

**NAME: OMOSEHIN OYINKANSOLA SIMISOLA**

**MATRICULATION NUMBER: 18/MHS01/300**

**COLLEGE: MEDICINE AND HEALTH SCIENCES**

**DEPARTMENT: MEDICINE AND SURGERY**

**COURSE: EMBRYOLOGY**

**ASSIGNMENT**

## **SECOND WEEK OF DEVELOPMENT**

Three major events take place in the second week of development

- i. Completion of implantation of the blastocyst in the endometrium
- ii. Formation of bilaminar embryonic disc
- iii. Formation of extraembryonic structures; amniotic cavity, amnion, umbilical vesicle (yolk sac), connecting stalk and chorionic sac

### **DAY 8**

- blastocyst is partially embedded in endometrium
- the syncytiotrophoblast continues to erode the endometrium so eroding the endometrial blood vessels and glands

- the cells of the cytotrophoblast continue to divide and migrate into the region of the syncytiotrophoblast
- embryoblast will divide into two layers of two different types of cells; small cuboidal cells called **hypoblast** which are nearer to the blastocyst cavity and high columnar cells called **epiblast** which are closer to the amniotic cavity these two cell layers together form the bilaminar germ disc
- a cavity then develops within the epiblast which enlarges to form the amniotic cavity
- the cells of the epiblast close to the cytotrophoblast are called amnioblasts, so the amnioblast with the rest of the epiblast line the amniotic cavity

#### DAY 9

- The blastocyst is deeply embedded in the endometrium. Hence, the surface of the epithelium is closed by a coagulum called fibrin
- Vacuoles are formed at the region of the cytotrophoblast and they fuse to form larger lacunae; this phase is called the lacunar stage
- The cells of the hypoblast closest to the cytotrophoblast form a thin membrane called the exocoelomic membrane; it lines the inner surface of the cytotrophoblast
- This membrane together with the hypoblast forms the lining of the exocoelomic cavity/primitive yolk sac/primary umbilical vesicle

#### DAY 11-12

- The blastocyst is fully embedded in the endometrium, the surface epithelium almost entirely covers the original defect in the uterine wall. The blastocyst now produces a slight protrusion in the lumen of the uterus.

- Cells of the syncytiotrophoblast penetrate deeper into the stroma and erode the epithelial lining of the endometrial capillaries; these ruptured capillaries are called sinusoids
- The lacuna begin to communicate with the sinusoids and maternal blood enters the lacunar system, this communication is the primordial uteroplacental circulation, when this blood flows into the lacunae oxygen and nutrients are passed to the embryo
- New cells appear between the inner surface of the cytotrophoblast and the outer surface of the exocoelomic cavity, these cells are derived from the yolk sac cells and they form a fine connective tissue called extraembryonic mesoderm.
- Large cavities develop in the extraembryonic mesoderm and when they become confluent they form a new space called extraembryonic cavity or 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
- The extraembryonic mesoderm lining the cytotrophoblast and amnion is called the extraembryonic somatic mesoderm; this structure also forms the connecting stalk
- The lining covering the yolk sac is called extraembryonic splanchnic mesoderm
- As the conceptus implants, the endometrial connective tissue cells undergo a transformation called **decidual** reaction, here the cells of the endometrium swell due to accumulation of glycogen and lipid in their cytoplasm, and they are then known as **decidual cells**. This reaction aims at providing nutrition and immunologic response for the embryo

## DAY 13

- The surface defect on the endometrium is fully covered by surface epithelium

- There is increased blood flow into lacunar spaces
- Cells of cytotrophoblast proliferate and penetrate into the syncytiotrophoblast forming cellular columns surrounded by syncytium called primary villi
- The primary yolk sac becomes reduced in size and known as secondary yolk sac/definitive yolk sac/secondary umbilical vesicle during its formation, large portions of the exocoelomic cavity are pinched off to form exocoelomic cysts. This exocoelomic cysts are often found in the extraembryonic cavity
- The extraembryonic coelom expands and forms a large cavity called chorionic cavity
- The extraembryonic mesoderm lining the inside of the cytotrophoblast is then known as the chorionic plate
- The connecting stalk becomes the umbilical cord