

New user interface – preview

HUMAN ANATOMY & PHYSIOLOGY

Topics

Histology of bone

Microanatomy of Bone and Cartilage

Introduction

Microanatomy of Bone and Cartilage

Gross Anatomy of Bone

Embryonic Bone Formation

Bone Growth, Repair, and Remodeling

Organization of Skeletal Tissue

Skull

Vertebral Column

Bones of the Upper Limb

Bones of the Lower Limb

Joints

Osteoclasts

Osteoclasts are large cells containing approximately 15-20 nuclei. They are derived from the fusion of monocytes present within bone marrow or from other blood producing tissue. Osteoclasts lie in close contact with the bone surface in resorption bays called Howship's lacunae, and are mainly concentrated within the layer of connective tissue on the inside of the bone. Functionally, osteoclasts are responsible for the local removal of bone during bone growth and the subsequent remodeling of the bone surface. This process is termed resorption and is commonly seen in the normal development, maintenance, and repair of bone.

Structurally, the edge of the cell that is closest to the bone has a highly infolded cell surface called a ruffled border. Here, powerful lysosomal enzymes and acids are released, and the digestion of the protein and mineral components of the extracellular matrix takes place.

BONE MATRIX

Bone matrix contains both organic and inorganic components.

The organic part of the bone matrix is composed of a material known as osteoid. This tissue is produced and secreted by osteoblasts, and is maintained by the osteocytes. Osteoid is made predominantly of type 1 collagen fibers, and a small proportion of ground substance, which contain chondroitin sulfate and

Structures in view

New user interface – quick start guide

HUMAN ANATOMY & PHYSIOLOGY	Topics	Histology of bone	Microanatomy of Bone and Cartilage
<ul style="list-style-type: none"> Browse topics Browse alphabetically Browse interactive learning activities Browse quizzes Discover clinical topics, aging and case studies Share a URL Adjust the settings Save favorite views Save, images, text and movies 	<ul style="list-style-type: none"> Introduction <li style="background-color: #e6f2ff;"> Microanatomy of Bone and Cartilage Gross Anatomy of Bone Embryonic Bone Formation Bone Growth, Repair, and Remodeling Organization of Skeletal Tissue Skull Vertebral Column Bones of the Upper Limb Bones of the Lower Limb Joints 	<div style="border: 1px solid #ccc; padding: 10px; position: relative;"> <div style="position: absolute; top: -20px; left: 50%; transform: translate(-50%, -50%);"> Swipe to rotate </div> <div style="position: absolute; top: 20px; right: 20px;"> Move back and forward </div> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%);"> Select 3D views </div> <div style="position: absolute; bottom: 20px; right: 20px;"> Read interactive topic text </div> </div>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <p>Osteoclasts</p> <p>Osteoclasts are large cells containing approximately 15-20 nuclei. They are derived from the fusion of monocytes present within bone marrow or from other blood producing tissue. Osteoclasts lie in close contact with the bone surface in resorption bays called Howship's lacunae, and are mainly concentrated within the layer of connective tissue on the inside of the bone. Functionally, osteoclasts are responsible for the local removal of bone during bone growth and the subsequent remodeling of the bone surface. This process is termed resorption and is commonly seen in the normal development, maintenance, and repair of bone.</p> <p>Structurally, the edge of the cell that is closest to the bone has a highly infolded cell surface called a ruffled border. Here, powerful lysosomal enzymes and acids are released, and the digestion of the protein and mineral components of the extracellular matrix takes place.</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">BONE MATRIX</p> <p>Bone matrix contains both organic and inorganic components.</p> <p>The organic part of the bone matrix is composed of a material known as osteoid. This tissue is produced and secreted by osteoblasts, and is maintained by the osteocytes. Osteoid is made predominantly of type 1 collagen fibers, and a small proportion of ground substance, which contain chondroitin sulfate and</p> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <p style="background-color: #4a7ebb; color: white; padding: 2px;">Structures in view</p> </div>
	<div style="border: 1px solid #ccc; padding: 2px; display: inline-block;"> 2 </div> ↑ ↓	← →	+ - ↔ ⌂
	Layer up or down through the anatomy	Rotate the 3D model	Zoom in and out Flip the image List 3D view/image contents

New user interface – comparison

Top Interface (Modern):

- Header:** HUMAN ANATOMY & PHYSIOLOGY
- Left Sidebar (Topics):** Introduction, Microanatomy of Bone and Cartilage (highlighted), Gross Anatomy of Bone, Embryonic Bone Formation, Bone Growth, Repair, and Remodeling, Organization of Skeletal Tissue, Skull, Vertebral Column, Bones of the Upper Limb, Bones of the Lower Limb, Joints.
- Central Panel:** Histology of bone. Features a large 3D model of a bone cross-section with a central medullary canal and surrounding trabeculae.
- Right Panel:** Microanatomy of Bone and Cartilage. Contains a section on Osteoclasts with a small image and text, and a section on BONE MATRIX with three small 3D models and text.
- Bottom Bar:** Navigation icons (back, forward, search, etc.) and a 'Topic quiz' button.

Bottom Interface (Older):

- Header:** MICROANATOMY OF BONE AND CARTILAGE
- Left Sidebar:** Introduction, Microanatomy of Bone and Cartilage (highlighted), Gross Anatomy of Bone, Embryonic Bone Formation, Bone Growth, Repair, and Remodeling, Aging, Clinical, Case studies, Module quiz.
- Central Panel:** Histology of bone. Features a 3D model of a bone cross-section.
- Right Panel:** Anatomy and Physiology. Contains a section on Osteoclasts with a small image and text, and a section on BONE MATRIX with three small 3D models and text.
- Bottom Bar:** Frame 14 of 16, Layer 3 of 4, and a 'Topic quiz' button.

New user interface – flexible workspace

