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**Gastrulation and Gastrula**

**Synopsis**

1. **Introduction**
2. **Gastrula**
3. **Gastrulation**
4. **Archenteron**
5. **Germ layers**
6. **Outer Ectoderm (Epiblast)**
7. **Middle Mesoderm (Mesoblast)**
8. **Inner Endoderm (Hypoblast)**
9. **Salient features of Gastrulation**
10. **Introduction**

* **1. Embryology - the science dealing with the embryo and its development**
* **2. EMBRYOGENY/EMBRYOGENESIS - the development of the embryo**
* **3. EMBRYO - the juvenile stage of an animal while it is contained in the egg (within the egg membranes) or in the maternal body**
* **4. Types of eggs based on the amount of yolk they contain:**
  + **i. MICROLECITHAL (OLIGOLECITHAL) - little yolk present (amphioxus, marsupial and placental mammals)**
  + **ii. MESOLECITHAL - moderate amounts of yolk present (lamprey, sturgeon, lungfish, and amphibians)**

**iii.. MACROLECITHAL (POLYLECITHAL) - large amounts of yolk present (hagfish, sharks, rays, teleost fish, reptiles, birds, and monotreme mammals)**

* **5. Types of eggs based on how the yolk is distributed in it:**

**The pole where the yolk is concentrated is called vegetalpole, the opposite end (with nucleus) is the animal pole.**

1. **Isolecithal (homolecithal) - the yolk is diffused throughout the egg (true for microlecithal eggs) microscopic eggs of mammals, amphioxus**
2. **Telolecithal - the yolk is concentrated towards one side of the egg (true for mesolecithal and macrolecithal eggs) : fishes, reptiles amphibians, birds**

* **Embryology: Embryogenesis and Organogenesis**
* **Embryogenesis – development of primary germ layers and their locations Organogenesis – formation of the different organs (Organogenesis)**

**Stages of Embryogenesis**

**Fertilization zygote cleavage**

**Blastulation Gastrulation Neurulation**

**organ formation**

**Blastulation and types of Blastula**

**Blastulation:**

* **The development of blastula is blastulation**
* **As the cleavage is going on, a central cavity develops among the blastomeres. This cavity is called blastocoel**
* **It begins to develop from the four cell stage**
* **It is filled with a gelatinous fluid called blastocoel jelly**
* **This jelly gradually absorbs water from athe surrounding medium and the cavity increases in its volume**
* **The embryo in this stage is called Blastula**

**Blastula**

* **Cleavage produces an embryonic stage is called Blastula**
* **It is developed from the Zygote**
* **It is more or less spherical in shape with a cavity inside called Blastocoel**
* **It is formed of more than 200 cells**
* **The cells are arranged in layer around the cavity. This layer of cells is called blastoderm**
* **The blastoderm is formed of two ypes of cells, namley micromeres and macromeres**
* **The micromeres are situated at the animal pole and the macromeres are at the vegetal pole**
* **Hence the blastocoel is eccentric and not central**

1. **Gastrula**

**The single layered blastula Is converted into a double or triple layered embryonic stage called Gastrula.**

1. **Gastrulation**

**The development of gastrula is called gastrulation**

1. **Archenteron or Gastrocoel or Primitive gut**

* **The gastrula has a cavity called gastrocoel or archenteron or primitive gut**

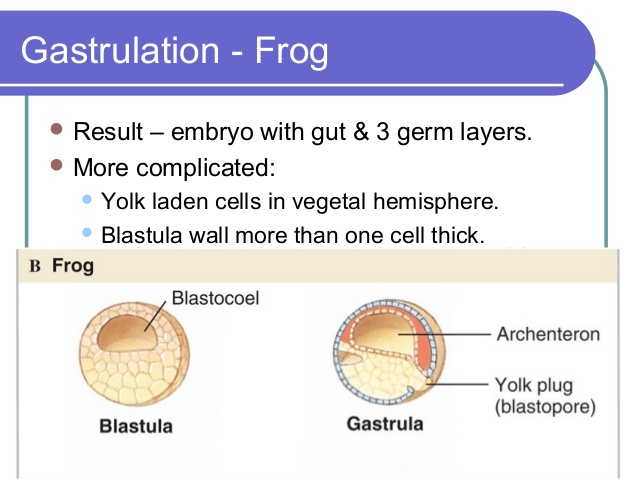
1. **Germ layers**

* **A gastrula is formed of three layers of cells called germ layers with a cavity inside. They are**

1. **Outer Ectoderm (Epiblast)**
2. **Middle Mesoderm (Mesoblast)**
3. **Inner Endoderm (Hypoblast)**

* **The archenteron may open to the outside by an opening called blastopore**
* **The cavity inside is called archenteron or primitive gut or gastrocoel**

1. **Salient features of gastrulation**
   * **Gastrulation converts blastula into gastrula.**
   * **Cells move from one place to another and these movements are called morphogenetic movements**
   * **The cells are arranged into 3 germ layers by morphogenetic movements**
   * **A new cavity called archenteron is formed**

* **The rate of cell division is reduced**
* **The nuclei are more active**
* **The rate of oxidation is increased**
* **The paternal genes express themselves**
* **New proteins are synthesized**

**Author**

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