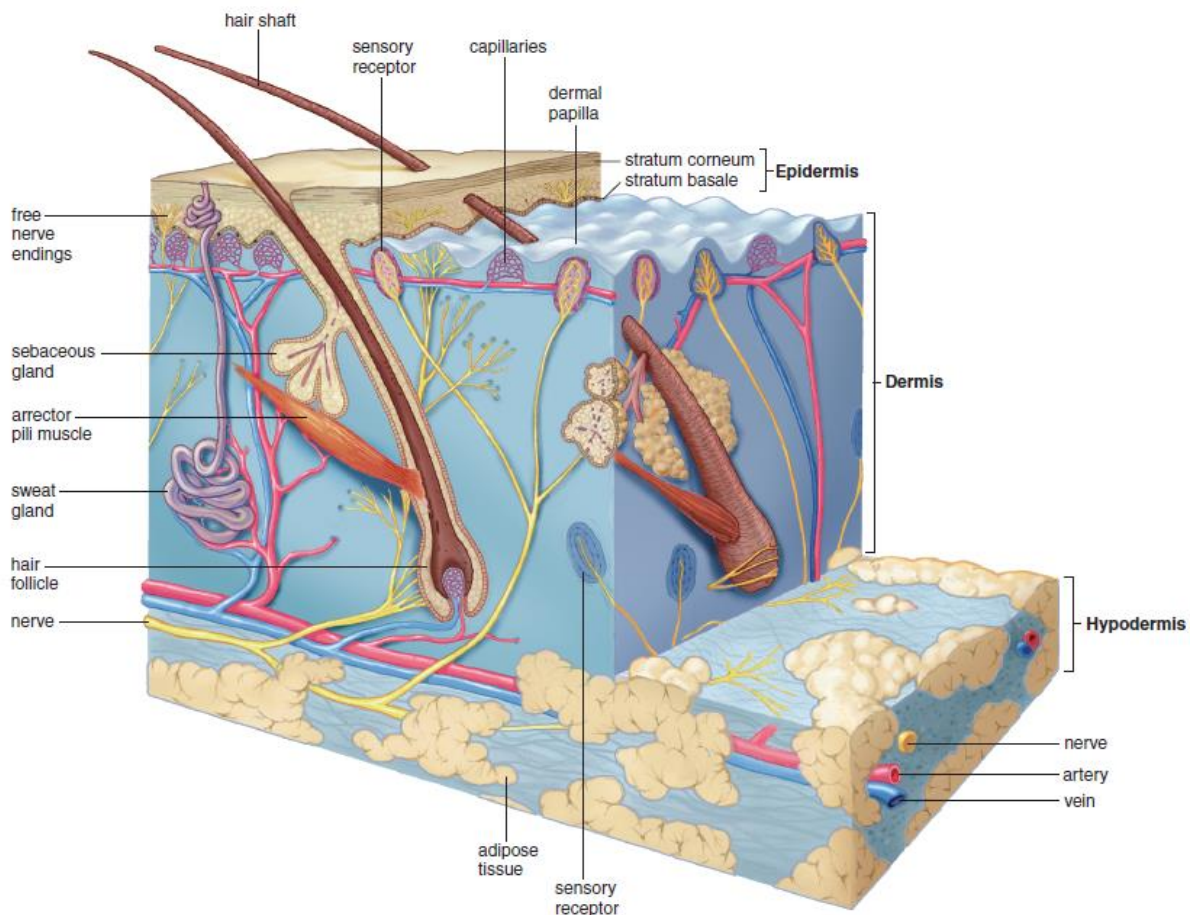


Structure of the Skin

The skin covers the entire surface of the human body. The skin is sometimes called the **cutaneous membrane** or the **integument**. Because the skin has several accessory organs, it is also possible to speak of the **integumentary system**. The skin has two regions: the **epidermis and the dermis**. The **hypodermis**, a subcutaneous tissue, is found between the skin and any underlying structures, such as muscle. Usually, the hypodermis is only loosely attached to underlying muscle tissue, but where no muscles are present, the hypodermis attaches directly to bone.

Figure 5.1 Skin anatomy. Skin is composed of two regions: the epidermis and the dermis. The hypodermis, or subcutaneous layer, is located beneath the skin.



Epidermis

The **epidermis** is the outer and thinner region of the skin. It is made up of *stratified squamous epithelium* divided into several layers; the deepest layer is the stratum basale, and the most superficial layer is the stratum corneum.

Stratum Corneum

As cells are pushed toward the surface of the skin, they become flat and hard, forming the tough, uppermost layer of the epidermis, the **stratum corneum**.

Hardening is caused by keratinization, the cellular production of a fibrous, waterproof protein called **keratin**. Over much of the body, keratinization is minimal, but the palms of the hands and the soles of the feet normally have a particularly thick outer layer of dead, keratinized cells. The waterproof nature of keratin protects the body from water loss and water gain. The stratum corneum allows us to live in a desert or a tropical rain forest without damaging our inner cells.

Dermis

The **dermis**, a deeper and thicker region than the epidermis, is composed of dense irregular connective tissue. The upper layer of the dermis has fingerlike projections called dermal papillae. Dermal papillae project into and anchor the epidermis. In the overlying epidermis, dermal papillae cause ridges, resulting in spiral and concentric patterns commonly known as “fingerprints.” The function of the epidermal ridges is to increase friction ,fingerprints and footprints can be used for identification purposes. The dermis contains collagenous and elastic fibers.

Hypodermis

Hypodermis, or **subcutaneous tissue**, lies below the dermis. From the names for this layer, we get the terms **subcutaneous injection**, performed with a **hypodermic needle**.

The hypodermis is composed of loose connective tissue, including adipose (fat) tissue. **Fat** is an energy storage form that can be called upon when necessary to supply the body with molecules for cellular respiration. Adipose tissue also helps insulate the body. A well-developed hypodermis gives the body a rounded appearance and provides protective padding against external assaults. Excessive development of adipose tissue in the hypodermis layer results in obesity.

Accessory Structures of the Skin

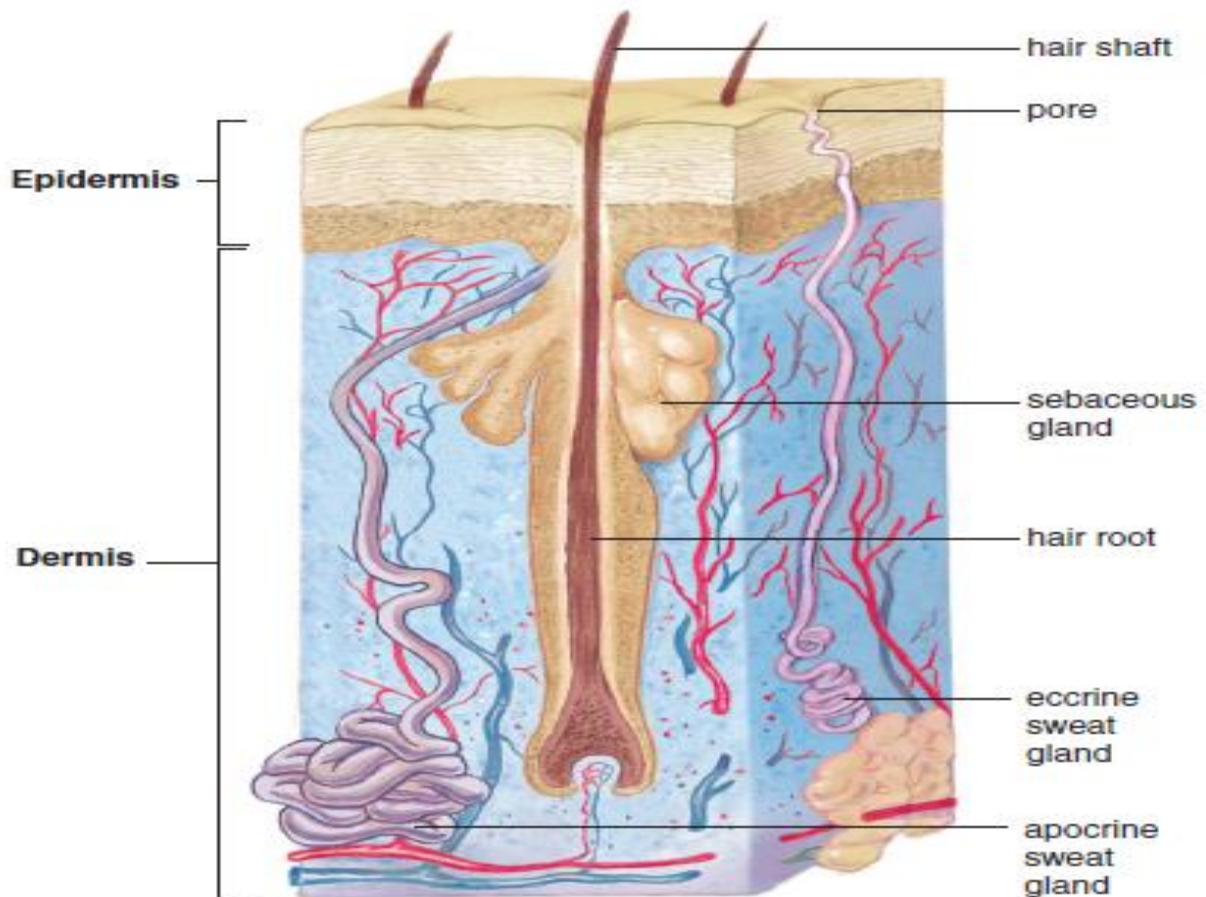
Hair, nails, and glands are structures of epidermal origin, even though some parts of hair and glands are largely in the dermis

Hair and Nails

Hair is found on all body parts except the palms, soles, lips, nipples, and portions of the external reproductive organs.

Nails grow from special epithelial cells at the base of the nail in the region called the *nail root* .These cells become keratinized as they grow out over the nail bed. The visible portion of the nail is called the *nail body*. The cuticle is a fold of skin that hides the nail root. Ordinarily, nails grow only about 1 millimeter per week.

Figure 5.5 Types of skin glands. Apocrine glands and eccrine glands are types of sweat glands.



Glands

The *glands* in the skin are groups of cells specialized to produce and secrete a substance into ducts.

- *Sweat Glands*
- *Sebaceous Glands*
- *Mammary Glands*