Syllabus:

Course No. FBG 123

Course Title: Embryology of Aquatic Animals

Credit: 2

Course objectives :

Students successfully completing this course should be able to describe the processes of cleavage, gastrulation and neurulation in aquatic animals, describe patterns of organogenesis common to all vertebrates and identify embryological structures in multiple planes over successive developmental stages.

Course contents :

1.The origin and structure of gametes.
2. Fertilization: Types, mechanism of egg-sperm interaction, fusion of gametes, prevention of polyspermy.
3. Cleavage: Patterns of cleavage in different animals, blastulation Gastrulation: Fate of cells, gastrulation in different animals and formation of organ rudiments, Organization of early embryo, epigenesis, nucleic acid and protein synthesis in embryos, Organogenesis: formation of general body form.
4. Embryonic development of representative animal groups.

Text books :

Balinsky, B. I. 1981. Introduction to Embryology (4th edition). Holt Rinehart & Winston. 688 pp.
Gilbert, S. F. 2010. Developmental Biology (9th edition) Sinauer Associates, Inc. Sunderland.711 pp.
Yvette, W. K. 2004. Developmental Biology of Teleost Fishes. Springer. 636 pp.

References :

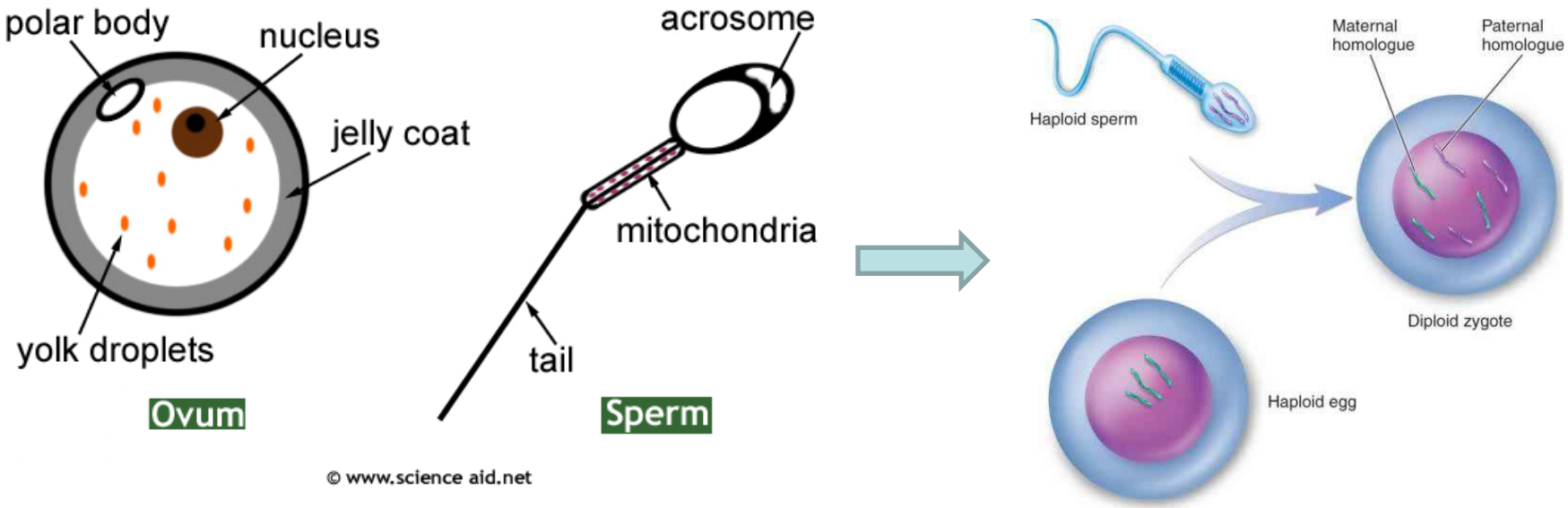
Belon, E. K. 1985. Early Life History of Fishes. Dr. W. Junk Publisher.
Nelson, O. E.1953. Comparative Embryology of Vertebrates. MaGraw Hill Book Company. 982 pp.
Wolpert, L. 1983. From Egg to Embryo: Determinative Events in Early Development. Cambridge University Press.

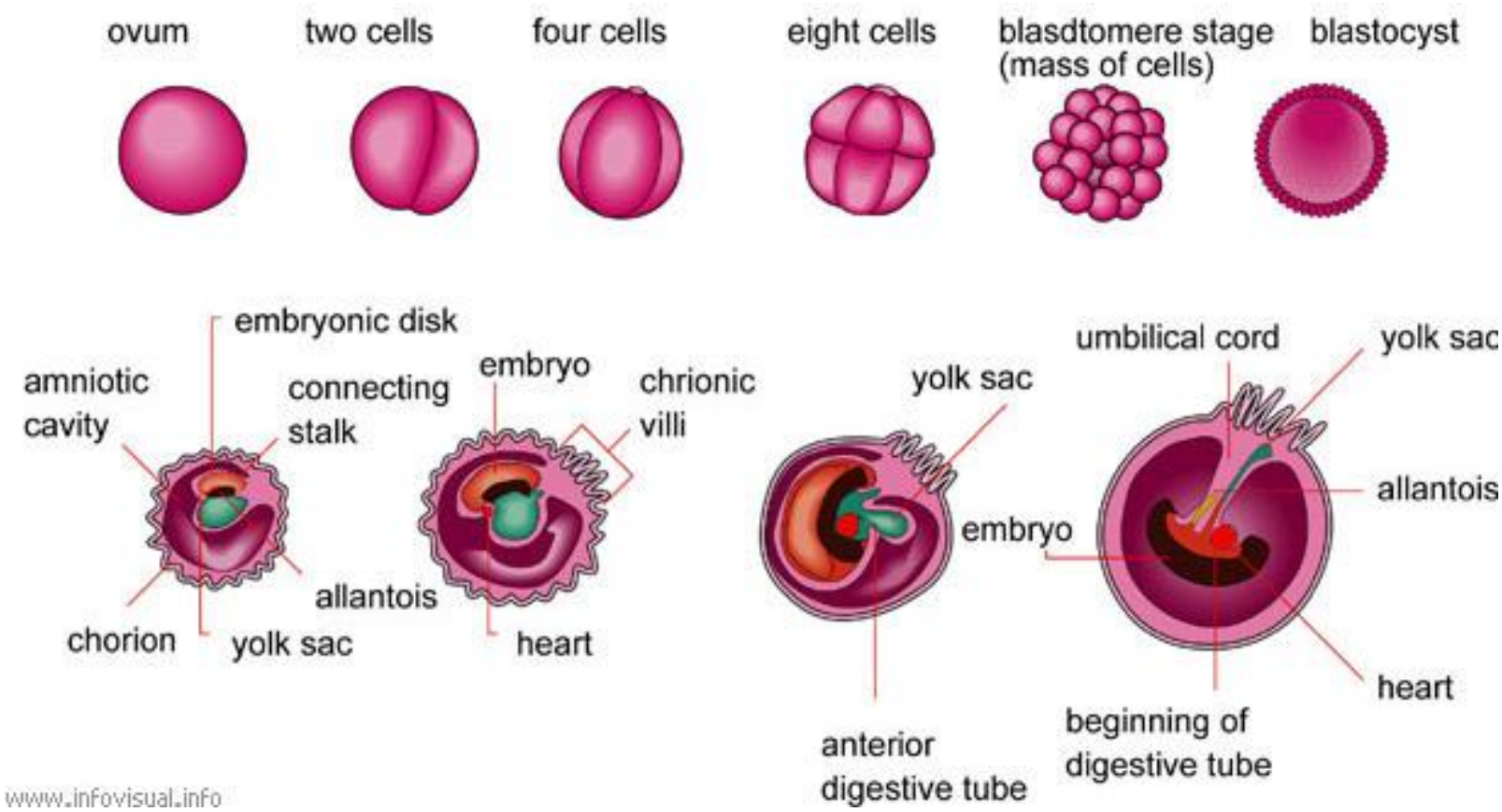
What is embryology:

Embryology (from Greek, *embryon*, "unborn, embryo"; and *-logia "knowledge*") is the study of the development of an embryo.

An embryo is defined as any organism in a stage before birth or hatching, or in plants, before germination occurs.

Fertilization: Fertilization is the fusion of two gametes (sex cells), a male and a female one, followed by the joining together of the nuclei of the two gametes.





Cleavage: cell resulting from fertilization in dividing, egg becomes a new being Ovum: female reproductive cell.
Two cells: part of its intrauterine growth when the ovule consists of two cells.
Four cells: part of its intrauterine growth when the ovule consists of four cells.
Eight cells: part of its intrauterine growth when the ovule consists of eight cells.
Blastomere stage (mass of cells): part of its intrauterine growth when the ovule consists of more than eight cells.
Blastocyst: part of development of the egg where the dividing cells form a sac.

Embryonic disk: round, flat form related to the embryo.
Connecting stalk: tissue that holds the embryo in place.
Embryo: organism in midst of development.
Chrionic villi: velvety surface of the placenta.
Yolk sac: pocket containing the vitellus.
Umbilical cord: cord connecting the fetus to the placenta.
Allantois: one of three accessory parts of the embryo.
Heart: blood-pumping organ.
Digestive tract developing: the beginning of the development of the digestive tract.
Anterior disgestive tube: terminal part of the cloaqua.
Chorion: external embryonic menbrane.

