

Osseous Microscopy

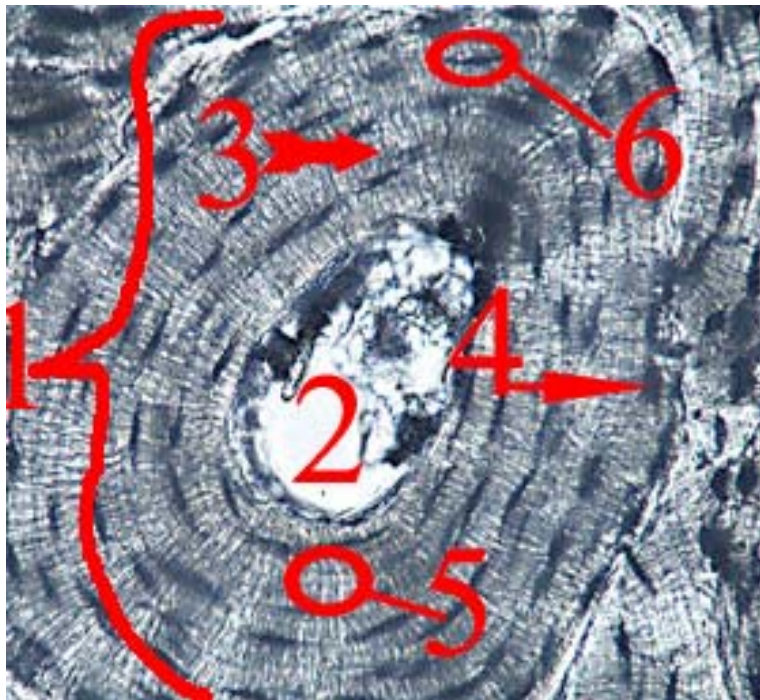
Introduction

Bones are important to health care providers because they allow muscles to attach to them. Muscles give palpable land marks to determine the location of various veins and arteries – these are of great interest to health care providers!

Bones are also significant in that they, through their micro-macroscopic structures, provide spaces at the ends of the long bones for red marrow and spaces in the middle of the bone for yellow marrow to flourish. Red marrow is the “stuff of blood cell formation”, i.e., this is where the RBC, WBC and platelets are manufactured and from which they are released. Yellow marrow is primarily fat and used for energy when absolutely necessary.

Macroscopically, bone consists of two kinds of tissue: compact bone and spongy (cancellous) bone. Cancellous bone is found IN the ends of long bones and sandwiched inside flat bones and has numerous large spaces. Compact bone is found AROUND the ends of the bones and also makes up the shaft of the bone. Compact bone is very dense with no visually obvious spaces.

Microscopically, compact bone resembles multiple tree trunks that have grown together side-by-side, see illustration, below:



The salient features in the above microscopic view are labeled numerically and correspond to the following:

Number	Structure
1	Osteon – a “tree trunk”
2	Haversian canal: contains blood vessels and nerves; in center of osteon
3	Lamella: concentric rings of osseous tissue
4	Lacunae: contains the osteocyte; “little lake”
5	Canaliculi: “little canals” that communicate between lacunae
6	Osteocyte: bone cell that secretes the minerals that make the bone hard; sits in lacunae.

Experimental

Obtain a microscope and a microscope slide of bone tissue. Examine the bone tissue under the microscope and draw and label what you see, below:

Bone Tissue Sketch

Questions

- 1) Based upon your knowledge of bone chemistry, if you were to soak a thigh bone in nitric acid overnight, could you then tie the bone in a knot? Why or why not?

- 2) Based upon your knowledge of bone chemistry, if you were to bake a thigh bone in an oven at 150°F for 6 hours, what would it do when you dropped it on the floor? Why?