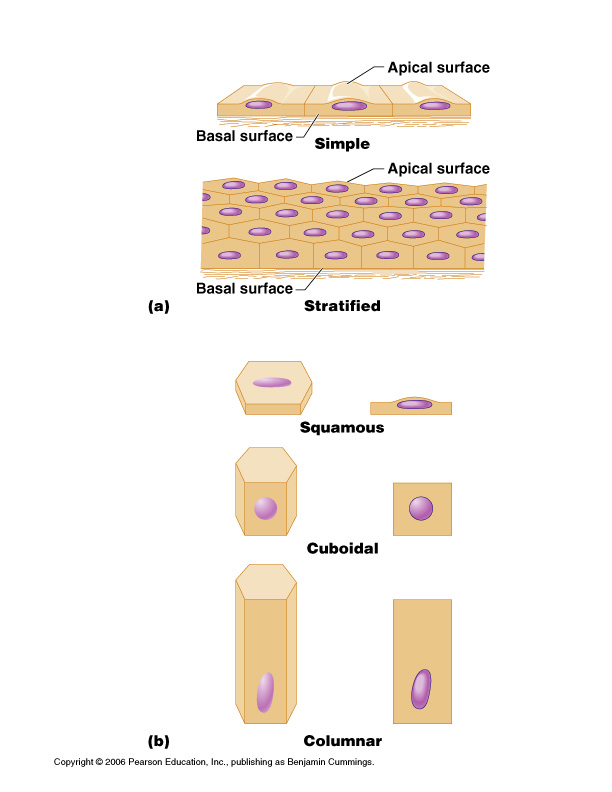
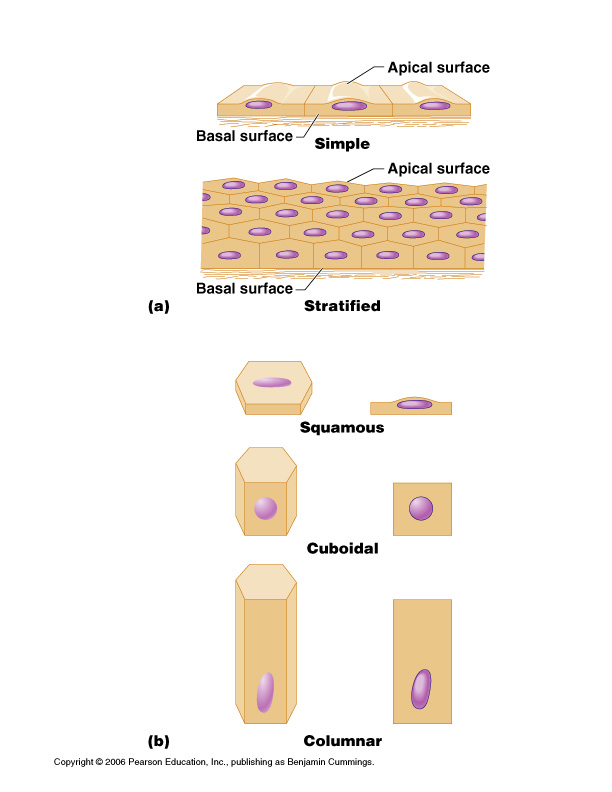
**Chapter 3: Tissues**

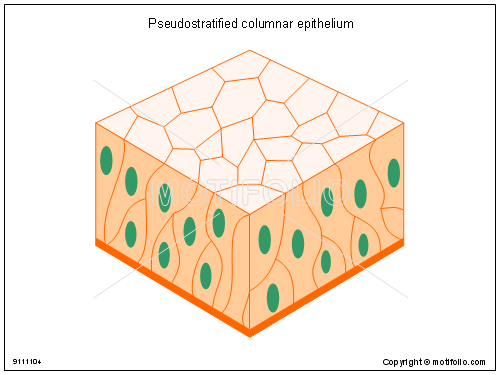
* **Body Tissues**
  + Cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for particular functions
  + Tissues
    - Groups of cells with similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Four primary types
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* *Epithelial Tissues*
* Found in different areas
  + Body \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Body \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue



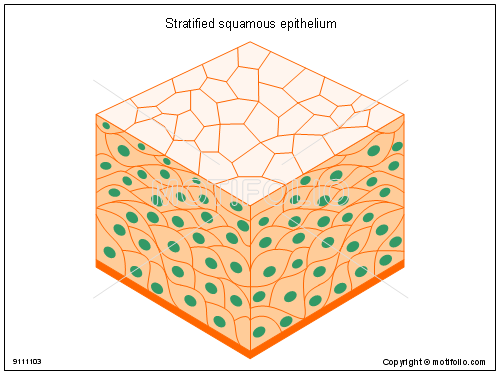
* Functions
  + Protection
  + Absorption
  + Filtration
  + Secretion
  + Epithelium Characteristics
    - Cells fit closely together
    - Tissue layer always has one free surface
    - The lower surface is bound by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ membrane
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (have no blood supply)



* + - Regenerate easily if well nourished
  + Classification of Epithelium
    - Number of cell layers
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – one layer
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – more than one layer
    - Shape of cells
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – flattened
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – cube-shaped
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – column-like
  + Simple Epithelium
    - Simple squamous
      * Single layer of flat cells
      * Usually forms membranes
        + Lines body cavities
        + Lines lungs and capillaries
    - Simple cuboidal
      * Single layer of cube-like cells
      * Common in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and their ducts
      * Forms walls of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tubules
      * Covers the ovaries
    - Simple columnar
      * Single layer of tall cells
      * Often has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (which produce mucus)imbedded in it

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=ysS5XU_ralJXIM&tbnid=EvgcttNT2QcFGM:&ved=0CAUQjRw&url=http%3A%2F%2Fwww.motifolio.com%2F9111104.html&ei=IkVDUuavB-6v4AOM5oHICQ&bvm=bv.53077864,d.dmg&psig=AFQjCNHnbCfT4uSy3U6YM-jJnv0HqjnhfA&ust=1380226712025783)

* + - * Lines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tract
    - Pseudostratified
      * Single layer, but some cells are shorter than others
      * Often looks like a double cell layer
      * Sometimes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tract
      * May function in absorption or secretion
  + Stratified Epithelium
    - Stratified squamous
      * Cells at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ edge are flattened
      * Found as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ covering where friction is common



* + - * Locations
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
        + Mouth
        + Esophagus
    - Transitional epithelium
      * Subclass of Stratified Squamous that lines only a few organs
      * Shape of cells depends upon the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Lines organs of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system
    - Stratified cuboidal
      * Two layers of cuboidal cells
    - Stratified columnar
      * Surface cells are columnar, cells underneath vary in size and shape
    - \*\*Stratified cuboidal and columnar are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in human body and are found mainly in ducts of large glands
  + Glandular Epithelium
    - Gland – one or more cells that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a particular product
    - Two major gland types
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gland
        + Ductless
        + Secretions are hormones
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gland
        + Empty through ducts to the epithelial surface
        + Include sweat and oil glands
* *Connective Tissue*
  + Found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the body
  + Includes the most abundant and widely distributed tissues
  + Functions
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ body tissues together
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the body
    - Provides \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Connective Tissue Types
    - There are 5 types of connective tissue

*Supporting Connective Tissues*

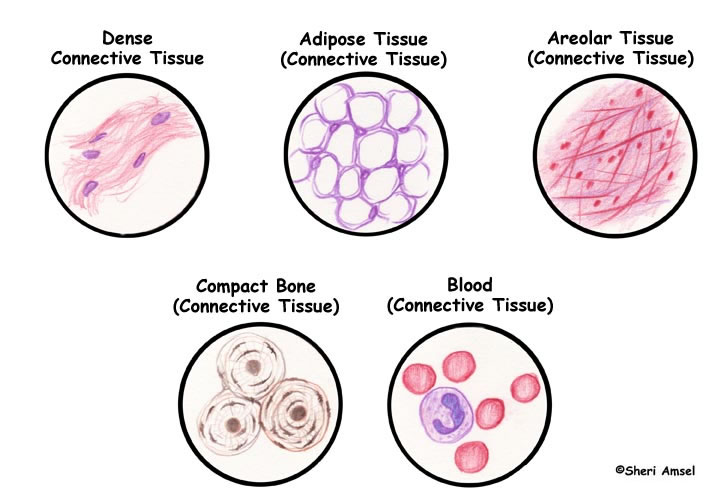
* + - * Bone (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) Tissue
      * Cartilage

*Connective Tissues Proper*

* + - * Dense Connective Tissue (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
      * Loose Connective Tissue

*Fluid Connective Tissues*

* + - * Blood
  + Connective Tissue Characteristics
    - Variations in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ supply
      * Some tissue types are well vascularized
      * Some have poor blood supply or are avascular
    - Made of cells and an extracellular matrix
      * Extracellular matrix is a \_\_\_\_\_\_\_\_\_\_\_\_\_ material that surrounds living cells
    - Extracellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Non-living material that surrounds living cells
      * Two main elements
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – mostly water along with adhesion proteins and polysaccharide molecules
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=nXekPxldjP-t6M&tbnid=MHkFu-klzTEQ1M:&ved=0CAUQjRw&url=http%3A%2F%2Fwww.exploringnature.org%2Fdb%2Fdetail.php%3FdbID%3D45%26detID%3D691&ei=mEZDUpenI_Sp4AO-soCgCA&bvm=bv.53077864,d.dmg&psig=AFQjCNHpbJhYcWCe44obIGxSv_0szb7UtA&ust=1380227077135775)

Produced by the cells

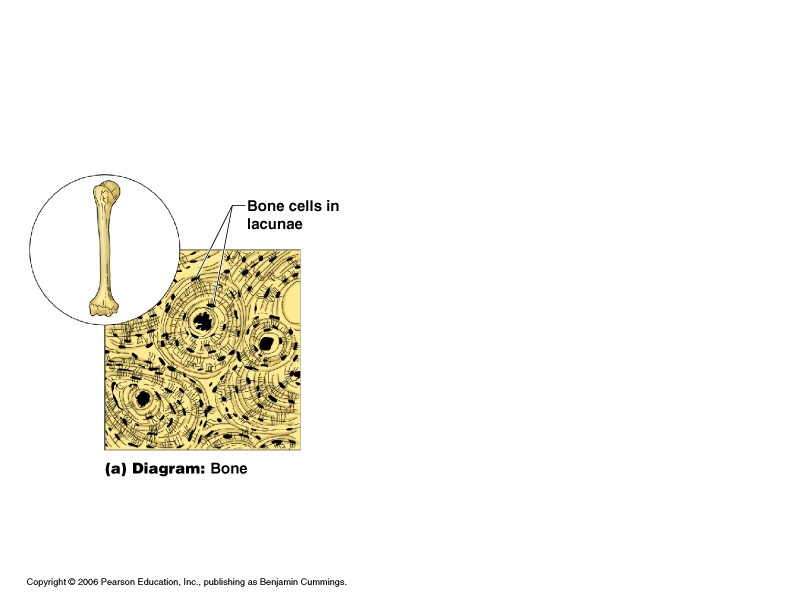
Three types

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers- made of the triple-stranded coiled protein collagen (thickest)

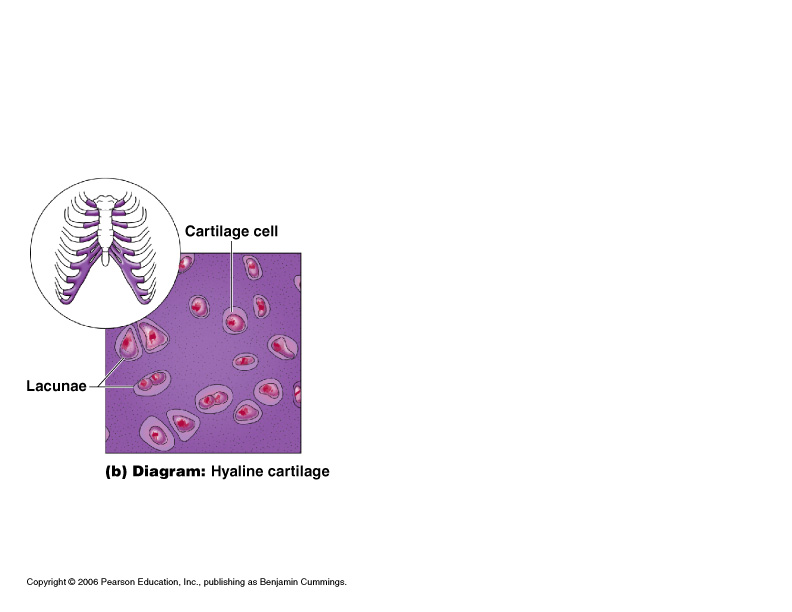
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers- made of a proteinaceous substance Elastin which has only about .1 the tensile strength of collagen (thinnest)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers- made of the triple-stranded coiled protein collagen

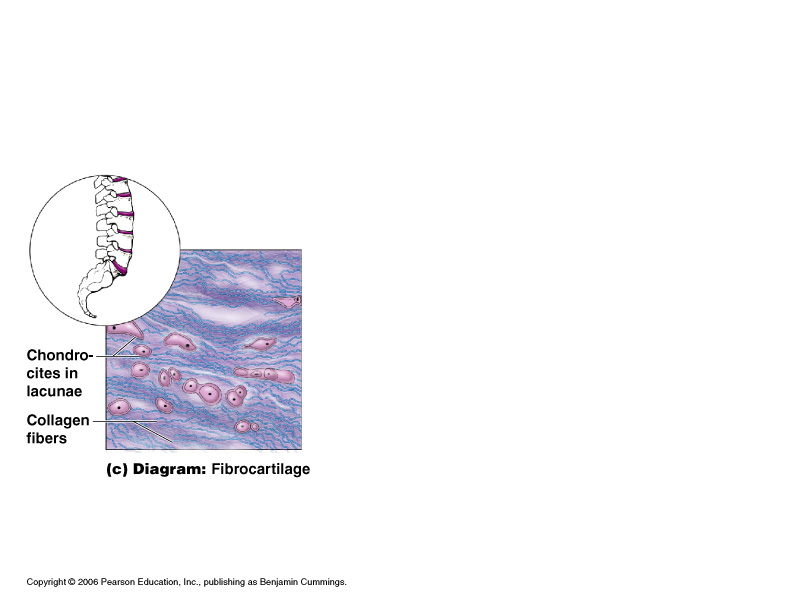
* + Connective Tissue Types



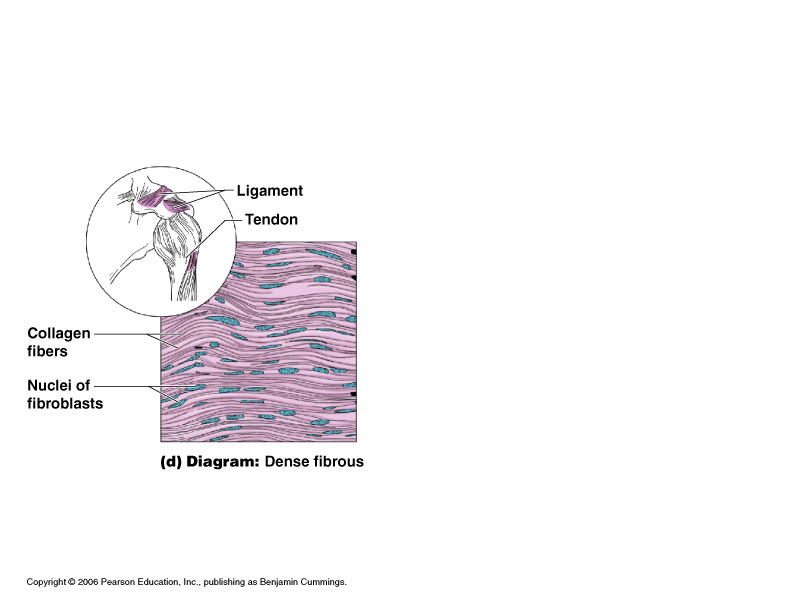
* + - Bone (osseous tissue)
      * Composed of:
        + Bone cells (osteocytes) in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cavities)
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matrix of calcium salts
      * Large numbers of collagen fibers
      * Used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the body
    - Hyaline cartilage



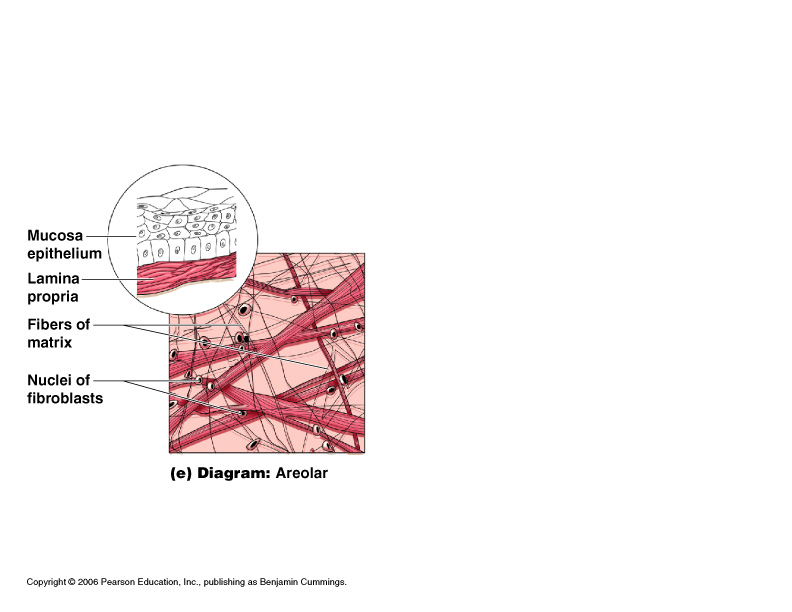
* + - * Most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage used for support and reinforcement
      * Composed of:
        1. Abundant collagen fibers
        2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matrix
        3. Chondrocytes (\_\_\_\_\_\_\_\_\_\_\_)
      * Entire fetal skeleton is hyaline cartilage, found on ends of long bones, found attaching ribs to sternum
    - Elastic cartilage
      * Provides \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(flexibility)
      * Consists of elastic fibers and chondrocytes in a rubbery matrix



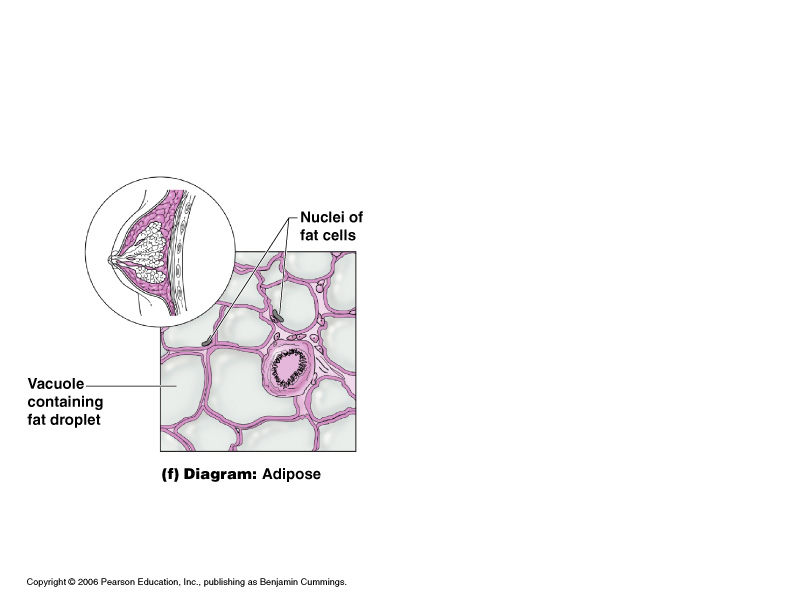
* + - * Example: supports the external ­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Fibrocartilage
      * Highly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to absorb shock
      * Found in intervertebral \_\_\_\_\_\_\_\_\_\_ between vertebrae, in the knee, and in the pubic symphisis
      * Consists of thick collagen fibers and chondrocytes in a rubbery matrix (less rubbery than hyaline)
    - Dense Regular Connective Tissue
      * Main matrix element is collagen fibers with a few elastic fibers.
      * Very little ground substance because of the number of fibers
      * Cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cells)
      * Found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (attach muscle to bone) and \_\_\_\_\_\_\_\_\_\_\_\_ (attach bone to bone)
    - Dense Irregular Connective Tissue



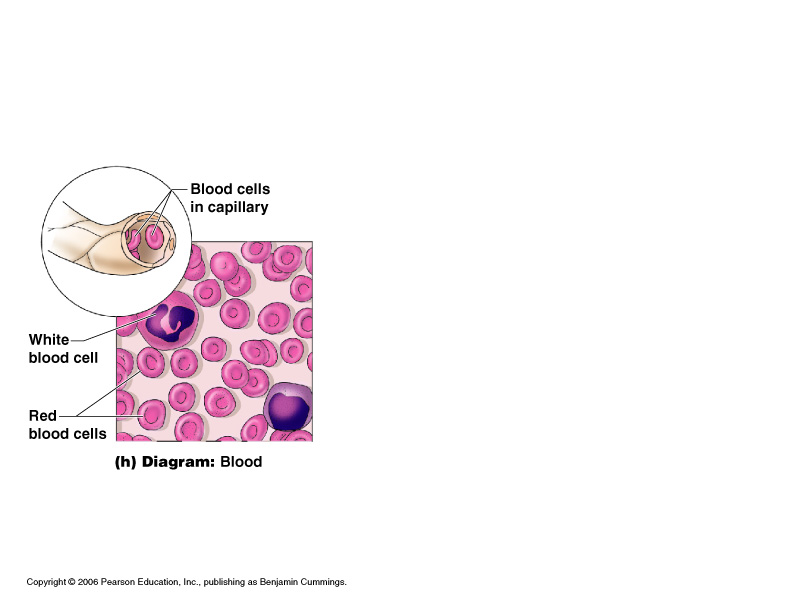
* + - * Main matrix element is collagen fibers with some elastic fibers.
      * Very little ground substance because of the number of fibers
      * Cells are fibroblasts (cells)
      * Found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of skin

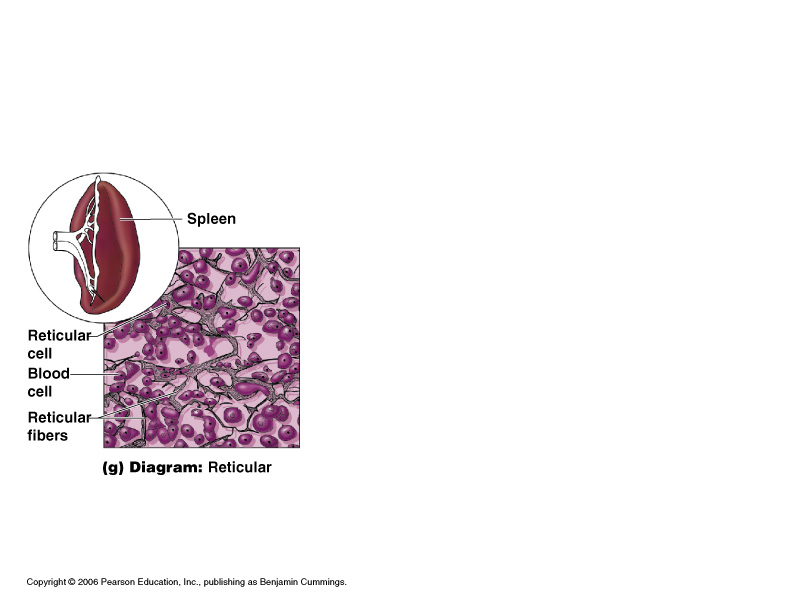


* + - Areolar connective tissue
      * Most widely distributed connective tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, pliable tissue that wraps and cushions organs, can also soak up excess fluid
      * Contains \_\_\_\_\_\_\_\_ fiber types and ­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a gel-like matrix
    - Adipose tissue (Fat)



* + - * Matrix is an areolar tissue in which fat globules predominate
      * Many cells contain large lipid deposits that cause the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to shift to the edge of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cell)
      * Functions
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_the body
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_some organs
        + Serves as a site of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_storage
    - Reticular connective tissue
      * Delicate network of interwoven \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers and blood cells in a gel-like matrix

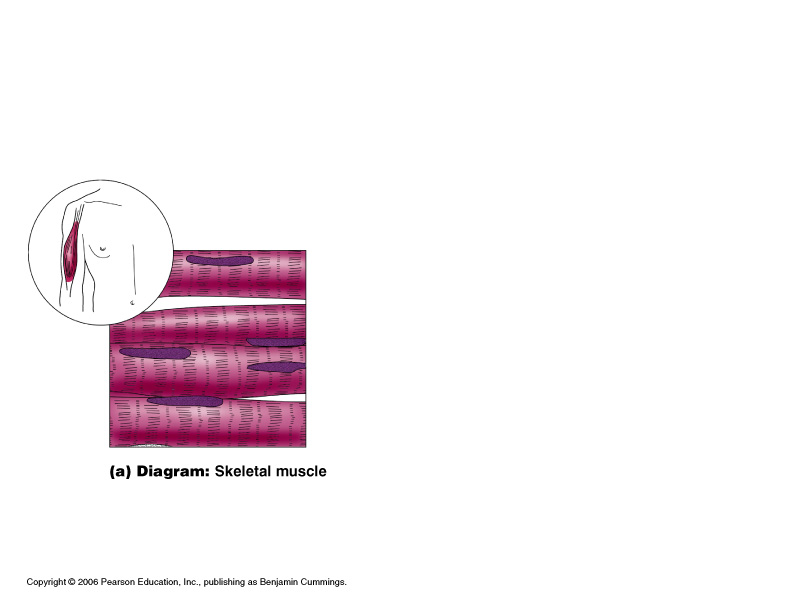




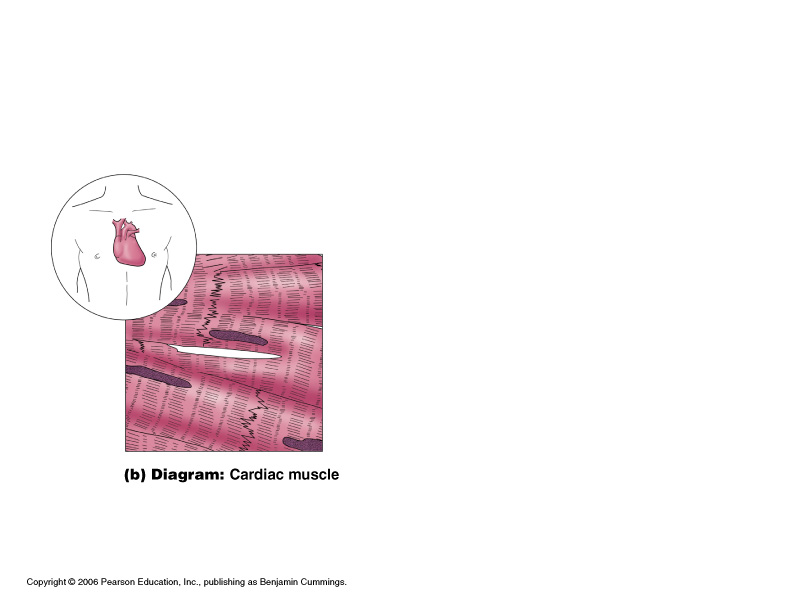
* + - * Forms stroma (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ supporting

network) of lymphoid organs

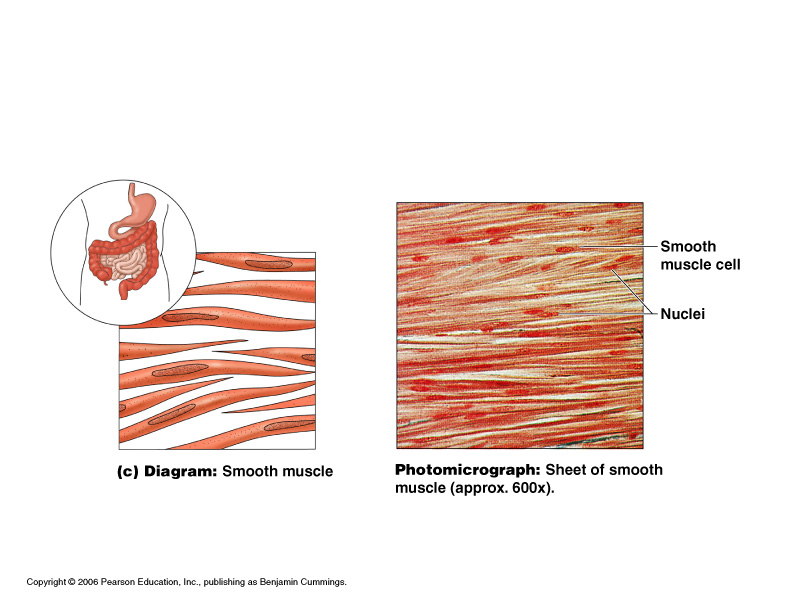
* + - * + Lymph nodes
        + Spleen
        + Bone marrow
    - Blood
      * Red and white blood cells surrounded by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matrix
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are visible during clotting
      * Functions as the transport vehicle for materials throughout the entire body
* *Muscle Tissue*



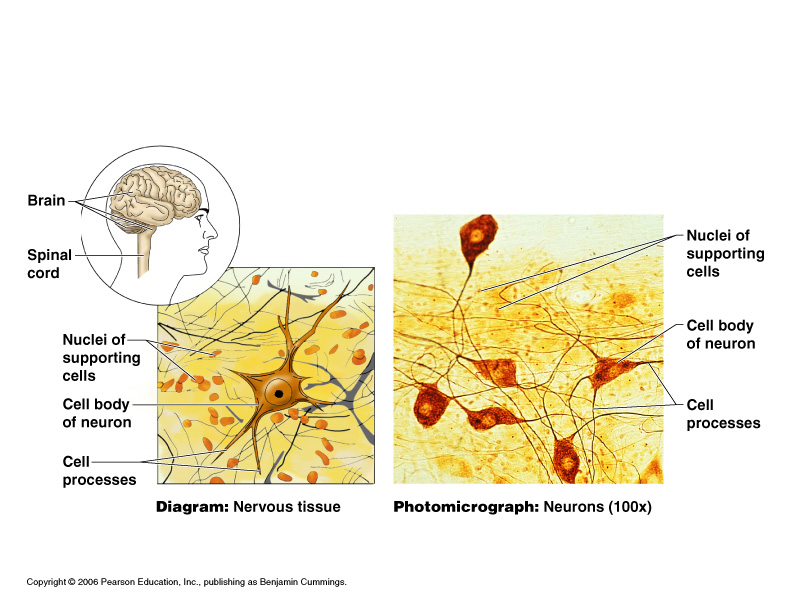
* + Function is to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Three types
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
  + Muscle Tissue Types
    - Skeletal muscle
      * Can be controlled \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Cells attach to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tissue
      * Cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Cells have more than one nucleus



* + - Cardiac muscle
      * Found only in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Function is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_blood (involuntary)
      * Cells attached to other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle cells at intercalated disks



* + - * Cells are striated
      * One nucleus per cell
    - Smooth muscle
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_hollow organs
      * Attached to other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle cells
      * No visible striations
      * One nucleus per cell



* + - * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- a wavelike motion

that moves materials through hollow organs.

* *Nervous Tissue*
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and nerve

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells

* + Function is to send impulses to other areas of the body
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Tissue Repair
  + Regeneration
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of destroyed tissue by the same kind of cells
  + Fibrosis
    - Repair by dense fibrous connective tissue

(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue)

* + Determination of method
    - Type of tissue damaged
    - Severity of the injury
  + Events in Skin and Mucous Membrane Tissue Repair
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_become very permeable
      * Introduce clotting proteins
      * Wall off injured area
    - Formation of granulation tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tissue is composed of new capillaries that provide blood to the damaged area and will destroy eventually the clot once it is no longer needed
    - Regeneration of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_epithelium
  + Regeneration of Tissues
    - Tissues that regenerate easily
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_connective tissue and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Tissues that regenerate poorly
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
    - Tissues that are replaced largely with scar tissue
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_muscle
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tissue within the brain and spinal cord
* Developmental Aspects of Tissue
  + Epithelial tissue arises from all three primary germ layers
  + Muscle and connective tissue arise from the mesoderm
  + Nervous tissue arises from the ectoderm
  + With old age there is a decrease in mass and viability in most tissues

