Periodic Graphics

A collaboration between C&EN and Andy Brunning, author of the popular graphics blog *Compound Interest*

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To see more of Brunning's work, go to **compoundchem.com.** To see all of C&EN's Periodic Graphics, visit **cenm.ag/periodicgraphics.**

WHAT ARE OUR SKELETONS MADE OF?

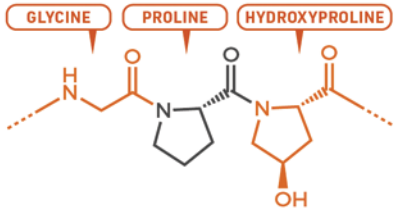
Our bones don't just create the supporting frames for our bodies—they also perform a number of important roles for our health. Here we look at the materials in bones and what some of them do.

BONE COMPOSITION

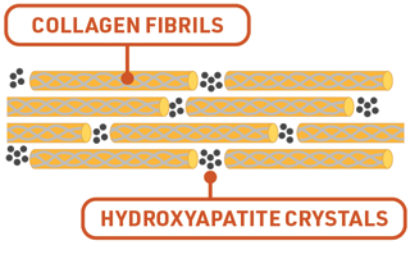
Hydroxyapatite, a calcium phosphate mineral, is the main component of our bones (65–70% by mass).

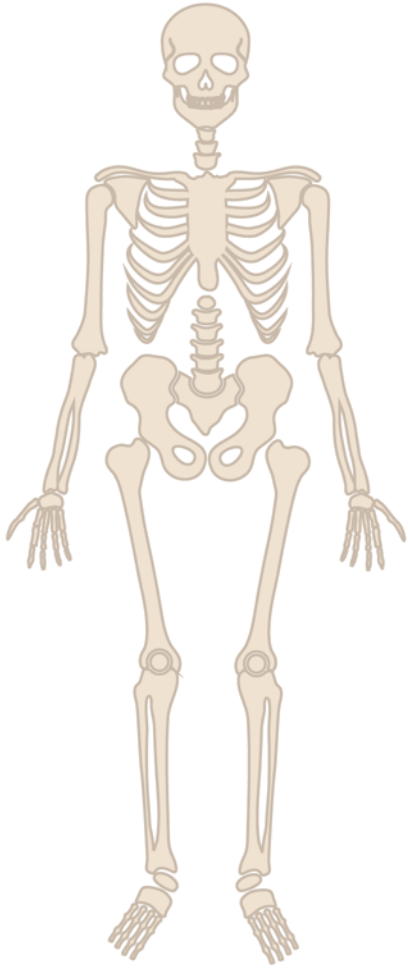
$Ca_{10}(PO_4)_6(OH)_2$ — HYDROXYAPATITE

Collagen is another key bone material. Collagen is a protein that is also found in skin, tendons, and cartilage. The main amino acids in collagen are glycine, proline, and hydroxyproline.



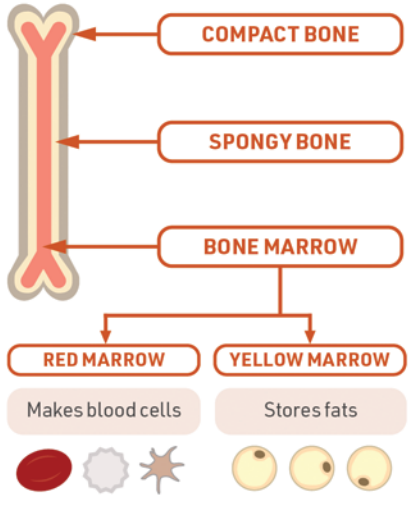
Bone is a composite consisting of hydroxyapatite crystals within collagen fibrils.



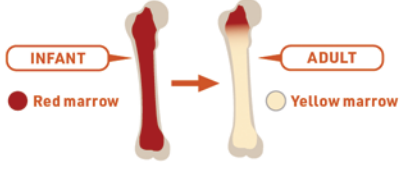


BONE MARROW

Most bones have a dense exterior of compact bone with spongy bone in the interior. While both types of bones consist of mineralized collagen, bone marrow inside the bone is made up of fats and water.



When we are born, all our bone marrow is red, but most of it gradually converts into yellow marrow as we age.



PERIODIC GRAPHICS