# Oogenesis

Oogenesis is the female gametogenesis that results in production of a mature egg. Females have a set number of primary oocytes that are created during the third trimester at birth. Primary oocytes, which are diploid, enter meiosis I once a month (coinciding with the menstrual cycle). The products of meiosis I are one haploid secondary oocyte and one polar body. The polar body is created because the secondary oocyte takes a disproportionate amount of cytoplasm. The polar body does not undergo any additional divisions and gets rid of one haploid set of chromosomes. The secondary oocyte enters meiosis II, but is frozen in metaphase II until fertilization occurs. During ovulation, the egg matures further and is released from the ovarian follicles into the oviduct. If it is fertilized by sperm, it finishes meiosis II and becomes an ootid. In meiosis II, another polar body is produced, analogous to meiosis I. The ootid matures into an ovum, with sperm already fertilizing it. Once the sperm and egg nuclei fuse, a zygote is formed, which is diploid again, and this serves as the starting cell of a human baby.




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## Characteristics

**Primary Oocytes From Birth**
(1) Wand O-Faced Baby in Seat
Females are born with a set number of primary oocytes at birth. Oocytes are immature eggs, and oogenesis results in the formation of primary oocytes during the fetal period.

**Meiosis I Once a Month**
Mouse-rose (1) Wand watching Monthly-moon
Meiosis I only occurs once a month in females. Primary oocytes enter meiosis I as diploid and are reduced to haploid secondary oocytes. Genetic diversification occurs here because of crossing over and independent assortment.

**Secondary Oocyte Plus Polar Body**
(2) Tutu O-Face baby and Polar-bear
The products of meiosis I are a secondary oocyte and one polar body. The polar body is produced because the secondary oocyte takes a disproportionate amount of cytoplasm. The polar body, subsequently, does not undergo any additional divisions.

**Frozen in Metaphase II, in Meiosis II**
Meat Plate, (2) Tutu Baby Seat, and (2) Tutu Mouse-Rose in Ice Cube
Secondary oocytes are frozen in metaphase II (metaphase in meiosis II) until fertilization occurs (if it does occur). If fertilization occurs, an ootid and another polar body are produced.

**Ovulation**
Ice-cube leaving the moon through Oval
Ovulation is the phase of the menstrual cycle where a mature egg is released into the oviduct from the ovarian follicles. Afterwards, it is available for fertilization by sperm.

**Fertilization by Sperm**
Sperm Attacking ice cube
The secondary oocyte requires fertilization in order to finish meiosis II and proceed along the developmental pathway.

**Meiosis II**
Mouse-rose in (2) Tutu
Meiosis II finishes upon fertilization by sperm. Once this occurs, the ootid that leaves meiosis II can further develop.

**Ovum**
Ovum-oven
The ootid develops into a mature ovum after meiosis II, which is a haploid female gamete.

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**Zygote Forms**

Zorro-goat

The nuclei of the ovum and the penetrating sperm fuse which results in zygote formation. The zygote is now diploid and is the starting cell of the child.

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