Membranes

Sheet-like organs that form protective coverings and barriers in the body

• Most membranes contain a layer of epithelial tissue over a layer of dense connective tissue

• The four major types of membranes are cutaneous, mucus, serous, and synovial

Fig 4.4

Integumentary system

The skin and the organs within the skin (sweat and oil glands, hair, nails)

• Function = To protect the body

Cutaneous membrane (The skin)

A membrane that lines the outside of the body to (a) protect the body from infection and other environmental hazards, and (b) to retain the body's fluids

• The skin is composed of two layers

√ Epidermis = stratified squamous epithelial tissue on outside

√ Dermis = dense connective tissue underneath epidermis

• The hypodermis (subcutaneous) = An adipose layer under the skin (it is not considered part of the skin)

Fig 5.2

Epidermis

Stratified squamous epithelial cells on the outside of the skin

• The lower-most cell layer of the epidermis = Stratum basale

√ Cells constantly dividing; New cells get pushed upward

- As the cells move upward, they slowly die and fill with keratin protein (a hard, waterproof protein)

√ Melanocytes = Cells in stratum basale that make melanin (anti-UV pigment)

• The upper-most cell layer of the epidermis = Stratum corneum

√ Dead cells completely filled with keratin

√ The thickest of the epithelial strata

Figs 5.2, 5.4, and 5.5

Dermis

Dense connective tissue below the epidermis

• The upper part of the dermis has papillae (wavy upward projections that indent the epidermis)

• The dermis is rich in blood vessels and nerve endings

√ The blood vessels (a) supply the stratum basale cells with the nutrients and oxygen they need for growth, and (b) regulate body temperature

√ The nerves sense touch, temperature, and damage

• Sweat glands and sebaceous (oil) glands are located in the dermis

√ Gland = any tissue that secretes (makes and releases) substances

Figs 5.2 and 5.7

Skin color is due to a combination of pigments and blood in the skin:

- Melanin = Brown
- Carotenes = Yellow
- Blood = Pink

- Changes in the blood in skin can cause skin color changes

  √ Erythema = Redness due to excess blood in skin's blood vessels

  √ Cyanosis = Blue skin due to low oxygen blood

  √ Jaundice = Yellow skin due to bile from faulty liver

Fig 5.8

Skin appendages

The organs in the integumentary system that assist the skin in protecting the body

- The sweat glands, sebaceous (oil) glands, hair, and nails

- All skin appendages are located in the dermis

Sebaceous glands (oil glands)

Glands that release oily sebum

- Sebum softens the hair and the skin and kills bacteria

- Usually found as part of a hair follicle

Fig 4.11

Sweat glands

Glands that release sweat (water with salts, and other solutes) to cool the body

Fig 5.14

Hair

Long thin skin appendages made of dead keratin-filled epithelial cells

- Shaft = the part of a hair above the skin
- Root = the part of a hair below the skin
  - √ Follicle = The cells that surround the hair root
  - √ Each follicle is connected to a sebaceous gland and an arrector pili (a smooth muscle organ that raises the hair when we are frightened or cold)

Fig 5.11

Nails

Structures at the ends of fingers and toes made of dead keratin-filled epithelial cells

Fig 5.13