

## CHAPTER FIVE

### Answers to WHAT DID YOU LEARN?

1. The two major layers of the integument are the epidermis and the dermis. The epidermis is a stratified squamous epithelium, and the dermis is composed of dense irregular connective tissue.
2. Vitamin D (cholecalciferol) is synthesized from a sterol by some epidermal cells when exposed to ultraviolet radiation.
3. The cells of the stratum spinosum attach to all of their neighbors by intercellular junctions called desmosomes. These junctions form bridges between all cells to support the integrity of the epidermis.
4. The layers of the epidermis, beginning at the surface, are the stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, and stratum basale.
5. Keratinization is a process occurring in the stratum granulosum by which the keratinocytes fill up with the protein keratin. The nucleus and all organelles are lost.
6. Thick skin contains no hair follicles or sebaceous glands.
7. Hemoglobin in red blood cells appears bright red after it binds oxygen. Thus, it provides a reddish tint to the skin.
8. Melanocytes produce the pigment melanin, which surrounds the nucleus and absorbs UV light before it can harm nuclear DNA.
9. Friction ridges help us grasp objects, and they increase friction so that items do not slip from our hands and our feet do not slip on the floor.
10. Epidermal ridges are deep projections of the epidermis toward the dermis, whereas dermal papillae are projections of the dermis toward the epidermis.
11. Lines of cleavage indicate the predominant direction of the underlying bundles of collagen fibers. They are medically important because surgical incisions should be made parallel to these lines to promote faster healing and less scarring.
12. Circulation to the skin must be closely regulated to help maintain body temperature without wide fluctuations. Increased blood supply to the skin results in heat loss, whereas decreased blood supply to the skin helps the body retain heat.
13. The subcutaneous layer pads and protects the body and body parts, acts as an energy reservoir in the form of stored adipose connective tissue, and provides thermal insulation.
14. Soft keratin is flexible, and it occurs in the loosely arranged cells in the medulla of the hair. Flattened cells closer to the surface form the hard cortex and contain hard keratin.
15. The lunula has a whitish appearance because the underlying stratum basale is thick enough to prevent any coloration from showing through from the underlying vascular tissue.
16. The hair matrix is the epithelial layer involved in hair production, whereas the medulla is the soft core of the matrix.
17. The arrector pili is stimulated as a result of an emotional state, such as fear or rage, or by exposure to cold temperatures.

18. When myoepithelial cells contract, they squeeze the gland and help discharge its secretions.
19. Merocrine gland secretion is a protein-free filtrate of blood plasma, composed primarily of water with some dissolved electrolytes, metabolites, and waste products. Apocrine gland secretion is viscous and cloudy, contains proteins and lipids, and becomes odorous after being acted upon by bacteria.
20. Apocrine glands are located in the axillary, areolar, anal, and pubic regions.
21. Sebaceous glands secrete an oily, waxy substance called sebum.
22. New epidermal cells come from stem cells in the stratum basale; new dermal cells come from mesenchymal cells.
23. Skin repair processes take longer to complete in aged individuals because of the reduced number and activity of stem cells.
24. A decreased number of melanocytes causes increased sensitivity of the skin.