The integumentary system

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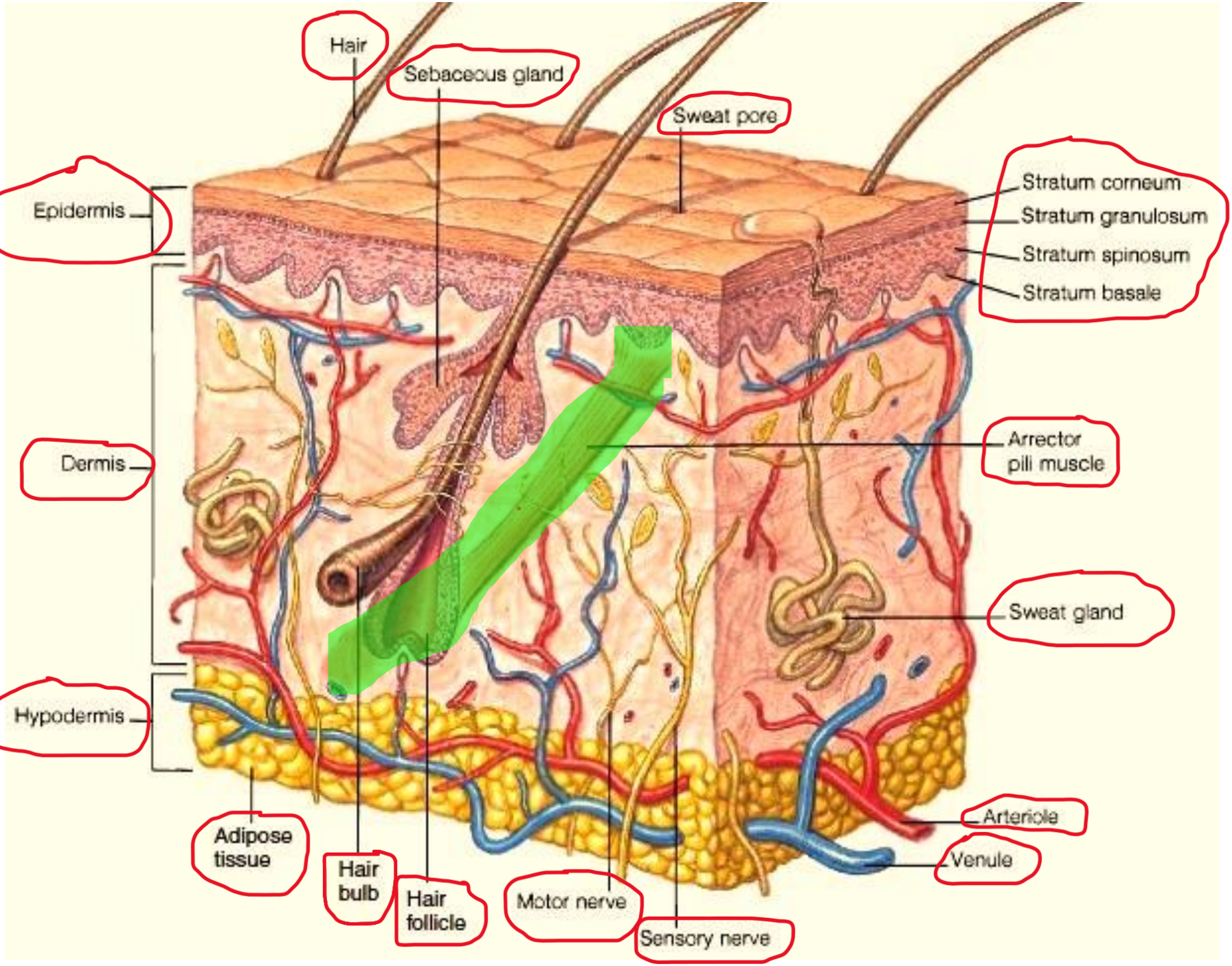
By the end of this lesson we will be able to :

1. Describe the functions of the skin.
2. Distinguish between the two layers that form the skin.
3. Identify two types of glands found in the skin, and describe their functions.
4. Describe the structure of nails.
5. Describe the structure of hair.

skin

- The skin is one of the human body's largest organs.
- Skin contains sensory receptors that monitor the external environment, and mechanisms that rid the body of wastes.
- The skin is composed of two layers—the epidermis and the dermis.

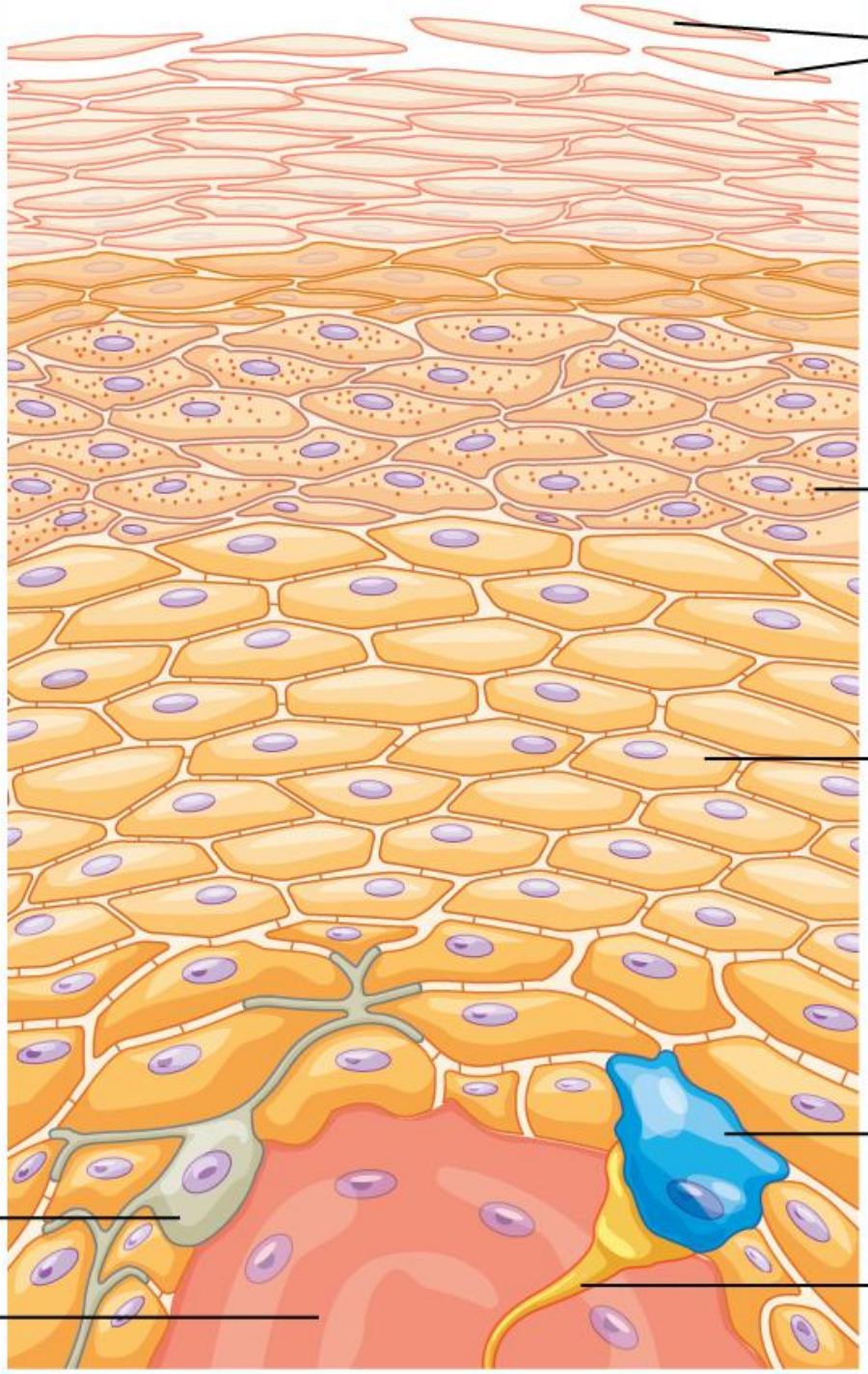

Hair
Sebaceous gland
Sweat pore
Epidermis
Stratum corneum
Stratum granulosum
Stratum spinosum
Stratum basale
Dermis
Arrector pili muscle
Sweat gland
Hypodermis
Arteriole
Venule
Adipose tissue
Hair bulb
Hair follicle
Motor nerve
Sensory nerve

Epidermis

The epidermis, which is the outermost layer of the skin, consists of numerous layers of flattened, scale-like epithelial cells.

The uppermost layers primarily consist of dead cells.

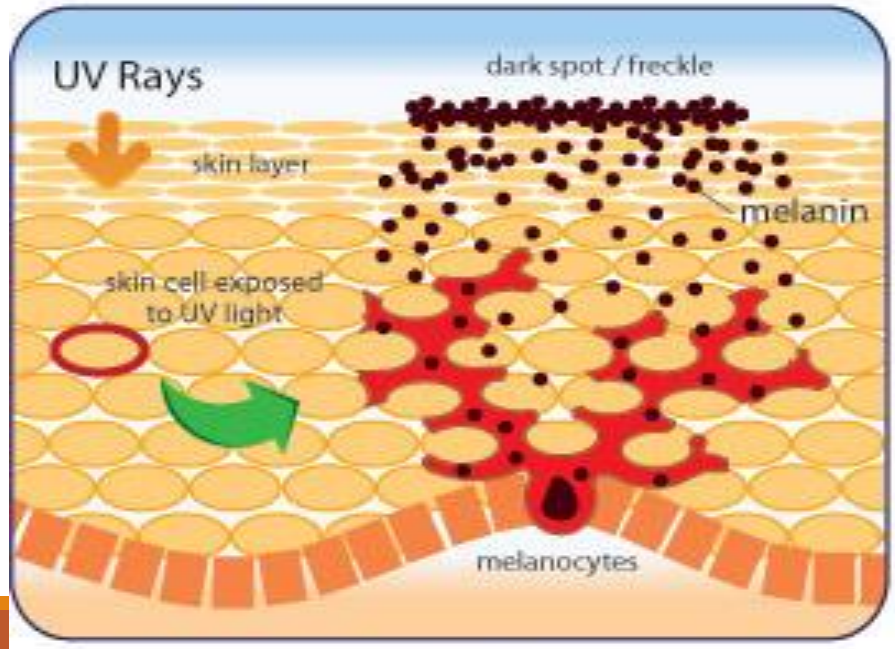
These cells are continuously shed through daily activities like scraping or rubbing, and they are replenished by new cells that are generated in the actively dividing lower layers.


Dead cells filled with keratin
Stratum corneum
Stratum lucidum
Stratum granulosum
Lamellar granules
Stratum spinosum
Keratinocyte
Stratum basale
Merkel cell
Melanocyte
Sensory neuron
Dermis

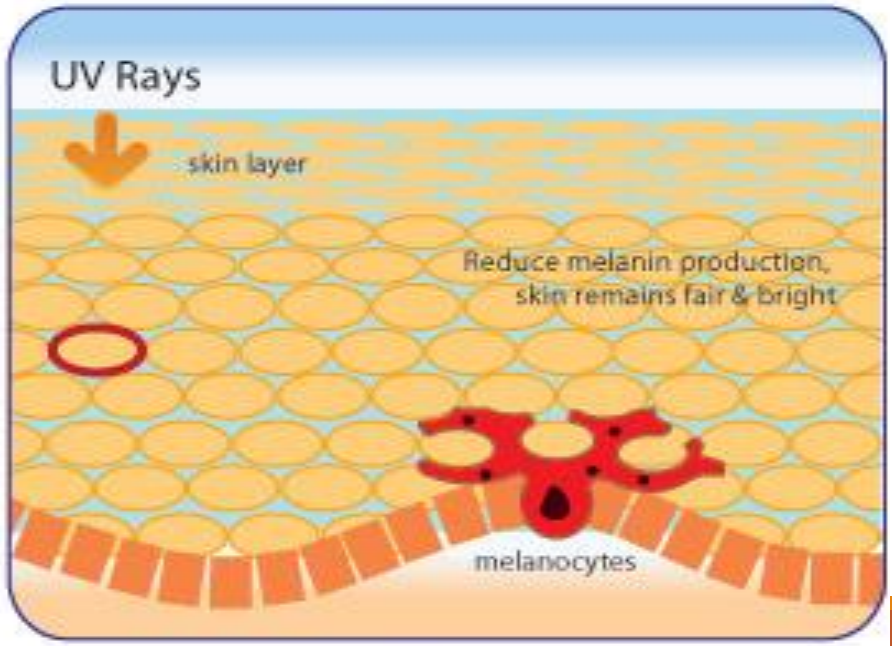
Products that protect from UV rays

What makes skin light and dark?
If your body makes too much melanin, your skin gets darker. Pregnancy, Addison's disease, and sun exposure all can make your skin darker. If your body makes too little melanin, your skin gets lighter.

How R…n.

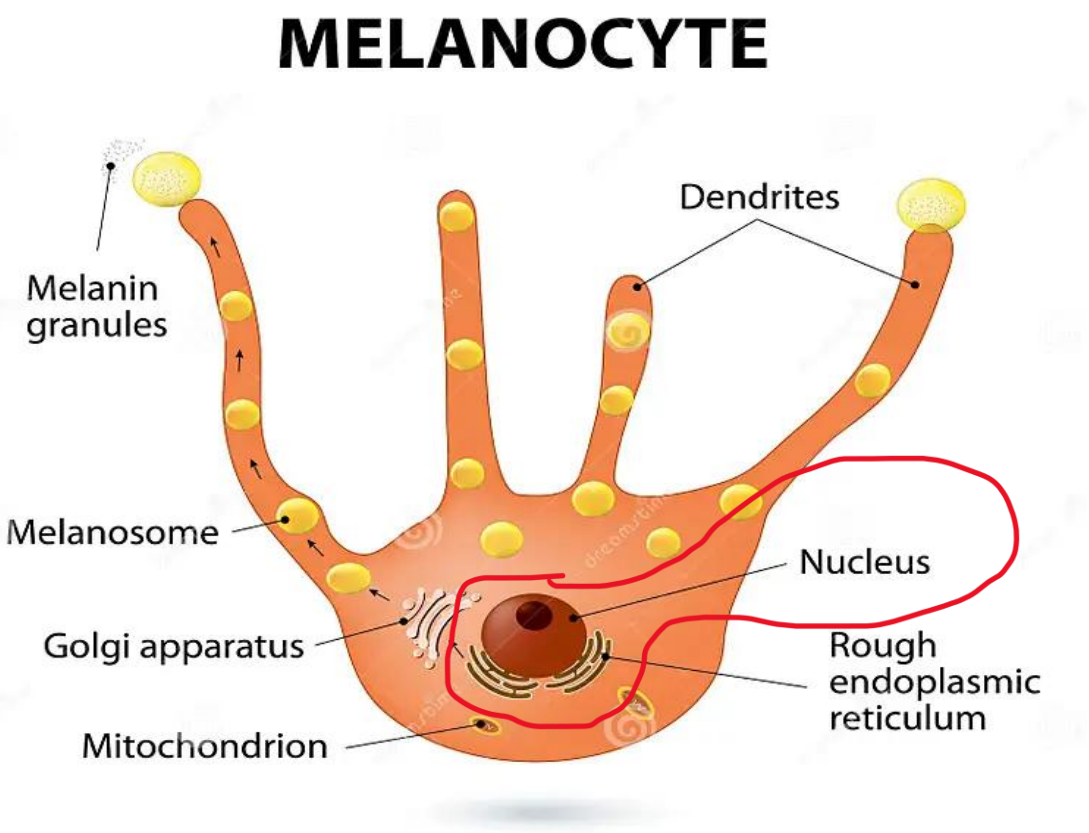


before



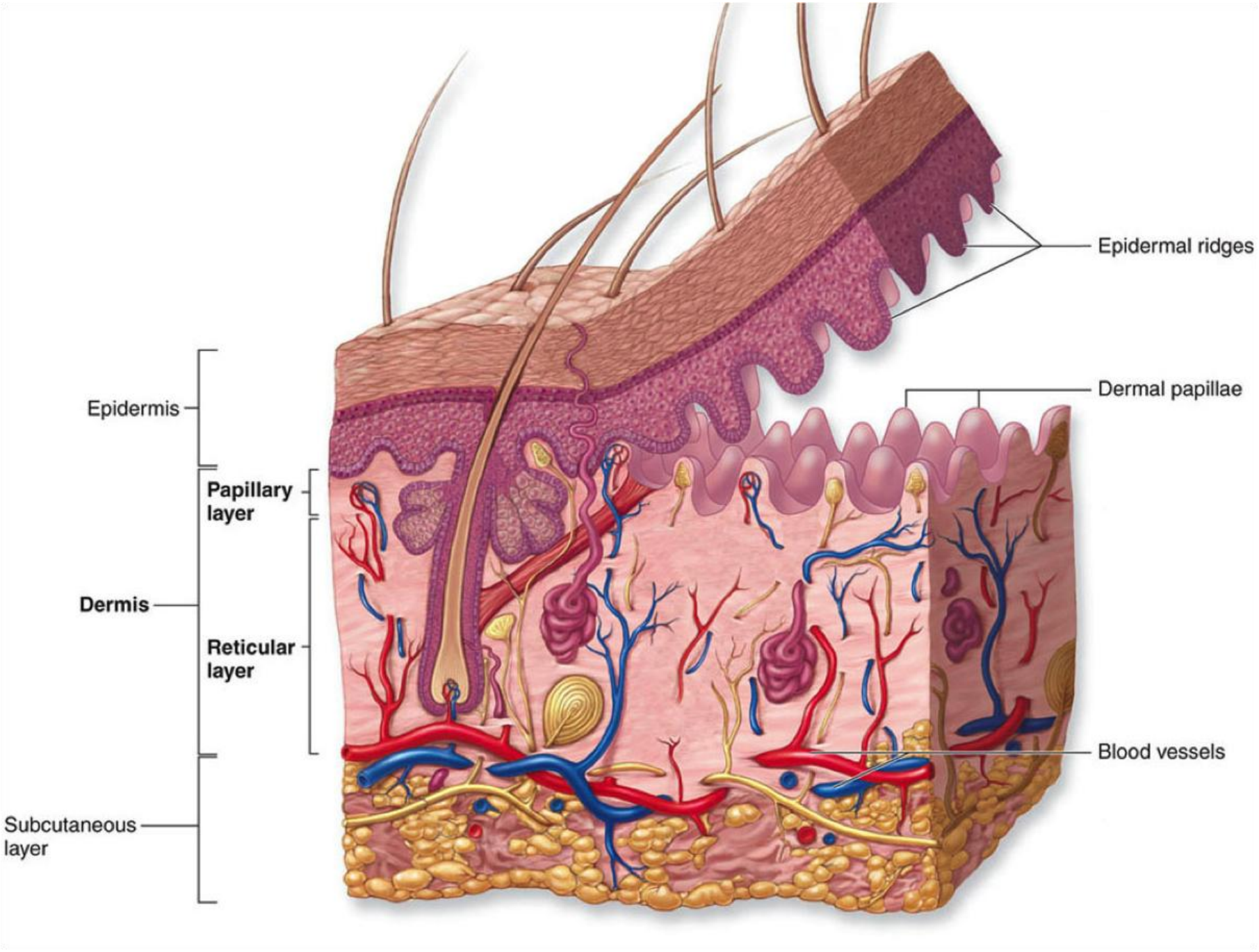
after

Capacity for **melanin** production is limited by DNA inside of the nucleus of melanocytes.



The dermis

The dermis, the inner layer of skin, is composed of living cells and specialized structures, such as sensory neurons, blood vessels, muscle fibers, hair follicles, and glands.

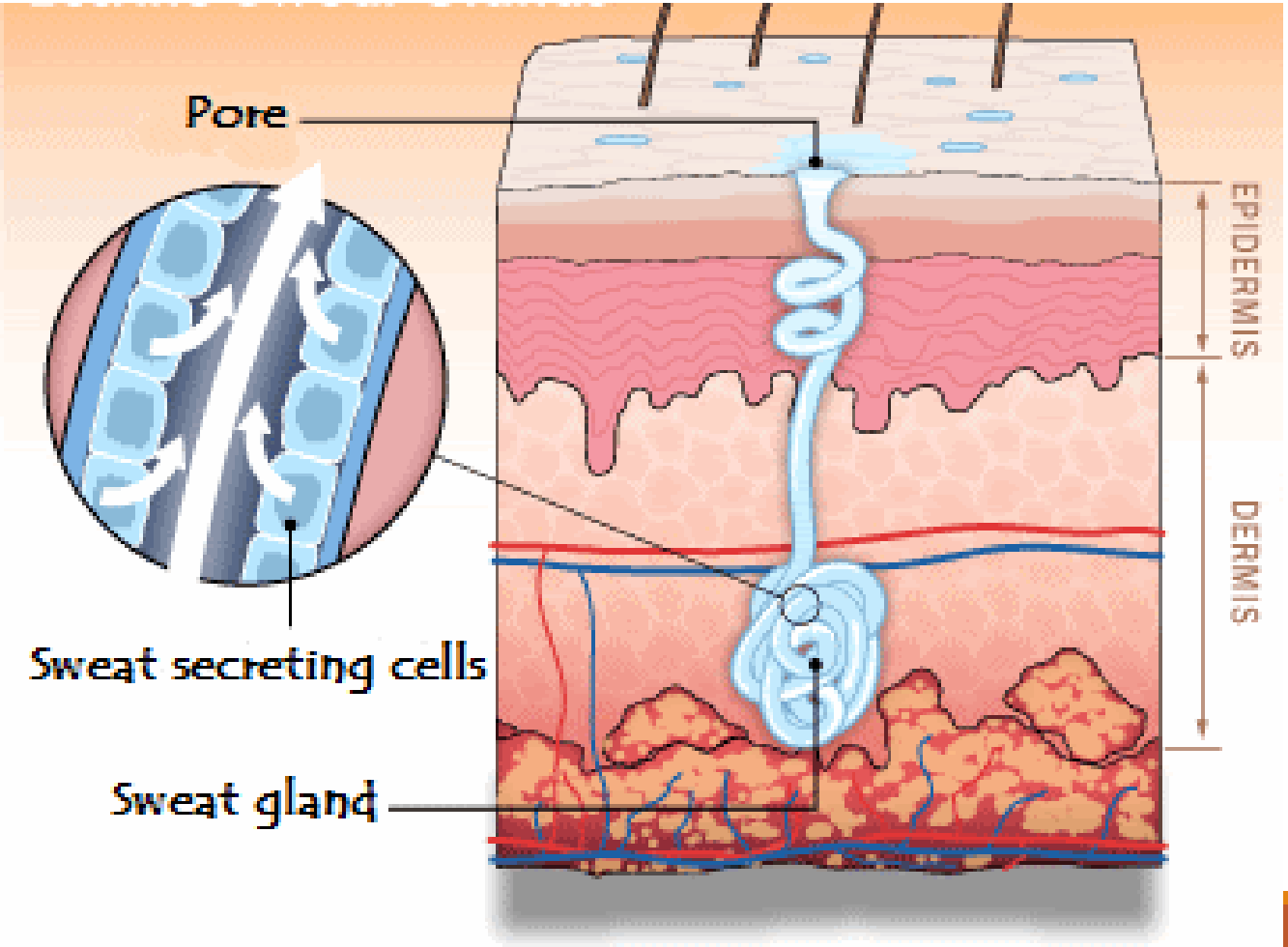

Epidermal ridges
Dermal papillae
Epidermis
Papillary layer
Dermis
Reticular layer
Blood vessels
Subcutaneous layer

Glands

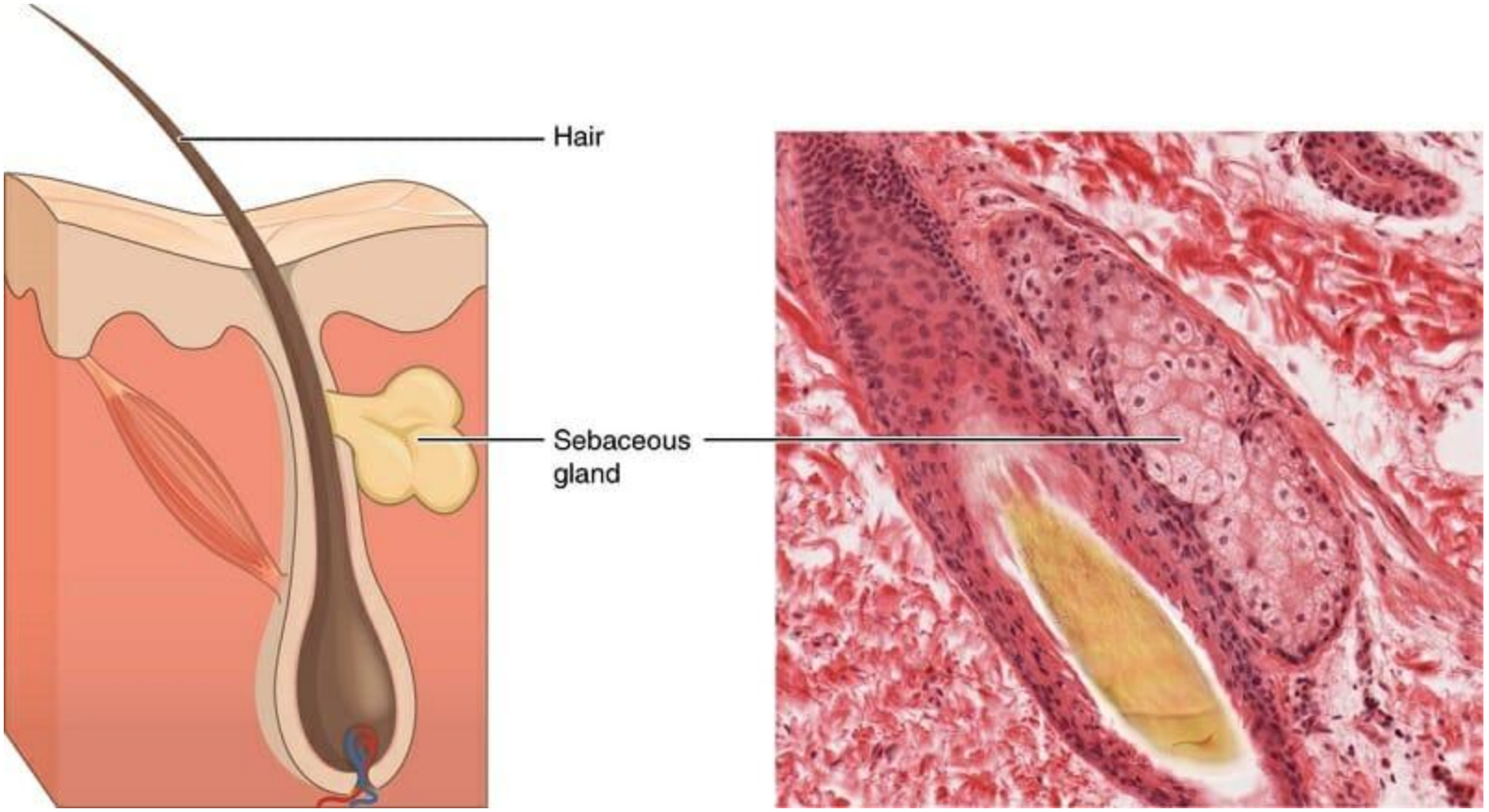
The skin contains exocrine glands, glands that release secretions through ducts.

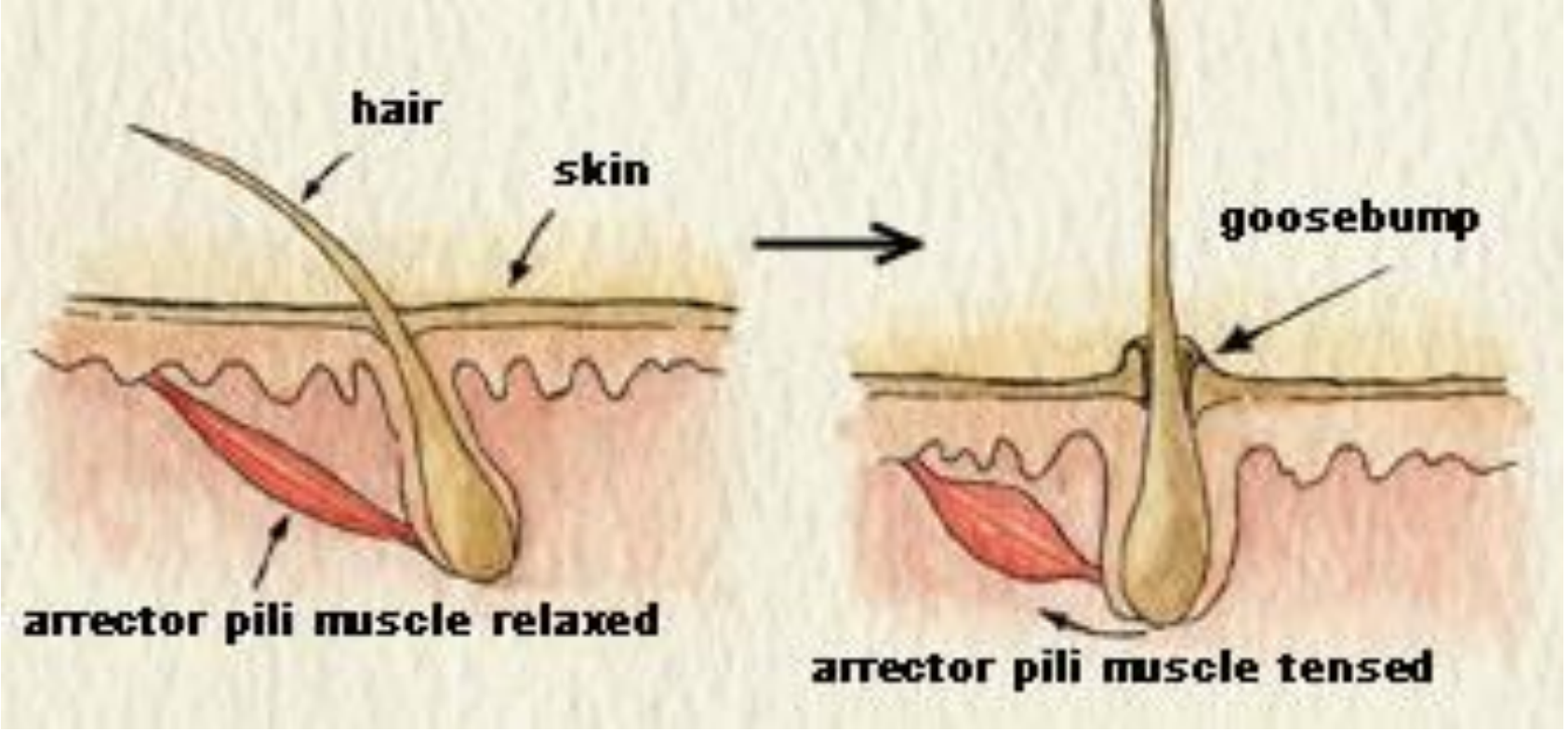
The main exocrine glands of the skin are the sweat glands and the oil glands.

Sweat glands



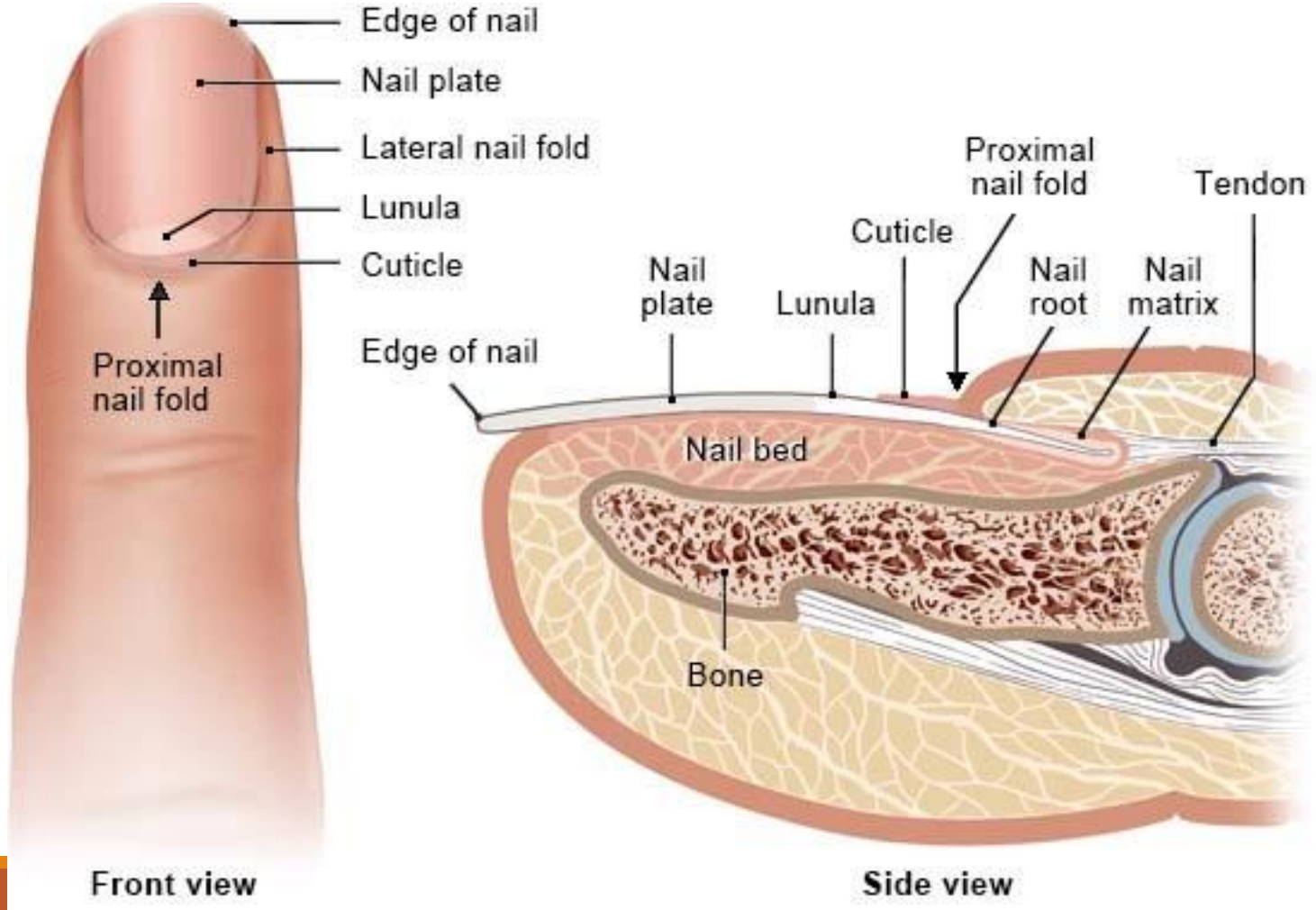
Oil (sebaceous) glands





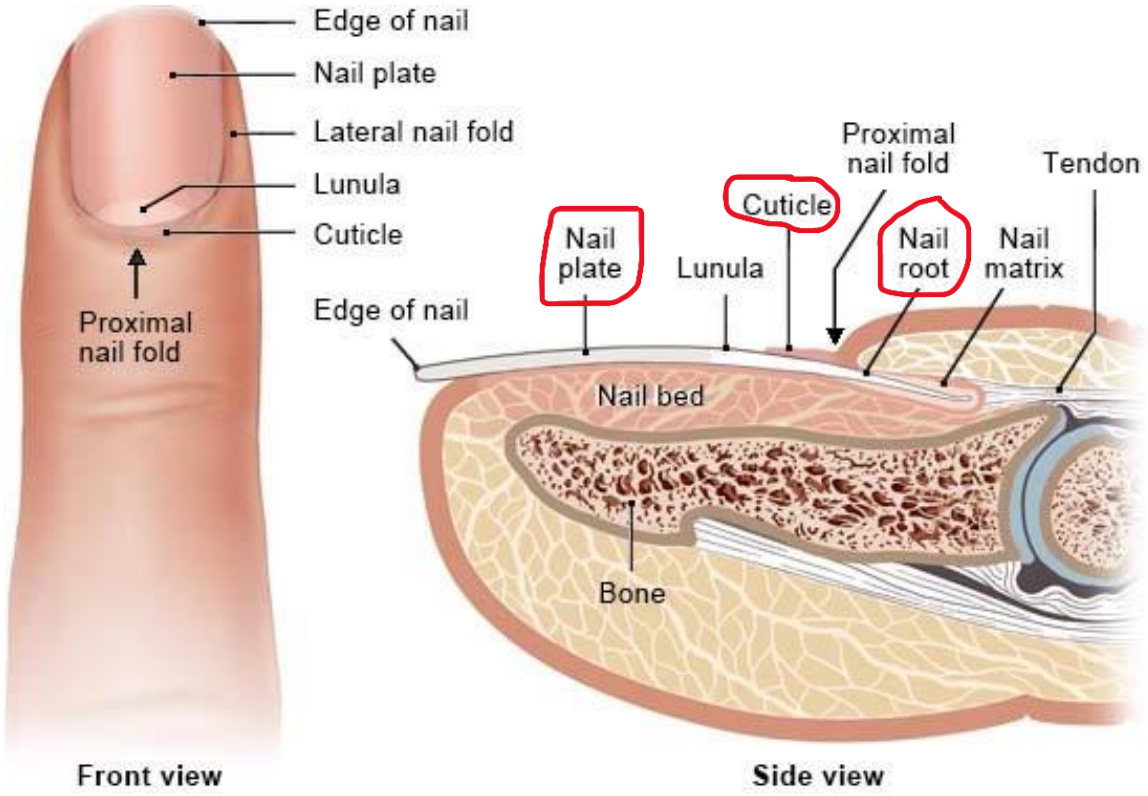
"Do you know what the Arrector pili muscle does?"

Nails

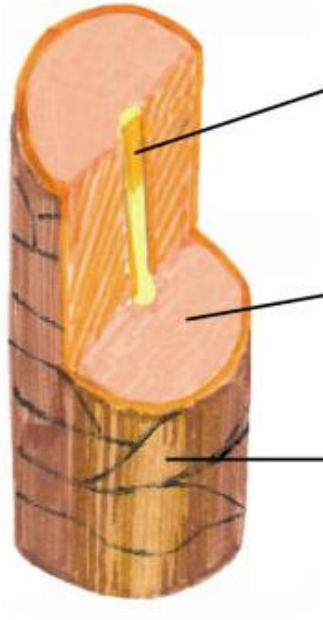

Edge of nail
Nail plate
Lateral nail fold
Lunula
Cuticle
Proximal nail fold
Front view
Proximal nail fold
Cuticle
Tendon
Nail plate
Lunula
Nail root
Nail matrix
Edge of nail
Nail bed
Bone
Side view

Nail growth mechanism

Nails start in the **nail root**, hidden under the **cuticle**. **When cells at the root of the nail grow, the new nail cells push out the old nail cells.** These old cells **flatten and harden, thanks to keratin**, a protein made by these cells. **The newly formed nail then slides along the nail bed**, the flat surface under your nails.



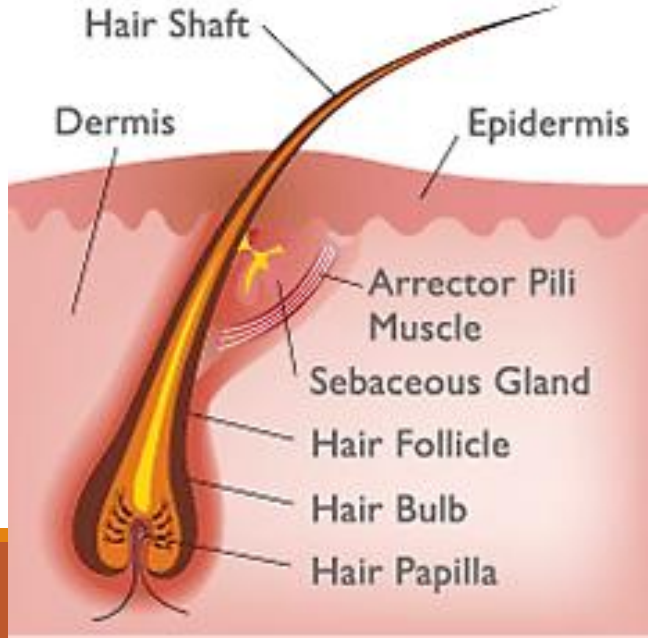
hair



Medulla
the inner most layer
may even be absent (especially in fine or light blonde hair)

Cortex
provides strength, moisture, colour and texture

Cuticle
outermost layer protects the cortex
a hard shingle-like layer of overlapping cells, like scales



Homework

What was the first human skin color?