CHAPTER 1

ANATOMY OF SKIN

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INTRODUCTION

The skin is the largest organ of the body, accounting for about 15 % of the total body weight of an adult (1,2). It covers the whole surface of the body and provides a physical barrier against external environment. This barrier function is important for people to survive, to protect against external physical, chemical and biological hazards, and to reduce water loss. Besides barrier properties against microbial threats, it also contributes to innate immunity with keratinocyte- and sweat-derived anti-microbial peptides and Langerhans cells. The skin is one of the major organs in maintaining the homeostasis of the body by its role in thermoregulation and blood pressure control (3). These functions are achieved by vasodilatation and vasoconstriction of the cutaneous vascular plexus, and sweating. It is an important sensory organ, sensing pain, changes in heat and pressure, by its rich nerve supply. Vitamin D synthesis takes place in the skin, so it plays a role in calcium metabolism and bone formation. It has an endocrine function provided by its subcutaneous fat content (1). For this reason, diseases involving the skin can lead to a large number of problems that disrupt patients' overall health and quality of life at different degrees. For better understanding the pathophysiology of the skin diseases, it is important to learn the structure and function of the healthy skin.

The skin is composed of three layers, namely from top to bottom: epidermis, dermis and hypodermis (subcutis). There are also skin appendages, including hair follicles, sebaceous glands, eccrine and apocrine sweat glands and nails. The thickness of these layers, distribution of epidermal appendages and the density of melanocytes varies considerably according to body site. The thickness of the epidermis varies from 0.1 to1.5 mm, the thinnest in the eyelid and the thickest in the palms and soles (2,4,5). The back is the site where the thickest dermis is found

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REFERENCES

1. Lai-Cheong JE, McGrath JA. Structure and function of skin, hair and nails. Medicine 2013; 41: 317-320.
2. Kolarsick PA, Kolarsick MA, Goodwin C. Anatomy and physiology of the skin. J Dermatol Nurs Assoc 2011; 3, 203-213.
3. Walters KA, Roberts MS. The structure and function of skin. Drug Pharm Sci 2002; 119: 1-40.
4. Chu DH. Overview of biology, development, and structure of skin. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, eds. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008: 57-73.
5. James WD, Berger TG, Elston DM. Skin: Basic structure and function. In: James WD, Berger TG, Elston DM. Andrews' Diseases of the Skin: Clinical Dermatology 12th ed. China: Elsevier. 2016: 1-10.
6. Kanitakis J. Anatomy, histology and immunohistochemistry of normal human skin. Eur J Dermatol 2002; 12: 390-399.
7. McGrath JA, Eady RAJ, Pope FM. Anatomy and organization of human skin. In: Burns T, Breathnach S, Cox N, Griffiths C, eds. Rook's Textbook of Dermatology. 7th ed. Massachusetts: Blackwell Publishing, 2004: 3.1.
8. McLafferty E, Hendry C, Alistair F. The integumentary system: anatomy, physiology and function of skin. Nurs Stand 2012; 27: 35-42.
9. Vandergriff TW, Bergstresser PR. Anatomy and physiology. In: Bolognia JL, Jorizzo JL, Schaffer JV, eds. Dermatology. 3rd ed. China: Elsevier, 2012: 43-54.
10. de Berker D, Higgins CA, Jahoda C, Christiano AM. Biology of hair and nails. In: Bolognia JL, Jorizzo JL, Schaffer JV, eds. Dermatology. 3rd ed. China: Elsevier, 2012: 1075-1092.
11. Tosti A, Piraccini BM. Biology of nails and nail disorders. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, eds. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008: 778-794.
12. Daniel CR 3rd, Piraccini BM, Tosti A. The nail and hair in forensic science. J Am Acad Dermatol 2004; 50: 258-261.
13. Perrin C. The two clinical subbands of the distal nail unit and the nail isthmus. Anatomical explanation and new physiological observations in relation to the nail growth. Am J Dermatopathol 2008; 30: 216-221.
14. Yaemsiri S, Hou N, Slining MM, He K. Growth rate of human fingernails and toenails in healthy American young adults. J Eur Acad Dermatol Venereol 2010; 24: 420-423.
15. Liyanage D, Sinclair R. Telogen Effluvium. Cosmetics. 2016: 3.2; 13.

Paus R, Cotsarelis G. The biology of hair follicles. N Engl J Med 1999; 341: 491-497.

16. Slominski A, Wortsman J, Plonka PM, Schallreuter KU, Paus R, Tobin DJ. Hair follicle pigmentation. J Invest Dermatol 2005; 124: 13-21.

Stenn KS, Paus R. Controls of hair follicle cycling. Physiol Rev 2001; 81: 449-494.

17. Tobin DJ. Human hair pigmentation-biological aspects. Int J Cosmet Sci 2008; 30: 233-257.
18. Thiboutot D. Regulation of human sebaceous glands. J Invest Dermatol 2004; 123: 1-12.
19. Cotsarelis G, Botchkarev V. Biology of hair follicles. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, eds. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008: 739-749.
20. Kreyden OP, Scheidegger EP. Anatomy of the sweat glands, pharmacology of botulinum toxin, and distinctive syndromes associated with hyperhidrosis. Clin Dermatol 2004; 22: 40-44.
21. Nelson AM, Thiboutot DM. Biology of sebaceous glands. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, eds. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008: 687-690.
22. Mauro TM, Goldsmith LA. Biology of eccrine, apocrine, and apoeccrine sweat glands. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, eds. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill, 2008: 713-720.
23. Schaller M, Plewig G. Structure and function of eccrine, apocrine and sebaceous glands. In: Bolognia JL, Jorizzo JL, Schaffer JV, eds. Dermatology. 3rd ed. China: Elsevier, 2012:539-544.