

The Skin (Integumentary System)

Basic Structure of the Skin

1. Complete the following statements by writing the appropriate word or phrase on the correspondingly numbered blank:

The two basic tissues of which the skin is composed are dense connective tissue, which makes up the dermis, and 1, which forms the epidermis. Most cells of the epidermis are 2. The protein 3 makes the dermis tough and leatherlike. The specialized cells that produce the pigments that contribute to skin color are called 4.

1. KERATINIZED STRATIFIED ^{SQUAMOUS} EPITHELIUM
 2. DEAD
 3. COLLAGEN
 4. MELANOCYTES

2. Name four protective functions of the skin: INSULATES + CUSHIONS, PROTECT FROM MECHANICAL, CHEMICAL, THERMAL DAMAGE + BACTERIAL INVASION

3. Using the key choices, choose all responses that apply to the following descriptions. (Some choices may be used more than once.)

- Key: a. stratum basale d. stratum lucidum g. reticular layer
 b. stratum corneum e. stratum spinosum h. epidermis (as a whole)
 c. stratum granulosum f. papillary layer i. dermis (as a whole)

STRATUM GRANULOSUM 1. layer containing sacs filled with fatty material or keratin subunits

STRATUM CORNEUM 2. dead cells

PAPILLARY LAYER 3. the more superficial dermis layer

EPIDERMIS 4. avascular region

DERMIS 5. major skin area where derivatives (nails and hair) reside

STRATUM BASALE 6. epidermal region exhibiting the most mitoses

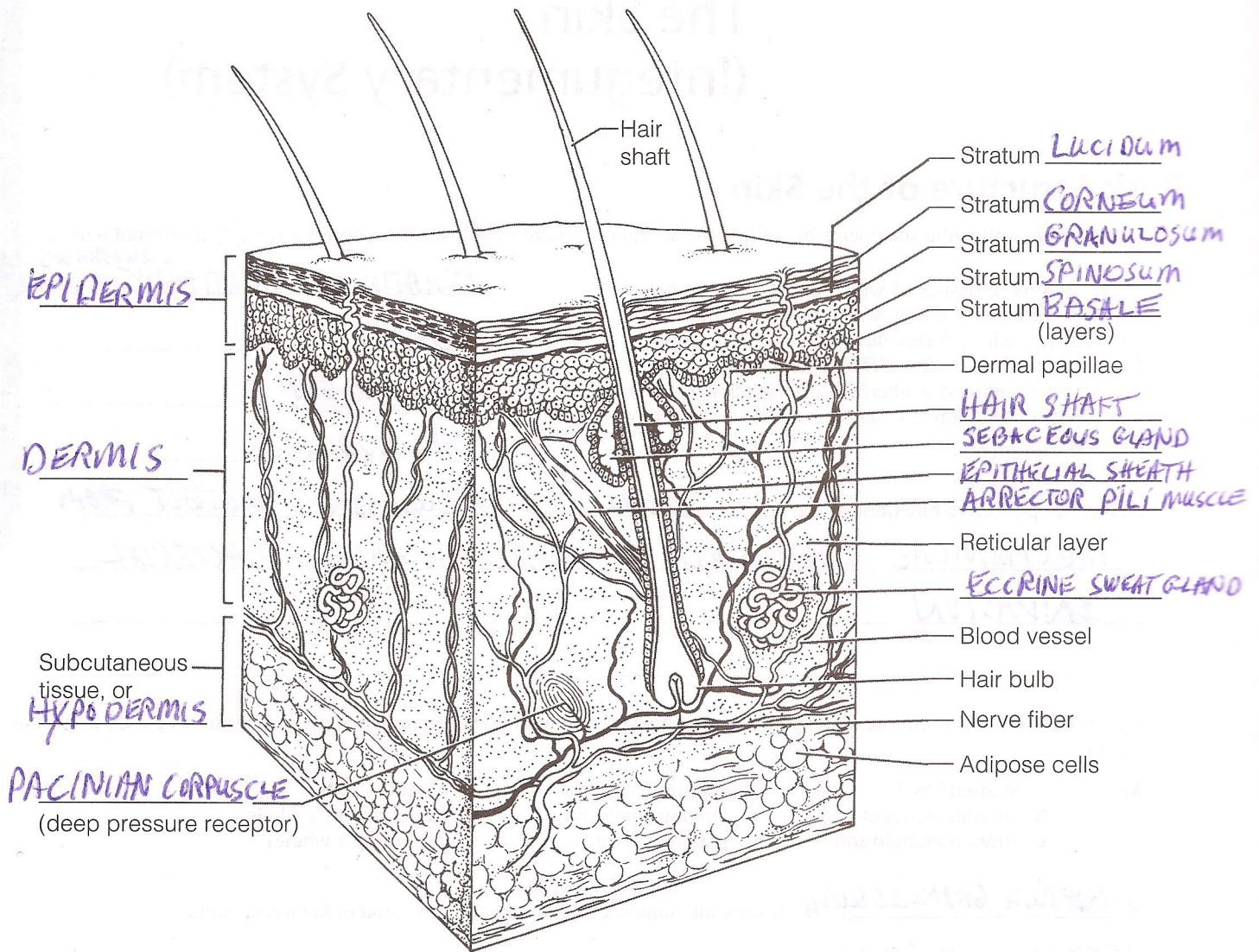
STRATUM CORNEUM 7. most superficial epidermal layer

DERMIS 8. has abundant elastic and collagenic fibers

STRATUM BASALE 9. region where melanocytes are most likely to be found

STRATUM CORNEUM 10. accounts for most of the epidermis

4. Label the skin structures and areas indicated in the accompanying diagram of skin.



5. What substance is manufactured in the skin (but is not a secretion) to play a role in calcium absorption elsewhere in the body?

VITAMIN D

6. How did the results you obtained in Activity 2, "Visualizing Changes in Skin Color Due to Continuous External Pressure," relate to formation of decubitus ulcers? (Use your textbook if necessary.)

WHEN PRESSURE APPLIED, SHUTS DOWN BLOOD FLOW TO SKIN, IF PROLONGED CELLS OF SKIN DIE FORMING DECUBITUS ULCERS

7. Some injections hurt more than others. On the basis of what you have learned about skin structure, can you determine why this is so?

SOME AREAS OF THE SKIN HAVE GREATER OR LESSER AMOUNTS OF NERVE ENDINGS TO DETECT PAIN

8. Two questions regarding general sensation are posed below. Answer each by placing your response in the appropriately numbered blanks to the right.

- 1-2. Which two body areas tested were most sensitive to touch? 1-2. PALM + FINGER TIP
 3-4. Which two body areas tested were the least sensitive to touch? 3-4. BACK OF HAND, BACK OF NECK

9. Define adaptation of sensory receptors: AFTER PROLONGED STIMULUS, RATE OF RECEPTOR RESPONSE SLOWS + FINALLY STOPS

10. Why is it advantageous to have pain receptors that are sensitive to all vigorous stimuli, whether heat, cold, or pressure?
TO MINIMIZE DAMAGE FROM SEVERE HEAT, COLD, PRESSURE

Pain receptors do not adapt. Why is this important? TO MAKE SURE YOU DO SOMETHING SOMETHING TO MAKE THE PAIN STIMULUS STOP

11. Imagine yourself without any cutaneous sense organs. Why might this be very dangerous? SEVERE, HEAT, COLD, PRESSURE WOULD CAUSE MUCH MORE DAMAGE

Appendages of the Skin

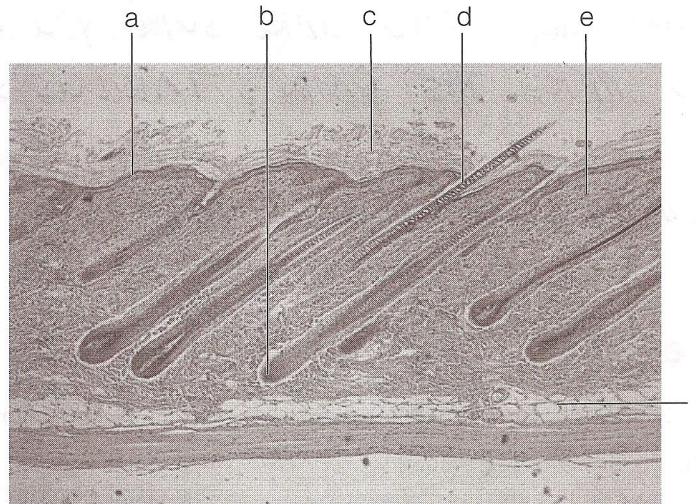
12. Using the key choices, respond to the following descriptions. (Some choices may be used more than once.)

- | | | | |
|------|----------------------|------------------|----------------------|
| Key: | arrector pili muscle | hair follicle | sweat gland—apocrine |
| | cutaneous receptors | nail | sweat gland—eccrine |
| | hair | sebaceous glands | |

- SEBACEOUS GLANDS 1. acne is an infection of this
- HAIR FOLLICLE 2. structure that houses a hair
- SWEAT-GLAND-ECCRINE 3. more numerous variety of perspiration gland that produces a secretion containing water, salts, and vitamin C; activated by rise in temperature
- HAIR FOLLICLE 4. sheath formed of both epithelial and connective tissues
- SWEATGLAND-APOCRINE 5. type of perspiration-producing gland that produces a secretion containing proteins and fats in addition to water and salts
- HAIR 6. found everywhere on body except palms of hands and soles of feet
- HAIR, NAIL 7. primarily dead/keratinized cells
- CUTANEOUS RECEPTORS 8. specialized nerve endings that respond to temperature, touch, etc.
- SEBACEOUS GLANDS 9. its secretion contains cell fragments
- NAIL 10. "sports" a lunule and a cuticle

13. How does the skin help to regulate body temperature? (Describe two different mechanisms.) SKIN ACTS AS INSULATOR; SWEAT ON SURFACE IS HEATED BY BLOOD CAUSING EVAPORATION WHICH REMOVES HEAT FROM THE BODY

14. Several structures or skin regions are lettered in the photomicrograph below. Identify each by matching its letter with the appropriate term that follows.



- | | | | |
|-----------|---------------|-----------|---------------------------------|
| <u>f.</u> | adipose cells | <u>b.</u> | hair follicle |
| <u>e.</u> | dermis | <u>d.</u> | hair shaft |
| <u>a.</u> | epidermis | <u>c.</u> | sloughing stratum corneum cells |

Plotting the Distribution of Sweat Glands

15. With what substance in the bond paper does the iodine painted on the skin react? STARCH

16. Which skin area—the forearm or palm of hand—has more sweat glands? PALM OF HAND

Which other body areas would, if tested, prove to have a high density of sweat glands? ARMPITS, FOREHEAD

17. What organ system controls the activity of the eccrine sweat glands? AUTONOMIC NERVOUS SYSTEM