

Second week of human development

8. day

The **blastocyst** is partially incorporated into the endometrium of the uterus (into which it penetrates thanks to the proteolytic enzymes of syncytiotrophoblast cells) and in order to be inserted there, the blastocyst must partially collapse.

- **Trophoblast** differentiates into two layers (in the area around the inner cell mass) - inner layer = **cytotrophoblast** and outer multinucleated layer without visible boundaries between cells = **syncytiotrophoblast**. The cells of the "cytotrophoblast" divide, we find mitotic figures here. The cells of the "cytotrophoblast" migrate to the "syncytiotrophoblast" where they fuse and lose their individual plasma membrane. We do not find mitotic figures in the cells of the "syncytiotrophoblast".
- The cells of the **embryoblast** (inner cell mass) also differentiate into two layers - a layer of cuboidal cells adjacent to the blastocyte cavity = **hypoblast** and a layer of tall cylindrical cells = **epiblast**.

Together, the hypoblast and epiblast form a flat patty. A cavity is formed inside the epiblast, it enlarges and becomes the **amniotic cavity**. Epiblast cells adjacent to the *cytotrophoblast* are called **amnioblast**. The amniotic cavity is bordered by the amnioblast together with the epiblast. **Stromal cells** in the endometrium are filled with glycogen and lipids, take on a polyhedral shape and thus transform the endometrium into decidua (themselves into decidual cells). The decidual cells near the syncytiotrophoblast degenerate, then are absorbed by the embryo (so-called **histiotrophy**).

Day 9

The blastocyst is deeper in the endometrium. The place where the blastocyst entered the endometrium was closed with a fibrin coagulum = **operculum**. The *trophoblast* develops further mainly at the embryonic pole, where sinuses are formed in the syncytium. Eventually, these cysts coalesce to form larger lacunae. At the same time, at the **abembryonic pole**, flat cells form a thin **exocoelomic = Heuser's membrane**, which lines the inner surface of the cytotrophoblast. Heuser's membrane, together with the hypoblast, delimits the **exocoelomic cavity = primitive yolk sac**.

Day 11 to 12

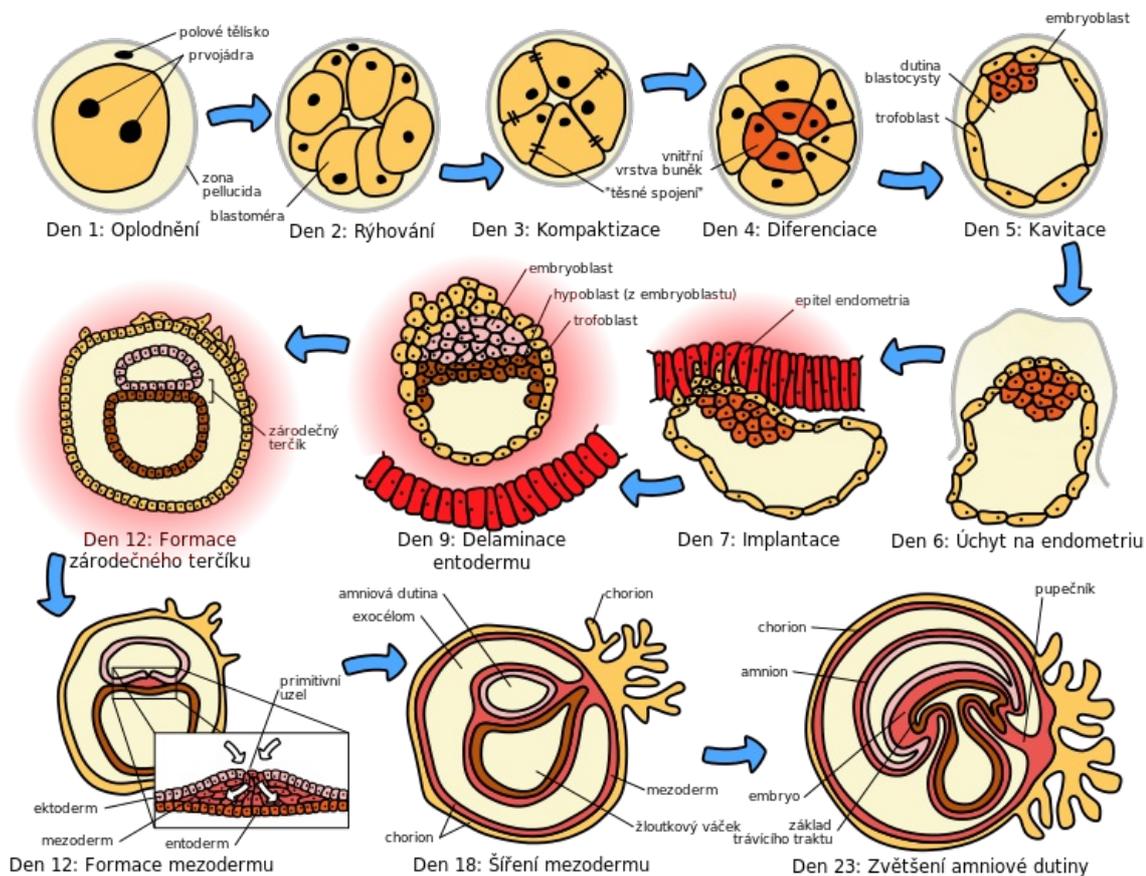
From 11/12 on the day the blastocyst is completely embedded in the endometrial stroma and the surface epithelium of the endometrium is completely re-epithelialized at the site of blastocyst penetration. The lacunae in the syncytium create a mutual communicating network, mainly at the embryonic pole, at the abembryonic (opposite) pole, the trophoblast is made up mainly of cells of the cytotrophoblast. Cells of the **syncytiotrophoblast** penetrate deeper into the stroma of the endometrium, where they disrupt the endothelial layer of the blood capillaries (congested and dilated *sinusoids*). Eventually, the sinusoids connect with the lacunae and maternal blood enters the lacunar system. Maternal blood begins to flow through the trophoblastic system of lacunae, the uteroplacental circulation begins. Meanwhile, a new population of cells derived from yolk sac cells appears between the inner surface of the cytotrophoblast and the outer surface of the exocoelomic cavity. These cells will form fine fibrous tissue = **extraembryonic mesoderm**. In the extraembryonic mesoderm, large cavities are formed relatively quickly, when these cavities fuse, a cavity is formed = **extraembryonic coelom = chorionic cavity**. The chorionic cavity surrounds the primitive yolk sac and the amniotic cavity, except where the *embryonic target* is connected to the trophoblast (connecting stalk).

- Extraembryonic mesoderm below the *cytotrophoblast* and around the amniotic sac is referred to as *extraembryonic somatopleural mesoderm*.
- Extraembryonic mesoderm covering the yolk sac is referred to as extraembryonic splanchnopleural mesoderm.

The target remains relatively small.

Day 13

From the 13th day, the surface defect in the endometrium is usually healed. Sometimes there is bleeding at the site of *implantation* (increased blood flow in the lacunar spaces). This bleeding can occur around *28. day* of the menstrual cycle and can therefore be mistaken for normal menstrual bleeding. The *trophoblast* has a characteristic *villous* structure. Cells of the *cytotrophoblast* locally proliferate and penetrate the *syncytiotrophoblast* to form cell columns surrounded by syncytia = **primary villi**. The *hypoblast* produces other cells, which migrate along the inner wall of the *Heuser's membrane*. These cells proliferate and eventually form a cavity within the *exocoelomic cavity* the **secondary yolk sac** (the *definitive yolk sac*). The latter is much smaller than the *exocoelomic cavity* (*primitive yolk sac*). During the formation of the definitive yolk sac, a large part of the *exocoelomic cavity* is separated. The detached part represents the **exocoelomic cyst**, which is often found in the *extraembryonic coelom* (*chorionic cavity*). While the extraembryonic coelom *expands to form a large cavity* (*chorionic cavity*), the *extraembryonic mesoderm* lies on the inside of the cytotrophoblast as a **chorionic plate**. Only seats where the *extraembryonic mesoderm* intersects the *chorionic cavity* is the **germoid**. With the development of blood vessels, the germ tube becomes the **umbilical cord**.^[1]



Links

External links

- *Image 1* (<http://anmat.chytrak.cz/emb/kap02.jpg>)

Related Articles

- Prenatal Development: Embryo • Fetus
- Gametogenesis • Fertilization • Types of eggs and their furrowing
- First week of human development • Second week of human development • Third week of embryo development • Fourth to eighth week of embryo development

References

1. KEITH L, MOORE - T.V.N, PERSAUD. *Zrození člověka*. 1. edition. Prague : ISV, 2002. 564 pp. ISBN 80-85866-94-3.

References

- KEITH L, MOORE - T.V.N, PERSAUD. *The Birth of Man*. 1. edition. Prague : ISV, 2002. 564 pp. ISBN 80-85866-94-3.}}