

INTEGUMENTARY SYSTEM

I Introduction

- A. Integument = covering = skin (largest organ of the body)
- B. Integumentary system = Skin + Exocrine glands + Hair + Nails + associated nerves + associated blood vessels

II Layers of the Integument

A. Epidermis: (epi = on, derma = skin)

1. Outer layer
2. Composed of Keratinized Stratified Squamous epithelium
3. Avascular
4. Thick skin = 5 layers
Thin skin = 4 layers

B. Dermis

1. Middle layer
2. Composed of dense irregular and areolar connective tissues
3. Contains nerve endings, hair follicles, & glands
4. Dermal papillae (projections of the dermis into the epidermis)

Subcutaneous layer (= hypodermis; superficial fascia) not considered part of the integument.

- Below dermis
- Stores fat and anchors upper layers to other tissues
- Composed of areolar CT and adipose CT

III Layers of Epidermis

- A. Stratum Basale: single layer of columnar/cuboidal cells resting on the basement membrane; cells are very mitotic
- B. Stratum Spinosum: several layers of polygonal-shaped cells with spines. Small degree of mitosis here
- C. Stratum Granulosum: 3-5 layers of flattened cells with visible granules; cells undergo keratinization here (keratinization = the process by which the nucleus shrivels up, cell dies, and cell fills up with the protein keratin)

- D. Stratum Lucidum: 2-3 layers of dead, anucleated, keratinized, clear cells; only found in thick skin
- E. Stratum Corneum: 20-30 layers of dead, keratinized, anucleated cells (cornified = brittle, hardened); outer cells are constantly shed

IV Cells of the Epidermis

1. Keratinocytes: most numerous; found in all layers; produce keratin
2. Melanocytes: 2nd most numerous; found in the stratum basal with processes extending into the stratum spinosum; produce melanin
3. Tactile Cells: 3rd most numerous; found only in the stratum basale; provide information regarding tactile (light touch) sensation
4. Epidermal Dendritic Cells: 4th most numerous; found primarily in the stratum spinosum; phagocyte

V Layers of the Dermis

- A. Papillary Layer: uppermost; composed of areolar C.T. and dermal papillae; contains blood vessels; sensory receptors (neurons); portions of the ducts of glands and hair roots.
- B. Reticular Layer: deepest; composed of primarily dense irregular C.T., contains blood vessels; sensory receptors (neurons); secretory portions of glands; hair follicles; ducts of glands

VI Epidermal Derivatives (Skin Appendages)

A. Hair:

1. 3 parts: bulb, root, and shaft
2. Arrector pili muscle
3. Function: protect from sun damage and trauma. Also, for heat retention

B. Nails:

1. Formed from stratum corneum (dead keratinized cells)
2. Function: protection and grasping

C. Exocrine glands:

1. Sebaceous glands = Oil (= sebum) glands
 - a. associated with hair follicles
 - b. Functions: soften the skin & is bactericidal
2. Sweat (sudoriferous) glands
 - a. Merocrine
 - i. found everywhere
 - ii. Releases perspiration (sweat) for thermoregulation
 - b. Apocrine
 - i. Axillary and pubic regions
 - ii. Secretes onto hair roots
 - iii. Releases odorous secretions called pheromones

Other Skin Glands:

1. Ceruminous glands (cerumen = earwax)
 - a. modified sweat glands
 - b. in external auditory canal
 - c. cerumen can trap foreign particles and small insects, and it helps to keep the eardrum “soft”
2. Mammary glands
 - a. modified sweat glands
 - b. produce milk

Which of the following cells is found only in the stratum basale and is a light touch receptor?

- a. Keratinocyte
- b. Fibrocyte
- c. Epidermal Dendritic Cell
- d. **Tactile Cell**
- e. Melanocyte