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Science News

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Vitamin D Signals To Prevent Bone Loss During Osteoporosis

ScienceDaily (Jan. 24, 2006) — The risk of bone fracture resulting from falls increases as we age due to bone loss and osteoporosis. Physicians have routinely prescribed vitamin D and vitamin D-related drugs to retard bone loss, but until now, little was known about the specific targets of vitamin D in bone.

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In a study appearing online on January 19 in advance of print publication in the February 2006 issue of the Journal of Clinical Investigation, Kyoji Ikeda and colleagues from the National Center for Geriatrics and Gerontology in Japan examine mice with severe osteoporosis and show that oral vitamin D treatment inhibits the production of the protein c-Fos.

As c-Fos plays a key role in the development of osteoclasts, which are the specialized cells responsible for bone breakdown and resorption, the authors also show that the vitamin D-mediated inhibition of c-Fos prevented bone loss through a suppression of osteoclast development.

In addition, the authors used mice whose ovaries had been removed, in a more "human-like" model of osteoporosis, to screen for other vitamin D-like agents with c-Fos-suppressing activity. They identified a new vitamin D-related compound (DD281) that could prevent bone loss in these mice more potently than the natural vitamin D.

These findings clarify how vitamin D helps limit bone resorption in conditions such as osteoporosis, and suggest that synthetic vitamin D analogs, including DD281, may warrant clinical trial to assess their potential in the treatment of osteoporosis and other related disorders of bone resorption.

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TITLE: c-Fos protein as a target of anti-osteoclastogenic action of vitamin D, and synthesis of new analogs

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Adapted from materials provided by Journal of Clinical Investigation, via EurekAlert!, a service of AAAS.

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