



**Shree H. N. Shukla Institute of Pharmaceutical
Education and Research, Rajkot**

**B. Pharm
Semester-I**

**Subject Name: Human Anatomy & Physiology-I
Subject Code: BP101TP**

Chapter-3

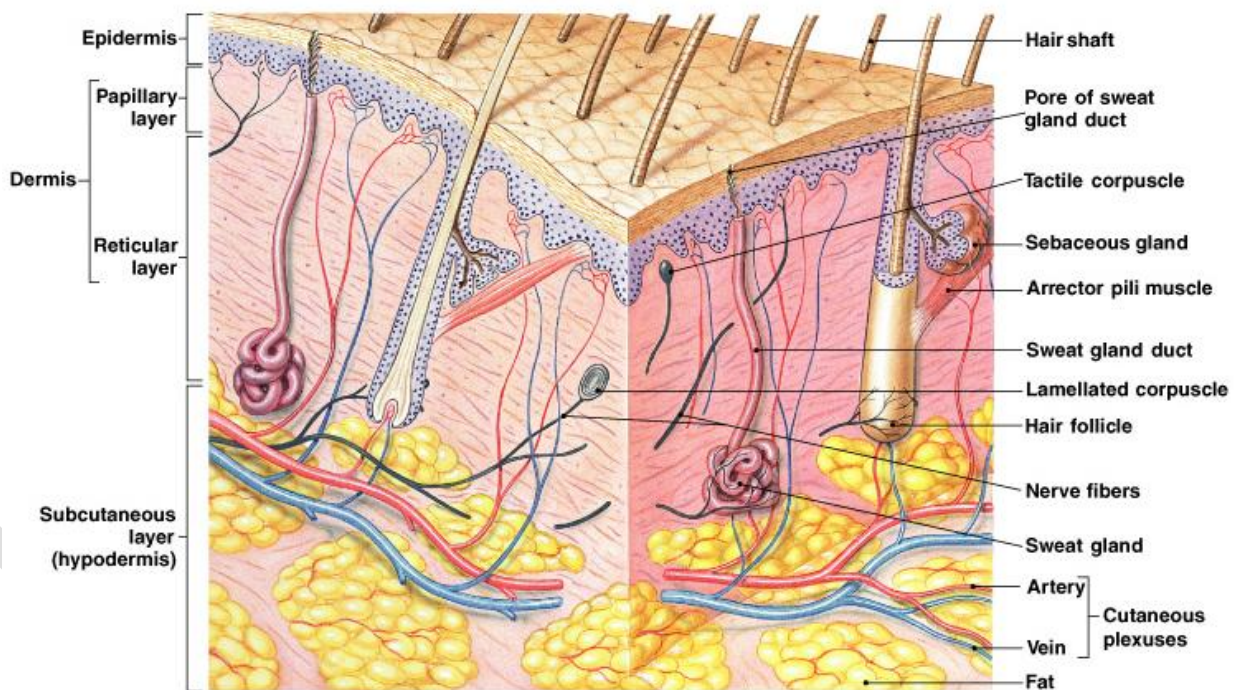
Integumentary System

What are the structures and functions of the integumentary system?

- **Size of the Integument:**
- The integument is the largest system of the body:
 - 16% of body weight
 - 1.5 to 2 m² in area

Parts of the Integument

- The integument is made up of 2 parts:
 1. cutaneous membrane (skin)
 2. accessory structures



Parts of the Cutaneous Membrane

- Outer epidermis:
 - superficial epithelium (epithelial tissues)
- Inner dermis:
 - connective tissues
- Originate in the dermis
- Extend through the epidermis to skin surface:

- hair
- nails
- multicellular exocrine glands

Connections

- Circulatory system:
 - blood vessels in the dermis
- Nervous system:
 - sensory receptors for pain, touch, and temperature

The Subcutaneous Layer

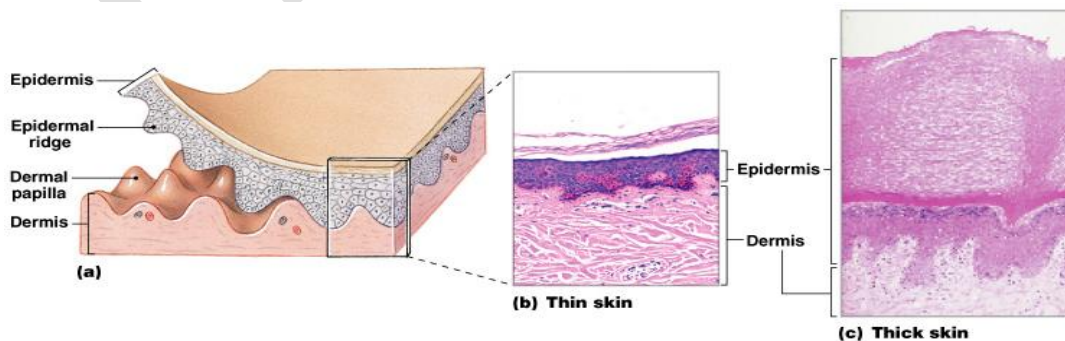
- Subcutaneous layer (superficial fascia or hypodermis):
 - loose connective tissue
 - below the dermis
 - location of hypodermic injections

Functions of Skin

- Protects underlying tissues and organs
- Excretes salts, water, and organic wastes (glands)
- Maintains body temperature (insulation and evaporation)
- Synthesizes vitamin D₃
- Stores lipids

What are the main structures and functions of the epidermis?

- Avascular stratified squamous epithelium
- Nutrients and oxygen diffuse from capillaries in the dermis



Cells of the Epidermis

Keratinocytes:

- contain large amounts of keratin
- the most abundant cells in the epidermis

Thin Skin

- Covers most of the body
- Has 4 layers of keratinocytes

Thick Skin

- Covers the palms of the hands and soles of the feet
- Has 5 layers of keratinocytes

Layers of the Epidermis

- From basal lamina to free surface:
 - stratum germinativum
 - stratum spinosum
 - stratum granulosum
 - stratum lucidum
 - stratum corneum

Stratum Germinativum

- The “germinative layer”:
 - has many germinative (stem) cells or basal cells
 - is attached to basal lamina by hemidesmosomes
 - forms a strong bond between epidermis and dermis

- Epidermal ridges (*e.g.*, fingerprints)
- Dermal papillae (tiny mounds):
- increase the area of basal lamina
- strengthen attachment between epidermis and dermis

Ridges and Ducts

