

Connective Tissues:

Blood

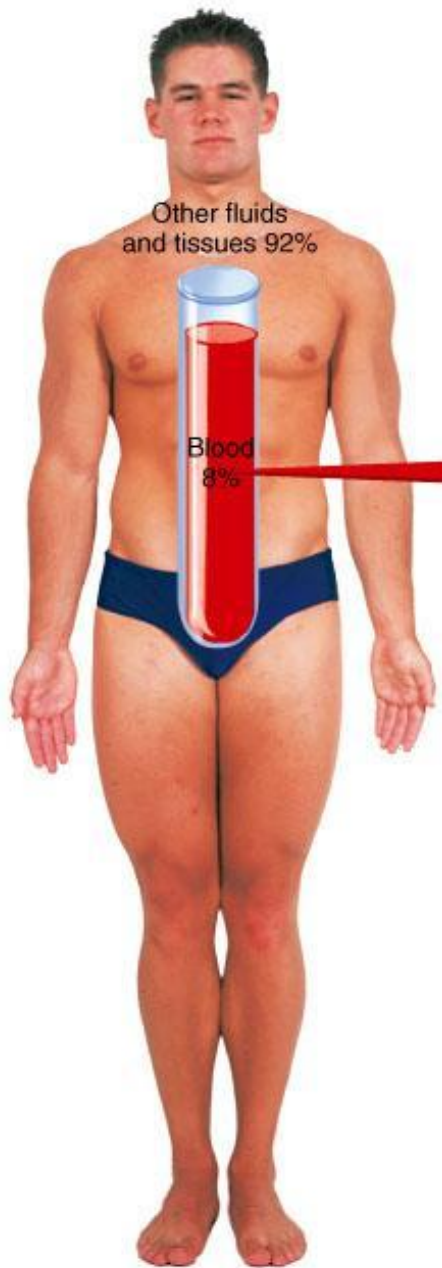
Repair

Membranes

Components of Blood

- **Cells: Formed Elements**
 - RBC (Erythrocytes; **95%**)
 - WBC (Leucocytes)
 - Platelets (Thrombocytes)
- **Matrix: Plasma**
 - Water (**91%**)
 - Extracellular **Proteins** (7%)
 - Ions, gases, nutrients (2%) - ground substance

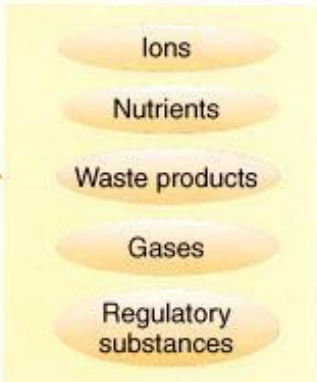
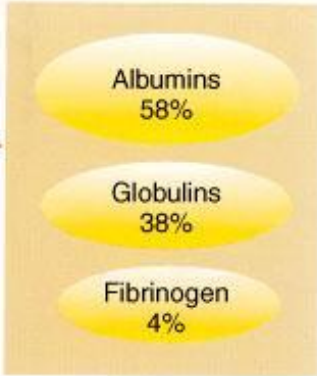
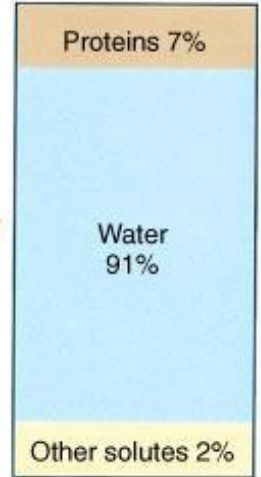
Percentage by body weight



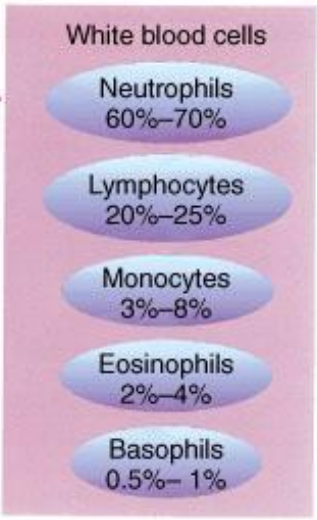
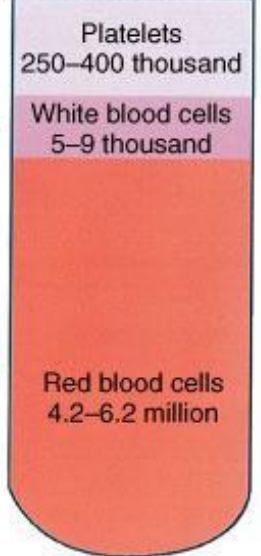
Percentage by volume



Plasma (percentage by weight)



Formed elements (number per cubic mm)



Extracellular proteins

- **Albumin** - contributes to osmotic pressure of blood
- **Globulins** - Antibodies, transport molecules, clotting factors
- **Fibrinogen** - Clotting factor; produces fibrin (threadlike, blood-clot-forming protein)
- **Serum** = Plasma minus clotting factors

Types of Leucocytes

- **Granulocytes:** Leukocytes containing large cytoplasmic granules
 - Neutrophils
 - Basophils
 - Eosinophils
- **Agranulocytes:** Leukocytes lacking cytoplasmic granules
 - Lymphocytes
 - Monocytes

Granulocytes

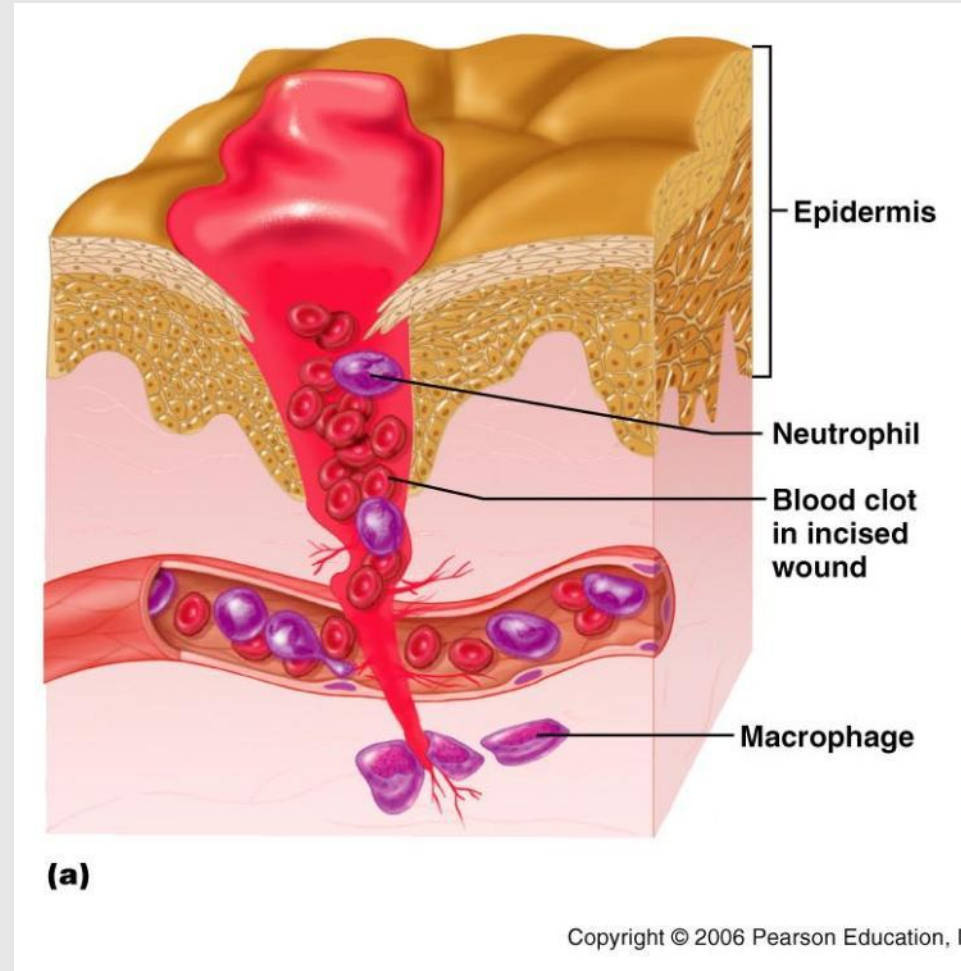
- **Neutrophils: Most common**
 - spend 10-12 hours in blood
 - **phagocytize** microorganisms & foreign substances in tissues --> pus!!
- **Basophils (mast cells): Least common**
 - release **histamine** & others *promoting inflammation*
 - release **heparin** which *prevents clotting*
- **Eosinophils**
 - release *inflammation suppressing* compounds (antihistamine)
 - Produce chemicals which destroy worm parasites

Agranulocytes

- **Lymphocytes: Smallest WBC; immune response;**
 - produce antibodies & chemicals to destroy foreign cells
 - contribute to allergic reactions
 - reject tissue grafts
- **Monocytes: Largest WBC; become macrophages in tissues**
 - Phagocytize bacteria, dead cells, cell fragments
 - Present phagocytized particles to lymphocytes -> **activation**

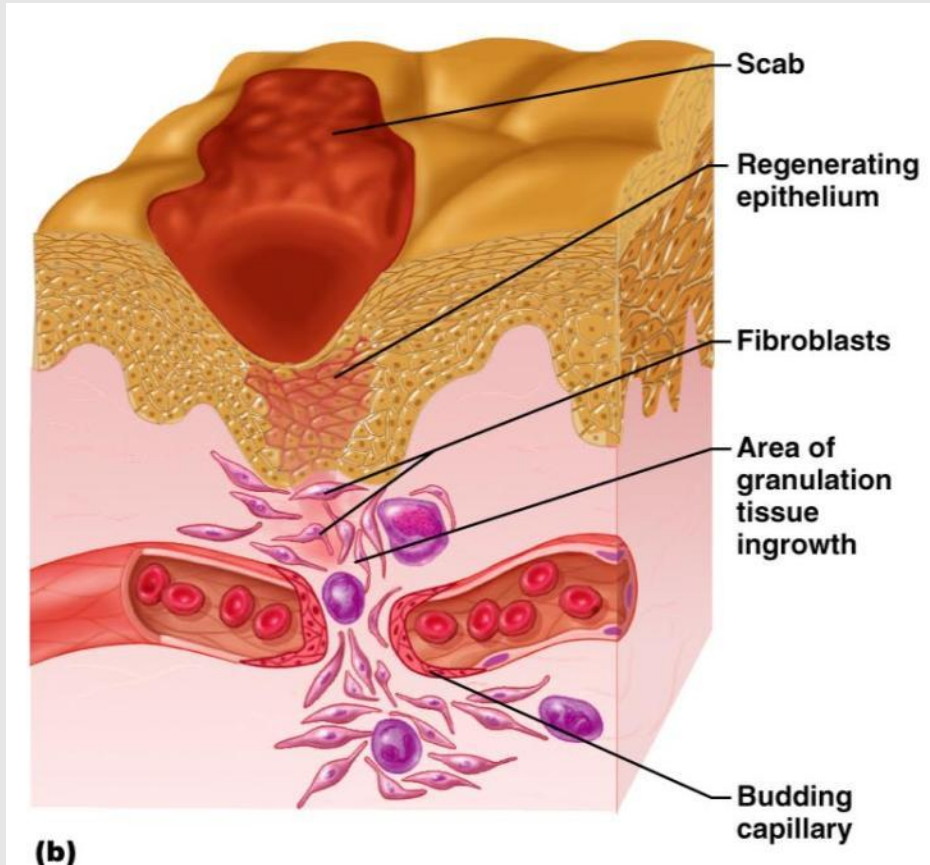
Tissue Repair

- Inflammation
 - Macrophages, injured cells, mast cells *release inflammatory chemicals*
 - *Capillaries dilate; permeability increases*
 - Proteins, leucocytes, *blood leak into injured area.*
 - clot forms



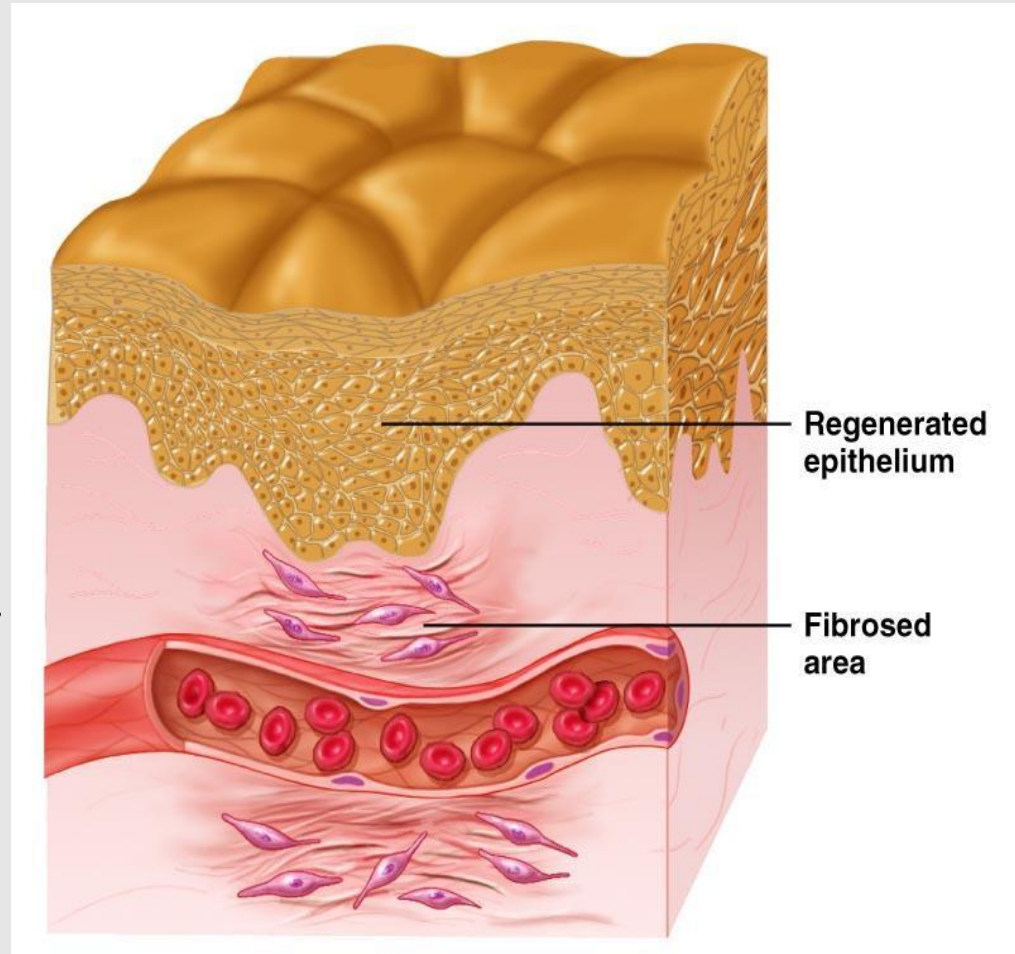
Tissue Repair

- Organization
 - Fragile, capillary-laden tissue grows into wounded area
 - Fibroblasts proliferate; stimulate growth & new collagen fibers
 - Macrophages digest blood clot

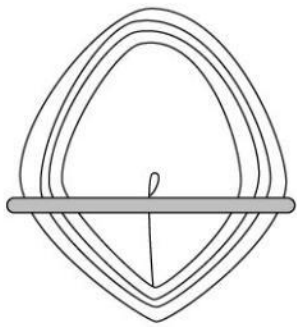


Tissue Repair

- Regeneration
 - Basal lamina grows *under* the scab & epithelium thickens
 - Connective tissue contracts and thickens = scar tissue



Tissue Origins



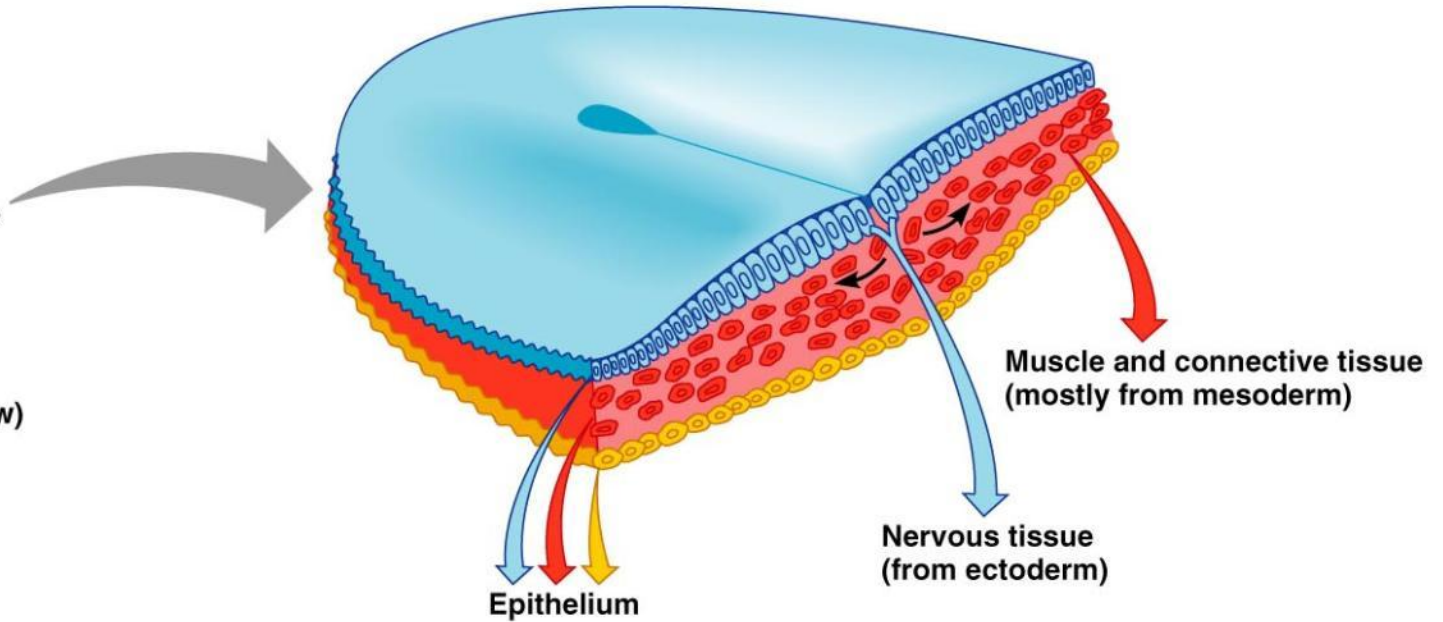
16-day-old embryo
(dorsal surface view)

Key:

 = Ectoderm

 = Mesoderm

 = Endoderm



Membranes

Fascia: CT framework

- **Superficial**
 - Connects skin to organs
 - areolar & adipose CT
- **Deep**
 - Connects organs to body wall; connects to bones & muscles
 - Irregular CT
- **Subserous**
 - Connects deep to serous membranes
 - Areolar CT

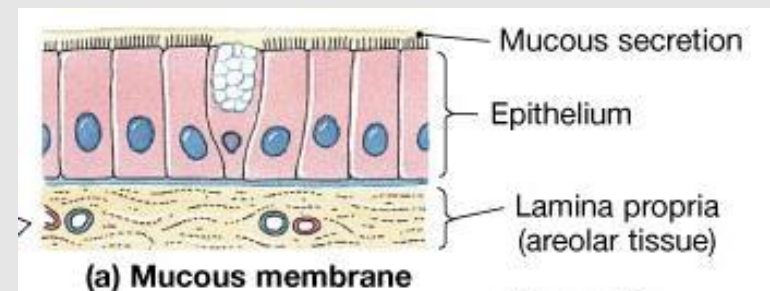
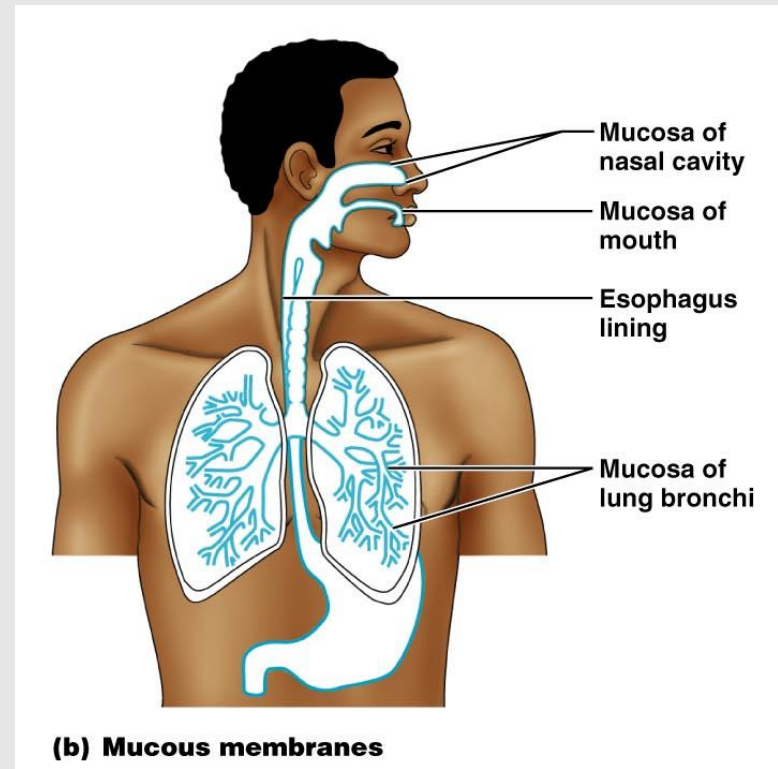


Membranes

- **Composition:** All consist of ET supported by CT
- Membranes line body surfaces
 - Mucous
 - Serous
 - Cutaneous
 - Synovial

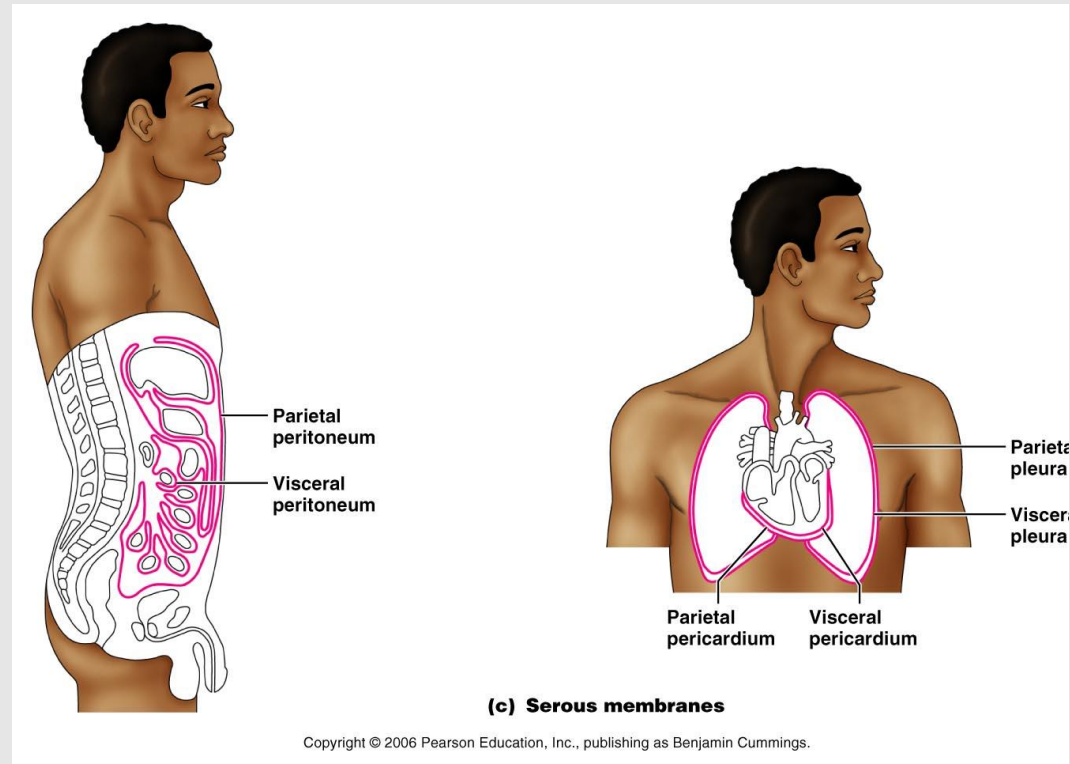
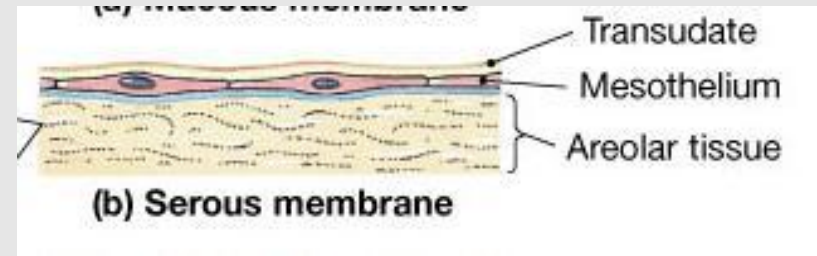
Mucous Membranes

- Line passageways and chambers that communicate with exterior
 - Digestive, respiratory, reproductive, urinary
 - Kept ET moist
 - reduces friction
 - facilitate absorption or secretion
 - Thin ET over areolar CT



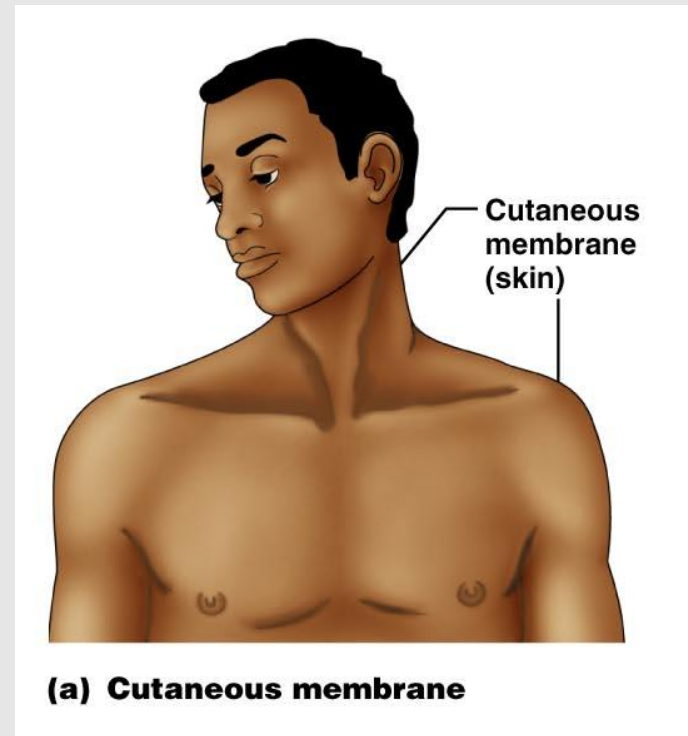
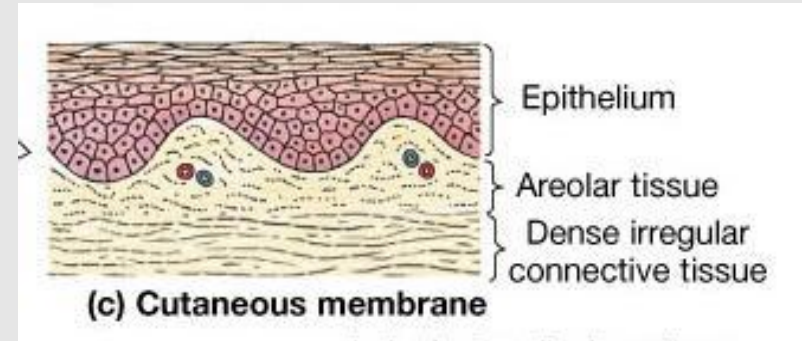
Serous Membranes

- Separate viscera
 - 3 types:
 - Pleura, peritoneum, pericardium
 - Thin
 - Prevent friction between neighboring organs
 - Mesothelium supported by areolar CT



Cutaneous Membrane

- Skin!
- Thick!
- Relatively water proof and dry
 - Stratified squamous ET over areolar CT over dense irregular CT



Synovial Membranes

- Joint capsule membranes
 - **Lubricates** joint cavities surrounding adjacent bones
 - Major layer of **areolar CT**
 - matrix = collagen fibers & "cement" + incomplete layer of macrophages and fibroblasts (derived from ET)

