Skin Functions

The skin has a variety of functions in multiple physiological systems. It assists with thermoregulation, as part of homeostasis, by using sweat to cool the body down during states of fever, exercise, stress, or hot environmental conditions. It also uses hair to trap heat near the surface of the skin and prevent heat loss during cold conditions. It protects the body from ultraviolet light and DNA damage through both melanin from melanocytes and keratin from keratinocytes. The skin is one of the nonspecific barriers of the immune system, helping to keep pathogens out by physically blocking them from entering the body. This is part of the innate immune system protection. In addition to protect, the skin is also a site for Vitamin D synthesis. Vitamin D is photochemically produced, with exposure to sunlight, in the innermost strata of the epidermis layer. It also is a site of water and salt excretion through sweating, playing a role in homeostasis. Salts are secreted out of the skin and water follows osmotically, which is why sweat often tastes salty. Finally, there are surface capillaries that run out to the skin. These are dilated when heat needs to be given off, as more blood will run close to the outside of the body and heat will leave through convection. They are conversely constricted when heat needs to be conserved. When these vessels are dilated, they serve as a blood reservoir that is tapped into under conditions of circulatory stress from exercise or hemorrhage.



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Characteristics

Thermoregulation
Thermometer
The skin assists with thermoregulation by using sweat to cool down the body or by running more blood through surface capillaries and giving off heat through convection.

Protection
Shield Protecting against the sun
The skin protects the body from UV radiation, heat, poor environmental conditions, etc. It does so through melanocytes and keratinocytes.

Innate Immune Protection
Inmate Moon Fighting Pathogen
The skin is a nonspecific barrier to pathogens in the immune system. It is part of innate immunity because it doesn't adapt to different pathogens. It just serves as a physical barrier for pathogen entry.

Synthesize Vitamin D
Viking (D) Daisy
Vitamin D is synthesized in the skin photochemically, specifically in the innermost strata of the epithelium.

Water and Salt Excretion
Water and Salt-shakers shot out of water bottle
Water and salt are excreted through the skin to maintain homeostatic conditions in the body. Salt is excreted and water follows osmotically during sweating.

Dilated Capillaries are a Blood Reservoir
Dyed Caterpillar Drinking from Blood-tower
Surface capillaries run near the surface of the skin and can be dilated when heat needs to be given off. This results in more blood flowing through and greater convection, allowing loss of heat to the environment. When dilated, the capillaries serve as a reservoir of blood in case of circulatory stress from exercise or hemorrhage.

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