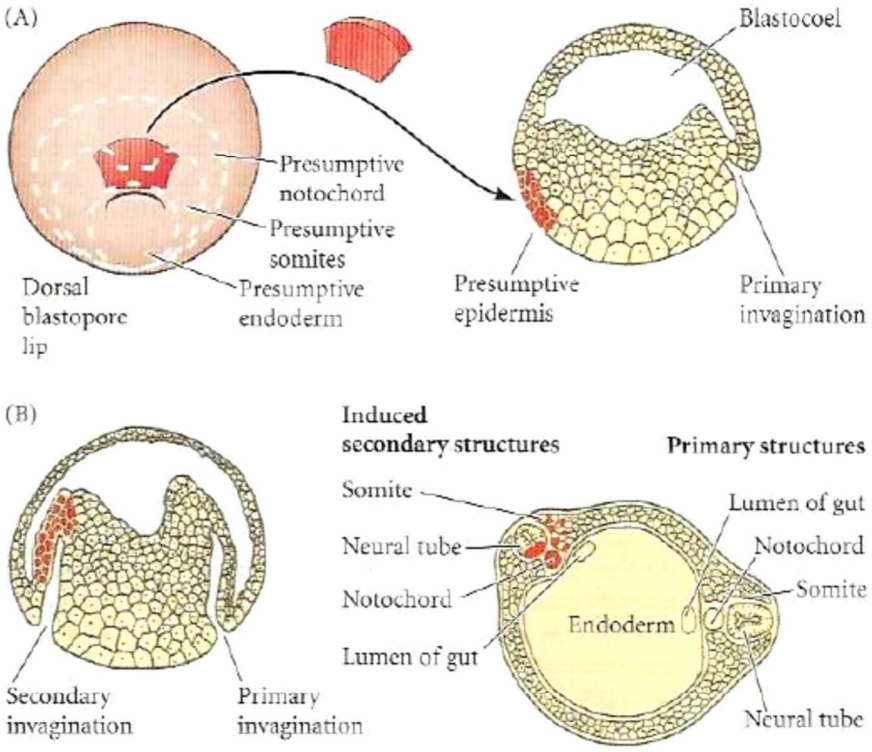
Primary Organizer

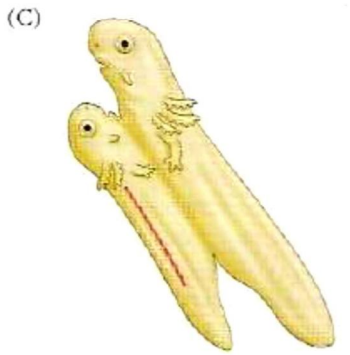
An "organizer" is a group of cells that has ability to change the fate and produce an organized set of structures in neighbouring embryonic cells. Followings are some of them: the primary or Spemann organizer (Hensen's node in amniotes), the notochord, the zone of polarizing activity of the limb bud, and the mid-hindbrain boundary. (Anderson and Stern, 2012)

Amphibia

In amphibians, dorsal lip cells and their derivatives (notochord and head endomesoderm) are referred to as the organizers because
(1) They induce the host's ventral tissues to form a neural tube and dorsal mesodermal tissue (such as somites)
(2) They organize host and donor tissues into a secondary embryo with clear anterior-posterior and dorsal-ventral axes.
During normal development, these cells "organize" the dorsal ectoderm into a neural tube and transform the adjoining mesoderm into the anterior-posterior body axis (Spemann 1938). As there are many inductions during embryonic development, the progeny of dorsal lip cells is traditionally called the primary embryonic induction.



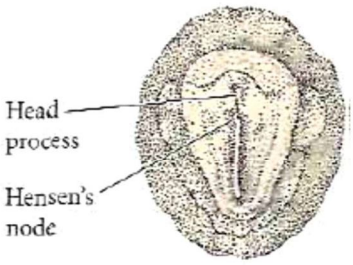
Organization of a secondary axis by dorsal blastopore lip tissue. (A-C) Spemann and Mangold's 1924 experiments visualized the process by using differently pigmented newt embryos. (A) Dorsal lip tissue from an early *T. taeniatus* gastrula is transplanted into a *T. cristatus* gastrula in the region that normally becomes ventral epidermis. (B) The donor tissue invaginates and forms a second archentcron, and then a second embryonic axis. Both donor and host tissues are seen in the new neural tube, notochord, and somites.
(C) Eventually, a second embryo forms joined to the host.



The chick "organizer"

The "organizer" of the chick embryo forms from cells initially located just anterior to the posterior marginal zone- The epiblast and middle layer cells in the anterior portion of Koller's sickle become Hensen's node.

Hensen's node (also known as **primitive knot**) is found at the anterior end of the primitive streak (also known as the **primitive knot**). The center of Hensen's node contains a funnel-shaped depression (called **primitive pit**) through which cells can enter the embryo to form notochord and prechordal plate. It is the functional equivalent of the dorsal lip of the amphibian blastopore and the fish embryonic shield.



Primitive streak extends from posterior to anterior; migrating cells enter through its dorsal side and move to its ventral side; and separates the left portion of the embryo from the right. The axis of the streak is equivalent to the dorsal-ventral axis of amphibians. Hensen's node gives rise to the prechordal mesoderm, notochord, and medial part of the somites- Cells that ingress through the middle of the streak give rise to the lateral part of the somites and to the heart and kidneys. Cells in the posterior portion of the streak make the lateral plate and extraembryonic mesoderm.

References: Developmental Biology by Gilbert