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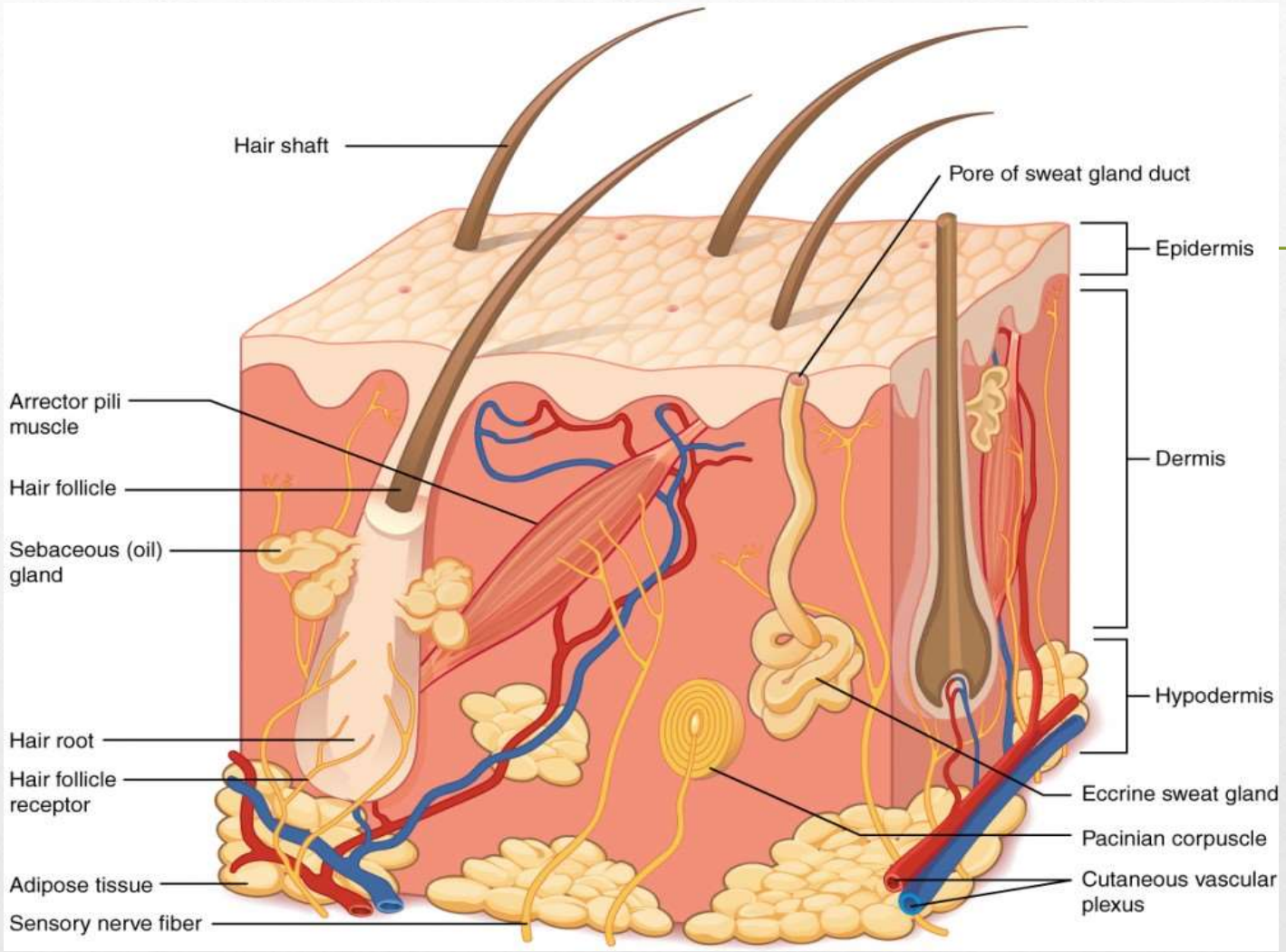

Hair shaft
Pore of sweat gland duct
Epidermis
Dermis
Hypodermis
Arrector pili muscle
Hair follicle
Sebaceous (oil) gland
Hair root
Hair follicle receptor
Adipose tissue
Sensory nerve fiber
Eccrine sweat gland
Pacinian corpuscle
Cutaneous vascular plexus

The skin is the largest organ of the body, with a total area of about 20 square feet. The skin protects us from microbes and the elements, helps regulate body temperature, and permits the sensations of touch, heat, and cold.

Facts about the skin

The skin is the body's largest organ. It covers the entire body. It serves as a protective shield against heat, light, injury, and infection. The skin also:

Regulates body temperature

Stores water and fat

Is a sensory organ

Prevents water loss

Prevents entry of bacteria

Acts as a barrier between the organism and its environment

Helps to make vitamin D when exposed to the sun

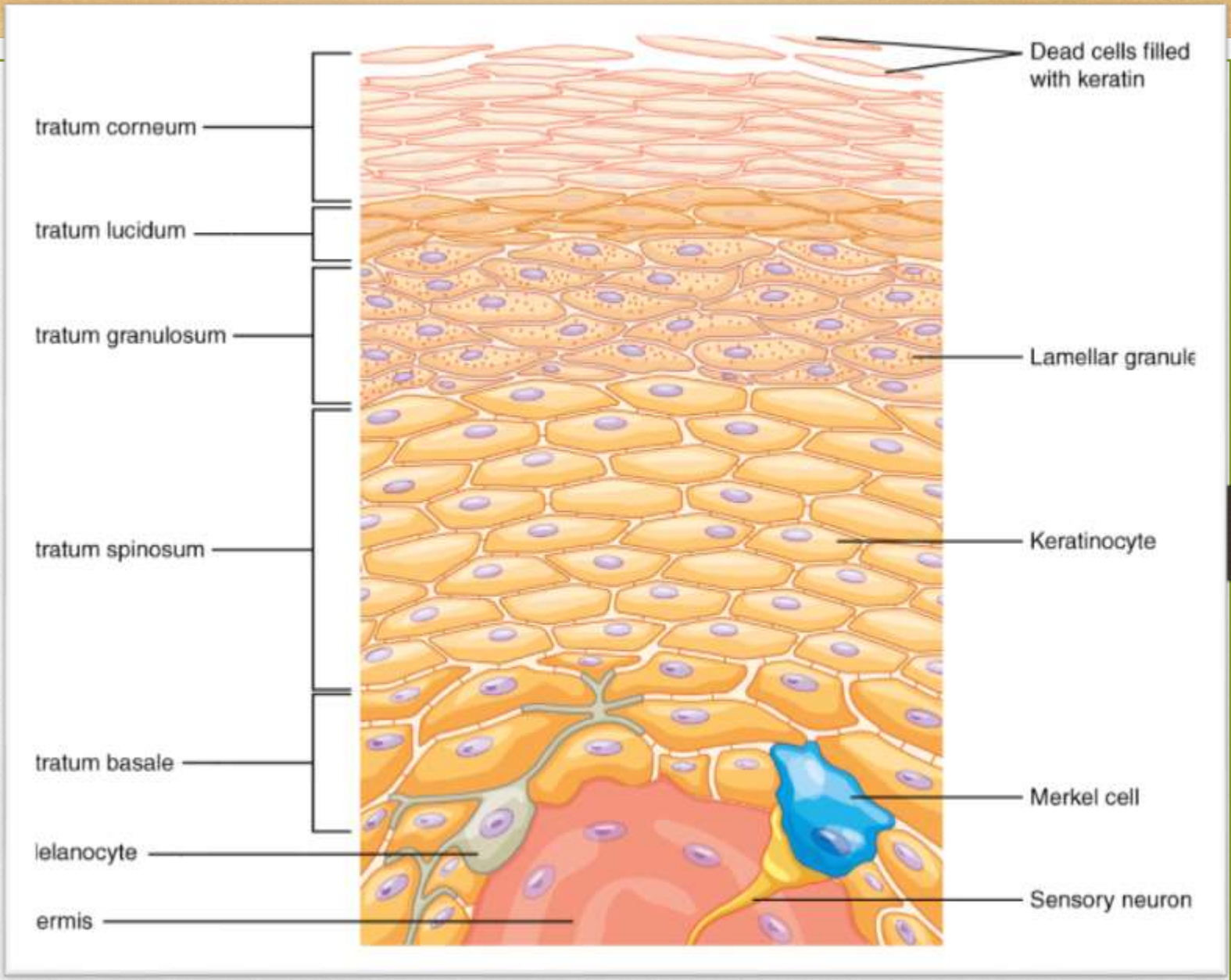
Your skin takes on different thickness, color, and texture all over your body. For example, your head contains more hair follicles than anywhere else. But the soles of your feet have none. In addition, the soles of your feet and the palms of your hands are much thicker than skin on other areas of your body.

The skin is made up of 3 layers. Each layer has certain functions:

Epidermis

Dermis

Subcutaneous fat layer (hypodermis)


Dead cells filled with keratin
tratum corneum
tratum lucidum
tratum granulosum
Lamellar granule
tratum spinosum
Keratinocyte
tratum basale
Merkel cell
elanocyte
Sensory neuron
ermis

THE EPIDERMIS

STRATUM CORNEUM

The **stratum corneum** is the most superficial layer of the epidermis and is the layer exposed to the outside environment The increased keratinization (also called cornification) of the cells in this layer gives it its name.

Cells in this layer are shed periodically and are replaced by cells pushed up from the stratum granulosum (or stratum lucidum in the case of the palms and soles of feet). The entire layer is replaced during a period of about 4 weeks.

STRATUM LUCIDUM

The **stratum lucidum** is a smooth, seemingly translucent layer of the epidermis located just above the stratum granulosum and below the stratum corneum. This thin layer of cells is found only in the thick skin of the palms, soles, and digits.

- **STRATUM GRANULOSUM**

The **stratum granulosum** has a grainy appearance due to further changes to the keratinocytes as they are pushed from the stratum spinosum. The cells (three to five layers deep) become flatter, their cell membranes thicken, and they generate large amounts of the proteins keratin, which is fibrous, and **keratohyalin**, which accumulates as lamellar granules within the cells. The nuclei and other cell organelles disintegrate as the cells die, leaving behind the keratin, keratohyalin, and cell membranes that will form the stratum lucidum, the stratum corneum, and the accessory structures of hair and nails.

STRATUM SPINOSUM

As the name suggests, the **stratum spinosum** is spiny in appearance due to the protruding cell processes that join the cells via a structure called a **desmosome.** The stratum spinosum is composed of eight to 10 layers of keratinocytes, formed as a result of cell division in the stratum basale .

STRATUM BASALE

- The **stratum basale** (also called the stratum germinativum) is the deepest epidermal layer and attaches the epidermis to the basal lamina, below which lie the layers of the dermis. Two other cell types are found dispersed among the basal cells in the stratum basale. The first is a **Merkel cell**, which functions as a receptor and is responsible for stimulating sensory nerves that the brain perceives as touch.
- These cells are especially abundant on the surfaces of the hands and feet. The second is a **melanocyte**, a cell that produces the pigment melanin. **Melanin** gives hair and skin its color, and also helps protect the living cells of the epidermis from ultraviolet (UV) radiation damage.

DERMIS

- the dermis is the middle layer of the three layers of skin. It's located between the epidermis and the subcutaneous tissue. It contains connective tissue, blood capillaries, oil and sweat glands, nerve endings, and hair follicles. The dermis is split into two parts—the papillary dermis, which is the thin, upper layer, and the reticular dermis, which is the thick, lower layer.[5] The thickness of the dermis varies depending on its location on the body. On the eyelids, it's 0.6 millimeters thick. On the back, the palms of hands, and the soles of feet it's 3 millimeters thick.
- The dermis is home to three different types of tissues that are present throughout:
- Collagen
- Elastic tissue
- Reticular fibers[6]
- The dermis contains several specialized cells and structures, including:
- Hair follicles
- Sebaceous glands
- Apocrine and endocrine glands
- Blood vessels and nerve endings
- Meissner corpuscles and lamellar corpuscles that transmit the sensations of touch and pressure.

- **PAPILLARY LAYER**
- The **papillary layer** is made of loose, areolar connective tissue, which means the collagen and elastin fibers of this layer form a loose mesh. This layer also contains lymphatic capillaries, nerve fibers, and touch receptors called the Meissner corpuscles.
- **RETICULAR LAYER**
- Underlying the papillary layer is the much thicker **reticular layer**, composed of dense, irregular connective tissue. This layer is well vascularized and has a rich sensory and sympathetic nerve supply. The reticular layer appears reticulated (net-like) due to a tight meshwork of fibers. **Elastin fibers** pro vide some elasticity to the skin, enabling movement.

HYPODERMIS

- Subcutaneous tissue is the deepest and innermost layer of the three layers of skin. It's mostly made up of fat, connective tissue, and larger blood vessels and nerves.[8]
- The thickness of this layer varies depending on where it's located on the body—for example, it's thickest on the buttocks, the soles of the feet, and the palms of the hands.
- Subcutaneous tissue is a vital component of body temperature regulation. It also acts as a cushion, so if you ever fall or hit something with your body, it protects your insides and makes the injury hurt less.

Skin function

- protection: an anatomical barrier from pathogens and damage between the internal and external environment in bodily defense.
- Sensation: contains a variety of nerve endings that jump to heat and cold, touch, pressure, vibration, and tissue injury .
- Thermoregulation: eccrine (sweat) glands and dilated blood vessels (increased superficial perfusion) aid heat loss, while constricted vessels greatly reduce cutaneous blood flow and conserve heat. Erector pili muscles in mammals adjust the angle of hair shafts to change the degree of insulation provided by hair or fur.
- Control of evaporation: the skin provides a relatively dry and semi-impermeable barrier to reduce fluid loss.[4]
- Storage and synthesis: acts as a storage center for lipids and water
- Absorption through the skin: Oxygen, nitrogen and carbon dioxide can diffuse into the epidermis in small amounts; some animals use their skin as their sole respiration organ (in humans, the cells comprising the outermost 0.25–0.40 mm of the skin are "almost exclusively supplied by external oxygen", although the "contribution to total respiration is negligible")Some medications are absorbed through the skin.
- Water resistance: The skin acts as a water resistant barrier so essential nutrients aren't washed out of the body. The nutrients and oils that help hydrate the skin are covered by the most outer skin layer, the epidermis. This is helped in part by the sebaceous glands that release sebum, an oily liquid. Water itself will not cause the elimination of oils on the skin, because the oils residing in our dermis flow and would be affected by water without the epidermis.
- Camouflage, whether the skin is naked or covered in fur, scales, or feathers, skin structures provide protective coloration and patterns that help to conceal animals from predators or prey.

One Square inch of skin contains

- 19 feet of blood vessels
- 94 oil glands
- 60 hairs
- 19,000,000 cells
- 12 heat receptors
- 12 cold receptors
- 1,250 pain receptors
- 155 pressure receptors
- 75 feet of nerves
- 19,000 sensory cells
- 625 sweat glands