

- \* skin called Integumentary system
- \* Epidermis + Dermis are cutaneous
- Hypodermis is subcutaneous
- \* Classification: 1) Epidermis: epithelial / keratinized
- 2) Dermis: CT
- 3) Hypodermis: fat / adipose / superficial fascia

\* Temp regulation: by duct of sweat gland + cutaneous b.v (only cutaneous / subcutaneous not included)

\* skin form vitamin D (calciferol) which need sun to form and this hormone help in  $Ca^{+2}$  absorption

\* dermal papillae → extension of dermis } epidermal ridges → - - - of epidermis prevent skin separating

\* Epidermis is avascular (no blood vessels)

## Epidermis layer:

type: Keratinized stratified squamous epithelium

composed of four or five layers,

From down to up:

(1) stratum basale: deepest / single layer / columnar or cuboidal cell / attach to each other by: desmosomes / mitotic activity & to basement membrane by hemidesmosomes

(2) stratum spinosum connect by spines (desmosomes) / (8-10 row) / desmosomes attach to keratin tonofibril of keratinocytes

(3) stratum granulosum (granule cell)

\* 3-5 layer of flat cell / x keratin granules + lamellar granules

(Filaggrin bound to keratin tonofibrils)

(4) stratum lucidum

In thick skin only / made by cells without nuclei or organelles attach by desmosomes

(5) stratum corneum

\* cell fill with keratin / lipid rich layer

disorder: pressure make it grow thicker (calluses + corns)

psoriasis disorder life cycle accelerated

## Type of skin

- Thick (5 layer): palm + soles
- Thin (4 layer): sebaceous gland secrete (sebum)

## type of cells:

(1) keratinocytes (الخلايا الكيراتينية): 90% of cells / keratin / lamellar granules / 2-4 week to regenerate

(2) melanocytes

derived from neural crest cells + protrusions transfer melanin

synthesis melanin and transfer it to keratinocyte / In basalis

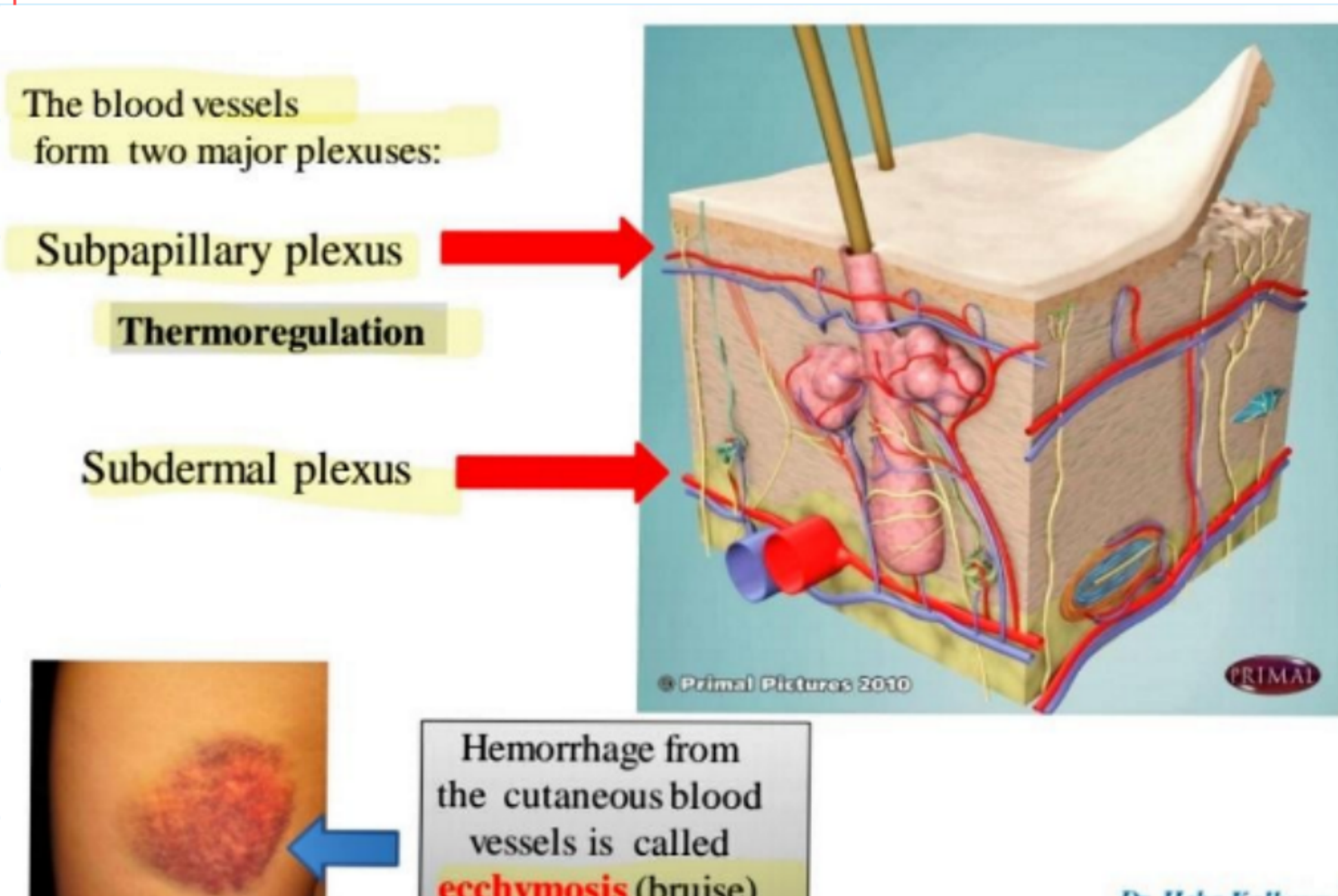
(3) langerhans cells: from b.m (monocytes) / its the macrophage of skin

In spinosum 12-8% of cells

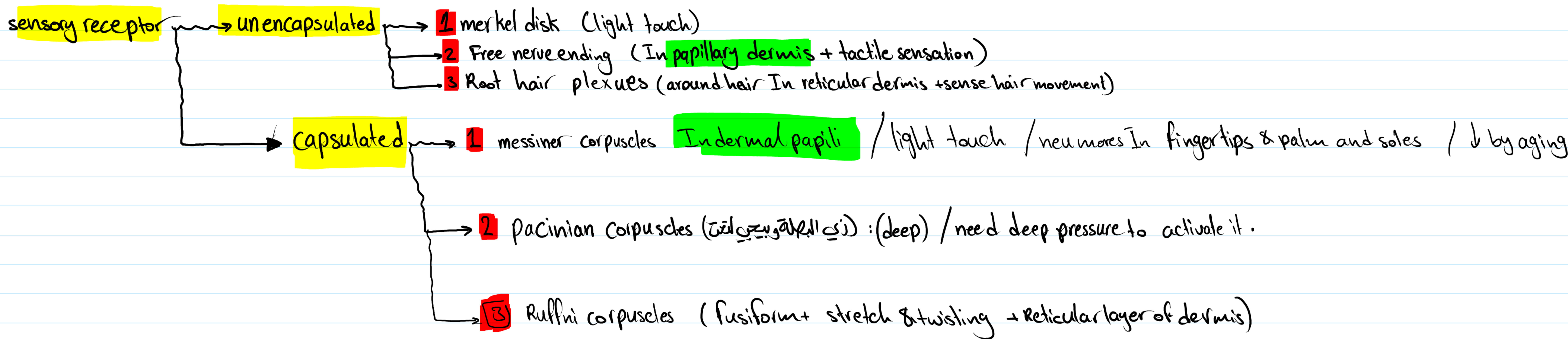
(4) merkel cells: In basale / In fingertips / attach to afferent (sensory) unmyelinated axons / light touch receptor

## dermis

- \* elasticity + strength of skin
- \* from mesoderm
- 2 layer: weak → papillary layer of dermis (loose CT collagen I, elastic fiber)
- strong → Reticular layer of dermis (Dense Irregular CT)



The end



\* **skin appendages**: Hair follicle + sweat gland + sebaceous gland + Nail (keratinized dead cell + extension of epi)

\* Hair <sup>Types:</sup> 1 lanugo: fetal 2-Down: child 3-Terminal: adult  
 above skin: shaft / below skin: root. / Hair bulb: القعدة

\* sebaceous gland → lubricate hair shaft & surface of skin  
 \* outer root sheath continuation of epidermis (basale + spinosum)  
 \* **matrix** continuation of (basalis) / generate hair + internal root sheath.

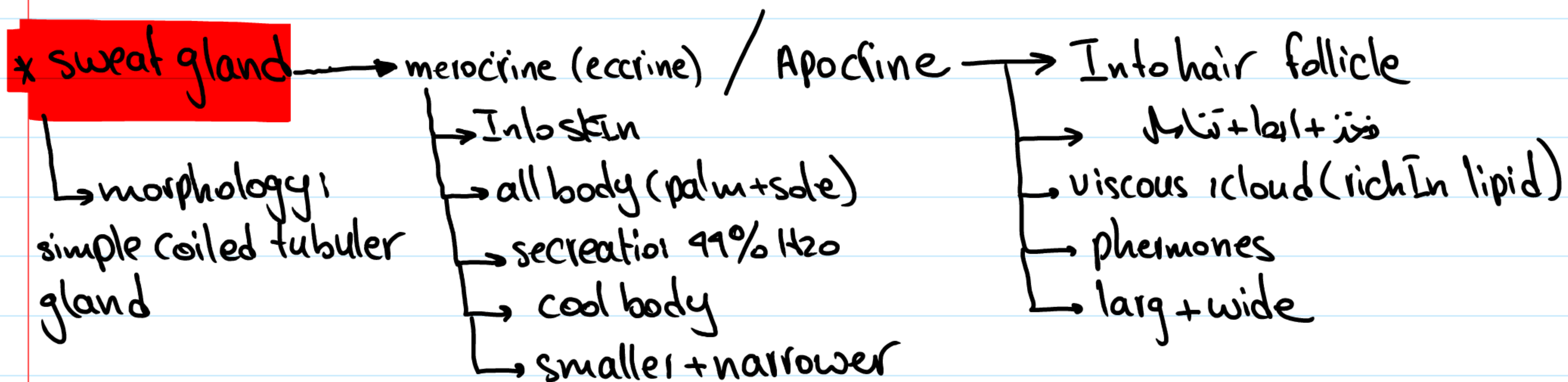
\* sebaceous gland → secrete sebum (holocrine)  
 \* Comedo: oil & keratin في الرأس → الرؤوس السوداء  
 \* **Arrector pilum muscle** extend from hair follicle to dermal papilla / cause (goose bumps) / sympathetic (autonomic)  
 ↳ to reduce heat loose

\* Depilatory: remove hair  
 \* **structure of hair shaft**: medulla + cortex + cuticle

\* **growth cycle of hair**: Anagen (active) → catagen (1-2 week) → Telogen phase (5-6 week) → Return to Anagen  
 (3-6 year) transitional (dermal papilla detached from hair bulb)  
 85% hair 15% of hair

**mode of secretion**

- merocrine: no lose of plasma membrane
- apocrine lose of ---
- holocrine lose of whole cell



**Nails**: → colorless  
 ↳ part: 1) free edge 2) body 3) lunula 4) Eponychium 5) Hyponychium 6) Nail bed 7) nail matrix (growth)  
 ↳ only (basalis + spinosum)

11-Which of the following is the most abundant sensory receptor of the skin?

- a. Free nerve endings
- b. Ruffini's corpuscles
- c. Pacinian corpuscles
- d. Krause's end bulbs
- e. Meissner's corpuscle

A

15-Which of the following components of the epidermis provides sealant between adjacent cells?

- a. Keratohyaline granules
- b. Glycolipids and lipids
- c. Keratin
- d. Desmosomes
- e. Adherent junctions

ممانتیرب

b

22-A 64-year-old woman, who has always been proud of her suntanned, healthy look, is referred to a dermatologist with a blue-violet, painless, 1.5-cm lump in the skin of her left shoulder. The lump is firm and cannot be moved, and has grown very rapidly over the past few weeks. The mass is removed surgically and the pathologist diagnoses it as a Merkel cell carcinoma. If the UV radiation to which her skin was exposed affected the Merkel cells, what other cell type sharing the same specific epidermal layer might also be affected?

- a. Fibroblasts of the papillary layer
- b. Keratinocytes of the stratum granulosum
- c. Cells of tactile (Meissner) corpuscles
- d. Keratinized epithelial cells
- e. Basal stem cells for keratinocytes

E

21-A 52-year-old woman presents with severe blistering over her buttocks. Analysis of her serum demonstrates the presence of antibodies which by immunohistochemical techniques stain material located at the basement membrane of the epidermis in a biopsy of her skin. The underlying biological mechanism of her skin disorder involves an abnormality in which of the following structures?

- a. Macula adherens
- b. Gap junctions
- c. Hemidesmosomes
- d. Zonula occludens (tight junctions)
- e. Zonula adherens

C

24-Which of the following is composed of loose connective tissue?

- a. Epidermis
- b. Reticular layer of dermis
- c. Hypodermis
- d. Both a and b
- e. Both b and c

C

29-Which of the following is composed of connective tissue?

- a. Epidermis
- b. Dermis
- c. Hypodermis
- d. Both a and b
- e. Both b and c

E

30-Which of the following is composed of dense irregular connective tissue?

- a. Epidermis
- b. Reticular layer of dermis
- c. Hypodermis
- d. Both a and b
- e. Both b and c

B

32-Which of the following responds to continuous pressure?

- a. Free nerve endings
- b. Ruffini's corpuscles
- c. Pacinian corpuscles
- d. Krause's end bulbs
- e. Meissner's corpuscle

B

34-Which layer of the epidermis contains star shaped cells?

- a. Stratum basale
- b. Stratum spinosum
- c. Stratum granulosum
- d. Stratum lucidum
- e. Stratum corneum

Langhan  
B

37-Which of the following statements about eccrine sweat glands is true?

- A) They are absent in thick skin.
- B) They are holocrine glands.
- C) They have a narrow duct lined by a stratified cuboidal epithelium.
- D) They secrete an oily material called sebum.
- E) They empty into hair follicles

C

part 2

part 2

5-Which of the following statement is not true ?

- A) The substance most produced in the hair is melanin
- B) The substance most produced in the epidermis is keratin
- C) The substance most produced in the dermis is collagen
- D) The substance most produced in the subcutis is fat

A

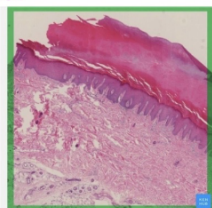
4-Choose the correct statement regarding hair follicles

- A) Males have more follicles than females
- B) Females have more follicles than males
- C) Males and females have the same number of follicles
- D) Children have more follicles than adults

C

6-Which of the followings might be found in this section

- A) Apocrine sweat glands
- B) Eccrine sweat gland
- C) Hair bulb
- D) Arrector pili muscle



B

part 3

# Histology - USMLE rx

A 5-year-old boy is brought to the physician for a routine check-up. The patient's mother states that she has noticed a dark mole on his abdomen, which first appeared about 6 months ago. Other than the mole, she states that the patient has been in good health, aside from an episode of otitis media 1 year ago. On physical examination, a dark circular lesion on his abdominal region is observed. The lesion is symmetric and circular with well-defined borders and homogeneous color. The mother states that it has not seemed to change in shape or size since she first noticed it 6 months ago.

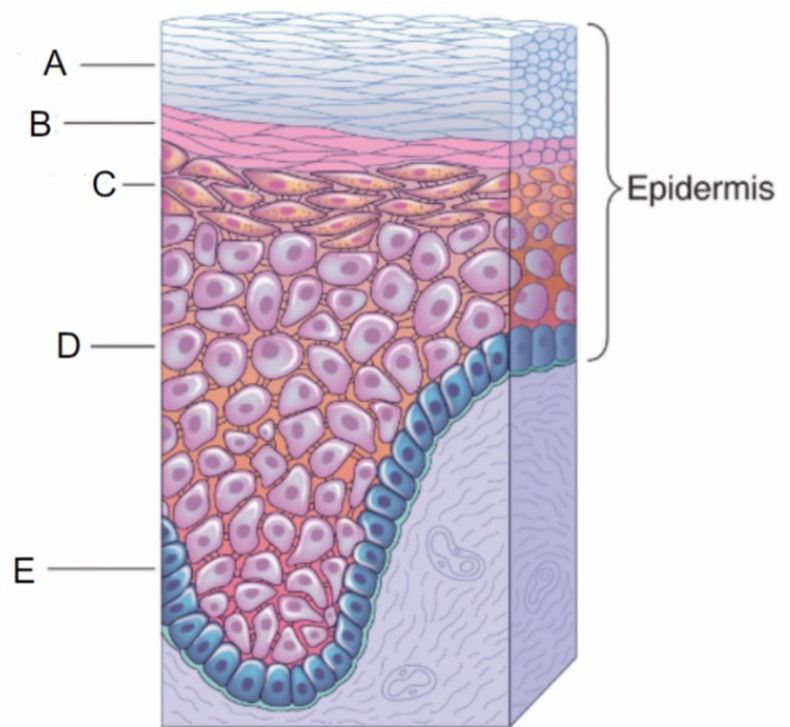
A

B

C

D

E



Answer : 239

E

This patient has a dark spot on his abdomen that is symmetric and homogenous in color with defined borders. This describes a benign nevus. Nevus cells are derived from melanocytes, which are melanin-producing cells located in the basal layer of the epidermis (stratum basalis) (see image below). Melanocytes have a variable distribution, depending on the skin color of the individual, and are interspersed between the columnar cells of the stratum basalis. Within the melanocytes are specialized melanin-containing granules called melanosomes, which are transferred from the cytoplasm of the melanocytes to nearby keratinocytes. The stratum basalis is also the most mitotically active of all the layers of the skin, providing a constant supply of new keratinocytes to all the other layers.

Melanoma is a malignant tumor of melanocytes that may manifest as moles with changing borders, growth in size, or change in color. Since this patient had a dark spot that was symmetric and homogenous with defined borders, melanoma can be ruled out.

A 45-year-old man comes to the dermatologist because of dry, thick, and rough skin on his foot. He has a previous history of allergy to pollen grains but is otherwise healthy and takes no medications. His temperature is 98.5° F (36.9° C), blood pressure is 126/70 mm Hg, pulse is 66/min, and respirations are 16/min. Physical examination findings of the right foot are shown in the image.

- A.
- B.
- C.
- D.
- E.



Answer;

B

This 45-year-old man presents with thick rough skin on his right foot as seen in the image. These findings are consistent with callus, which is an example of hyperkeratosis, or an increased thickness of the stratum corneum.

The stratum corneum is the outermost layer of the epidermis. It is made up of anucleated dead cells and is responsible for providing a mechanical barrier against microbes and mechanical injuries. Mechanical injury in the stratum corneum caused by chronic skin inflammation and irritation leads to the release of local cytokines, which results in proliferation of stratum corneum. Chronic atopic dermatitis or ill-fitting shoes can lead to calluses, which mostly develop on the flexural surfaces.

"ذلك المستقبل الذي يقلقك، ربما لست فيه!"