

## INTEGUMENTARY SYSTEM

### I Introduction

- A. Integument = covering = skin (largest organ of 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 primarily of dense irregular connective tissue
  
- 3. Contains nerve endings, hair follicles, & glands
- 4. Dermal papillae (projections of the dermis into the epidermis)

#### C. Subcutaneous layer (= hypodermis; superficial fascia)

- 1. Deepest layer
- 2. Stores fat and anchors upper layers to other tissues

- 3. 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 (90%); found in all layers; produce keratin
2. Melanocytes: 2<sup>nd</sup> most numerous (8%); found only in the stratum basale; produce melanin (protect against UV light)
3. Tactile (Merkel) Cells: 3<sup>rd</sup> most numerous (1%); found only in the stratum basale; provide information regarding tactile (light touch) sensation
4. Epidermal dendritic (Langerhans) cells: 4<sup>th</sup> most numerous (<1%); found primarily in the stratum spinosum; phagocyte

#### V Layers of the Dermis

- A. Papillary Layer: uppermost; composed of dermal papillae; contains blood vessels; sensory receptors (neurons); portions of the ducts of glands and hair roots
- B. Reticular Layer: deepest; 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 UV light, trauma, and heat loss

### B. Nails:

1. Formed from the stratum corneum
2. Function: protection and grasping

### C. Exocrine glands: 3 kinds

1. Sebaceous glands = Oil (= sebum) glands
  - a. Associated with hair follicles
  - b. Functions: soften the skin & bactericidal
2. Sweat (sudoriferous) glands
  - a. Eccrine
    - i. found everywhere
    - ii. release perspiration (sweat)
  - b. Apocrine
    - i. Axillary & pubic regions
    - ii. Secretes onto hair shafts
    - iii. Releases an odiferous secretion
3. Ceruminous (cerumen = earwax)
  - a. Modified sweat glands
  - b. In external auditory canal
  - c. Cerumen is an insect repellent and helps keep the eardrum "soft"