



DSE-1BT: Developmental aspects of embryo

Gametogenesis:

❖ Ultra structure of ovum

Ovum is a maternal haploid gamete and is primarily concerned with receiving the sperm and is determined to develop into a fully developed multicellular organism after fertilization (syngamy) or without fertilization (parthenogenesis). It is generally with reserve food and is genetically programmed.

An ovum is generally spherical, non-motile gamete with yolky cytoplasm and enclosed in one or more egg envelopes. Size of ovum varies in different animals and depends upon the amount of yolk. Size of ovum varies from 10μ to a few cm.

Largest sized egg is of ostrich and is about 170 x 135 mm. Egg size and yolk amount are interdependent. It is about 50μ in many polychaete worms, 150μ in tunicates but very large sized in birds and reptiles. In mammals, it is generally microlecithal and about 100μ .

Human ovum is microlecithal with large amount of cytoplasm. Cytoplasm is differentiated into outer, smaller and transparent exoplasm or egg cortex and inner, larger and opaque endoplasm or ooplasm. Egg cortex is with some cytoskeletal structures like microtubules and microfilaments, pigment granules and cortical granules of mucopolysaccharides. Endoplasm is with cell-organelles, informosomes, tRNAs, histones, enzymes etc.

Nucleus of ovum is large, bloated with nucleoplasm and is called germinal vesicle. Nucleus is excentric in position so human ovum has a polarity. The side of ovum with nucleus and polar body is called animal pole, while the opposite side is called vegetal pole.

Egg envelopes:

Human ovum is surrounded by a number of egg envelopes:

1. Vitelline membrane:

It is inner, thin, transparent and is secreted by ovum itself.

2. Zona pellucid:

It is middle, thick, transparent and non-cellular. It is secreted partly by follicular cells and partly by the oocyte.

3. Corona radiate:

It is outer, thicker coat formed of radially elongated follicular cells. Between the vitelline membrane and zona pellucid there is a narrow perivitelline space.

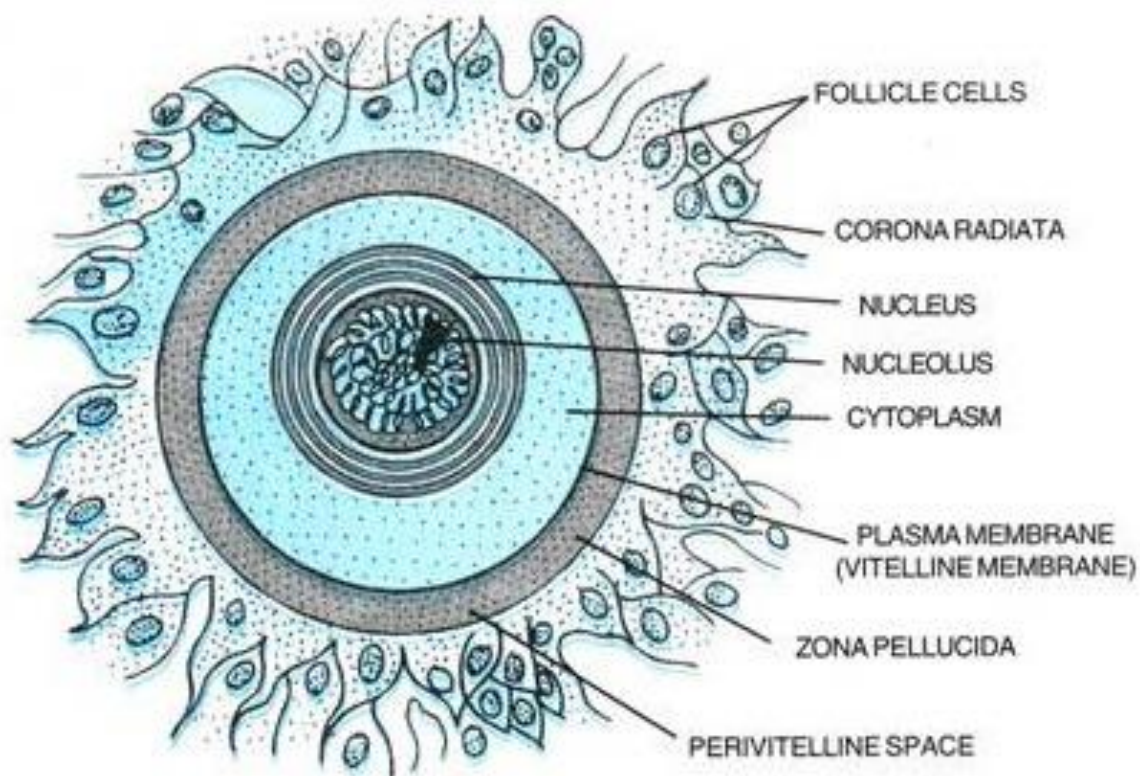


Fig. 3.17. Structure of ovum.