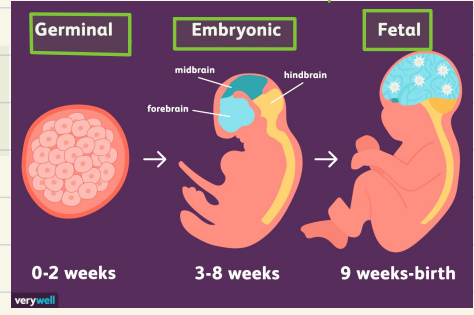


The Intrauterine life - Fertilization

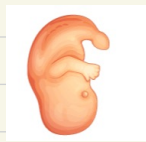
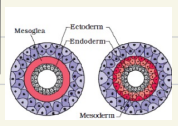
* it is the time between fertilization and birth of new individual

* about 10 lunar month

intrauterine life periods

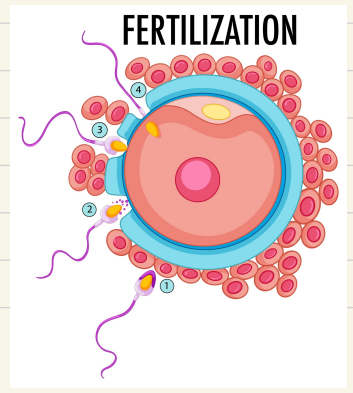
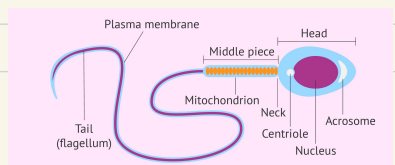


	Germinal Period	embryonic Period	Fetal Period
Duration	First two weeks	3-8 weeks	From beginning of 9th week to birth
Characters	2 germ layers [ectoderm & endoderm]	* Formation of mesoderm * differentiation of 3 layers to organ + systems <i>organogenesis</i>	* growth of organs & systems * appearance of external features of fetus
Congenital anomalies	more liable to occur		less liable to occur



First week of development is characterized by 4 processes :

- 1 Fertilization
- 2 migration
- 3 cleavage
- 4 implantation

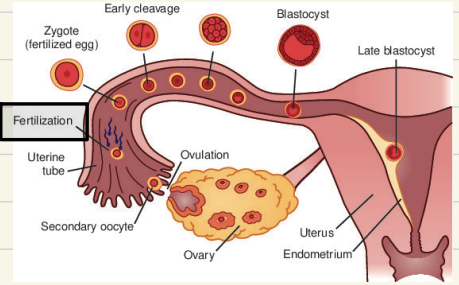


Fertilization \rightsquigarrow Fusion between a single sperm and ovum to form Zygote

Site \Rightarrow ampulla of uterine tube

Process of Fertilization

1. Capacitation of Sperms

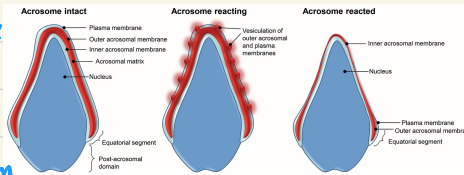


* Occurs in uterus and uterine tube

* removal of glycoprotein which covers acrosome of the sperm

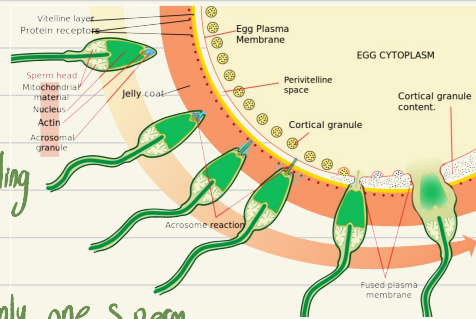
* the sperm becomes hyperactive, their tail move frequently and their head moves laterally

* this increase the activity of sperm



* only capacitated sperm can pass through corona radiata and undergo acrosome reaction

2. Penetration of Zona Pellucida:



* Capacitated sperm pass through corona radiata to reach and bind to the zona pellucida at specific binding sites

* they start secreting acrosomal enzymes that allow only one sperm to penetrate the zona pellucida \rightarrow acrosomal reaction

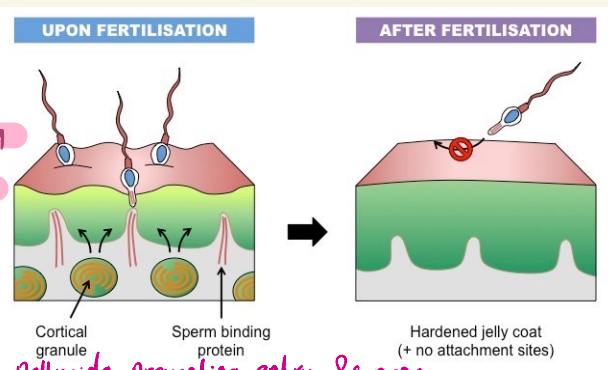
* the head of that sperm reaches plasma membrane of secondary oocyte

* the plasma membrane fuses with 2^o oocyte \rightarrow content of sperm enter cytoplasm of 2^o oocyte, leaving its cell membrane outside

3. Cortical and Zona reaction

Secondary oocyte releases enzymes from cortical granules lining its plasma membrane

These enzymes cause:



1 change of sperm binding sites at Zona pellucida preventing entry of sperms

2 changing the plasma membrane becoming impermeable to other sperms

4. Completion of 2nd meiosis

2nd oocyte changes to an ovum

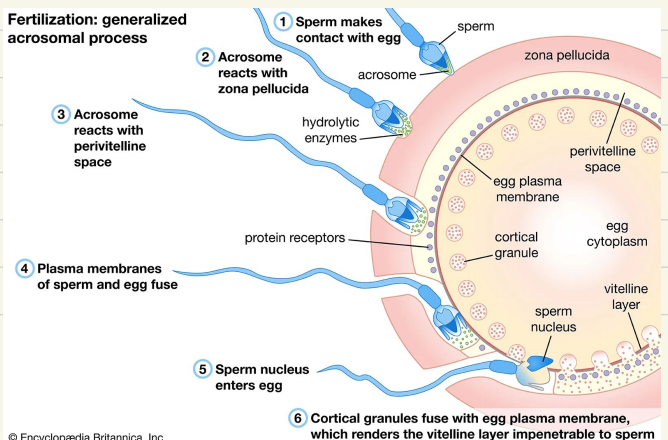
5. Formation of male and female pronuclei:

* nucleus of the head of sperm separates and enlarges to form male pronucleus

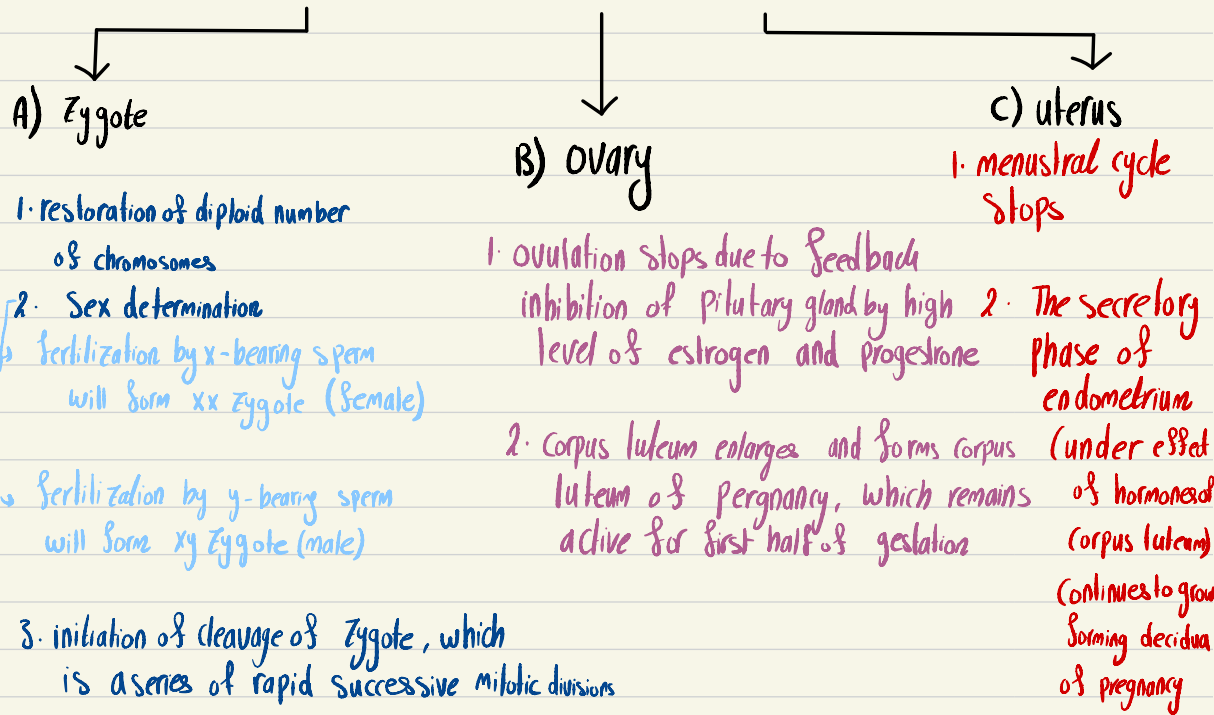
* The nucleus of the mature ovum forms female pronucleus

6. Fusion of the male and female pronuclei

with loss of their nuclear membrane to form a new cell called zygote



Result of fertilization



Chromosomal anomalies

A) Sex hormone anomalies

Klinefelter syndrome ($44+XXY$): male with rudimentary testis

Turner syndrome ($44+XO$) female with rudimentary ovaries and no sex maturation

B) Autosomal anomalies: Down syndrome or trisomy of chromosome 21 (mongolism) in which zygote contain 47 chromosomes either ($45+xy$) or ($45+xx$)