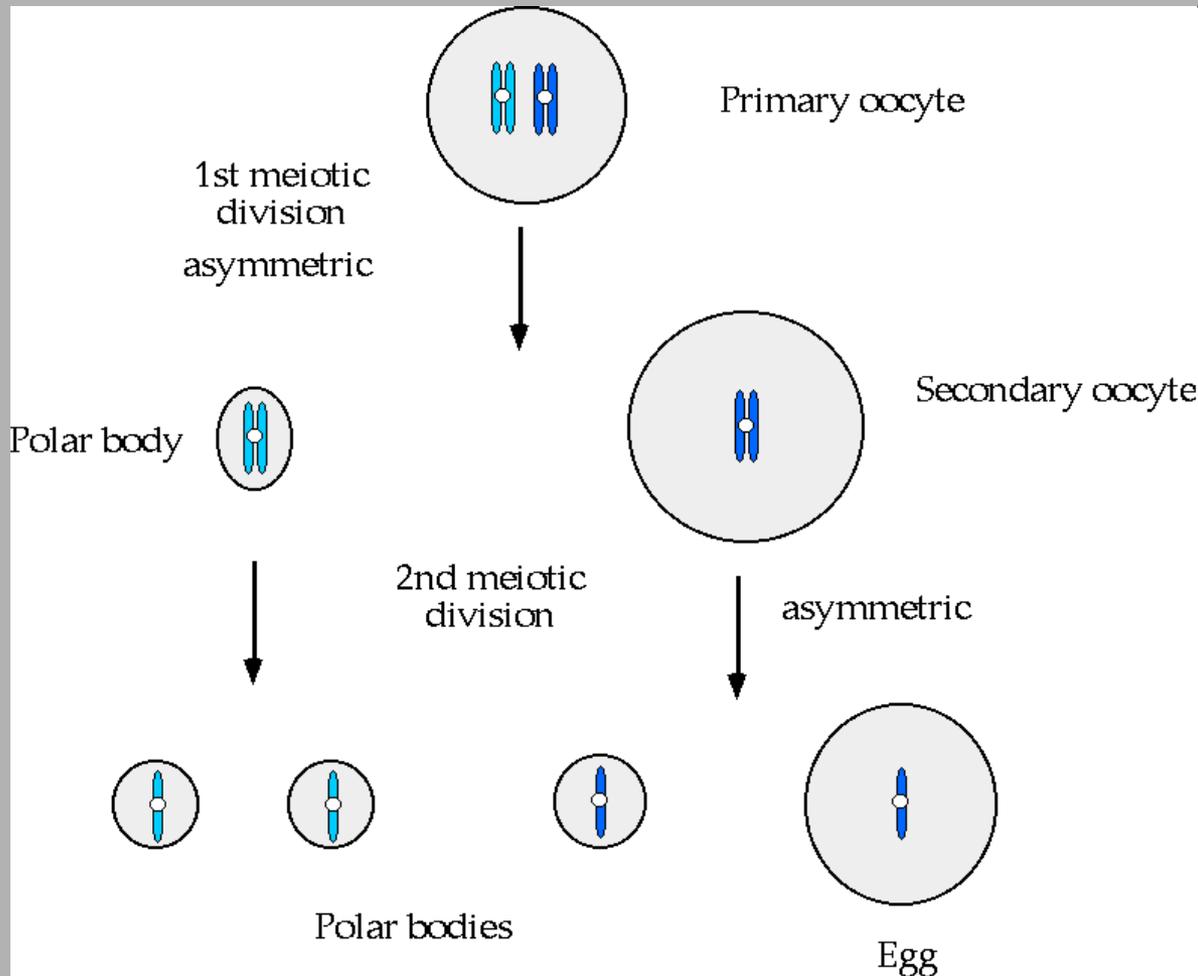
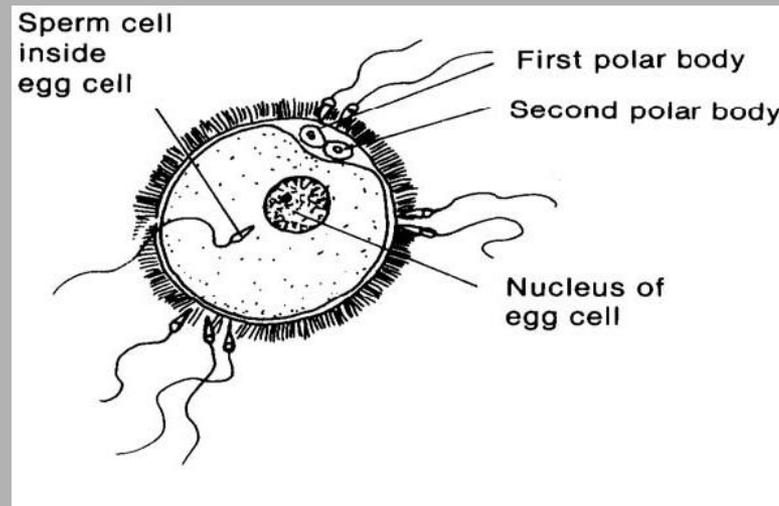


Oogenesis

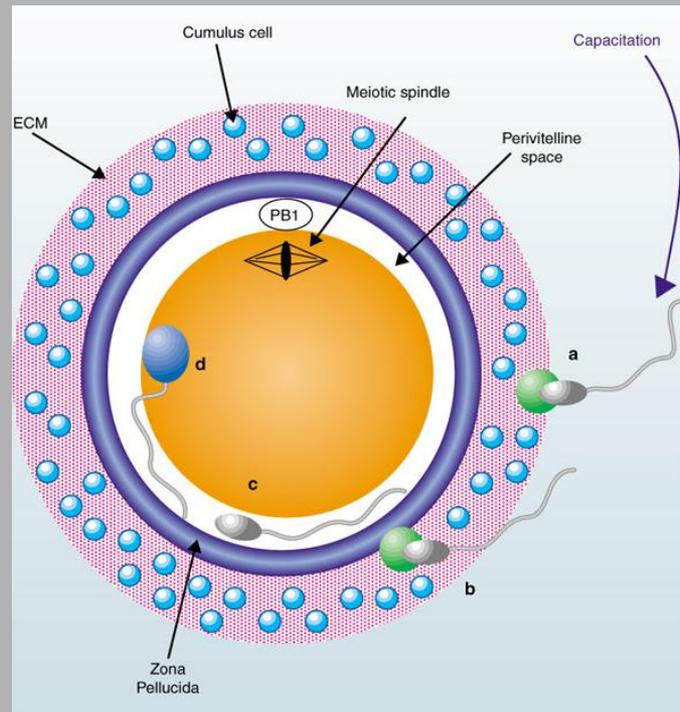


- **Oogenesis** is the creation of an ovum (an egg cell).
- It is the female process of gametogenesis.
- It involves the various stages of immature ova.



- Oogenesis is the process of meiosis in female organisms from an oogonium to a primary oocyte, to a secondary oocyte, and then to an ovum.
- Oogenesis begins soon after fertilization, as primordial germ cells travel from the yolk sac to the gonads, where they begin to proliferate mitotically.

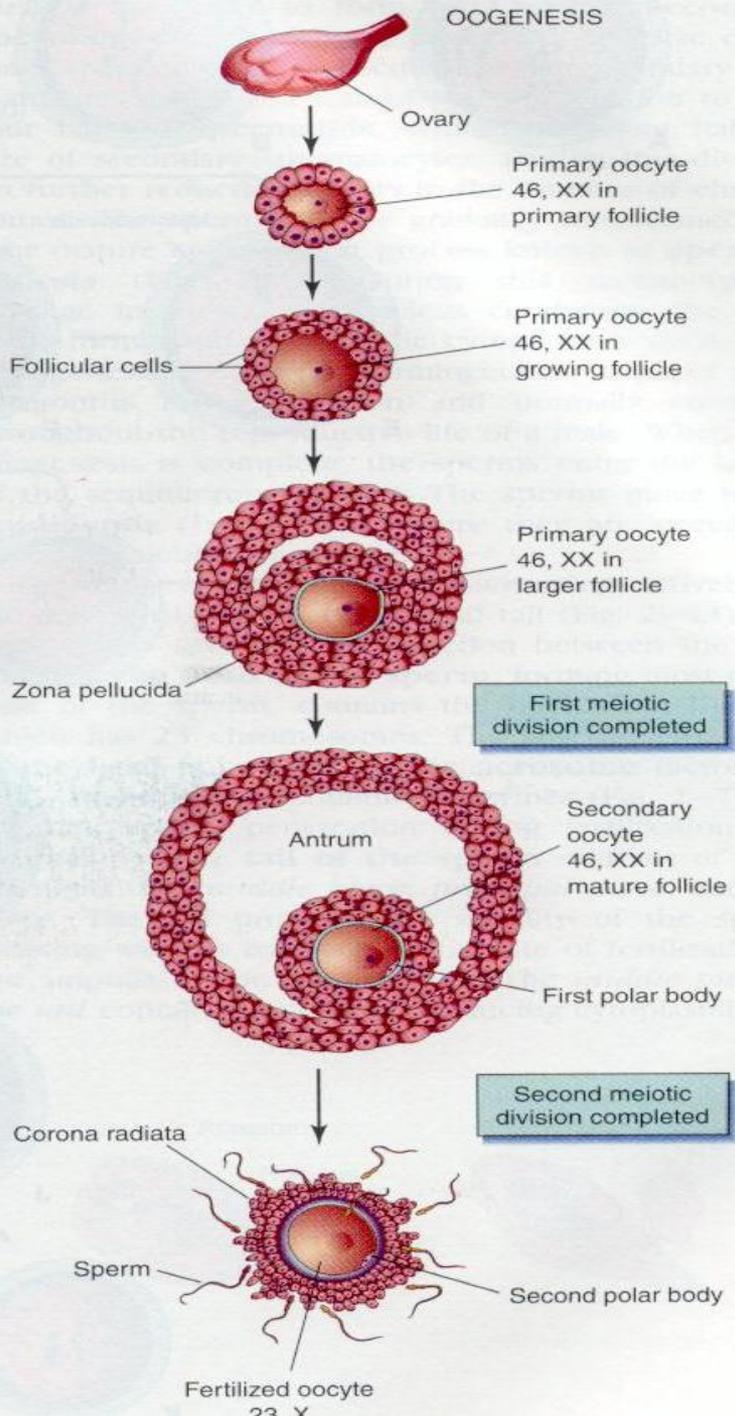
- The germ cells multiply from only a few thousand to almost 7 million. They become oocytes once they enter the stages of meiosis several months after birth.
- Now called primordial follicles, they are made up of oogenic cells from the primordial germ cells surrounded by follicle cells from the somatic line.
- The oocyte is then arrested in the first meiotic prophase until puberty.



- At puberty, between 4 to 10 follicles begin to develop, although only 1-2 are actually released.
- Surrounding each oocyte is a zona pellucida, membrana granulosa, and theca cell layer. Each oocyte finishes its first meiotic division, creating a secondary oocyte and polar body, which serves no further function.
- It begins the next meiosis cycle and is arrested in its second metaphase, at which point it is released from the ovary in ovulation.
- It will not finish the meiosis cycle until it encounters the stimuli of a sperm.

Process of Human Oogenesis

- At the start of the menstrual cycle some 12 to 20 primary follicles begin to develop under the influence of elevated FSH to form secondary follicles.
- By around day 9 of the cycle only one healthy secondary follicle is remaining, with the rest having undergone atresia.
- The remaining follicle is called the dominant follicle and is responsible for producing large amounts of oestradiol during the late follicular phase. Oestradiol production depends on co-operation between the theca and granulosa cells.



On day 14 of the cycle an LH surge occurs which is triggered by positive feedback of oestradiol. This causes the secondary follicle to turn into a tertiary follicle which ovulates some 24–36 hours later.

An important event in the tertiary follicle is that the primary oocyte completes the first meiotic division with formation of a polar body and a secondary oocyte.

The empty follicle then forms a corpus luteum (The **corpus luteum** (plural **corpora lutea**) is a temporary endocrine structure in mammals, involved in production of progesterone, which is needed to maintain the endometrium.).

