

Development of chorionic villi

Chorionic villi extend from the chorionic plate, they are **finger-like protrusions** of the placenta and enable **maximum exchange of substances between mother and fetus**. Chorionic villus sampling is used in prenatal diagnosis. Furthermore, chorionic villi from the amnion are a source of embryonic stem cells.

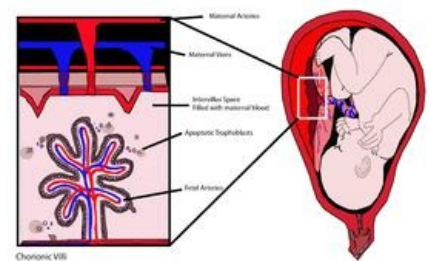
Development of villi

- **Primary villi** are formed by trophoblast 13–15. day of embryo development. They are formed by **cytotrophoblast and covered on the surface by a layer of syncytiotrophoblast**. Mesoderm cells enter them.
- **Secondary villi** are formed on the 16th–21st. day so that the primary villi grow towards the *decidua basalis*. They also contain mesoderm, which is covered with a single layer of cytotrophoblast cells and syncytium.
- **Tertiary (placental) villi** are formed on the 17th–22nd. day from the secondary ones, when blood cells differentiate from cells of the extraembryonic mesoderm (which penetrated them during the formation of primary villi) and **form blood vessels** that form the capillary networks of the villi. These capillaries **connect with vessels in the chorionic plate** and through the germinal shaft with the intraembryonic circulation.

This creates the basis for the exchange of substances between the blood of the mother and the embryo - the villi are able to **supply the embryo with nutrients and oxygen**, while the nutrients reach the embryo by the mother's blood washing the surface of the villi.

Enlargement of the chorionic cavity occurs, 19–20. day, the embryo is connected to the chorion by the germinal shaft (the basis for the development of the umbilical cord, which connects the embryo to the placenta).

Until the end of the 2nd month of pregnancy, the chorionic villi cover the **entire chorion** and are almost uniform in size, after which they develop unevenly - they form the **chorion frondosum** (villous chorion) see also Fetal envelopes and placenta.



Chorionic villi

Histological structure of villi

Chorionic villi are filled with jelly-like tissue, in which **Hofbauer cells** (similar to macrophages) and fibroblasts are located. At the beginning of placental development, the villi are covered with Langhans cells (<http://lekarske.slovník.cz/pojem/langhansovy-bunky>), which form the cytotrophoblast layer.

Links

Related articles

- Fetal envelopes and placenta
- Placenta
- Hemoplacental barrier

External links

- Chorionic villi (on the server <http://histologie.lf3.cuni.cz>) (http://histologie.lf3.cuni.cz/histologie/doc/Skripta_27.pdf)

Resources

- SADLER, Thomas, W.. *Langmanova lékařská embryologie*. 10. edition. Grada, 2011. ISBN 978-80-247-2640-3..
- VAJNER, Luděk – UHLÍK, Jiří – NOVOTNÝ, Tomáš. *Lékařská histologie II : Mikroskopická anatomie*. 1. edition. Praha : Nakladatelství Karolinum, 2012. ISBN 978-80-246-2165-4.