

1/28/15

INTEGUMENTARY SYSTEM

I Introduction

- A. **Integument** : covering=skin (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 primarily of dense irregular connective tissue
 - 3. Contains nerve endings, hair follicles(cells that make the hair), & 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 [stratum means layer] [**highly mitotic**---place where most mitosis happens]

- B. Stratum Spinosum: several layers of polygonal-shaped cells with spines. Small degree of mitosis here (looks like the spine=spiny layer]
- 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(lucid=clear):2-3 layers of dead, anucleated, keratinized, clear cells; only found in thick skin (where we have caliced skin)
- E. Stratum Corneum: 20-30 layers of dead, keratinized, anucleated(nucleus has disrupted) cells (cornified = brittle, hardened); outer cells are constantly shed

IV Cells of the Epidermis (4 populations of cells)

1. Keratinocytes: most numerous (**90%**); found in all layers; produce keratin (these are the epithelial cells that are squamous/bricklike/columnar/cuboidal/etc)
2. Melanocytes: 2nd most numerous (**8%**);found only in the stratum basale; produce melanin (comes in several diff forms of proteins---dictates your skin color)
→*****melanin** protects us from ultra violet light (could damage DNA and cause cancer
3. Tactile (Merkel) Cells: 3rd most numerous (1%); found only in the stratum basale; provide information regarding tactile (light touch) sensation
4. Epidermal dendritic (Langerhans) cells: 4th most numerous (<1%);found primarily in the stratum spinosum; phagocyte(defense system)

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 (pili=hair, arrect=to go up)
- 3. Function: protect from UV light, trauma, and heat loss

B. Nails:

- 1. formed from stratum corneum
-made out of keratin

- 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