What is embryology?

Embryology is the branch of science which deals with the development of Zygote in a individual.

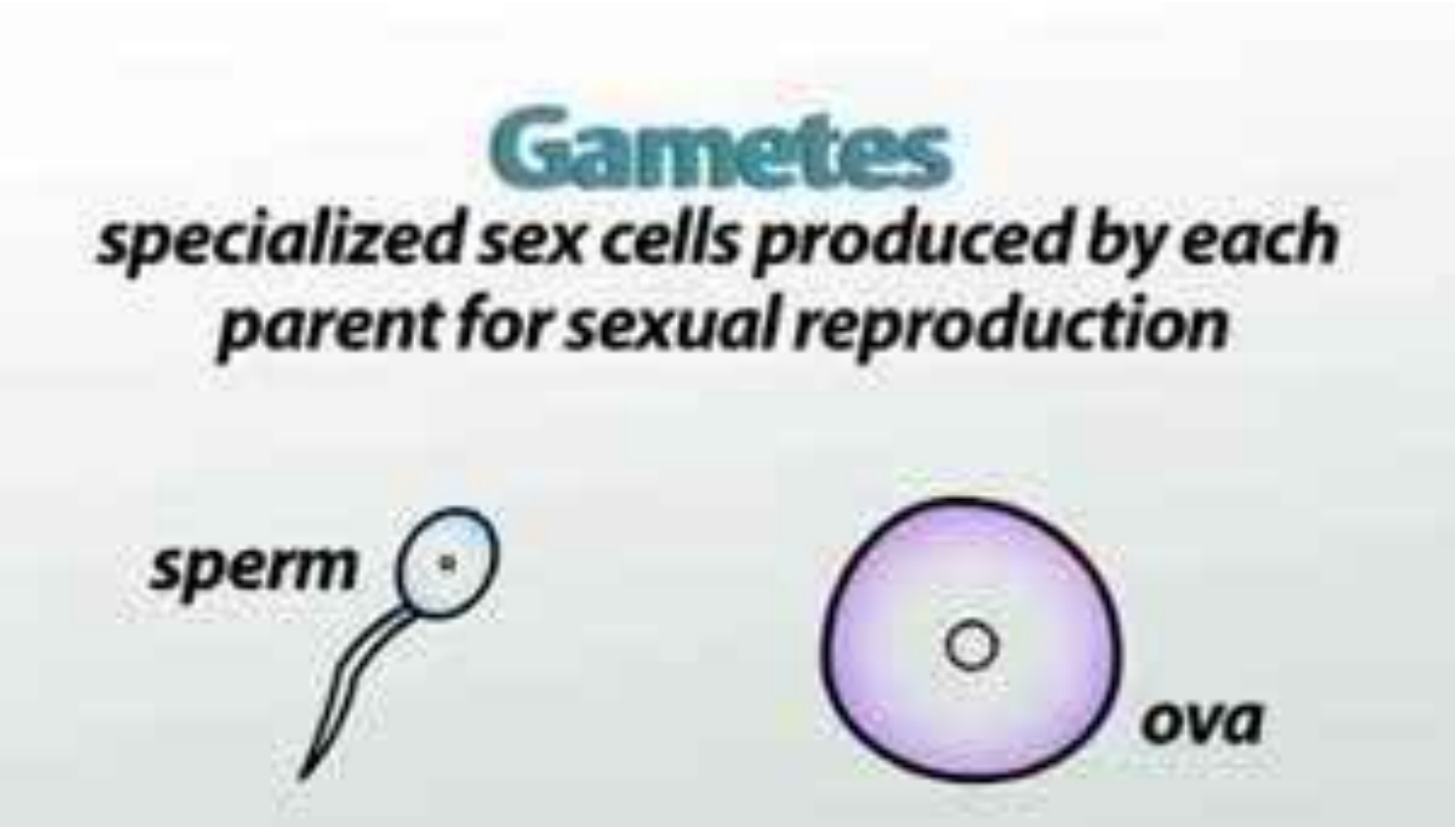
Book Reference:
An Introduction to Embryology
-B.I. Balinsky

Zygote development:

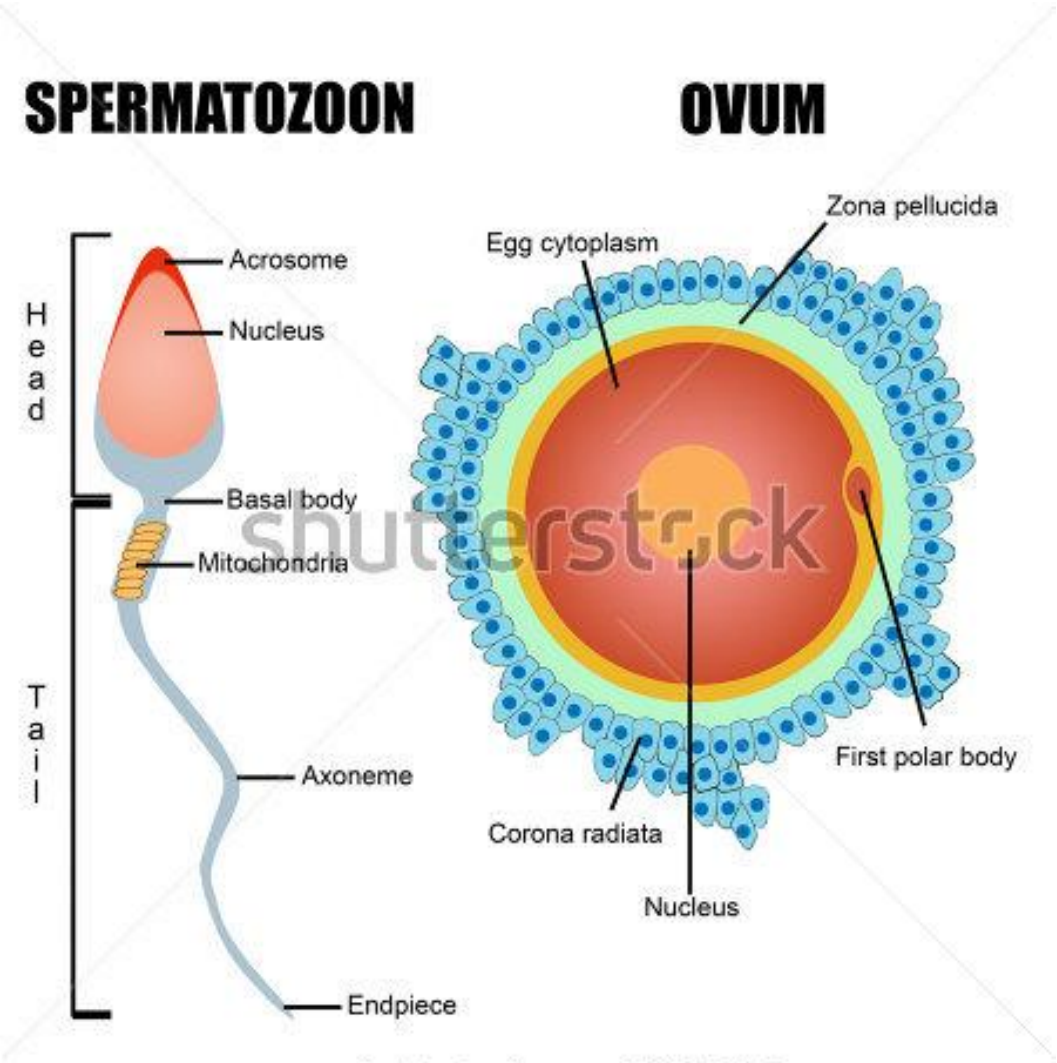
1) **Ontogenetic/Embrological development**
2) **Phylogenetic/Evolution**

There are six phases of ontogenetic development:

1) **Gametogenesis**
2) **Fertilization**
3) **Cleavage**
4) **Gastrulation**
5) **Organogenesis**
6) **Growth & histological differences**



Gamete: An egg or sperm.


SPERMATOZOON
OVUM
Head
Tail
Acrosome
Nucleus
Basal body
Mitochondria
Axoneme
Endpiece
Zona pellucida
Egg cytoplasm
First polar body
Corona radiata
Nucleus
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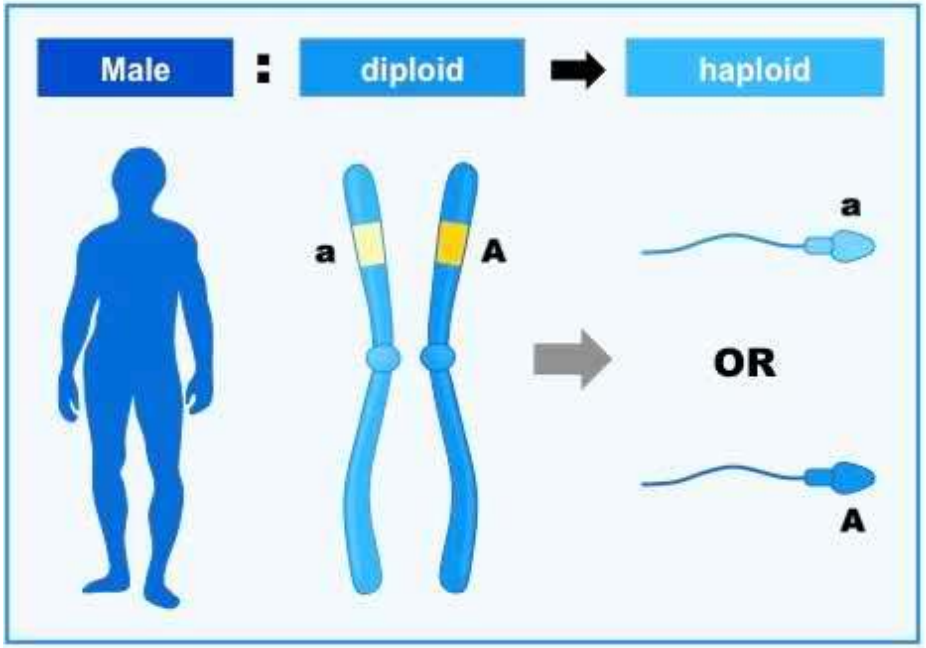
Male
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diploid
haploid
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OR
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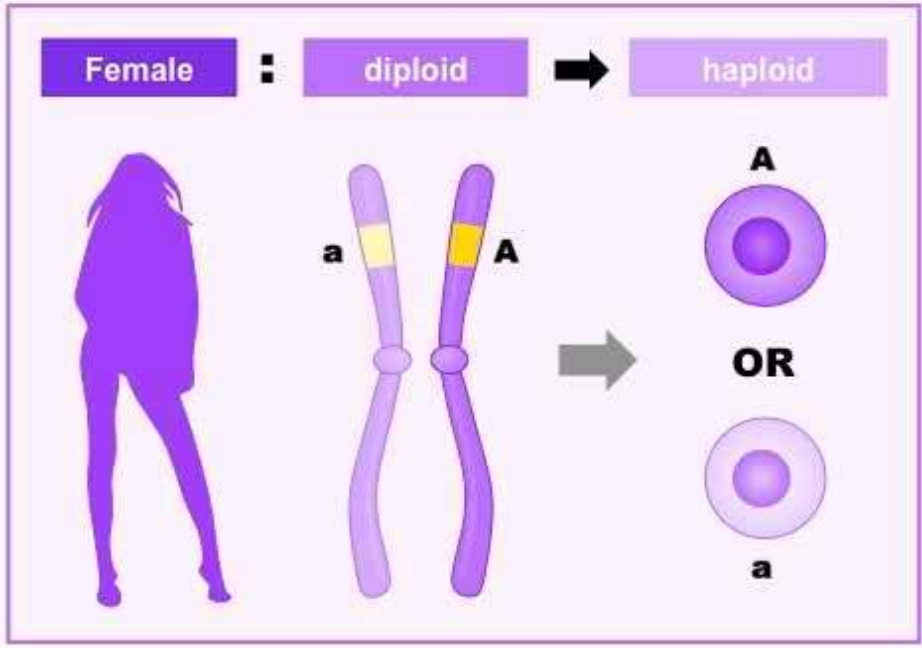
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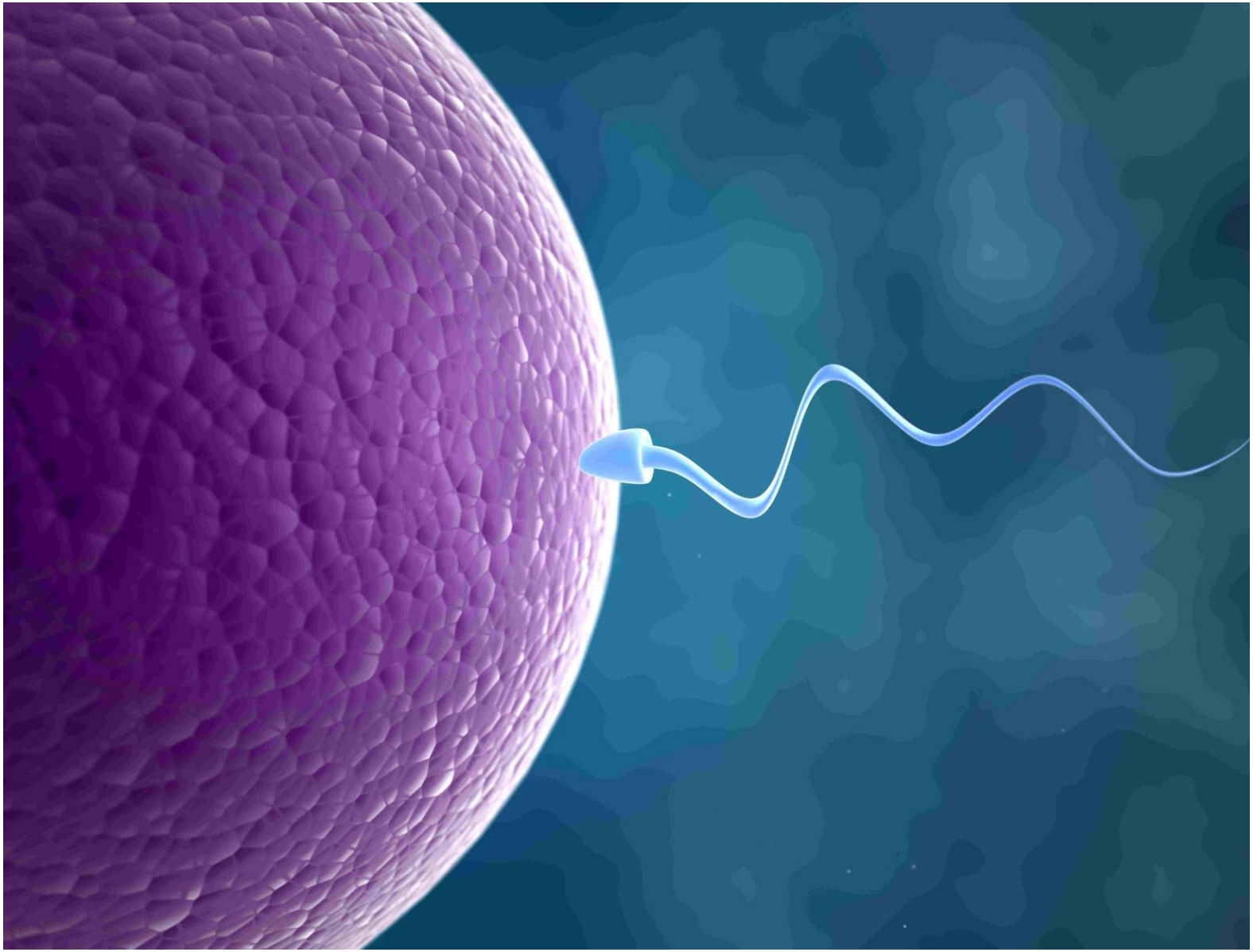

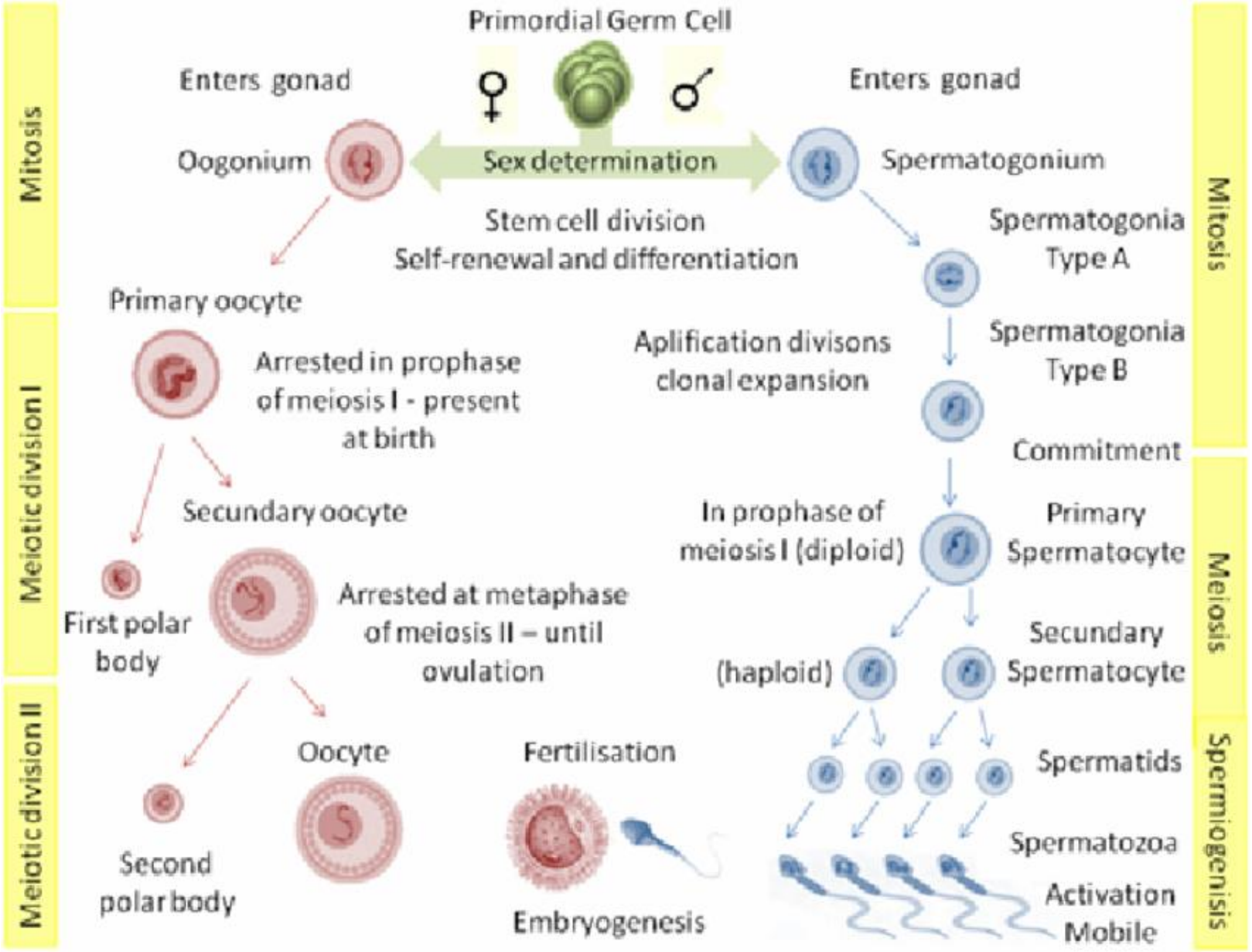
Mitosis
Meiotic division I
Meiotic division II
Primordial Germ Cell
Enters gonad
Oogonium
Sex determination
Enters gonad
Spermatogonium
Stem cell division
Self-renewal and differentiation
Spermatogonia Type A
Primary oocyte
Arrested in prophase of meiosis I - present at birth
Aplification divisons clonal expansion
Spermatogonia Type B
Commitment
Secundary oocyte
In prophase of meiosis I (diploid)
Primary Spermatocyte
First polar body
Arrested at metaphase of meiosis II – until ovulation
(haploid)
Secundary Spermatocyte
Oocyte
Fertilisation
Spermatids
Second polar body
Spermatozoa
Activation
Mobile
Embryogenesis
Mitosis
Meiosis
Spermiogenisis

Importance of embryology in Fisheries Science:

1) **To understand the early life stage of fishes. Therefore, embryology knowledge may help to improve the fertilization rate.**
2) **To control the proper development of fishes in their early stages.**
3) **Help to run a commercial fish farm properly. Therefore, it is possible to get profit from fish farming.**
4) **To yield better fish production in aquaculture.**