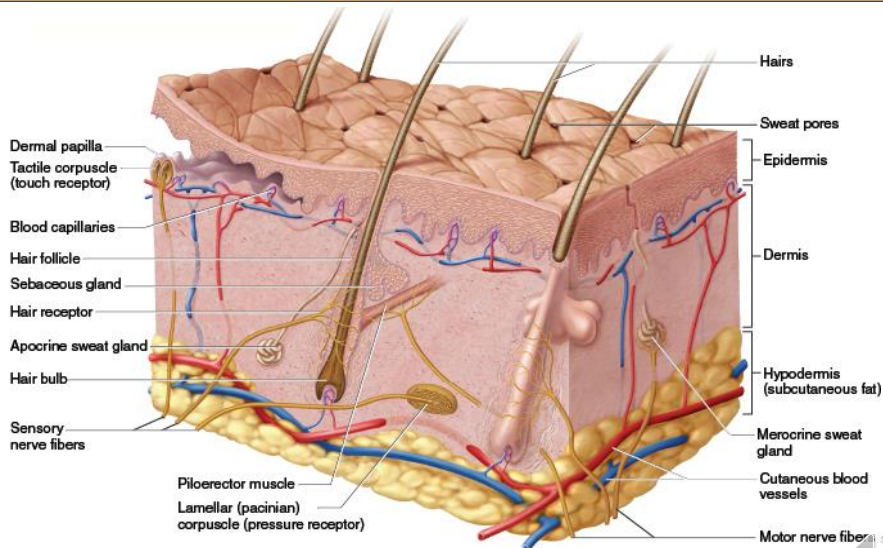


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## Integumentary System



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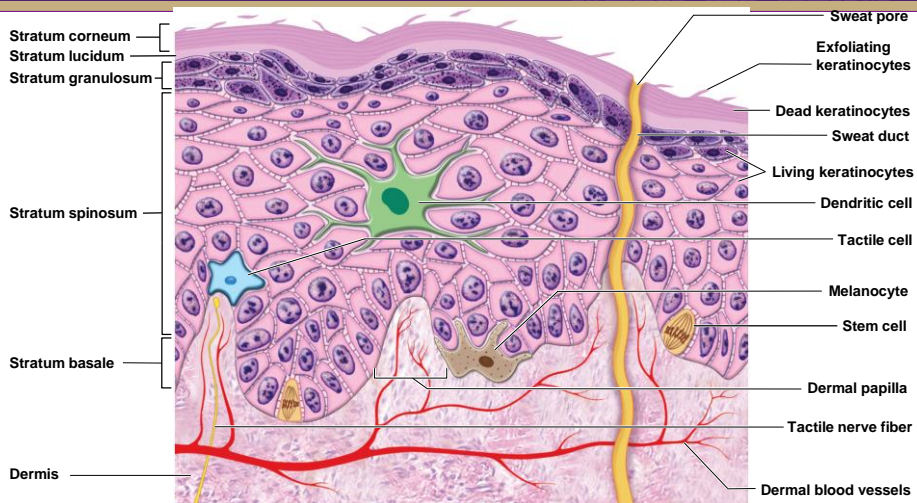
## Functions

- Resistance to trauma and infection
- Other Barrier Functions
- Vitamin D Production
- Sensation
- Thermoregulation
- Communication



## Structure of Skin (Fig. 6.3)

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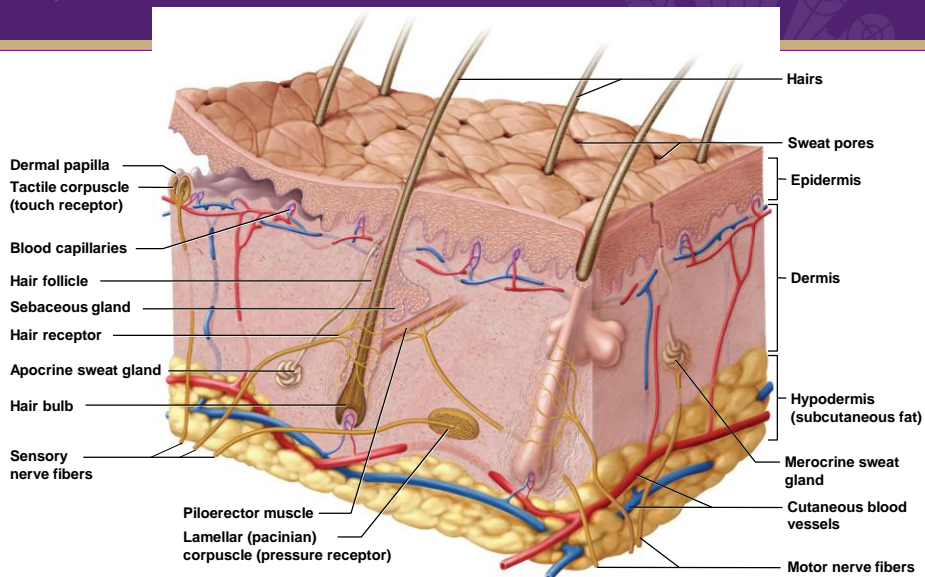
## Structure of Skin

- Epidermis
  - Stratum Basale
    - Keratinocytes
    - Melanocytes
    - Tactile Cells
  - Stratum Spinosum
    - Dendritic Cells
  - Stratum Granulosum
  - Stratum Lucidum
  - Stratum Corneum



Fig. 6.1

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## Vitamin D Synthesis

- Use of UV radiation to convert a form of cholesterol to Vitamin D.
- Liver then converts Vitamin D to Calcidiol.
- Calcidiol is then converted to Calcitriol by the kidneys.
- Calcitriol helps the body absorb more Calcium



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The diagram illustrates the synthesis of active Vitamin D. It begins with 7-dehydrocholesterol, a cholesterol derivative with a double bond at the 7-position and a hydroxyl group at the 3-position. Upon exposure to ultraviolet light, it is converted to Vitamin D<sub>3</sub> (cholecalciferol), which has a diene system in the B-ring and a methyl group at the 6-position. The liver then hydroxylates Vitamin D<sub>3</sub> at the 25-position to form Calcidiol. Finally, the kidneys hydroxylate Calcidiol at the 1-position to produce Calcitriol, the biologically active form of Vitamin D. The chemical structures are shown in green, orange, yellow, and red, corresponding to the stages of the process.

7-dehydrocholesterol

Ultraviolet light

Vitamin D<sub>3</sub> (cholecalciferol)

Calcidiol

Calcitriol



## Glands

- Exocrine vs. Endocrine
- Sweat Glands
  - Merocrine
    - Sweat
  - Apocrine
- Sebaceous Glands
  - Sebum
- Ceruminous Glands
  - Cerumen

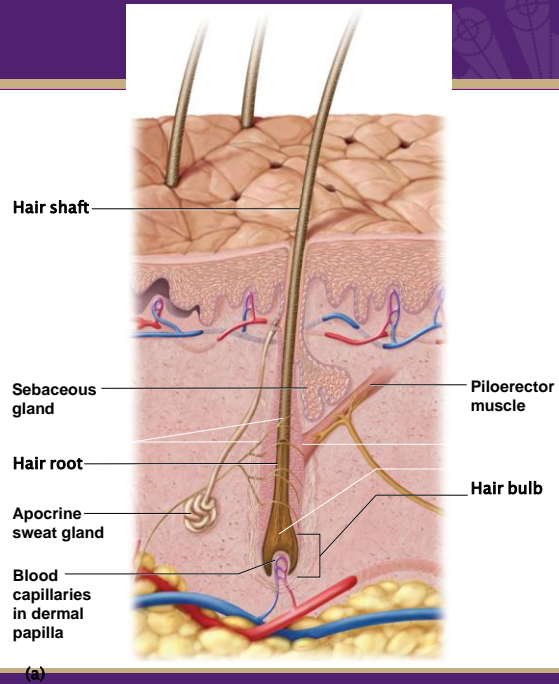


## Accessory Organs Continued

- Hair (pilus)
  - Keratinized cells
  - Found everywhere EXCEPT: tips of toes and fingers, palms, soles, lips, nipples, and some parts of the genitals.
  - Piloerector (arrector pili)
  - Functions:
    - Vestigial
    - Warnings
    - Heat Retention
    - Identification



Fig. 6.7a



## Accessory Organs Cont'd

- Nails
  - Derivatives of stratum corneum
  - Distinguishing characteristic of primates
  - Allow for more sensitive and tactile finger tips

Fig. 6.10

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