

Skin development

Skin, *cutis*, the largest organ of the body, has a double origin:

- *surface layer, epidermis*, arises from **ectoderm**;
- *deep layer, dermis (corium)*, develops from the **mesenchyme** lying below the ectoderm.

The skin also includes derivatives of the epidermis formed during prenatal development. Adnexa distinguish between **horn** and **glandular**.

Epidermis

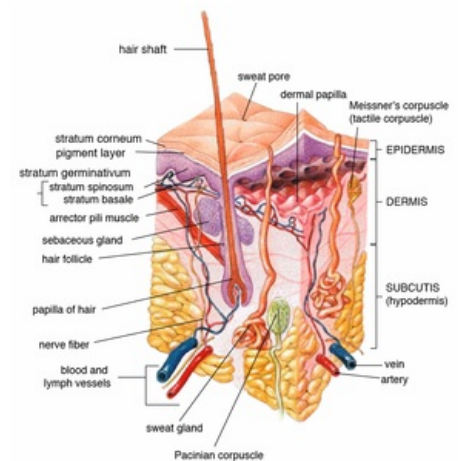
First, the developing germ is covered with a single layer of flattened cells. Later, the skin passes stages that lead to thickening of the epidermis. By the beginning of the second month, this epithelium divides into the outer layer of flattened cells that form **periderm** and **germinal basal layer**. The periderm undergoes keratinization, it peels off and participates in the formation of *vernix caseosa* (sebum on the surface of the body of the germ that prevents maceration by amniotic fluid). The cells of the basal layer proliferate and at the end of the 4th month give rise to the final 4-layer arrangement.

The definitive epidermis consists of:

1. **stratum basale**;
2. **stratum spinosum**;
3. **stratum granulosum**;
4. **stratum corneum**.

The stratum basale is responsible for the formation of new cells, while the stratum corneum consists of dying keratinized cells that form the resistant surface of the epidermis. In the thick skin type we find a **stratum lucidum** layer between the stratum spinosum and the stratum granulosum.

In the later embryonic period, the epidermis is populated by cells originating from the **neural crest**. They differentiate into **melanocytes**, which even before birth begin to produce melanin and distribute it to epidermal cells in the epidermis and in the hair follicle. In this way, the skin and adnexa are pigmented. The epidermis is also inhabited by other cell populations – **Langerhans cells** of the monocyto-macrophage system, which originate from **mesoderm**, and **Merkel** cells.



Skin

Dermis

It develops from mesenchyme, which originates in **dermatomes** of somites, **mesoderm of the lateral plate** and **ectomesenchyme**, which populates the facial area of the germ. This layer forms **dermal papillae**, that extend into the epidermis. The papillae contain sensitive endings of nerve cells and small capillaries. Under this layer, the **stratum reticulare** differentiates, containing a number of elastic and collagen fibers.

Under the dermis there is adipose tissue, **tela subcutanea**. However, the amount of subcutaneous fat is minimal until the 6th month of development, so the fetus has a strong red color with visibly shining blood vessels.

Vernix caseosa

Vernix caseosa protects the forming skin from the continuous action of amniotic fluid containing fetal urine, in addition, it facilitates the birth of the fetus, which is slippery due to sebum. Vernix is also mentioned in connection with its possible antibacterial effect. *Vernix caseosa* is made up of:

- by peeled cells of the periderm;
- *lanugo*, the primordial hair that falls off in later development;
- secretions of skin glands.

It appears on the surface of the body approximately in the twentieth week of development.

Hair

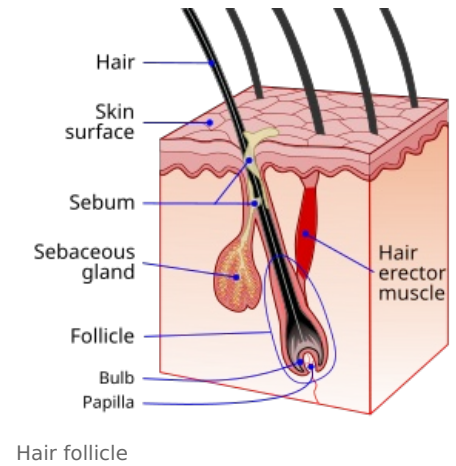
They grow out of the vagina, which was created by invagination of the epidermis into the dermis (dermis). The longest hairs are hair. At the end of the hair sheath, a hair bulb is formed, the **bulbus pili**, and the **dermal papilla**, which contains blood vessels and nerve endings, is immersed in it. Spindle-shaped cells in the center of

the hair follicle keratinize and form the hair root, while the cells on the periphery of the follicles are cubic and form the epithelial sheath of the hair root, **hair follicle**.

The surrounding mesenchyme forms a **follicle sheath** around the follicles. The smooth muscle of the **errector pili muscle**, a derivative of the mesenchyme, is clamped into it. The constant proliferation of epithelial cells in the bulb of the hair pushes the hair upwards, and by the end of the 3rd month, the first hairs appear on the surface of the embryo in the area of the eyebrows and upper lip. The first **lanugo** hair is separated before birth and is replaced by coarser hairs growing from the original hair follicles. In the epithelium of the hair follicle, a bud is formed, protruding into the surrounding mesenchyme. The cells of this bud form a sebaceous gland, **glandula sebacea**, which produces sebum secreted into the hair follicles and up to the surface of the skin.

Mammary gland

The first hint of the formation of the mammary gland appears in the form of a strip of thickened epidermis, a **milky bar**. In a seven-week-old embryo, this bar runs from the axilla to the inside of the thigh. The greater part of the mammary gland disappears soon after its formation and its small section on the chest persists and further proliferates into the depth, into the mesenchyma. From 16 to 24 epithelial pins are formed, from which small, solid buds are formed. Towards the end of prenatal development, the epithelial pins luminize and form the **lactiferous ducts, ducti lactiferi**, and glandular lobes arise from the buds. At first, the lactiferous ducts open into a small epithelial well, but soon after birth, this well bulges into the nipple.



Links

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- Physiology of the skin
- Skin Transplantation

External links

Vernix Caseosa - Wikipedia, the free encyclopedia (https://en.wikipedia.org/wiki/Vernix_caseosa)

Source

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