Supportive Connective Tissues (CT):

- **Function:** Provide physical support

- **Characteristics:**
  1. 
  2. Matrix consistency:
    - ∗ 
    - ∗
  3. Matrix physical feature: Compression:

- **Defined according to:**
  1. Cell types:
  2. Matrix protein fiber:
  3. Matrix composition:

- **2 subdivisions:**
  1. **Cartilage** (chondros = “cartilage”)

  - **Characteristics:**
  - **Functions:**
    a. Support of:
    b. 
    c. Scaffold for:

  - **Cartilage Cells:**
    a. Immature cartilage cells:
      “blast” = bud or precursor
    - **Differentiate from:**
    - **Function:** Secrete:
    b. Mature cartilage cells:
      - **Function:** Maintain:
      - **Location:** Lacunae: Lacus = “pool”
      - Space within:

  - **Matrix:**
    a. **Collagen fibers:**
b. **Elastic fibers**:

c. **Ground substance**:

- Glycosaminoglycan composition:
  - Consistency:

d. **Avascular**: (mostly)

- Nutrients acquired by:

- **Perichondrium**: Vascular Connective Tissue Sheath

  peri = “around”; Chondrium = “cartilage”

  ☆ **Function**:

  ☆ **Composition**: 2 part structure

1. **Fibrous Layer**:
2. **Cellular Layer**:

   ![Diagram of cartilage growth]

   a. 
   b. 

☆ **Cartilage Growth**:

1. **Appositional Growth**: *Surface enlargement*

   - Perichondrial mesenchymal cells become:
   - Lay down matrix at surface:

2. **Interstitial Growth**: “enlargement within”

   - Chondrocytes divide forming:
   - Add cartilage matrix;
     *
     * Increasing cartilage :
• 3 Cartilage types:

1. Hyaline Cartilage
   • Most:
   • Matrix:
   • Living form:
   • Histologically: Matrix
   • Examples: Larynx, Joint Cartilage, ends of ribs

2. Fibrocartilage
   • Contains high concentrations of:
   • Resists:
   • Living form: macroscopic
   • Histologically: Highly
   • Examples: Intervertebral disc, pubic symphysis

3. Elastic Cartilage:
   • Most:
   • High concentration:
   • Histologically:
   • Examples: Epiglottis, outside ear, tip of nose

Study Questions:
1. What are the 2 classes of supportive connective tissues?
2. Cartilage is classified as a connective tissue. Describe the specific characteristics of cartilage which identify cartilage as a connective tissue. Cartilage is also a very specialized connective tissue, describe some of the unique properties specific to cartilage.
3. What do cartilage cells secrete and add to the matrix to produce the firm gel consistency?
4. What is the perichondrium? What are the two layers to the perichondrium? What are the functions of each layer?
5. Describe the differences in the function and location of the chondroblast, chondrocyte and the mesenchymal cells?
6. Describe cartilage appositional and interstitial growth.
7. Cartilage has a very slow (if any) ability to repair, explain why this is true.
8. Describe the difference between the three main cartilage types. Include the histological differences, the composition differences, where they can be found in the body, and how they function differently.