids begin to form a tail, the anterior part of the tail (called mid piece) thickens because mitochondria which ensure energy supply, the DNA is packaged firstly with specific nuclear basic proteins, one of the centrioles of the cell elongates to become the tail of the sperm.



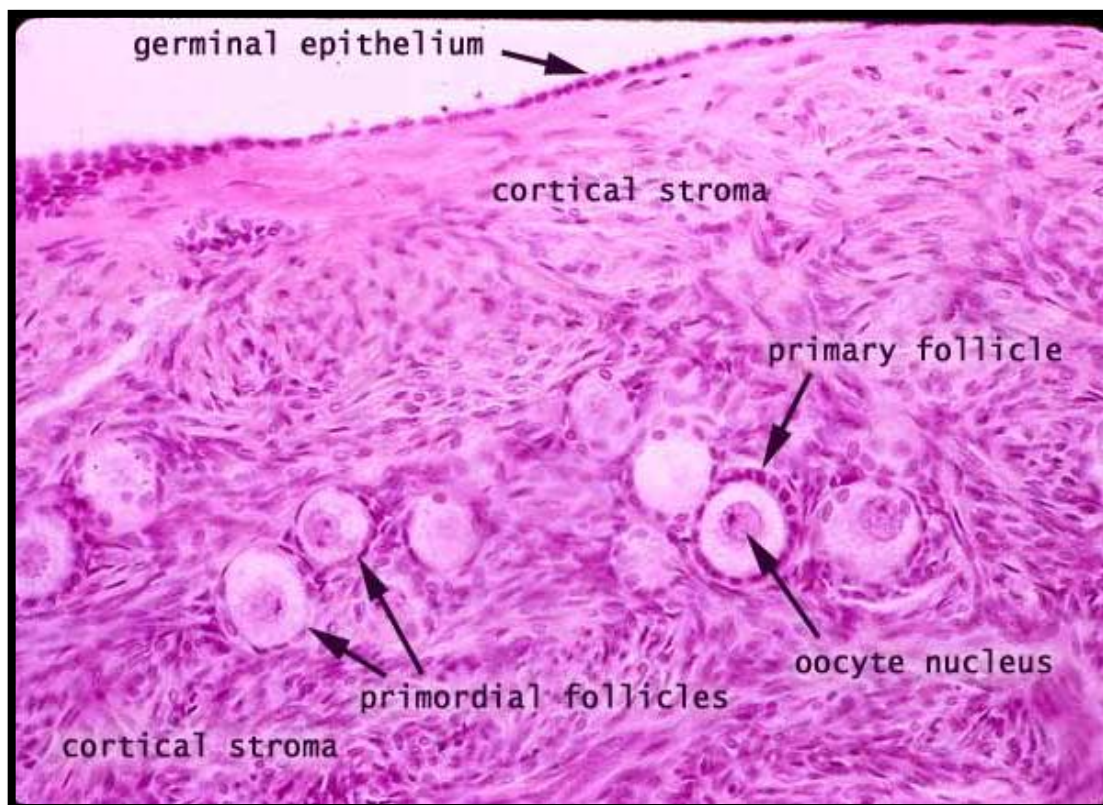
B. Stage of the Oogenesis

1. Primary oocyte,
2. Secondary oocyte,
3. Oogamous.



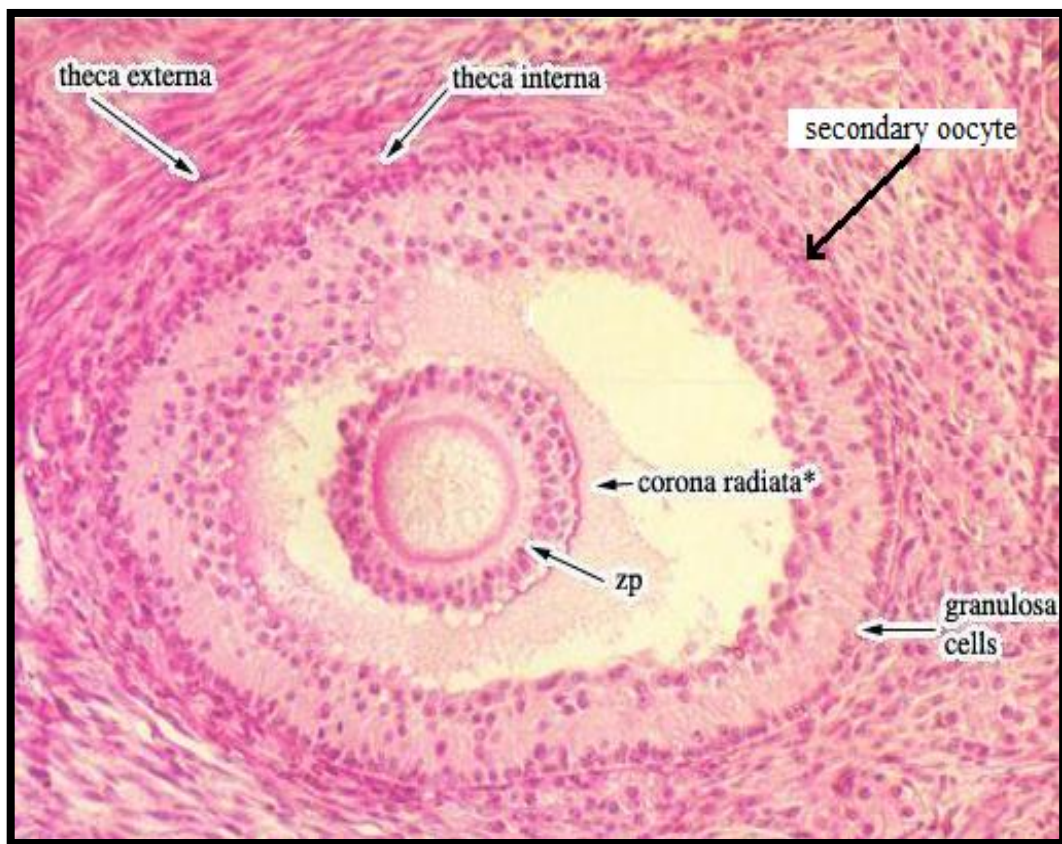
1. Primary oocyte

The primary oocyte is defined by its process of ootidogenesis, which is meiosis. It has duplicated its DNA, so that each chromosome has two chromatids. When meiosis I is completed, one secondary oocyte and one polar body is created, this Primary oocytes have been created in late fetal life.



1. Secondary oocyte

The secondary oocyte is the cell that is formed by meiosis I in oogenesis. Thus, it has only one of each pair of homologous chromosomes, each chromosome still has two chromatids, making a total of 46 chromatids. The secondary oocyte continues the second stage of meiosis (meiosis II), and the daughter cells are one ootid and one polar body.



3. Oogamous

The egg cell, or ovum, is the female reproductive cell (gamete) in oogamous organisms. The egg cell is typically not capable of active movement, and it is much larger than the motile sperm cells. When egg and sperm fuse, a diploid cell (the zygote) is formed, which gradually grows into a new organism.

