Fate map in Frog

Zoology department

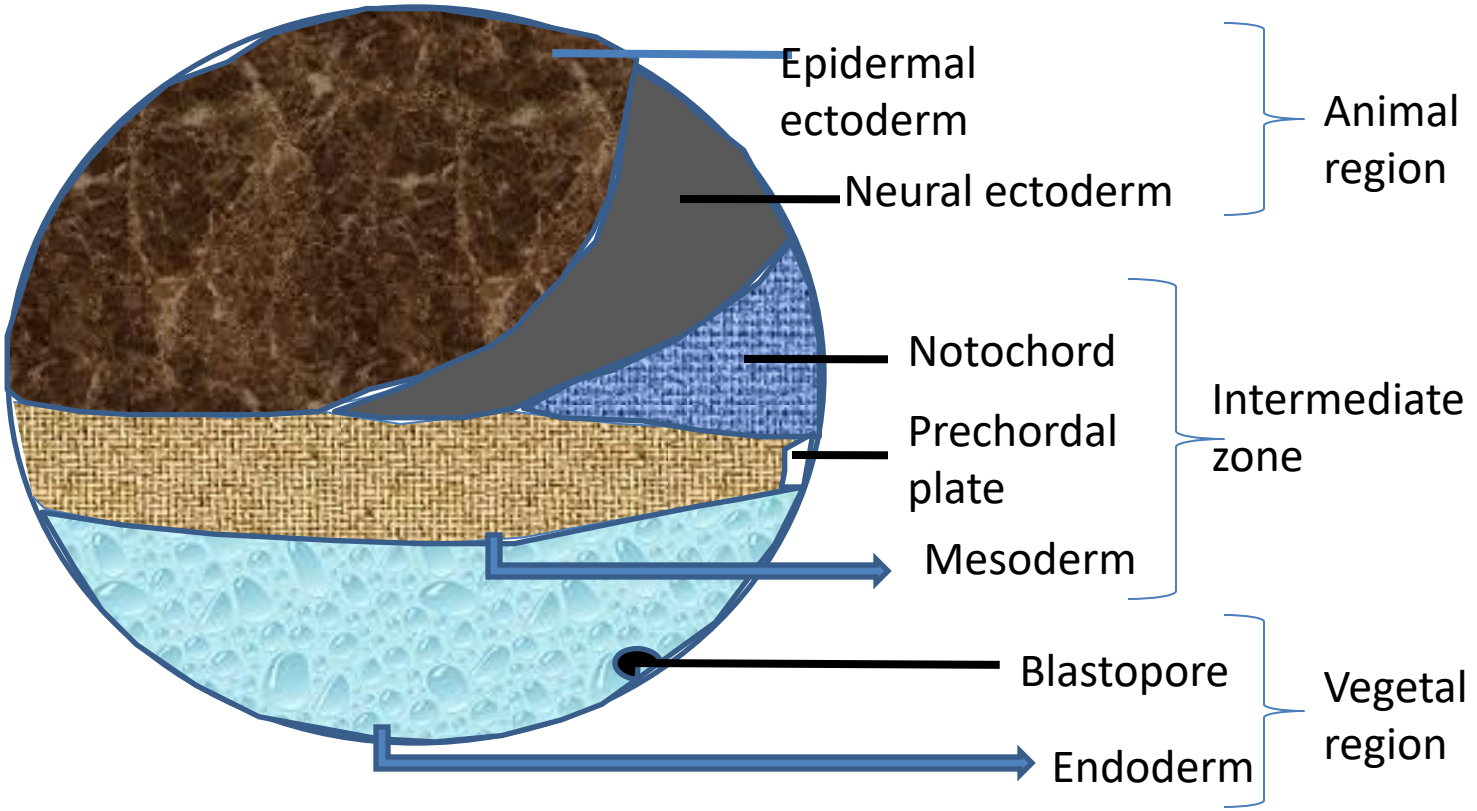
Fate map and its significance.

- The topographical surface mapping to show the fate of each part of an early embryo i.e., blastula) is called the **Fate map**.
- Fate mapping is necessary because the correct interpretation of gastrulation is possible, only if we have perfect knowledge of the position of the **presumptive germinal layers** occupying the blastula.

Methods of construction of fate map: Generally two methods: Natural & artificial

- 1. **Natural markings**: In some animals, the egg cytoplasm is differentiated into distinctive regions having natural colour differences.
- Due to this, it is possible to follow the fate of these regions and the complete cell lineages.
- 2. **Artificial markings**: Vital staining; Carbon particle marking; Radioactive labeling; Fluorescence technique, Genetic marking etc.

Perspective fate map of Frog.



The whole surface of a frog blastula can be divided into:

- 1. A large dark grey or black area on and around the **animal pole**. It consists of two main regions:
- a. A region of **perspective epidermal ectoderm** which gives rise to skin and its derivatives.
- b. Region of **perspective central nervous system** which contains materials for brain, spinal cord and the area of sense organs (Eyes, ears, nose).

2. The grey crescent area lying in the intermediate or the marginal zone extending around the equatorial area. It consists of the following regions:

- **a. Perspective Notochord**: It is the region which gives rise to notochord.
- **b. Prechordal plate:** Area which lies near the notochordal region which develops into connective tissues of the embryo.
- **c. Perspective Endoderm:** It lies below the prechordal plate and gives rise to the endodermal lining of the mouth, gill region and pharynx.
- **d. Region of segmental muscles** that lies on both the sides of the notochordal area and develops into trunk muscles or somites.
- **e. Ventro-lateral mesoderm** consisting of lateral and ventral parts of marginal zone and gives rise to the mesodermal lining of the body cavity, kidneys and reproductive organs.

3. Vegetal region

- It occupies the **vegetal half of the blastula** and is formed of unpigmented large macromeres. This region develops into the midgut and hind gut.