

DEVELOPMENT Of CHICK

Egg

Type: The egg of chick is telolecithal, Macrolecithal

Release: The egg is released from the ovary; it takes 24 hours to pass down the oviduct, before being laid.

Fertilization

The fertilization is internal, upper part of the oviduct

Yolk Membrane

The layer of yellow yolk is thicker than those of the white yolks. Yolk consist of phospholipids, lecithin, Solid yolk shows 60% fats and 70% proteins , White yolk contains less fat and carotene.

Albumen

It has two types Thick albumen and thin albumen

Chalaza

Two end of the egg are some fibrous, rope like twisted structure formed during journey of the oviduct

Latebra

The central flask shaped area that is enclosed of white yolk is called latebra

Germinal Disc or Blastodisc

Nucleus of the egg is surrounded by the negligible amount of yolk free cytoplasm called germinal disc.

Cleavage or Segmentation

- it is meroblastic means confined to small area of blastodisc (called discoidal)
- The first two cleavage planes are vertical, cutting each other, while the third one is horizontal that cuts underneath the cytoplasm and it gets separated from yolk
- at the end cleavage 256 irregular cells formed

Blastulation

- A cavity is formed beneath the blastoderm by the detachment of its central cells from the underlying yolk which is called blastocoel.
- blastomeres are forced to become arranged in a disc-shaped mass on the surface of the yolk that is why blastula is called discoblastula.
- The epiblast divide into epiblast and hypoblast and blastocoel located between them.
- Area opaca: is the area where blastoderm is not detached from the yolk and It is peripheral. and the central area is called area pellucida.

Process Of Gastrulation

Converting of monoblastic egg into triploloblastic gastrula

Gastrulation involves the formation of ectoderm, endoderm and mesoderm

Primitive Streak Formation

The primitive streak is formed from the posterior marginal region cells .

The streak first becomes visible as the epiblast (ectoderm) thickens at the posterior pole .

Primitive Streak Formation 7-8 Hours After Fertilization

The epiblast (ectoderm) is separated from the hypoblast by the blastocoel; the epiblast will give rise to the three germ layers the embryo, while the hypoblast will give rise to extra embryonic structure.

Primitive Streak Extension 15-16 Hours After Fertilization

The primitive streak extends by convergent extension from the posterior to anterior pole.

A depression form along the primitive streak called primitive groove.

Formation of Henson's Node 19-22 Hours After Fertilization

This bird eyes view shows the primitive streak and Henson's node.

At this stage ingression through the primitive streak of cells destined to become endoderm and mesoderm has begun.

Henson's Node

It Is Formed by Cells Of Presumptive Notochord And Floor Of Neural Tube.

Formation of notochord (notogenesis)

A narrow strip of blastoderm just in front of primitive knot consist of presumptive notochordal cell responsible for the formation of notochord.

Formation of neural tube (neurogenesis)

In front of the primitive streak lie neural plate cells . These cells folds roll up and unite mid-dorsally ,enclosing a neural tube , forming fore brain , mid and hind brain.

Meroblastic somites

On either side of notochord lies thick, solid, dorsal somatic

Origin of coelom

The ventral or lateral plate mesoderm split into two layers

The outer somatic or parietal layer lies next to ectoderm with which it forms the somatopleure, the inner splanchnic or visceral layer in contact with endoderm form the splanchnopleure. Space or cavity formed between these two mesodermal layers is coelom or splanchnocoel.

EXTRA EMBRYONIC MEMBRANE OR FOETAL MEMBRANE**YOLK SAC**

The chief embryonic food is yolk which is surrounded by the sac like membrane called yolk sac, Yolk sac is made up of splanchnopleure. The function of yolk sac is to protect the yolk keep it in position, digest and absorb it. Yolk sac serves as a primary organ of nutrition of embryo

AMNION: It is made up of inner ectoderm, the space between amnion and embryo is filled with amniotic cavity having amniotic fluid. It protects the embryo from mechanical jerks and prevent its dehydration.

CHORION

It is made up of outer ectoderm, the cavity between amnion and chorion is called chorionic cavity, Chorion also provides the liquid medium for the embryo.

ALLANTOISE

The bladder like structure, Allantois is made up of splanchnopleure endoderm inside and splanchnic mesoderm outside.

ALLANTO- CHORION

The mesodermal layers joined the allantois with chorion called allanto-chorion, a compound layer is formed, it serves as Respiratory organ, Excretory organ, Nutritional organ.

Table 47.1 Derivatives of the Three Embryonic Germ Layers in Vertebrates

Germ Layer	Organs and Tissues in the Adult
Ectoderm	Epidermis of skin and its derivatives (e.g., skin glands, nails); epithelial lining of mouth and rectum; sense receptors in epidermis; cornea and lens of eye; nervous system; adrenal medulla; tooth enamel; epithelium of pineal and pituitary glands.
Endoderm	Epithelial lining of digestive tract (except mouth and rectum); epithelial lining of respiratory system; liver; pancreas; thyroid; parathyroids; thymus; lining of urethra, urinary bladder, and reproductive system.
Mesoderm	Notochord; skeletal system; muscular system; circulatory and lymphatic systems; excretory system; reproductive system (except germ cells, which start to differentiate during cleavage); dermis of skin; lining of body cavity; adrenal cortex.

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