# SKIN STRUCTURE &FUNCTION

## Skin

---skin is the largest organ of the body, it constitutes about 16% of body weight

---its total surface area is about 1.2-2.2 $m^2$

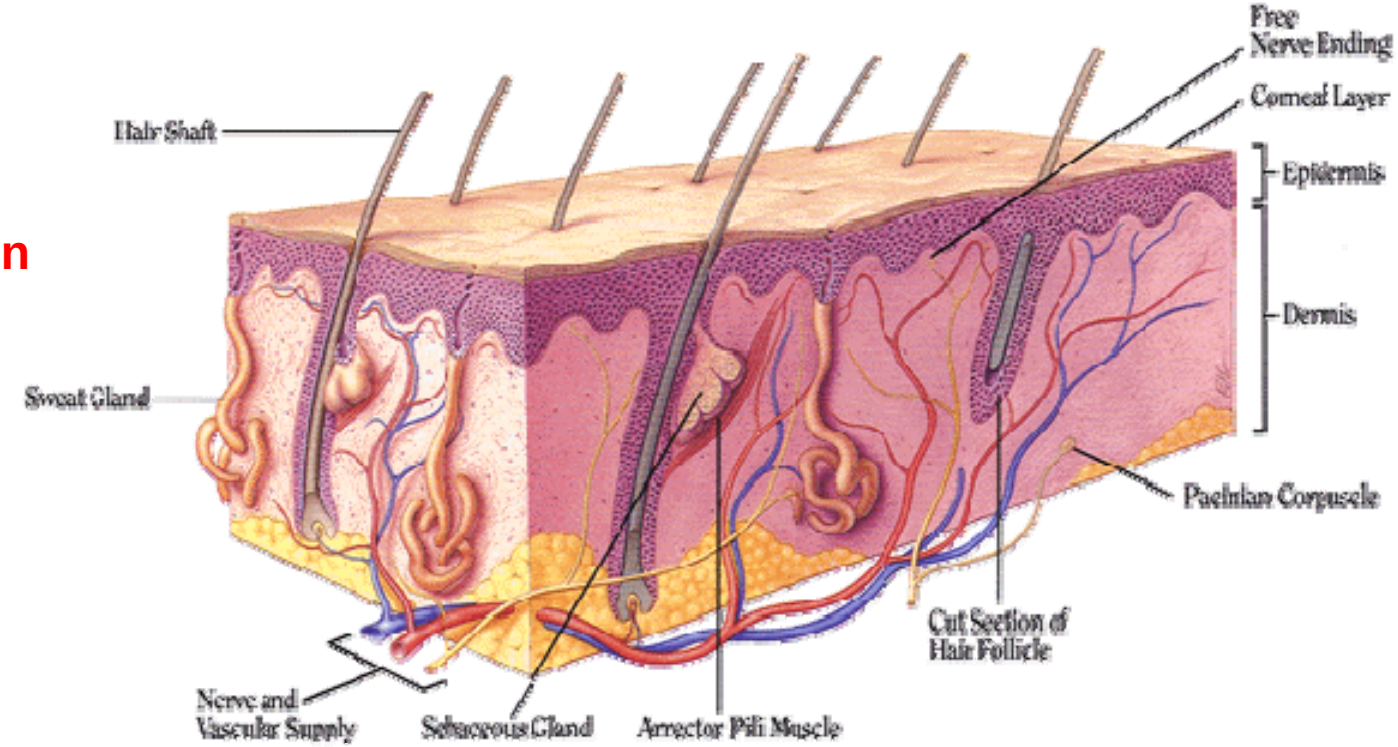
---function:

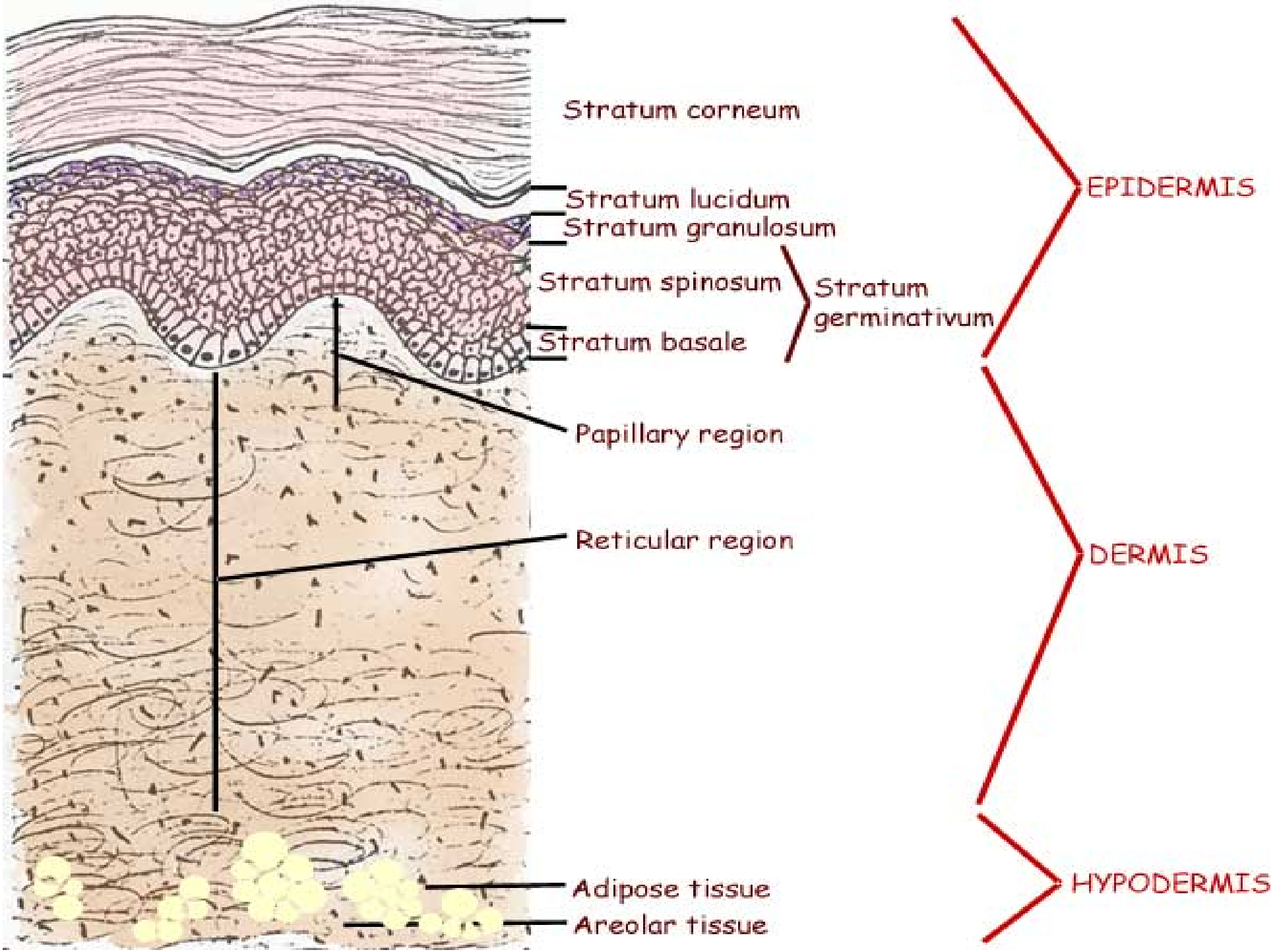
protection,sensory reception,excretion and thermoregulation

### 1. Structure of skin

---epidermis

---dermis

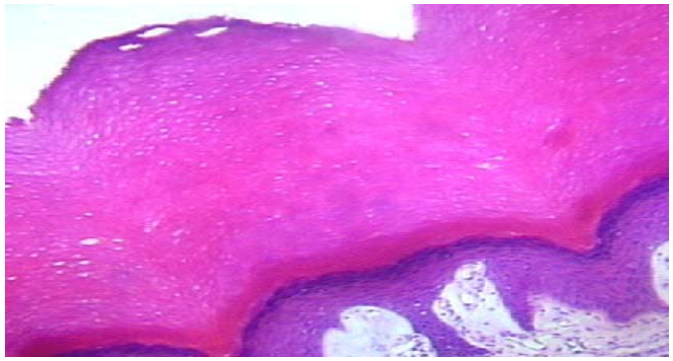



Stratum corneum
Stratum lucidum
Stratum granulosum
Stratum spinosum
Stratum basale
Stratum germinativum
EPIDERMIS
Papillary region
Reticular region
DERMIS
Adipose tissue
Areolar tissue
HYPODERMIS

1) epidermis

---keratinised stratified squamous epithelium

---consist of keratinised cell and non-keratinised cell



①**keratinised cell**:

---from basal to surface, we can classify the cells into five layers

**a. stratum basale**

---structure:

LM: -a layer of cuboidal or low columnar cell with a large, pale N

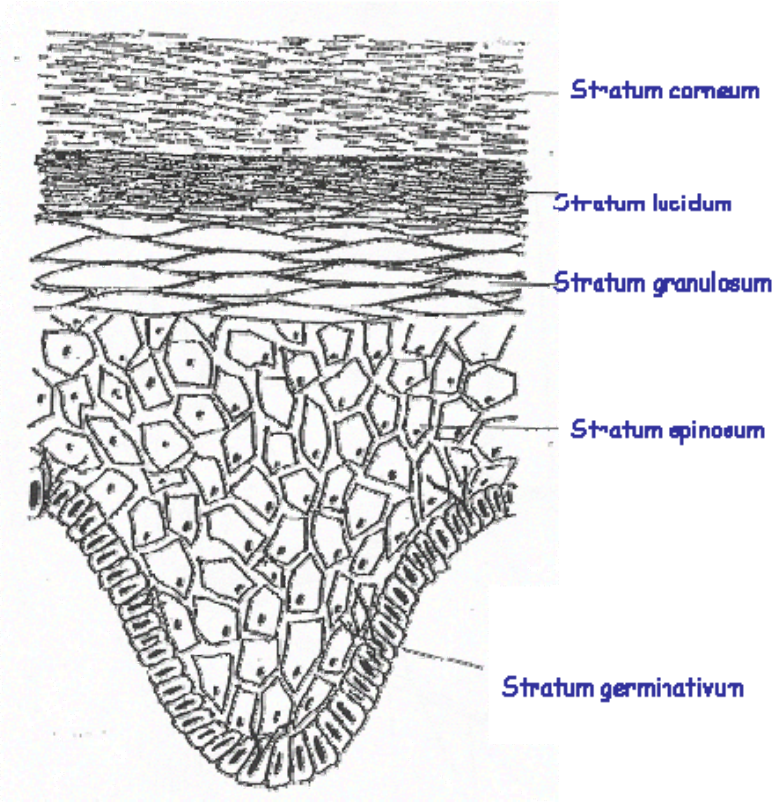
-basophilic cytoplasm

EM: -free ribosome

-keratin filament-tonofilament

-desmosome

---function: mitotic activity and proliferation



b. **stratum spinosum**

---structure:

LM: -4-10 layers polygonal cell with large round nucleus

-spinous processes

-slight basophilic cytoplasm

EM: -tonofibrils

-lamellated granules:

/100-300nm membrane-coated

/contain phospholipid and steroid

-intercellular bridges- Desmosome

c. **stratum granulosum**

---structure:

LM: -3-5 layers flattened cell

-muclei begin to degenerate-stained slightly

-keratohyalin granules: basophilic

EM: -keratohyalin granules: with tonofilament insert into them

-lamellated granules: fused with cell membrane

* keratohyalin + tonofilament = keratin

d. **stratum lucidum**

---structure:

LM:

-3-4 layers of cell appear homogeneous and transparent

-no nucleus and organella

-eosinophilic-keratohyalin

-tonofilament embedded in homogeneous matrix

**e. stratum corneum**

---structure:

LM: -several layers horny cell

-died cell- no nucleus and organella

-eosinophilic

-keratin

* desquamation: surface keratin will shed from outer surface

② **non-keratinised cell**:

a. **melanocyte**:

---structure:

LM: -large cell with long branches

-located among stratum basale cells

EM: -risosome

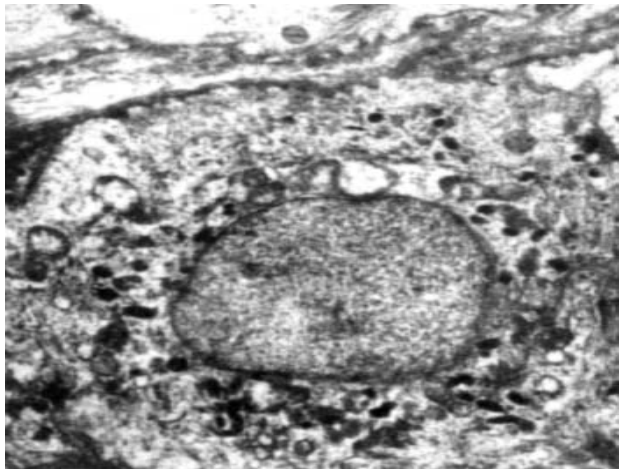
-RER

-Golgi complexes tyrosine

-melanosome(tyrosinase) → ↓

↓ melanin

melanin granules



---function:

responsible for skin color

absorb ultraviolet light

protect deep tissue

b. **Langerhans cell**

---structure:

LM: -deep nucleus, light cytoplasms

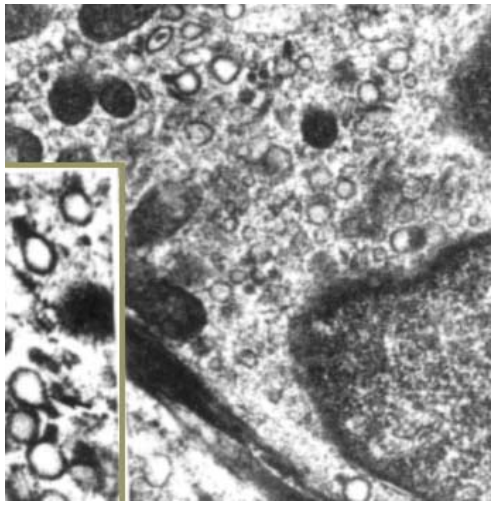
-among the spinous cell

-dendritic-typed processes

EM: -lysosome

granule:membrane-coated

/15-30 nm long, 4 nm in D



---function:

- antigen presenting cell in skin
- involve in immune reaction

**c. Merkel's cell**

---structure:

located in basal layer

with short processes

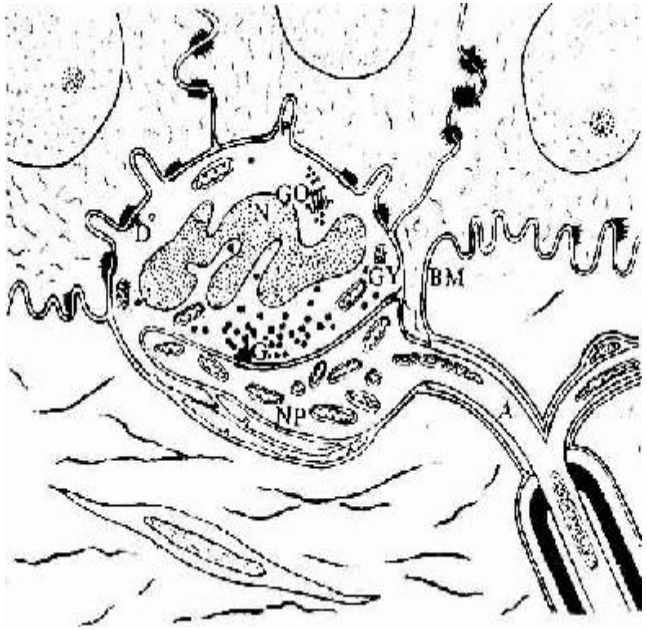
contain many dense-core granules

chemical synapse: between Merkel's cell and afferent N

---function: not very clear, may be

sensory epithelial cell

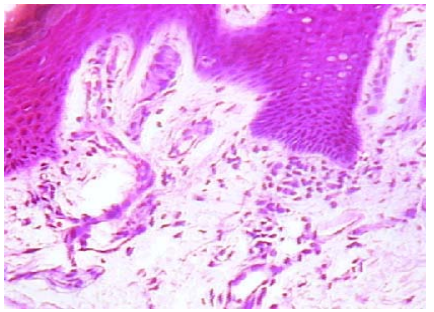
neuroendocrine cell ( APUD, amine precursor uptake and decarboxylation cell)



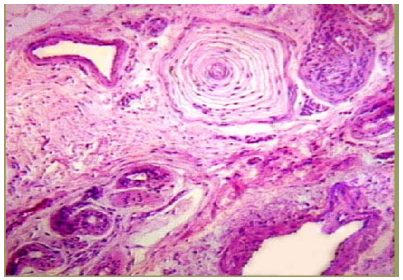
2) **Dermis**: DCT

---papillary layer: dermal papillae-increase the junction between epi. and underlying CT

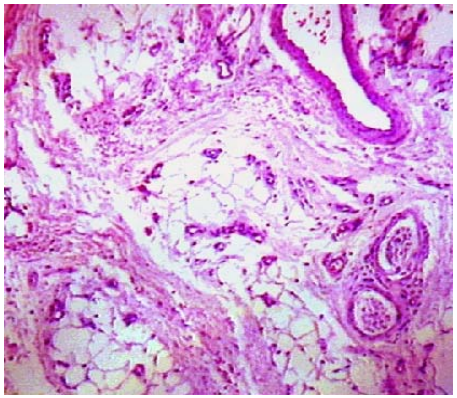
- capillary papillae
- nervous papillae



**---reticular layer:**
**DCT, contains rough F-CF, EF, RF**
**large BV, LV**
**NE: lamellar corpuscle**
**skin appendages: including sweat gland, sebaceous gland and hair**

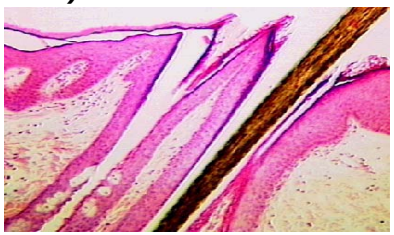


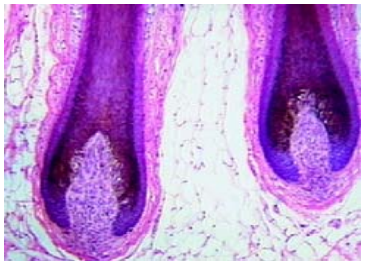
**2. hypodermis:**
**3. LCT and fat tissue**



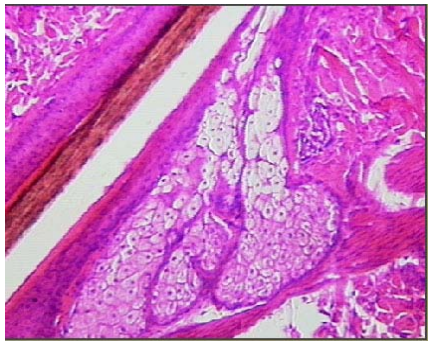
**skin appendages**

1) hair





2) sebaceous gland



3) sweat glands