

Skin is the outermost protective covering of the body. With all its appendages it is also called **integument**.

Structure

The skin though not uniformly thick all over the body is divided into two main layers to be present uniformly everywhere. These are : outer epidermis and inner dermis.

Table. 7.8

Epidermis is composed of :	
(i) Stratum corneum	
(ii) Stratum lucidum	
(iii) Stratum granulosum	
(iv) Stratum spinosum	
(v) Stratum germinativum	
Dermis is composed of :	
(i) Papillary layer	
(ii) Reticular layer	

The epidermis

It is formed of stratified squamous epithelium. Its layers, from superficial to deep, are as follows :

Stratum corneum : It is composed of dead cells containing keratin but no nuclei (Fig. 7.41). The superficial cells are continuously shed off. This is thick particularly in palm and sole, where the skin is thicker than any other part of the body.

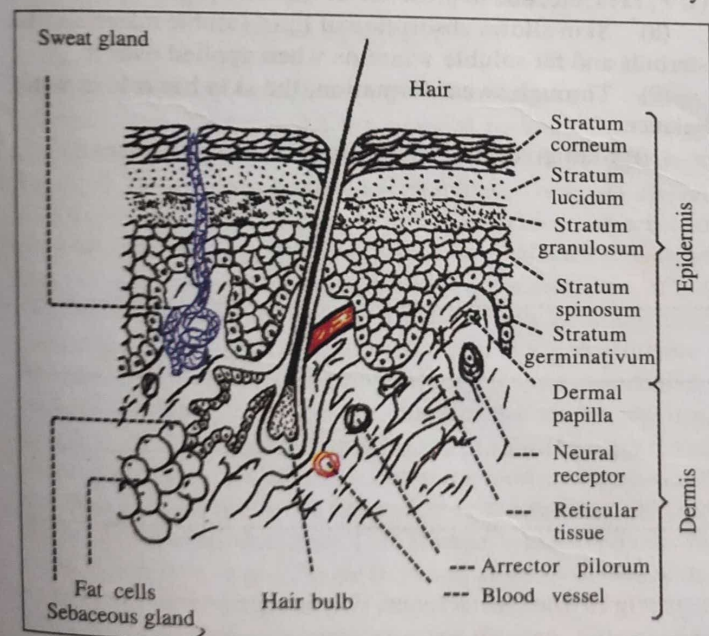


Fig. 7.41. Structure of skin.

Stratum lucidum : It looks homogenous and is composed of flattened cells containing eleidin, the precursor of keratin. These cells degenerate to form the stratum corneum. It is also present in thick skin.

Stratum granulosum : Cells of this layer contain granules (keratohyaline), hence the name, formed of multiple layers of rhomboidal cells.

Stratum spinosum : It is formed of multiple layers of polyhedral cells. These are also called **prickle cells** due to presence of spine-like processes on their surface. These cells move towards the surface forming the above layers one after another. Langerhans cells (p. 48) are present in this layer.

Stratum germinativum : This is formed by the last layer of cells of the epidermis. Cells are situated on a basement membrane in a single layer. Mitosis is seen in this layer and the cells gradually move through the above layers towards the surface. Melanocytes are seen in this layer of skin.

All these layers are not present everywhere, but in the skin of palm and sole. There is no blood vessels in the epidermis.

The dermis

It is the true skin and can be divided into a superficial papillary layer and a deeper reticular layer.

The papillary layer is compact and form papillae which project into the epidermis. These papillae contain the blood vessels, nerve endings and lymphatics.

The reticular layer is composed of reticular and elastic fibres impregnated with fat and loose areolar tissue. It merges with the subcutaneous fatty layer and binds the skin with deeper structures.

Different glands, hair follicles, some smooth muscles along with fibroblasts and histiocytes are present in the dermis.

Colour of the Skin

It depends on many factors. Firstly, the amount of melanin formed in stratum germinativum in the skin determines its black colour. Next is the amount of blood flow, more flow means the skin is pink, less flow means pale. Thickness of skin also determines its colour.

In abnormal cases carotene, reduced Hb, bilirubin etc. also colour the skin accordingly.

The Glands

Sweat glands are present all over the skin except in ear drum, lips, glans penis, etc. These are of two types : merocrine and apocrine.

The **merocrine** glands are also called **eccrine** glands. These are simple tubular glands but the tubes are very long and coiled. These glands are present in huge number and produce the usual sweat. Cells from these glands may contribute to regeneration of the skin in case of loss of epidermis, say, due to burn injury.

The **apocrine** glands are present on mons pubis, axilla, areola of breasts, etc. (The ceruminous glands also belong to

this variety, so also the mammary glands). The secretion of these glands start after puberty and is responsible for the characteristic body odour.

Sebaceous glands : These are small pear-shaped alveolar glands and open at the hair follicles or directly to the skin surface. The sebum is formed in these glands. These glands are responsible for acne, which is seen at puberty due to increased activity of dehydroepiandrosterone (DHEA).

Appendages

Hairs

The soft hairs on foetus are called lanugo hairs. After birth two types of hairs are seen :

(i) The vellous hairs which are soft and are found on the body of infants and children. (ii) The terminal hairs grow during puberty and replace the vellous hairs. (The vellous hairs persists on the face of adult females).

Hair is a keratinised thread developed from epidermis. It is divided into shaft (the part projecting outside the skin), the root (which is within the skin) and the deepest end, called hair bulb which is embedded in the hair follicle. It is indented below by the connective tissue papilla.

The hair is composed of : (i) medulla, the central part, formed of cubical cells at the root, which are cornified towards the shaft. (ii) Cortex is formed of cells as in medulla. (iii) The cuticle, the outermost layer, is formed of a single layer of cell. The hair follicle is composed of epithelial root sheath continuous with the stratum germinativum and a connective tissue sheath around it.

The arrector pilorum muscle is attached to the follicle and the sebaceous glands also open here; contraction of arrector pilorum causes erection of hair during sympathetic stimulation.

Nails

Nails are modified skin. Nails consist of a root, a body and the free margin.

Notes

The root is continuous with the stratum germinativum. Due to continuous proliferation of these cells the nail grows and is pushed forwards. The cells ultimately become flat and keratinised. The keratin then becomes hard.

Function of the Skin

(1) It is the protective layer on the body. It provides mechanical protection against infection. It is also impervious to many substances including air and water. Thus the body is protected from different toxic materials and also we do not get swollen after taking a bath.

(2) Sweat secretion acts in association with temperature regulation, i.e., provides water for evaporation from the skin. Skin also allows insensible perspiration, which helps in temperature regulation. Sebum makes the skin greasy and prevent drying.

(3) There are many cutaneous neural receptors which help to get information from the environment. Hairs on the skin are helpful for this purpose. The receptors present in skin are for pain, touch, temperature, etc.

(4) In the skin the vitamin D₃ is synthesised from 7-dehydrocholesterol.

(5) Cutaneous circulation plays important role in temperature regulation and also in translocation of blood volume.

(6) Sweat secreted in the skin also acts as an important avenue for excretion of waste materials, salts and water. Excessive sweating some times leads to sodium deficiency along with dehydration.

(7) It protects against the damaging effects of ultraviolet (UV) rays, etc. due to presence of melanin pigment.

(8) Skin allows absorption of lipid soluble materials like steroids and fat soluble vitamins when applied over it.

(9) Through sweat formation, the skin has role in water balance.

(10) Skin gives diagnostic signs of many diseases.