

FUNCTIONS OF THE SKIN

Skin Thermoregulation System

The skin is the main organ that regulates the body's temperature. It mediates between the body and the external environment. Regardless of the ambient temperature, the body of a healthy person stays at 36.6C. Two types of mechanisms serve this purpose – the first one consists in the contraction and expansion of capillaries, while the second one involves sweat glands. The essence of the first mechanism is the fact that the heat and cold receptors cause expansion or contraction of vessels depending on the temperature. In low temperatures capillaries shrink, and in high temperatures they expand.

With expanded capillaries, more blood flows in and the body is cooled down more quickly. At low temperatures, circulation is more difficult, which prevents the body from cooling down. The essence of the second mechanism is the activity of the sweat glands secreting salty sweat, which evaporates and cools the body. Sweat glands are able to secrete up to 10 liters of sweat to protect the body from overheating.

Skin as a protective covering

The integument protects the body from the loss of fluids and the penetration of microorganisms into the body. Antimicrobial protection is provided by the acidic hydro-lipid coating covering the epidermis. It includes, among others, the secretion of sebaceous glands and sweat. In addition, there is another barrier in the form of a layer of keratinized cells that is only permeated by molecules with an appropriate electric charge.

Protection from the penetration by microorganisms is also provided by constant peeling of dead epithelial cells. The skin also produces a hormone-like substance (interleukin) that helps during the mobilization of the body's immune system. In addition, Langerhans cells present in the skin capture microorganisms and other antigens to "present" them to T-lymphocytes, which are responsible for the development of an adequate response of the immune system.

The skin performs many protective functions: against infections caused by bacteria, fungi or viruses; against mechanical, thermal and chemical factors, as well as light radiation; and it provides stable conditions for the internal environment of the body (homeostasis). In addition, the skin performs the perceptual function in regards to heat, pain and touch; the expressive function in presenting one's emotional state; the resorptive function; and it also takes part in storage and metabolism. The skin around the natural orifices (mouth, nostril, anus, vagina, etc.) changes to mucous membranes.

Passive Functions of the skin:

- Defense against microorganisms that penetrated the skin
- Absorption of certain active substances
- Perspiration, cooling function; together with sebaceous glands, creating the lipid mantle
- Circulatory and thermal regulation thanks to dermal vascular system
- Sensory organ to detect pressure, vibration, pain and temperature

Active functions of the skin:

- Protection from cold, heat, radiation, pressure, blows, abrasion
- Protection from the action of chemical substances
- Protection from invasion by microorganisms, primarily by creating a lipid mantle