

Embryology Assignment

Name of Lecturer: Mr Ogedengbe

Assignment: Explain the 2nd week of Development

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Answer.

2ND WEEK OF EMBRYONIC DEVELOPMENT

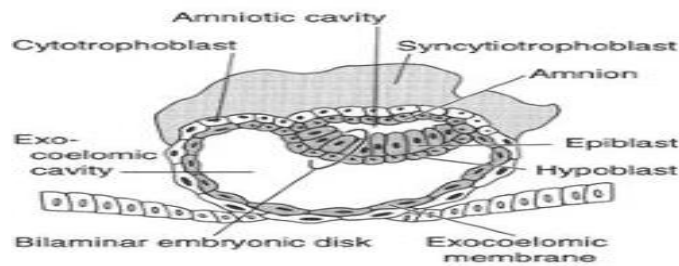
The second week of development is a period marked by;

1. Completion of implantation of the blastocyst
2. Formation of the bilaminar germ disc
3. Formation of extraembryonic structures

The development of the morula and the conversion of the morula to the blastocyst was an event that occurred in the 1st week of development. We also saw the differentiation of the trophoblast to syncytiotrophoblast and cytotrophoblast in which the syncytiotrophoblast begins to embed in the endometrium of the uterus.

During the **8th day**, the syncytiotrophoblast is partially embedded in the endometrium, cells from the cytotrophoblast divide and migrate to the region of the syncytiotrophoblast where they lose their individual cell membrane.

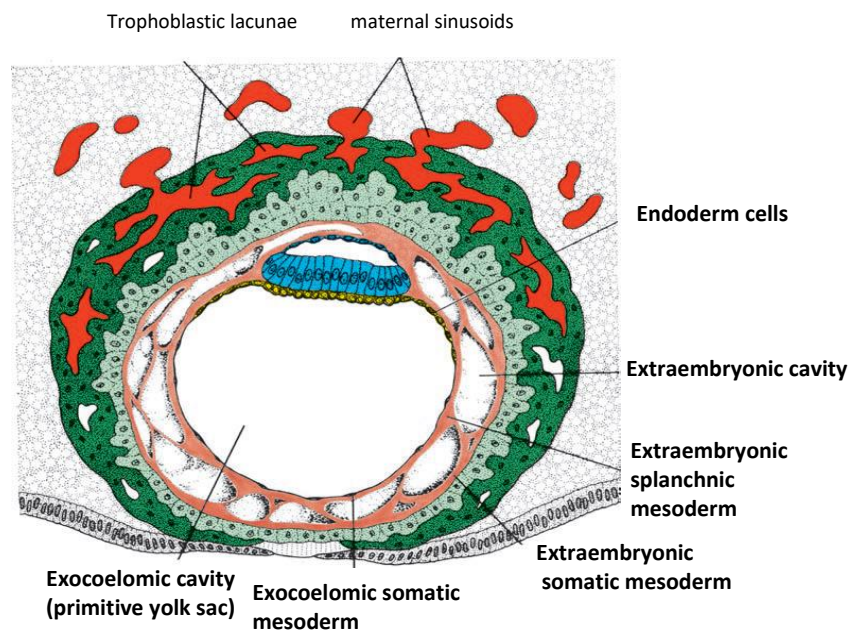
The cells in the embryoblast differentiate to form the epiblast and hypoblast. These two layers together form a flat disc called the bilaminar germ disc. The epiblast is made up of columnar cells while the hypoblast is made up of cuboidal cells. A cavity forms in the region of the epiblast and is called the Amniotic cavity. The epiblast cells adjacent to the cytotrophoblast is then called the amnioblast.



During the **9th day**, the blastocyst is deeply embedded in the endometrium. The surface defect on the endometrium is being covered by a *fibrin coagulum*. The trophoblast region enters the Lacuna stage in which vacuoles appear in the region of the syncytiotrophoblast the vacuoles enlarge to form lacunae.

The cells of the hypoblast adjacent to the cytotrophoblast form a thin membrane called the **exocoelomic (Heuser's) membrane**, this membrane lines the inner surface of the cytotrophoblast. This membrane together with the hypoblast forms a cavity called the Exocoelomic cavity or Primitive yolk sac or primary umbilical vesicle.

During the **11th to 12th day**, the blastocyst is completely embedded in the endometrium. The syncytiotrophoblast penetrates deeper and ruptures some endometrial capillaries. These capillaries are called sinusoids. The lacunae then communicates with the maternal blood through the sinusoids hence establishing a primordial uteroplacental circulation, hence, making oxygen and nutrients available to the developing embryo.



A new layer of cells is formed between the inner layer of the cytotrophoblast and the exocoelomic cavity. These cells gotten from the primitive yolk sac cells form a connective tissue called the Extraembryonic mesoderm. Soon, cavities develop in this region, called the extraembryonic cavity or chorionic cavity or extraembryonic coelom.

This space surrounds the Primitive yolk sac and Amniotic cavity, except where the germ disc is connected to the trophoblast by the connecting stalk (which develops into the umbilical cord). The Extraembryonic mesoderm lining the cytotrophoblast and amnion is called the Extraembryonic somatic mesoderm. Extraembryonic somatic mesoderm also forms the connecting stalk. The lining covering the yolk sac is known as the Extraembryonic splanchnic mesoderm.

The endometrial connective tissue undergoes a reaction called a decidual reaction in which its cells swell with the accumulation of glycogen and lipids. This is done to provide nutrition and an immunologically privileged site for the embryo.

During **day 13**, the surface defect is completely covered and blood flow to the lacunae is increased. Cells of the cytotrophoblast proliferate locally and penetrate into the syncytiotrophoblast, forming cellular columns surrounded by syncytium. Cellular columns with the syncytial covering are known as Primary villi.

The primitive yolk sac reduces in size and is called a secondary yolk sac. This is important to transfer nutrients from mother to child. During the formation of the secondary yolk sac, large portions of the original exocoelomic cavity is pinched off to form exocoelomic cysts. These cysts are found in the chorionic cavity.

The extraembryonic mesoderm lining the inside of the cytotrophoblast is then known as the Chorionic plate. The only place where extraembryonic mesoderm traverses the chorionic cavity is in the connecting stalk. With development of blood vessels, the connecting stalk becomes the Umbilical cord.

