

New gift from Mother Nature's medicine chest may help prevent and treat bone diseases

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One of Mother Nature's latest gifts to medical science is stirring excitement with the discovery that the substance — obtained from a coral-reef inhabiting cyanobacterium — appears to be an ideal blueprint for developing new drugs for serious fractures, osteoporosis, and other bone diseases. That's the conclusion of a study on the substance, Largazole, in the journal *ACS Medicinal Chemistry Letters*.

By some estimates, more than half of today's medications are in Largazole's family, the "natural products." They come from trees, snails, scorpion venom, soil bacteria, other plants and animals; however, so far only a few come from the ocean. In the report, Jiyong Hong, Seong Hwan Kim, Hendrik Luesch and colleagues indicate that Largazole was derived from and named for marine cyanobacteria that grow in Key Largo, Florida. Largazole, they add, already has attracted scientific attention for its ability to kill cancer cells in laboratory experiments.

Their research in laboratory dishes and test animals showed that Largazole has an unusual dual action on injured or diseased bones. It stimulates a process in the body called osteogenesis, which involves the growth of new bone and the repair of damaged bone. Largazole also blocks the oppose process in which the body naturally breaks down and resorbs bone. Both of those benefits, the scientists found, come from Largazole's effects on proteins called histone deacetylases, which are a sort of master control switch for protein production. Drugs that block

histone deacetylases are currently used to treat cancer, and they may have other health benefits as well. The researchers also showed that Largazole mixed with collagen and calcium phosphate, [bone](#) components, helped heal fractured bones in laboratory mice and rabbits.

More information: "In Vitro and In Vivo Osteogenic Activity of Largazole" *ACS Medicinal Chemistry Letters*.

Provided by American Chemical Society

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