

## Osseous Tissue

### 1. Introduction

- Osseous Tissue
- Orthopedics

### 2. Functions

#### A. Support

#### B. Protection

#### C. Movement facilitation

#### D. Storage

##### i. Minerals

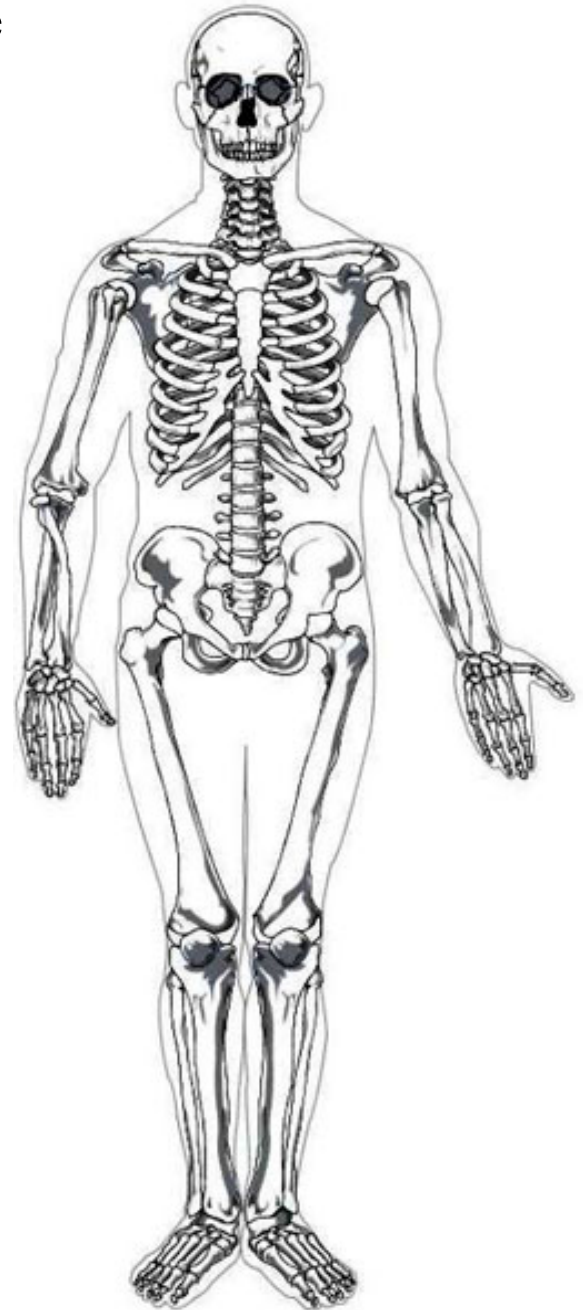
##### ii. Energy

#### E. Blood Cell Formation

##### i. Hemopoiesis

##### a. Erythropoiesis

##### b. Leukopoiesis



3. Bone Classification

A. By Shape

- i. Long Bones
- ii. Short Bones
- iii. Flat Bones
- iv. Irregular Bones

B. By Location

- i. Sutural Bones
- ii. Sesamoid Bones

4. Bone Anatomy

A. Diaphysis

B. Proximal Epiphysis

C. Distal Epiphysis

D. Articular Cartilage

E. Spongy Bone (or Cancellous Bone)

- i. Red Bone Marrow
  - a. Hemopoiesis
    - Erythropoiesis
    - Leukopoiesis

Anatomy and Physiology I Student Outline – Osseous Tissue

- F. Compact Bone (or Corical Bone)
- G. Medullary Cavity
  - i. Yellow Bone Marrow
    - b. Adipose Connective Tissue
      - 9 kcal/gm vs 4 kcal/gm
- H. Membranes
  - Endosteum
  - i. Periosteum
    - a. Superficial Fibrous Layer
      - Dense Connective Tissue
    - b. Deep Osteogenic Layer
      - Osteoprogenitor Cells: Stem Cells
- I. Nutrient Foramen

5. Histology - Osseous Tissue

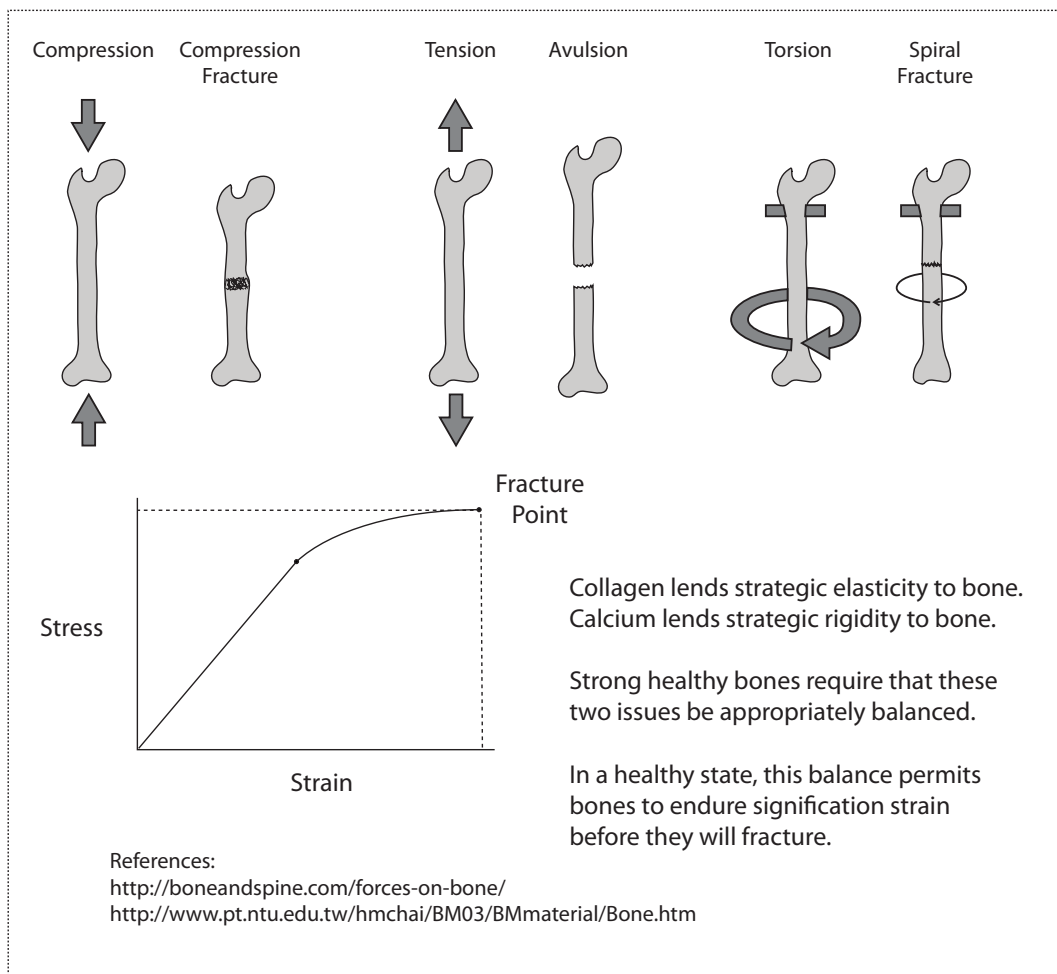
A. Cell Types (Be able to explain the developmental processes)

i. Osteoprogenitor Cells

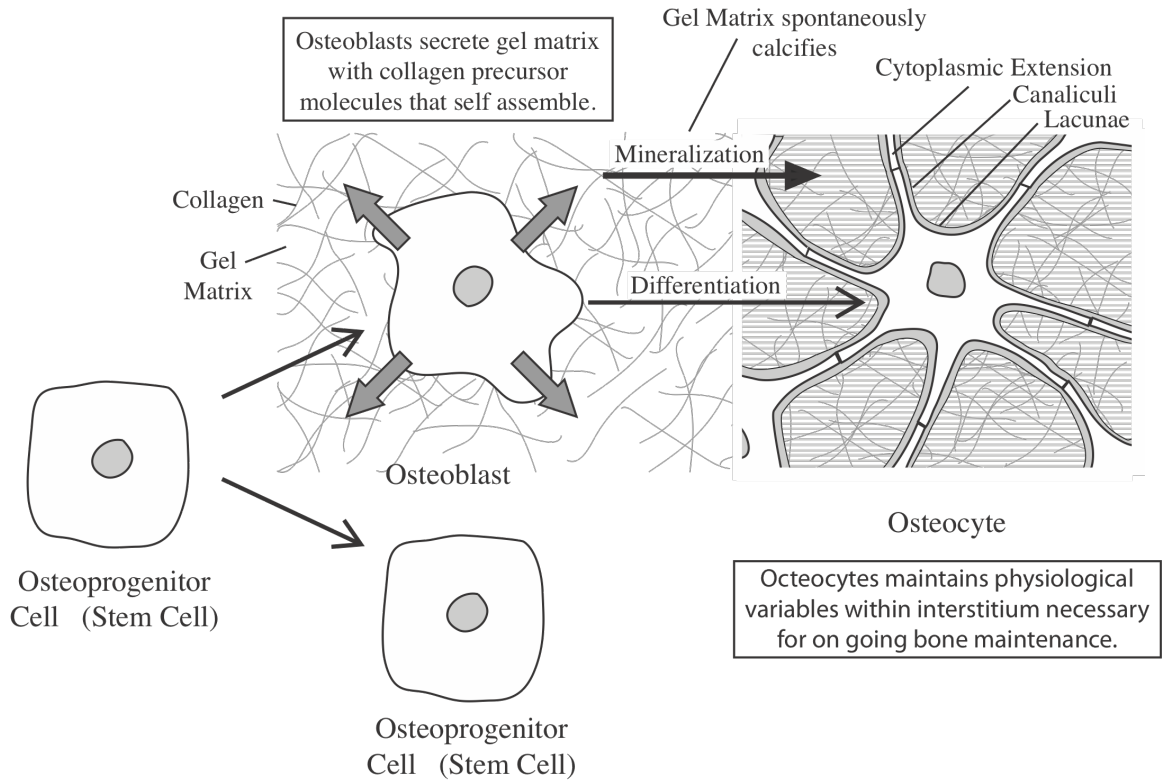
ii. Osteoblasts

a. Bony Matrix

- Calcification (or mineralization)
- Collagen



iii. Osteocytes



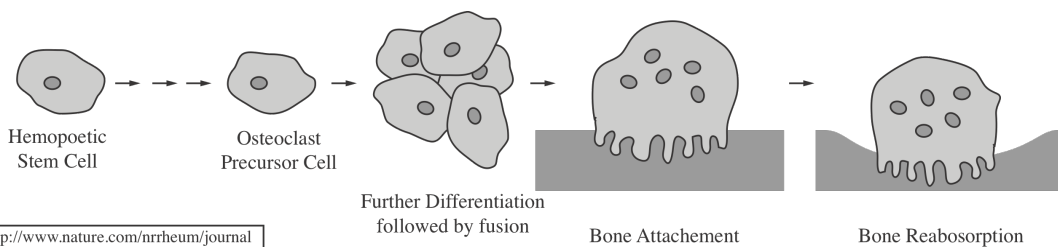
a. Collagen and Calcified Matrix in Bone Health

iv. [Osteoclasts \(See handout on Web\)](#)

a. Origin

b. Function

c. “Ruffled Border”

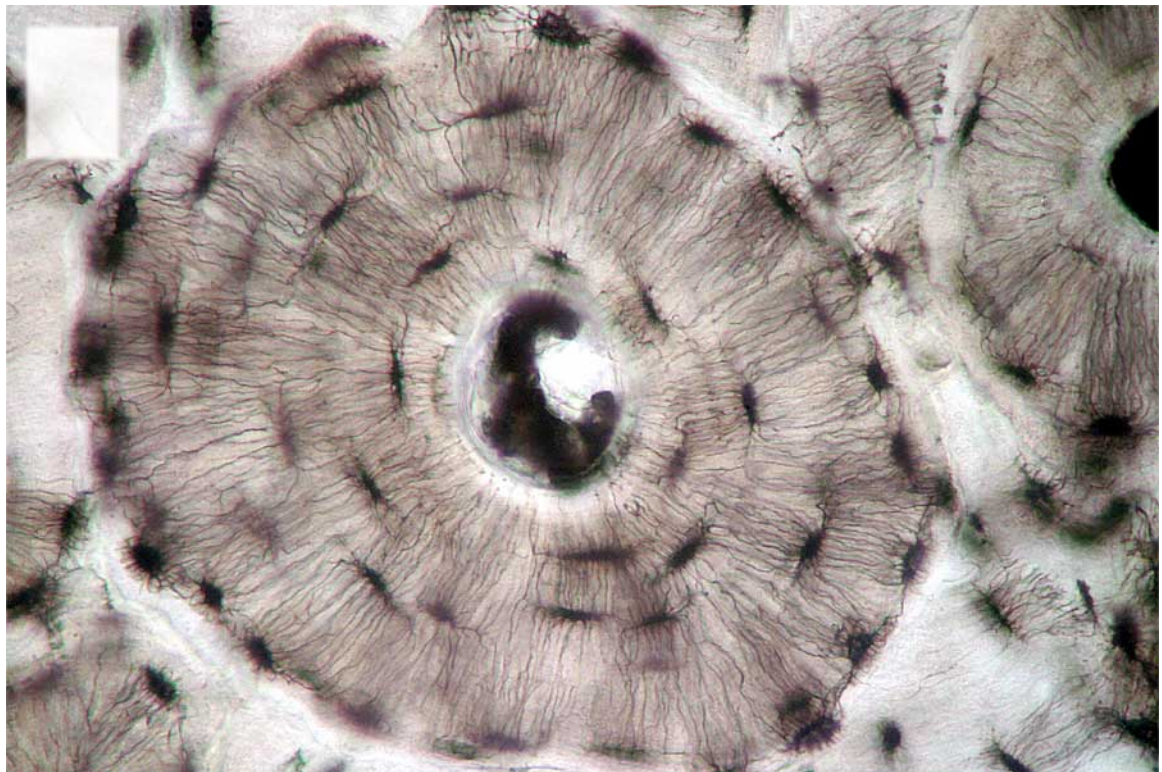


Credit: [http://www.nature.com/nrrheum/journal/v7/n4/fig\\_tab/nrrheum.2011.23\\_F1.html](http://www.nature.com/nrrheum/journal/v7/n4/fig_tab/nrrheum.2011.23_F1.html)

iv. Bone Longevity

B. Structure of Bone Tissue

- i. Compact Bone: Osteon System
  - a. Concentric Ring Structure
  - b. Perforating Canals
  - c. Central Canals
  - d. Concentric Lamellae
  - e. Canaliculi



- ii. Spongy Bone
  - a. Trabeculae

6. Ossification

Intramembranous Ossification

A. [Endochondral Ossification \(ESSAY\)](#)

Note that there are diagrams in your text, as well as useful links on the web.

- Epiphyseal Line

7. Bone Homeostasis

A. Remodeling

B. [Hormonal Control \(See Handout on Web\)](#)