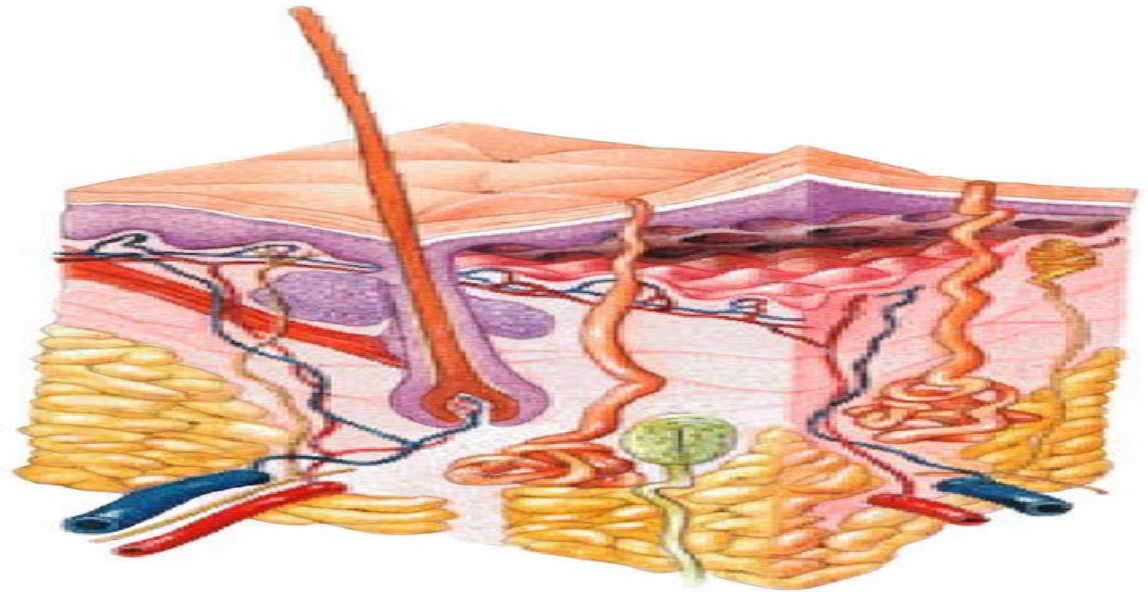


The Integumentary System

Assist.Lect. Noor Alaa Abdulrazziq

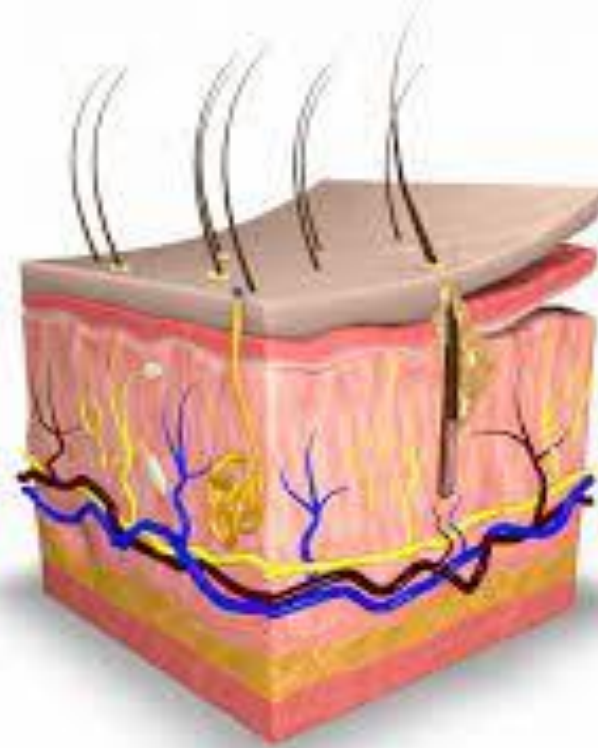
College of Dentistry/Mustansiriyah University

The integumentary system is the largest organ of the body that forms a physical barrier between the external environment and the internal environment that it serves to protect and maintain.



This system is divided into:

- 1** - skin
- 2** - hair
- 3** - nails
- 4** - glands
- 5** - nerve endings



Skin is an organ because it consists of different tissues that are joined to perform a specific function.

Largest organ of the body in surface area and weight.

Dermatology is the medical specialty concerning the diagnosing and treatment of skin disorders.



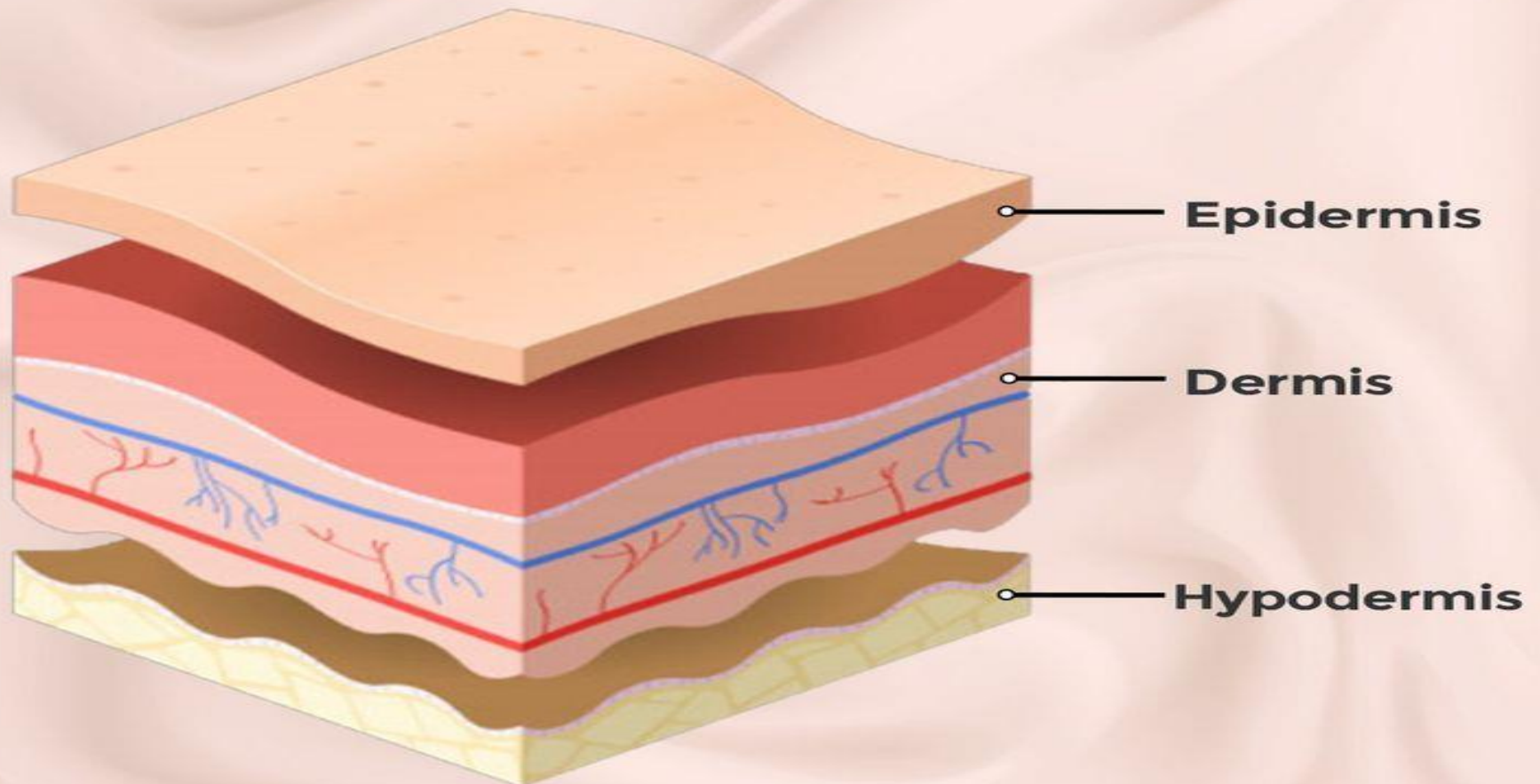
Skin layers

The human skin consists essentially of three superimposed layers. From the outside to the inside, these are called:

- ❖ **The epidermis**, the outermost layer of skin, provides a waterproof barrier and creates our skin tone.
- ❖ **The dermis**, beneath the epidermis, contains tough connective tissue, hair follicles, and sweat glands.
- ❖ **The hypodermis** is the deeper subcutaneous tissue and is made of fat and connective tissue.



LAYERS OF OUR SKIN



Epidermis

- Keratinized stratified squamous epithelium.
- It provides a barrier to infection from environmental pathogens and regulates the amount of water released from the body into the atmosphere.
- The epidermis **does not contain blood vessels and is nourished by diffusion from the dermis.**



Epidermis layers

It is composed of the following layers (strata):

Stratum corneum

Stratum lucidum

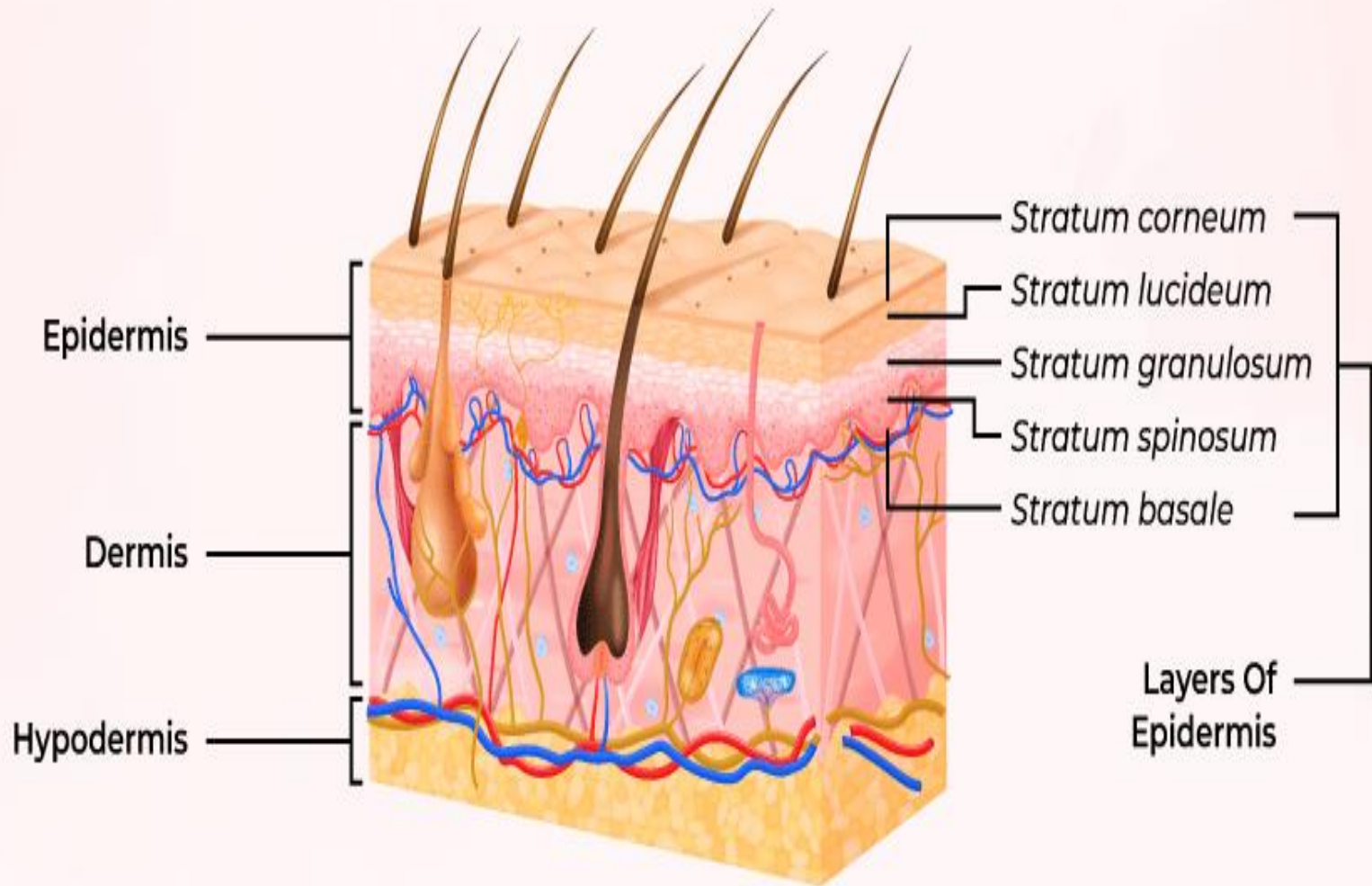
Stratum granulosum

Stratum spinosum

Stratum basale.



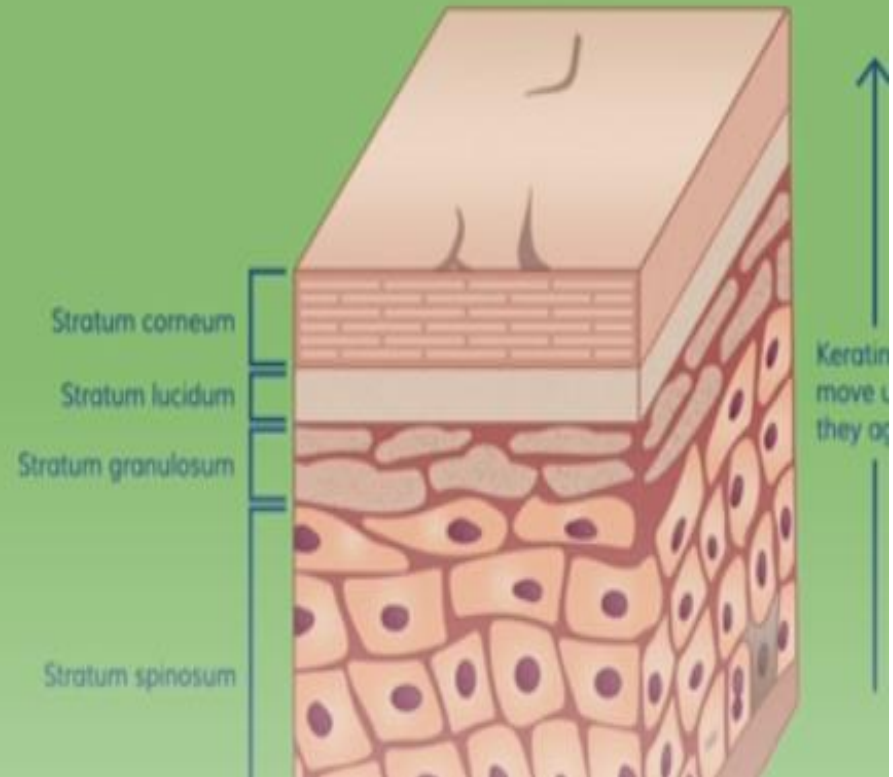
Layers of the Skin



The Epidermis

Stratum Corneum

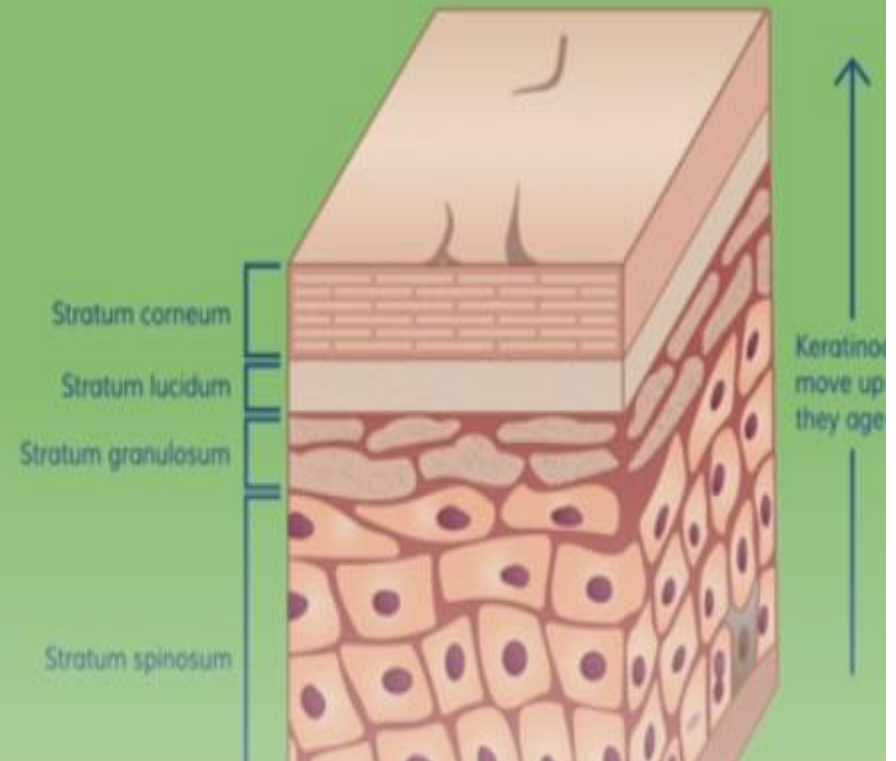
- Most superficial layer of the epidermis
- Several layers of dead, flattened keratinocytes
- Sheds dead keratinocytes



The Epidermis

Stratum Lucidum

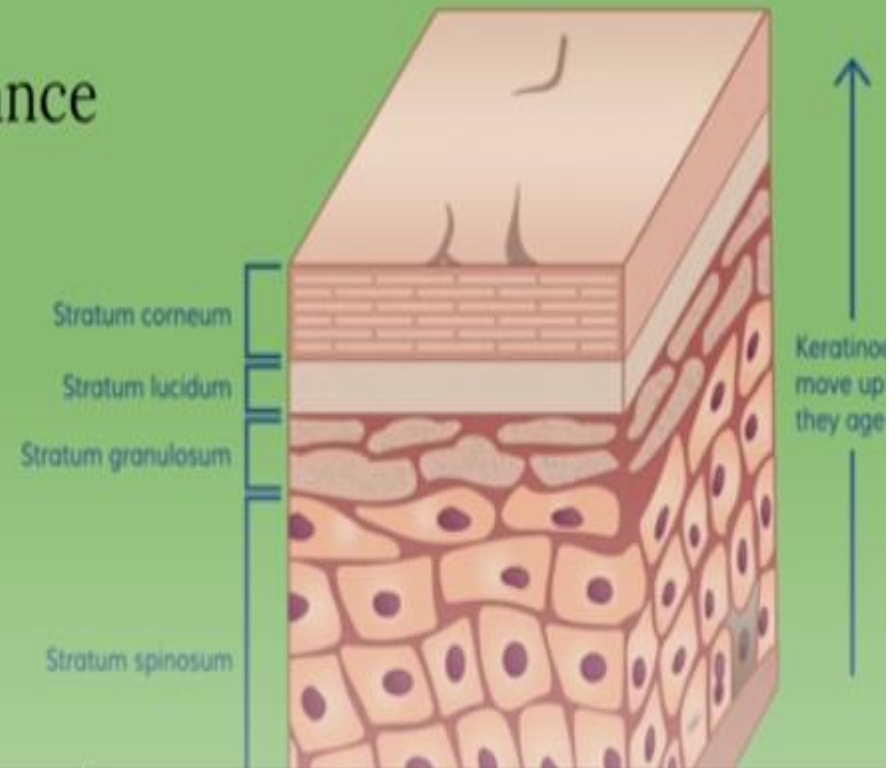
- Deep to the Stratum Corneum
- Found in thick skin
- Clear layer of dead keratinocytes



The Epidermis

Stratum Granulosum

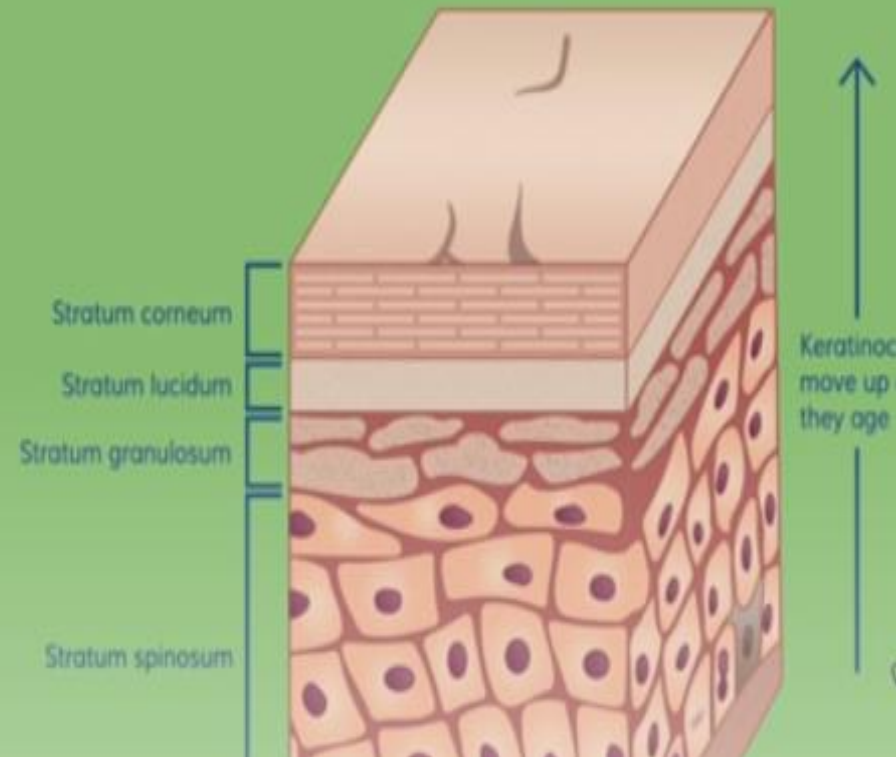
- Middle layer of the epidermis
- Named for prominent granules
- 3-5 rows of cells
- Excretes a lipid-based substance



The Epidermis

Stratum Spinosum (*spino-prickly*)

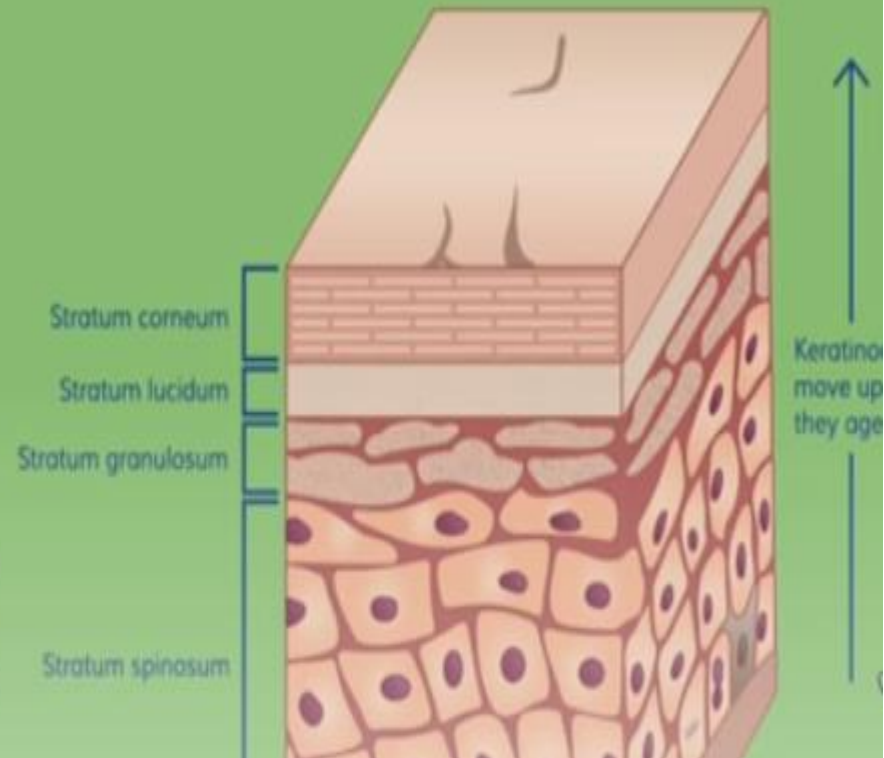
- Deep to the Stratum Basale
- Thickest stratum of the epidermis
- Named due to its spiky appearing cells
- Cells are metabolically active
- Undergo mitosis
- Help to synthesize vitamin D



The Epidermis

Stratum Basale (*basal-bottom*)

- The deepest layer of the epidermis
- Consists of a single layer of stem cells
- Richest supply of blood
- Most metabolically active
- Undergo mitosis
- Also known as “**Stratum Germinativum** (*germinating*)”
- Helps to synthesize vitamin D



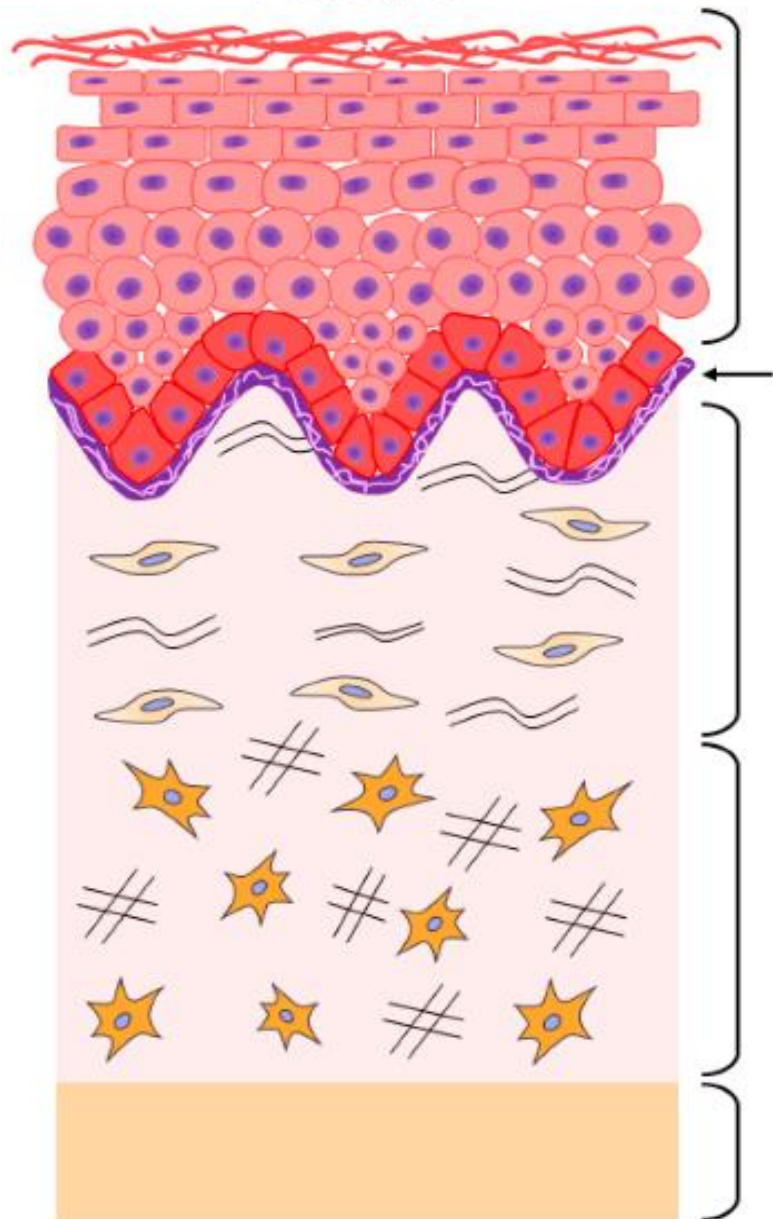
Dermis

The dermis is the layer of skin that lies beneath the epidermis.

- It is the thickest layer of the skin, and is made up of fibrous and elastic tissue. Thus it provides strength and flexibility to the skin.
- It is comprised of two layers:
 - **The papillary dermis**
 - **The reticular dermis**



YOUNG



Epidermis

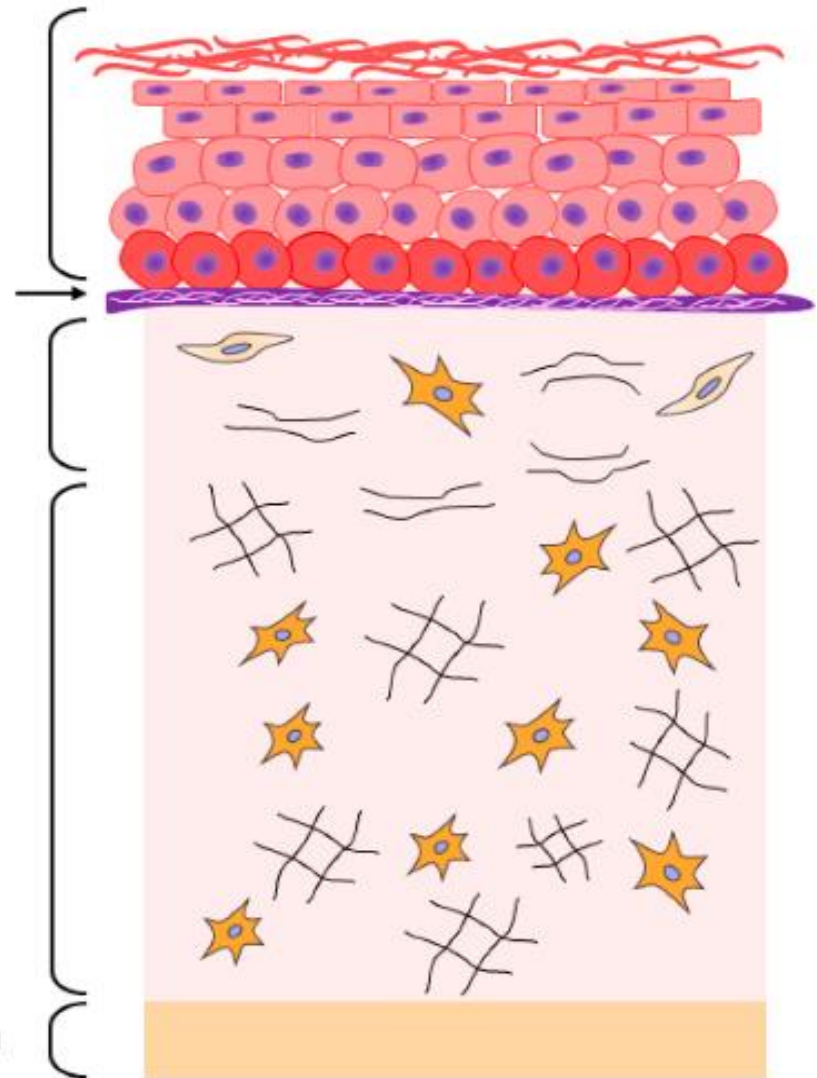
DEJ

Papillary
dermis

Reticular
dermis

Hypoderm

OLD



Hypodermis

The hypodermis (also called the **subcutaneous layer** or **superficial fascia**) is a layer directly below the dermis and serves to connect the skin to the underlying fascia (fibrous tissue) of the bones and muscles.

It consists of **loose connective tissue** and **adipose tissue**. Adipose tissue present in the hypodermis consists of **fat-storing cells called adipocytes**.

This stored fat can serve as an energy reserve, insulate the body to prevent heat loss, and act as a cushion to protect underlying structures from trauma.



Epidermal Derivatives

Epidermal derivatives (also called **epidermal appendages**), Accessory structures of the skin include **hairs, nails** and **glands**.

They are derived from the **stratum basale** of the epidermis and are embedded in the **reticular layer** of the dermis.

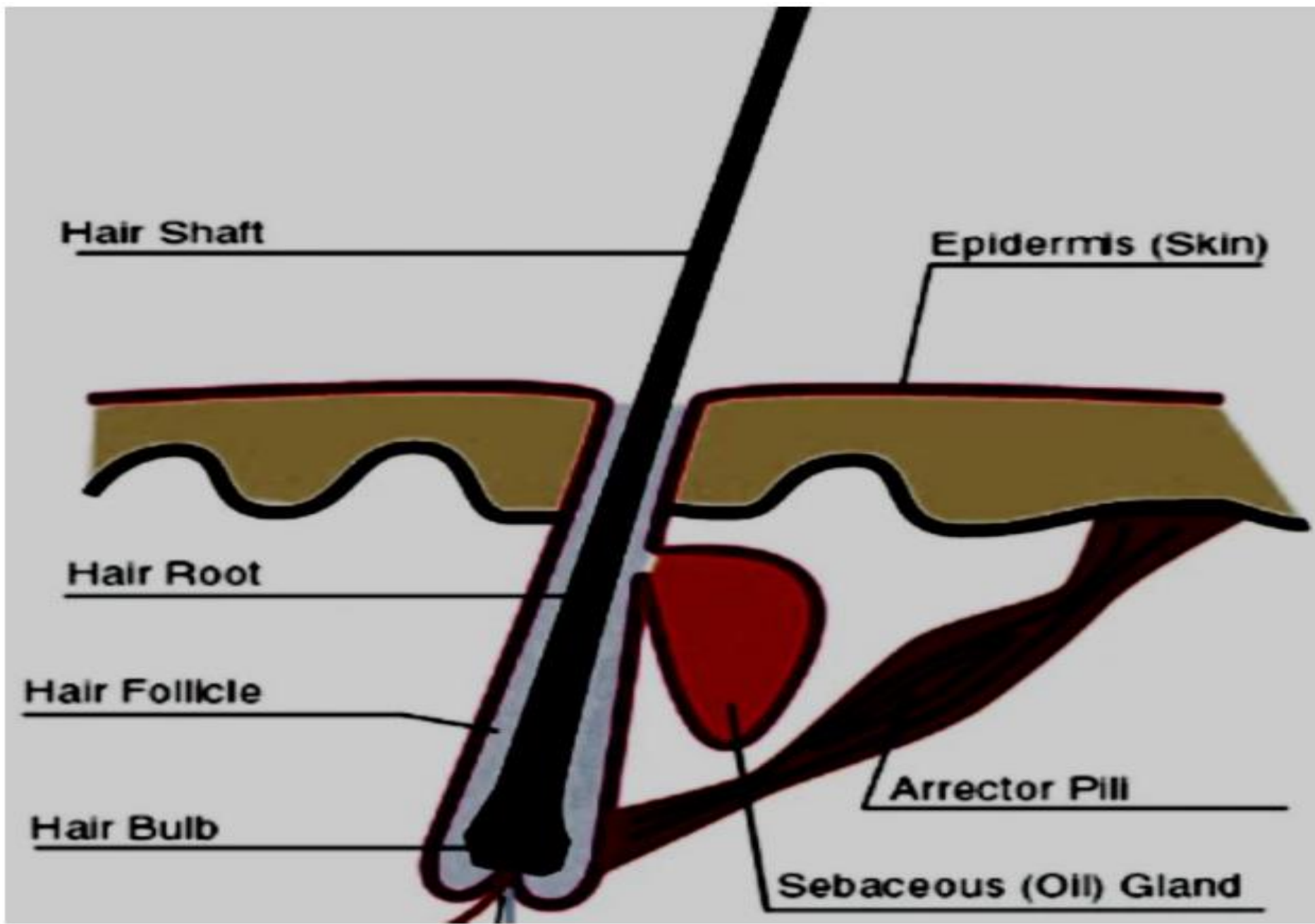


Hair

Hair consists of three parts:

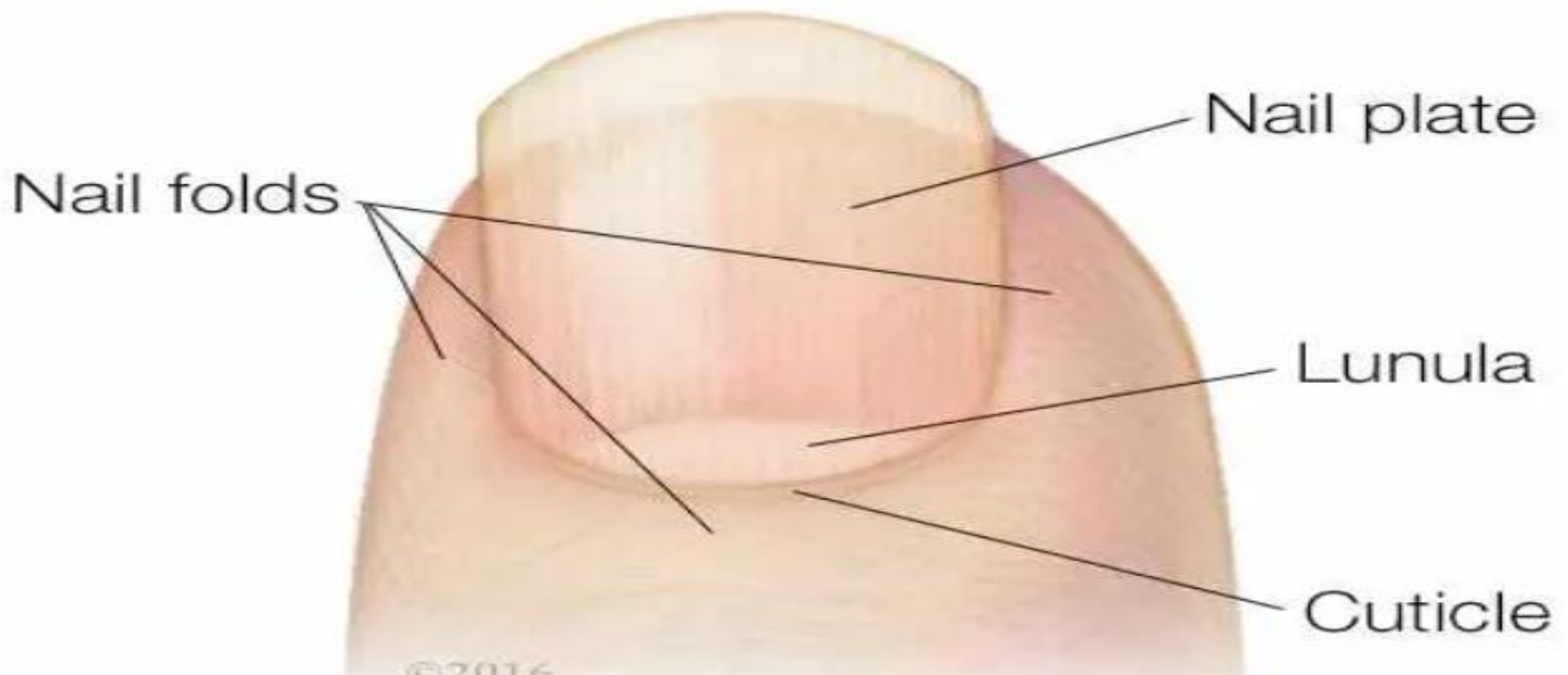
- **Hair shaft** is the part that projects from the skin and may extend slightly below the surface of the epidermis,
- **Hair root** is the part embedded within the dermis,
- **Hair bulb** contains a projection of the dermis called the hair papilla, with a capillary of blood supply.





Nails:

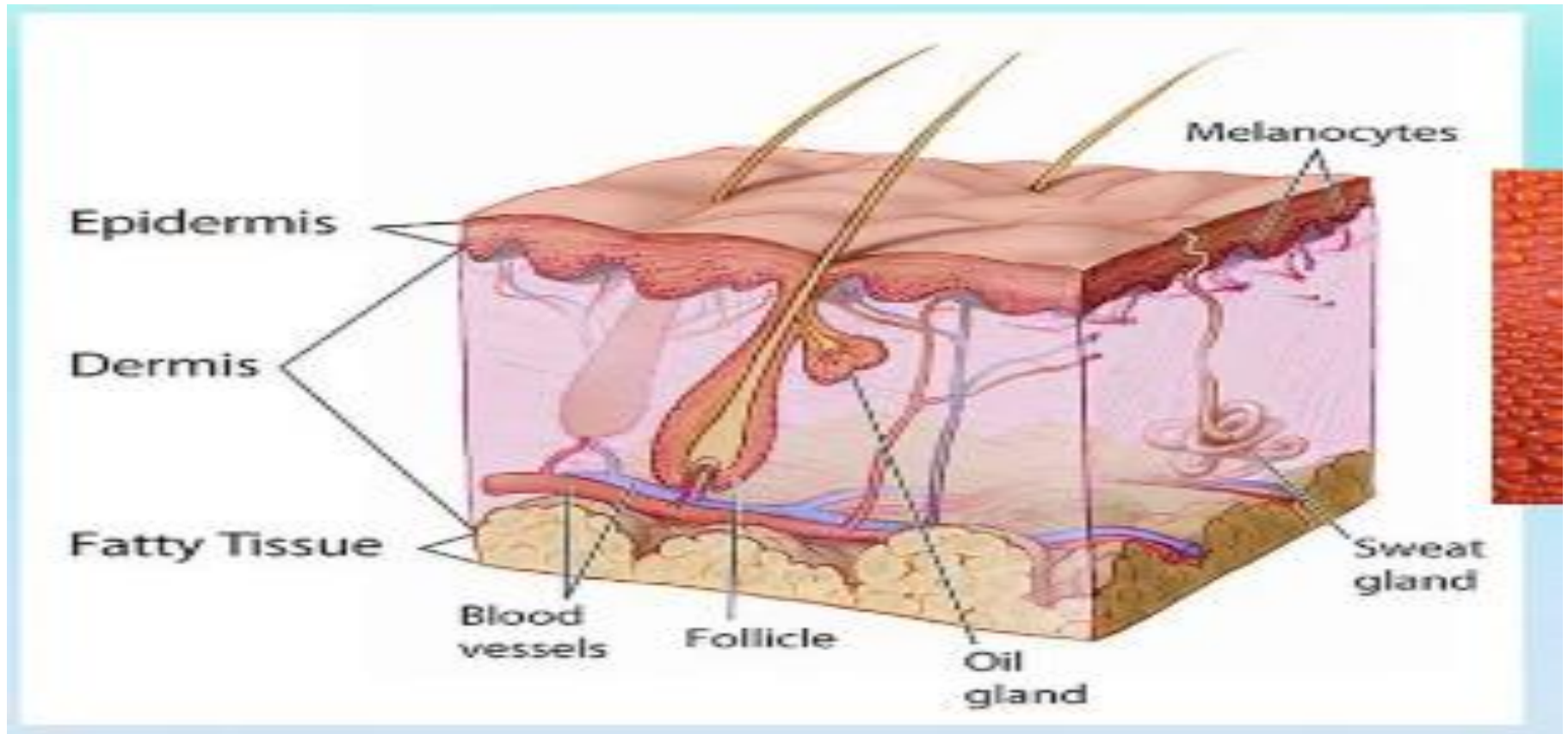
The nail is made up of hard, keratinized epidermal cells. It has:



Glands:

Two types of glands exist in the integument.

- **Sebaceous glands** (oil glands)
- **Sudoriferous glands** (sweat glands)



Skin receptors (Cutaneous receptors)

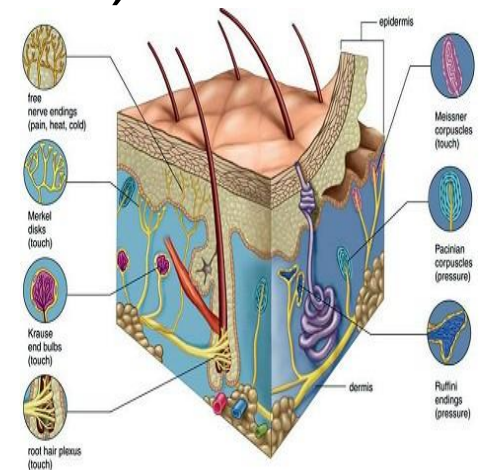
Skin is the most extensive sensory receptor of the body, and both dermis and epidermis layers contain nerve tissue.

❖ Cutaneous receptors :

Mechanoreceptors (touch & pressure).

Thermoreceptors (temperature).

Nociceptors (pain)



There are 7 main functions of the skin and these are:

- Sensation
- Heat regulation
- Absorption
- Protection
- Excretion
- Secretion
- Vitamin D production



Skin Disorders

These are some of the following disorders that affect the skin:

- **Leukoderma:** It is also known as ‘**vitiligo**’. Skin pigmentation (melanin) is lost from smaller or larger patches at different regions of the body. The exact cause of the disease is still unknown.

- **Albinism:** Loss of pigmentation of the skin all over the body including eyebrows, hair, eyelashes, and even the iris. The skin of affected individuals appears pinkish because of the underlying blood capillaries. Albinism is a recessive trait caused due to inheritance; an albino couple would produce all albino children.

- **Acne:** It commonly occurs on the face, neck, chest, and shoulders. The symptoms are redness, blackheads, pimples, or deep cysts. It may leave scars on the skin if untreated.



•**Measles**: It causes red rashes which spread from the face to down the body within 3 to 5 days. The symptoms include fever, red or watery eyes, cough, and runny nose.

•**Melanoma**: It is the most serious form of skin cancer. It can also appear as a mole that has changed color or gotten bigger over time. Melanoma occurs in areas that are less exposed to the sun and it is common in people with light skin.

•**Lupus**: The symptoms include fever, headaches, fatigue, and painful joints. It spreads across the cheeks and nose.

•**Wart**: It is caused due to different type of viruses called Human papillomavirus(HPV).



