SKIN AND THE INTEGUMENTARY SYSTEM

OBJECTIVE:
6. Describe the mechanisms that produce hair and the structural basis for hair texture and color.
7. Discuss the various kinds of glands in the skin, and list the secretions of those glands.
8. Describe the anatomical structure of nails, and explain how they are formed.

D. Accessory Organs of the Skin

1. HAIR (_____) [Figure 5.5 p129]

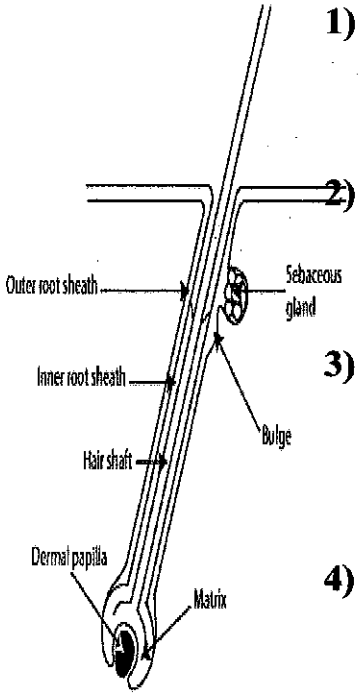
a. Definition: a keratinous strand produced by organs called hair follicles

b. Location: _____ skin surfaces _____ over the sides of the fingers/toes, lips, and portions of the external genitalia

c. Functions

1) _____
2) _____
3) _____
4) _____

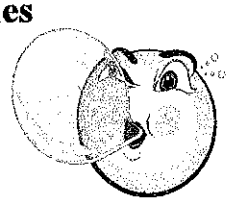
d. Structure



1) hair _____ (#_____)
   a) Definition: a tube lined by stratified squamous epithelium that begins at the surface of the skin and ends at the hair papilla
   b) located in the _____
2) hair _____ (#_____)
   a) Definition: a peg of c. t. containing _____ _____
   b) hair growth begins here
3) hair _____ (#_____)
   a) composed of epithelial cells and _____
   b) _____: bundles of pigment-protein complex varying in size type and distribution determine natural hair color
4) germinal _____ (#_____)
   a) Function
      (1) hair growth cycle (2-5 years @ 0.3 mm / day)
      (2) mitosis, movement of cell upward, keratinization
      (3) when these cells die, hair no longer regenerates
   b) about _____ of matrix cells are _____
5) hair _____ (#_____) located w/i the follicle
6) hair shaft (#_____)
   a) located from root to visible tip
   b) size, shape, and color are highly variable
7) _____ (#_____)
   a) _____ muscle bundle
   b) pulls on follicle to erect hair producing goosebumps
   c) emotional states / response to cold

e. Color

1) Melanin type is _____.
   a) Most common is eumelanin = brown/black
   b) phaeomelanin = red -> yellow, ginger, and red shades
   c) both are present in cortex -> *visible color* = _____
2) Natural color is determined by
   a) thickness (_____ if thick)
   b) _____ of pigment granules (blondes ↓ / less)
   c) ratio of melanin types, environment, and hormones
3) Gray hair
   a) natural aging process begins btw 28-40
   b) melanin production slows down
   c) serious illness/emotional conditions also factors



4) White hair: accumulation of _____ in shaft

f. Growth

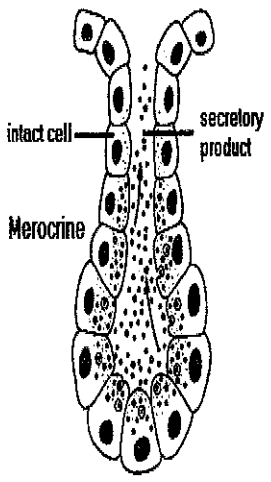
1) lanugo: fetal hair coat; extremely fine/soft; forms @ 7th ; shed 8th month
2) vellus: replaces lanugo; stronger, finer, non-pigmented appearing first on scalp, eyelids, brows
3) terminal: coarse, pubic and axillary develops at puberty; ♂ chest, extremities, beard ♀ less terminal replacement

2. GLANDS

a. Sebaceous (oil) (#_____)

1) Definition: _____ skin gland that secretes _____
   a) sebum: waxy, oily secretion; a mix of triglycerides, cholesterol, proteins, & electrolytes
   b) secretory cells manufacture large quantities of lipid
   c) cells rupture
2) Location: usually attached to hair follicle on face, back, chest, nipples, & ext. genitalia
3) Function to keep hair and skin soft, pliable, relatively waterproof and _____
4) highly active during adolescence due to hormones; extreme sensitivity to changes in concentrations of sex hormones
5) enlargement from accumulated sebum→ blackhead (color from oil & melanin)
6) Sebum is nutritive to some bacteria→ _____

_____



b. Sweat (Sudiferous)

1) Types

a) Merocrine aka: Eccrine (more common)

(1) Location: all over body; numerous on forehead, neck, back, axillae, palms; _____

(2) Secretion sweat: contents 99% water, ions Na+Cl-, wastes→urea, uric acid, ammonia, amino acids, glucose, lactic acid; pH =_____

(3) Structure

(a) smaller and numerous

(b) widely distributed

(c) _____

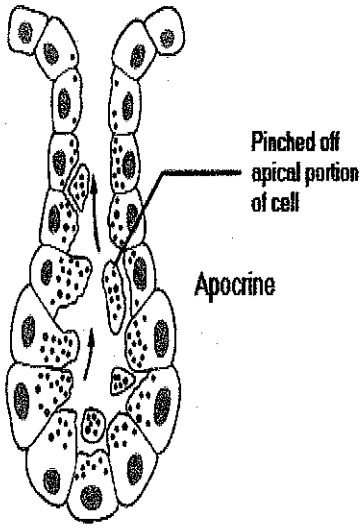
(d) secreted directly onto surface

(4) Function

(a) cool surface of skin

(b) decrease body temperature

(c) dilutes harmful environmental substances & discourages micro- organism growth



b) Apocrine

(1) Location: _____

(2) Stimulated by sex hormones during puberty & controlled by nervous system and circulation;"cold sweat"

(3) Secretion: same basic ingred. w/ lipids & proteins; sticky, cloudy, potentially odorous; nutrient source for bacteria which intensify odor

(4) Structure

(a) coiled, tubular

(b) myoepithelial cells capable of contraction around secretory cells

(c) squeeze accumulated secretion carbs / proteins

5) Function _____ (phermonal)

c. _____: work w/ sebaceous to secrete earwax (cerumin)

d. _____: secrete milk

3. NAILS

a. **Definition: multilayered protective structure composed of tightly packed epithelial cells containing hard keratin**

b. **Location: dorsal surfaces of tips of fingers/toes**

c. **Structure**

1) **nail plate (_____) (#____) free edge (#____) :consists of hard keratin (like stratum corneum of skin) over nail bed**
2) **nail bed (#_____): alive and continuously producing new cells which die, & stick together [epithelial layer from skin]**
3) **nail root: (#____) part hidden by cuticle ; where production occurs**
4) **eponychium (cuticle) (#_____ & #_____): junction btw skin and base of nail plate; protects against infective agents**
5) **hyponychium(#_____ / #_____): junction btw skin & free edge of nail plate**
6) **lunula: (#_____ /#_____) light or white region at base of nail plate; partially keratinized (immature); vascular tissue beneath doesn't show due to thickened stratum basale**

d. **Condition indicates health (av. growth 1 mm (0.004" / week)**

1) **bluish → _____**
2) **white bed or oval depressions → _____**
3) **horizontal furrows → _____**