Oocyte Encyclopedia Article

Oocyte

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Oocyte

An oocyte is a developing ovum which undergoes two meiotic (maturation) divisions to give rise to the mature female gamete, the egg. A fetus destined to becoming a female has primordial germ cells which migrate to the ovary. The primordial germ cells when in the ovary are known as oogonia. They proliferate in the ovary. In humans, oogonia vary in abundance with the largest number present at birth and a declining prevalence thereafter. Oogonia contain the same chromosome number, diploid, as body (somatic) cells. Oogonia give rise to primary oocytes which begin the first meiotic division. Primary oocytes in humans are found in the ovarian cortex and soon become surrounded by other ovarian cells to form primary non-fluid filled follicles. The primary oocyte grows in the follicle from a cell about 0.0008 in (0.02 mm) to a cell about 0.0055 in (0.14 mm) diameter while the follicle matures to its characteristic fluid filled structure. The great growth of the oocyte is associated with the fact that in mammals in general, and humans in particular, the fertilized ovum is enclosed in a capsule (the zone pellucida) and receives no nourishment from the mother until after transit of the uterine (Fallopian) tube, where fertilization occurs, and entrance into the uterus proper where implantation occurs. From fertilization through implantation in humans is about seven days and the zygote grows from one cell to a blastocyst containing the inner cell mass during that time. The primary follicles do not form mature follicles until the onset of puberty. At that time, certain oogonia contained within follicles may begin to grow. At about the time of ovulation, the primary oocyte finishes its first meiotic division and gives rise to a secondary oocyte and a first polar body. The secondary oocyte is lost if fertilization does not occur. However, if the secondary oocyte encounters a sperm and fertilization occurs, the second meiotic division proceeds resulting in a mature egg and the extrusion of the second polar body. The mature egg pronucleus is haploid and the sperm pronucleus is haploid and when they fuse, a zygote nucleus is formed which has the characteristic diploid chromosome number of the species. Oocytes disappear within a few years after menopause.