



Versatile in its functions, human skin is a waterproof fabric that serves as a first line of defence against injury or invasion by hostile organisms. This protective ability is due to the presence of a substance called Keratin. Keratin is a rather hard, horny protein with remarkable resistant properties.

Being a protein it contains the following elements.

- Carbon
- Hydrogen
- Nitrogen
- Sulphur

The presence of sulphur gives a degree of chemical and biological resistance. Keratin contains more sulphur than any other tissue in the body, which is only 6%.



**TUTOR TALK:** The skin and hair are a good indicator to our health, colour, appearance, functioning. The skin also acts as an indicator to traces of food or foreign matter to which the body may be allergic.

It is self healing and self replacing. Skin is capable of becoming thicker if exposed to wear and tear, e.g. skin on the soles of our feet. Our skin becomes darker in colour to protect against excessive sunlight. Even after burning our skin in the sun, the burnt skin peels off and is replaced by a new layer of skin. Skin is vitally important in the production of vitamin D. The skin plays a vital role in the regulation of our body temperature, as;

- It is a protective covering.
- It excretes waste products.
- It regulates temperature.
- It contains ergosterol which, under the influence of ultra-violet light, forms vitamin D.
- It is an important sensory organ.
- It is important for the maintenance of body shape.
- It protects against the entry of harmful organisms.

Immediately underneath the skin lies the superficial fascia. Underneath the superficial fascia lies the deep fascia. These tissues are closely related to the skin and play an important role in the mobility of the skin over the underlying structures.

## **STRUCTURE OF THE SKIN**

The skin is composed of two principal layers:

- Epidermis – Outer layer
- Dermis – Inner layer



**TUTOR TALK:** Besides the largest it is also a very complex organ whose correct functioning is essential to life.

Five different layers are distinguished in the epidermis of the skin which varies in thickness from place to place.

1. Stratum basale:

- This forms the deepest layer of cells. It is in contact with the Dermis.
- These cells are capable of quick mitotic division.
- Daughter cells are pushed towards the surface so that they can provide a constant replenishment for the cells which have been lost from the surface.

2. Stratum spinosum:

- This is also referred to as the prickle cell layer.
- It is derived from the basal cells layer by mitosis.
- They are not so tightly packed, therefore differ in form, being separated from each other by narrow spaces.

3. Stratum granulosum:

- This layer consists of granules of Keratin which is an Albuminous substance.

4. Stratum lucidum:

- These cells are clear, they have a flattened shape and do not possess Nuclei.

5. Stratum corneum:

- These cells are composed mostly of Keratin.
- It consists of many layers of very flattened scale like dead cells.
- These are shed from the surface as flakes.

Amongst the deeper cells of the epidermis are a number of branching cells called melanoblasts.

These produce the pigment melanin. The colour of the skin and hair depend on the amount of melanin and other pigments in the epidermis. Exposure to the rays from the sun increases the amount of pigment and this helps in the protection of the deeper layer to the sun. The epidermis can repair itself if damaged or burnt. The dermis cannot repair itself.



**TUTOR TALK:** Now just to recap the skin's most important functions:

- a. Mechanical protection
- b. Barrier function
- c. Sensation
- d. Vitamin D formation
- e. Temperature regulation

## THE DERMIS

The dermis is the structure underlying and interlocking with the epidermis. The body of the dermis is constructed of a network of white fibrous tissue (collagen) and yellow elastic fibres. It is very tough. This network acts as supporting structure for the blood and lymphatic vessels, the sweat glands and fat lobes.

There are numerous structures in the dermis, and this layer of the skin is also divided into layers:

a. **Papillary layer** (outer layer)

This layer contains blood vessels and nerve endings. Through the dermis, the epidermis receives its nourishment and sensitivity. Blood vessels nourish and nerves permit sensation. The papillary layer projects into the epidermis by means of cone-shaped elevations.

b. **Reticular layer**

This layer is made up of fibrous and elastic tissue, blood vessels, fat cells, lymphatics, nerves, hair follicles, and both sweat and sebaceous glands.

c. **Sub-cutis layer**

This layer is composed of loosely meshed connective tissue, blood and lymph supply, fat cells and nerves, it contains a reserve of fat which gives contour to the body.



**TUTOR TALK:** To summarise:

The dermis contains:

- sweat glands
- sebaceous glands
- nerve fibres
- nerve endings
- blood vessels
- capillaries
- hair follicles

The elasticity of the fibres is the reason why the skin fits the body so well.

Capillaries extend into the dermal ridges or papillae but DO NOT enter the epidermis. Lymphatics and nerve fibres are also found in the Dermis. Most of the nerves in the skin carry different forms of sensation, some of them ending in the deeper layers of the epidermis. The latter are pain endings so that although an injury that is confined only to the epidermis will not bleed, it may however be painful.

Under the dermis is a layer of adipose tissue (fat) which acts as a food store and keeps the body warm.

## **SWEAT GLANDS**

The main part of the sweat gland is situated in the dermis. The duct however spirals towards the surface through the epidermis. The gland is made up of a tightly convolute tube which is lined by cubical epithelium and surrounded by a network of capillaries.

Sweat contains certain waste products such as urea and electrolytes, principally sodium chloride. That is why so often in very hot climates you need to increase your salt intake. Sweat glands are found in the skin all over the body, but are most abundant in the palms of the hands, soles of the feet and the forehead.

Sweat is a clear fluid. The secretion of sweat is controlled by the sympathetic nervous system.

It evaporates quickly so that it is unobserved – insensible sweat (perspiration). When the amount is increased or evaporation is delayed it becomes visible – sensible sweat.