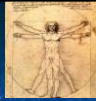




LAB 3

Objectives:

- Describe the structure and function of the integumentary system.
- Identify the layers of the skin histologically and describe the characteristics of each layer to include tissue composition.
- Compare and contrast the structure and function of the epidermis to the dermis.
- Identify accessory organs histologically and on models.
- Understand the structural components and functional roles of accessory organs.
- Describe the structure and function of the major membrane types.
- Describe the different locations of each type of membrane.



The Integumentary System

- Structurally- what does it include?

The integument (skin) and accessory organs (glands, hair, vessels, sensory receptors, muscle, nerves)

Functions of the Integumentary System

- Protection – chemical, physical, and mechanical barrier
- Body temperature regulation is accomplished by:
 - Dilation (cooling) and constriction (warming) of dermal vessels
 - Blood reservoir: skin blood vessels store up to 5% of the body's blood volume
 - Increasing sweat gland secretions to cool the body

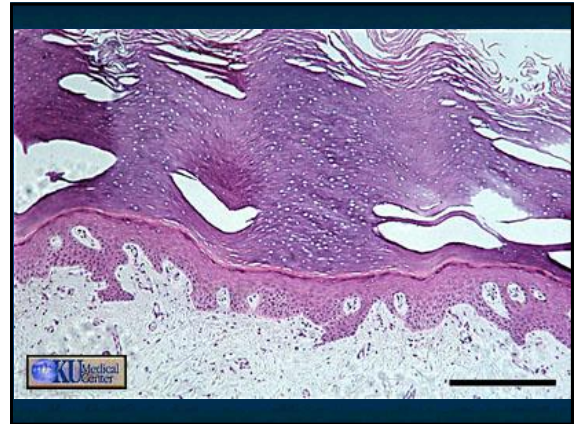
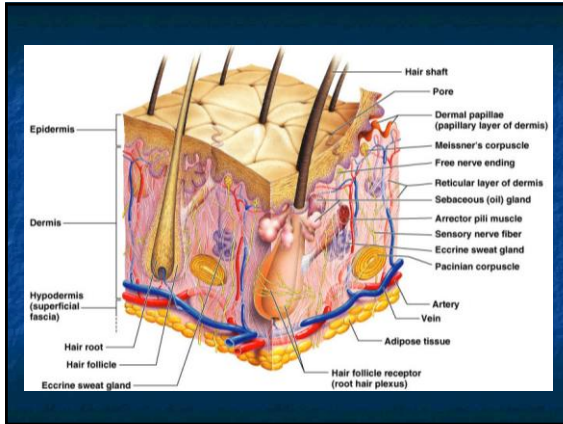
Functions of the Integumentary System

- Cutaneous sensation – exteroceptors sense touch and pain
- Metabolic functions – synthesis of vitamin D in dermal blood vessels
- Excretion – limited amounts of nitrogenous wastes are eliminated from the body in sweat



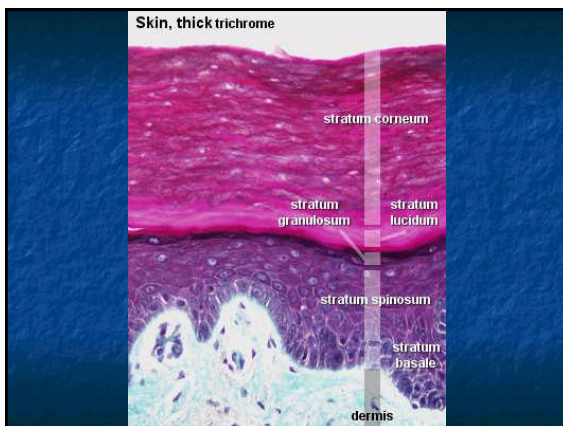
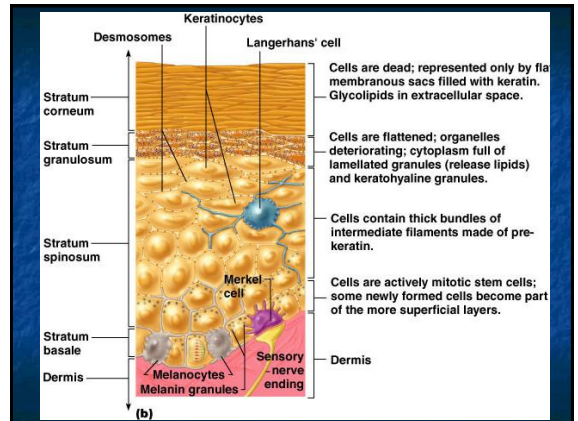
The Integument

- Structure: Cutaneous membrane
 - Two distinct layers and tissue types
 - Epidermis
 - stratified squamous epithelium
 - Dermis
 - areolar connective tissue
 - dense irregular
 - But also lots of nerve and muscle.



Layers of the epidermis

- **Stratum basale (germinativum)** – single row of cells directly adjacent to basement membrane which are rapidly dividing cells.
- **Stratum spinosum** – several rows of older daughter cells that are pushed superficially.
- **Stratum granulosum** – cells granules visible, upper boundary of this layer is where cells begin to die.
- **Stratum lucidum** – flattened dead keratinocytes – not present in thin skin.
- **Stratum corneum** – bulk of epidermis- cells are dead but their keratinized skeletons persist.

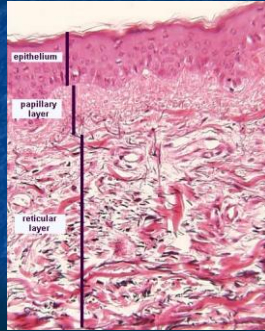


Types of cells in the epidermis

- **Keratinocytes** – most abundant, bound together by desmosomes. Produce keratin, which gives skin its protective qualities.
- **Melanocytes** – cells which produce melanin- pigment producers.
- **Langerhans' cells** – phagocytic cells involved with immunity
- **Merkel discs** – sensory receptors located at the dermal-epidermal junction

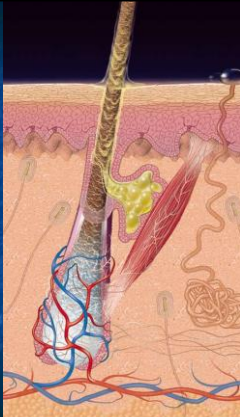
Dermis

- Connective tissue
- Highly vascular
- Two layers-
 - Papillary
 - Areolar
 - Reticular
 - Dense irregular
- Papillary layer is responsible for fingerprints.



Accessory structures

- Exocrine glands (sebaceous and sweat)
 - sebaceous always associated with hair follicle
- Hair (follicle and arrector pili muscle)
- Sensory receptors (Pacian corpuscles and Meissner's corpuscles, root hair plexes)
- Nails (and claws and scales) – keratin derivatives of the epidermis



Membranes

- Epithelial and Synovial membranes
- What are the three types of epithelial membranes?
 - Cutaneous, mucous, serous
- What is a synovial membrane?

Lab Activities

- Rotations : Models & histology
- Jeopardy!