

Skin and the Integumentary System

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✦ Structure of the Skin:

- A. Integumentary system is made up of the skin and its accessory organs.
- B. The skin is also called the cutaneous membrane or the integument.

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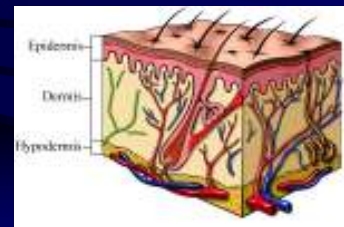
C. The skin is a large organ responsible for maintaining homeostasis through

- temperature regulation,
- protection of underlying tissues,
- prevention of water loss,
- housing sensory receptors,
- synthesizing certain chemicals,
- excreting wastes.

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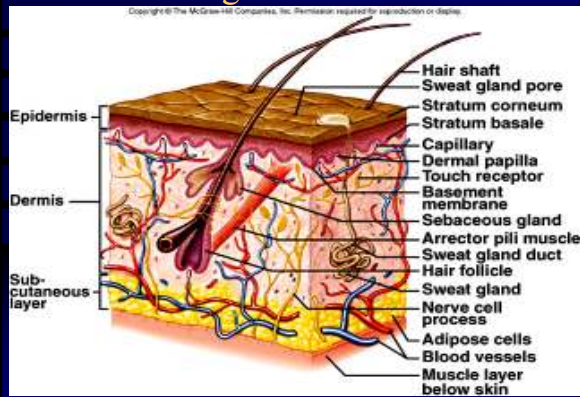
D. The skin has 2 regions:

1. epidermis (outer layer)
2. dermis (inner layer)



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Skin Regions & Structures



E. Epidermis

1. The epidermis is made up of stratified squamous epithelium and has no blood vessels.
2. There are 5 layers of epidermis:
 - 1) stratum basale (or germinativum)
 - 2) stratum spinosum
 - 3) stratum granulosum
 - 4) stratum lucidum (only sometimes)
 - 5) stratum corneum

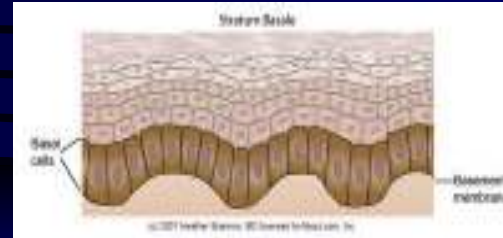
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1) Stratum basale

- Deepest layer of epidermis, closest to dermis
- single row of columnar or cuboidal cells
- Contains dividing cells

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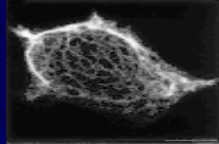
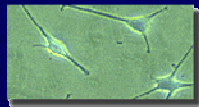
Stratum basale



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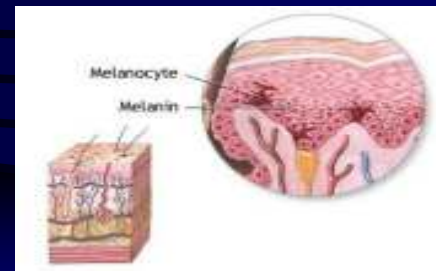
Stratum basale (continued)

- Contains Merkel cells (cells that sense touch)
- Contains melanocytes
 - Melanin=gives skin color & protects from UV rays
 - Freckles=patches of melanin



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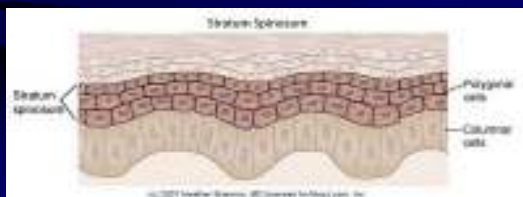
Melanocytes & Melanin



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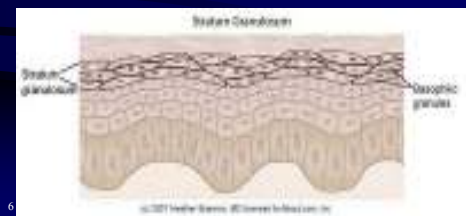
2) Stratum spinosum

- several layers of polygonal cells
- Contains “spiny” keratinocytes
- Contains Langerhans cells



3) Stratum granulosum

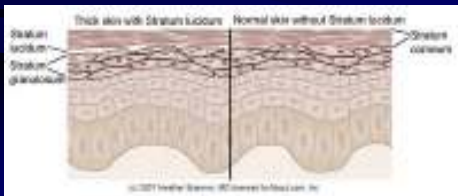
- 3-5 layers of cells
- Contains keratinocytes that have lost their nuclei and have clumps of protein keratin.



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4) Stratum lucidum

- only present in **thick skin** (palms & soles)
- Consists of **clear, flat, dead cells**
- helps reduce friction and shear forces between the adjacent layers.



5) Stratum corneum

- The uppermost layer of epidermis
- Consists of hard, flat, dead cells that are shed continuously.
- Composed mainly of **keratin protein** (provides strength and protection from the water loss or gain)



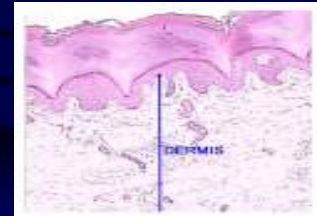
Keratinization: a process by which older cells (keratinocytes) harden as they produce a waterproof protein keratin and are pushed toward the surface of the skin.

- It takes 15-30 days for a cell to move from the stratum basale to the stratum corneum.
- The dead cell remains in the stratum corneum for about 2 weeks.

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F. **Dermis**

1. Dermis consists of **dense irregular connective tissue**.



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Components of dermis

1. **Collagenous fibers** are flexible and offer great resistance to overstretching
2. **Elastic fibers** stretch to allow movement of underlying muscles and joints.



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3. **Dermal papillae:** fingerlike projections of dermis that cause epidermal ridges; provide unique fingerprints and a better gripping surface



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4. Dermal blood vessels carry nutrients to upper layers of skin and help to regulate temperature.

5. The dermis also contains nerve fibers, sensory fibers, hair follicles, oil glands, and sweat glands.

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G. Subcutaneous Layer

1. Hypodermis

- binds the skin to underlying organs.
- composed of loose connective tissue and adipose tissue.
- contains blood vessels

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Skin and its accessory structures

