

# Evolution and Homologous Structures

## Remember:

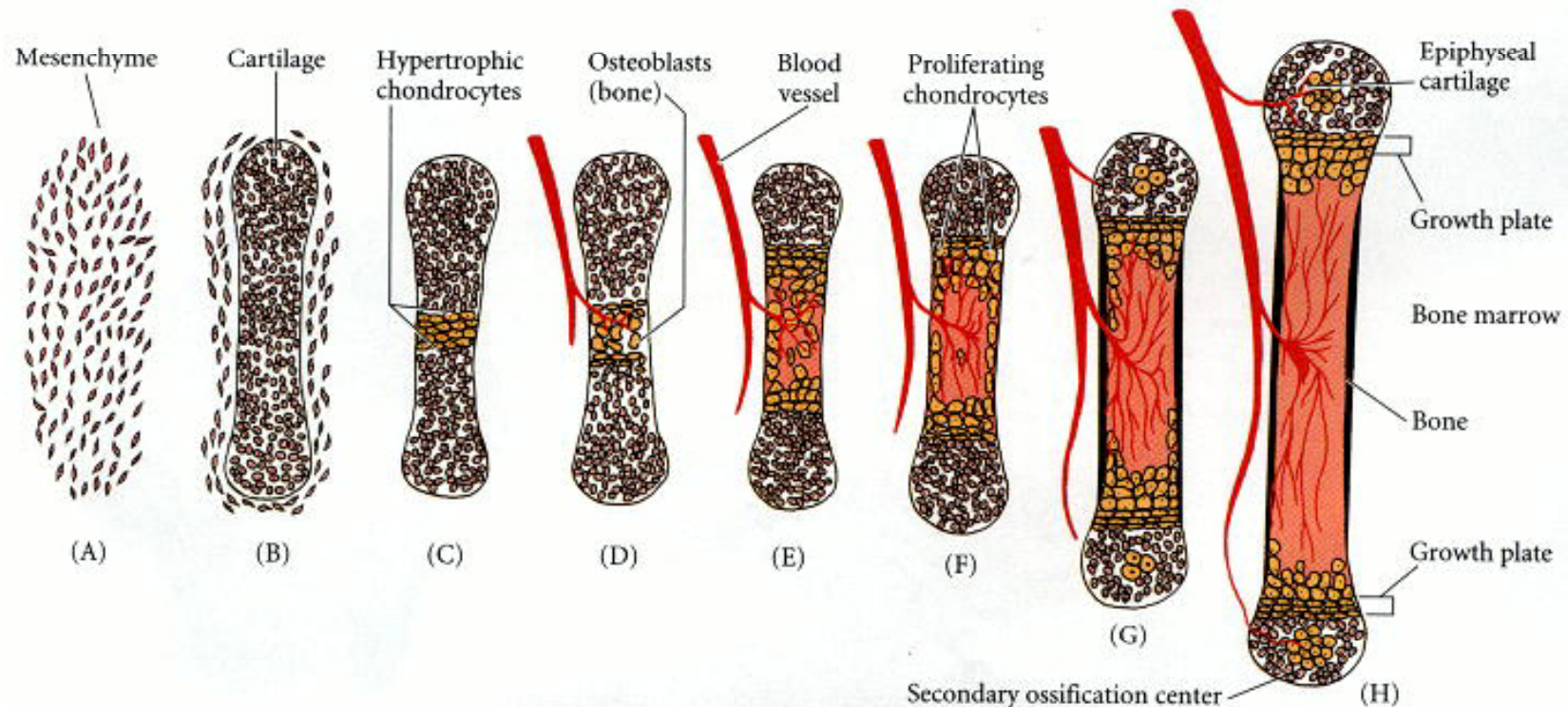
- Structure is dependent on function
- Homologous structures allow one to make an inference of the common ancestor and determine evolutionary relationships

**More importantly, the similarity between structure and function allows scientist to use various animal models to understand human diseases**

## My research focus...

Collect data and make observations that help one understand the role of heparanase (an enzyme) in bone development

# Humans: Development of bones (arms and legs)



**Figure 14.13.** Schematic diagram of endochondral ossification. (A, B) Mesenchymal cells condense and differentiate into chondrocytes to form the cartilaginous model of the bone. (C) Chondrocytes in the center of the shaft undergo hypertrophy and apoptosis while they change and mineralize their extracellular matrix. Their deaths allow blood vessels to enter. (D, E) Blood vessels bring in osteoblasts, which bind to the degenerating cartilaginous matrix and deposit bone matrix. (F-H) Bone formation and growth consist of ordered arrays of proliferating, hypertrophic, and mineralizing chondrocytes. Secondary ossification centers also form as blood vessels enter near the tips of the bone. (After [Horton 1990](#).)



2day old metatarsal from ICR mouse