

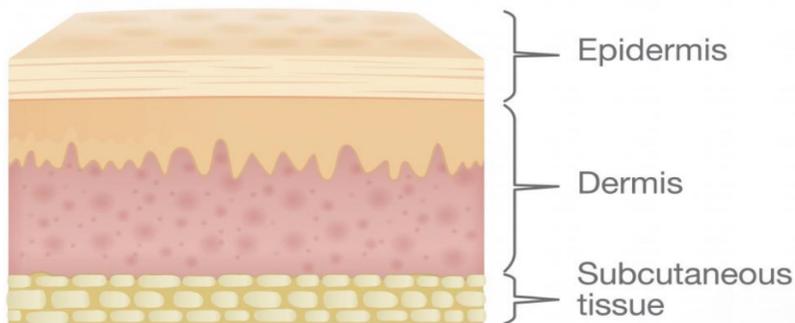
The Integumentary System

Anatomy and Physiology

• The skin, also called integument, is the largest organ in the body. Together with its accessory organs (hair, nails, and glands), the skin makes up the integumentary system.

• It's a system of distinct tissues includes **glands** that produce several types of secretions, **nerves** that transmit impulses, **blood vessels** that help regulate body temperature.

The Layers of Skin



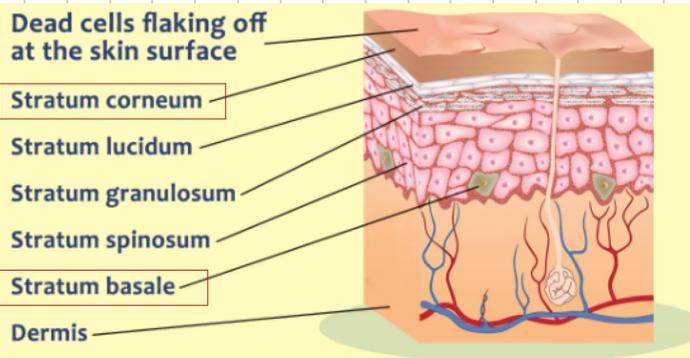
Epidermis

• It is relatively thin over most areas but is thickest on the palms of the hands and the soles of the feet.
• The epidermis is composed of several sublayers called strata (only 2 are mentioned here for their importance).

The stratum corneum is composed of dead flat cells that lack a blood supply and sensory receptors. Its thickness is correlated مترابطة with normal wear of the area it covers.

The stratum basale (deepest) is the only layer of the epidermis that is composed of living cells where new cells are formed. As these cells move toward the stratum corneum to replace the cells that have been sloughed off تتفصل, they die and become filled with a hard protein material called keratin. The entire process by which a cell forms in the basal layer, rises to the surface, becomes keratinized, and sloughs off takes about one month.

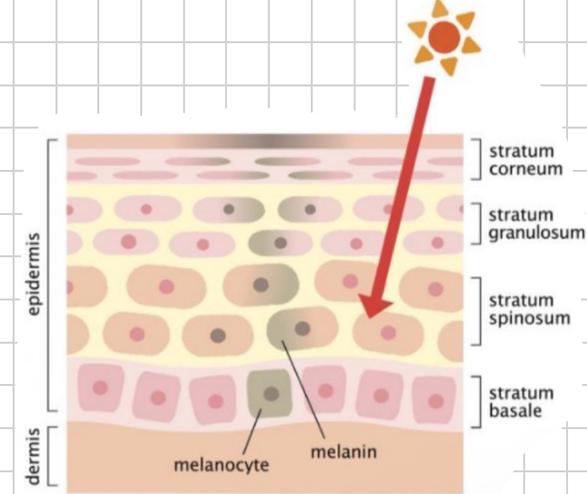
Functions of keratin: It prevents body fluids from evaporating and moisture from entering the body due to its relative waterproof characteristics.



Melanocytes are special cells, found in the basal layer. They produce a black pigment called melanin.

functions of Melanin

It provides a protective barrier from the damaging effects of the sun's ultraviolet radiation, which can cause skin cancer. Moderate sun exposure increases the rate of melanin production and results in a suntan. However, overexposure results in sunburn due to melanin's inability to absorb sufficient ultraviolet rays to prevent the burn.



Q/What is the location of melanocytes A/in the epidermis (stratum basale).

- Production of melanocytes is genetically regulated and, thus, inherited (وراثي).
- Local accumulations of melanin are seen in pigmented moles and freckles.



• An absence of pigment in the skin, eyes, and hair is most likely due to an inherited inability to produce melanin. An individual who cannot produce melanin has a marked deficiency of pigment in the eyes, hair, and skin and is known as albino.



Dermis , also called **corium**

- The second layer of the skin
- It lies directly beneath the epidermis.
- It is composed of living tissue and contains numerous capillaries, lymphatic vessels أوعية لمفاوية, nerve endings النهايات العصبية, hair follicles بصيالات الشعر, sebaceous (oil) glands الغدد الدهنية (الزيتية), and sudoriferous (sweat) glands الغدد العرقية (العرق).

Subcutaneous layer, also called **hypodermis**

- It binds the dermis to underlying structures.
- It is composed primarily of loose connective tissue and adipose (fat) tissue interlaced with blood vessels.
- It stores fats, insulates and cushions the body, and regulates temperature.

Accessory Organs of the Skin

• 1-Glands

- Two important glands located in the dermis produce secretions: the sudoriferous (sweat) glands produce sweat and the sebaceous (oil) glands produce oil.
- These two glands are exocrine glands because they secrete substances through ducts to an outer surface of the body rather than directly into the bloodstream.
- The sudoriferous glands secrete sweat onto the surface of the skin through pores. Pores are most plentiful on the palms, soles, forehead جبين, and axillae الابط (armpits). The main functions of the sudoriferous glands are to cool the body by evaporation, excrete waste products, and moisten surface cells. The sebaceous glands are filled with cells, the centers of which contain fatty droplets. As these cells disintegrate, they yield an oily secretion called sebum. The acidic nature of sebum helps destroy harmful organisms on the skin, thus preventing infection. When ductules of the sebaceous glands become blocked, acne بثور may result.
- Sex hormones, particularly **androgens** regulate production and secretion of sebum

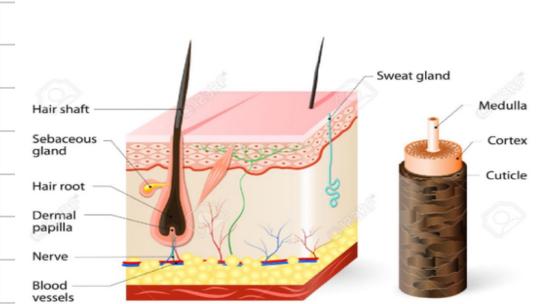
2-Hair

Hair is found on nearly all parts of the body except for the **lips, nipples, palms of the hands, soles of the feet, and parts of the external genitalia**. The visible part of the hair is the **hair shaft**; the part that is embedded in the dermis is the **hair root**. The root, together with its coverings اغطيه, forms the hair follicle. At the bottom of the follicle is a loop of capillaries enclosed in a covering called the papilla. The cluster مجموعه of epithelial cells lying over the papilla reproduces and is responsible for the eventual النهائي formation of the hair shaft. As long as these cells remain alive, hair will regenerate even if it is cut, plucked, or otherwise removed.

Alopecia (baldness) occurs when the hairs of the scalp are not replaced because of death of the papillae (singular, papilla).

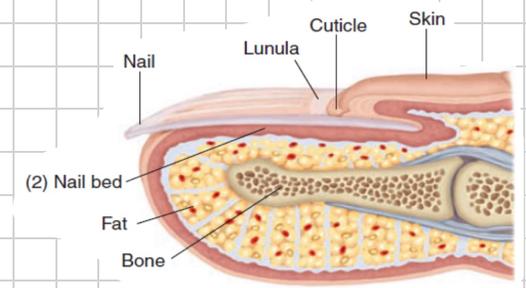


HAIR ANATOMY



3-Nails

Nails protect the tips of the fingers and toes from bruises and injuries. Each nail is formed in the nail root and is composed of **keratinized stratified squamous epithelial cells** producing a very tough covering. As the nail grows, it stays attached and slides forward over the layer of epithelium called the nail bed. This epithelial layer is continuous with the epithelium of the skin. Most of the **nail body appears pink because of the underlying vascular tissue**. The half-moon-shaped area at the base of the nail, the lunula, is the region where new growth occurs. **The lunula has a whitish appearance because the vascular tissue underneath does not show through.**



Prefixes

an=without,not
dia=through,across
epi=above,upon
homo=same
hyper= excessive,above normal
hypo= under,below
sub=under,below
dermat=skin

Word root

adipose=fat
lip=fat
steat=fat

cutane=skin
dermat=skin
derm=skin

hidr=sweat
sudor=sweat

onych=nail
ungul=nail

pil=hair
trich=hair

scler=hardening
sclera=white of eye

seb=sebum ,sebaceous
squam=scale
xen=foreign strange
xer=dry
aden=gland
nid=nest
ichthy=dry,scaly
kerat=horny tissue
melan=black
myc=fungus

Suffixes

osis=abnormal condition
cele=hernia
itis=inflammation
ous=pretaining to
ic= pretaining to
al= pretaining to
ous= pretaining to
plasty=surgical repair
esis=condition
oma=tumor
malacia=softening
pathy= disease
derma=skin
rrhea= discharge,flow
graft= transplantation
cyte= cell