

# OSTEOSCOOP

News on current events in osteoporosis and rheumatology

## Mechanical loading inhibits bone resorption: osteocytes are the sensors

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**B**one adjusts its structure to become better suited to withstand the mechanical demands it experiences. Physical loading and routine activities have been shown to inhibit bone resorption. However, the cellular mechanism underlying this phenomenon remains largely unknown. The focus of a recent study [1] was to determine the mechanisms by which osteocytes might transduce and regulate bone resorption, and the antiresorptive effects of loading.

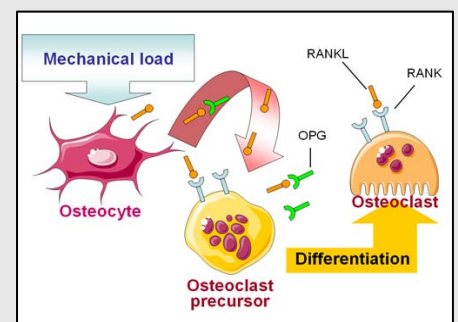
The authors demonstrate that mechanical stimulation of osteocyte-like cells decreases their osteoclastogenic-support potential when cocultured with osteoclast precursors. Soluble factors released by these mechanically stimulated osteocytes inhibit osteoclastogenesis induced by bone marrow stromal cells or osteoclast precursors. Moreover, soluble RANK ligand and OPG were released by osteocyte-like cells, and the expressions of both were found to be mechanically regulated, less RANKL and more OPG being released after mechanical stimulation.

These data suggest that mechanical loading decreases the osteocyte's potential to induce osteoclast formation by direct cell-cell contact. However, it is not clear whether osteocytes in vivo are able to form contacts with osteoclast precursors. These results also demonstrate that mechanically stimulated osteocytes release soluble factors that can inhibit osteoclastogenesis induced by other supporting cells including bone marrow stromal cells. The conclusion is therefore that osteocytes may function as mechanotransducers by regulating local osteoclastogenesis via soluble signals.

1. You L et al. *Bone*. 2008;42:172-179.

### Mechanical loading inhibits bone resorption: osteocytes are the sensors

Following mechanical load, osteocytes release less RANKL ligand (RANKL) and more osteoprotegerin (OPG). This imbalance inhibits osteoclast recruitment and differentiation and, thus, bone resorption decreases.



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