

# New cause of osteoporosis: Mutation in a miRNA

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Many biological processes are controlled by small molecules known as microRNAs, which work by suppressing the expression of specific sets of genes. Xiang-Hang Luo and colleagues, at Second Xiangya Hospital of Central South University, People's Republic of China, have now identified a previously unknown microRNA (miR-2861) as crucial to bone maintenance in mice and humans. Of clinical importance, expression of functional miR-2861 was absent in two related adolescents with primary osteoporosis.

Several lines of evidence determined the key role of miR-2861 in maintaining bone. First, miR-2861 promoted the in vitro development of a mouse stromal cell line into the cells responsible for [bone formation](#).

Second, in mice, in vivo silencing of miR-2861 inhibited bone formation and decreased bone mass. Last, analysis of ten patients with primary [osteoporosis](#) revealed two related adolescents in whom disease was caused by a mutation in the miR-2861 precursor (pre-miR-2861) that blocked expression of miR-2861. These data led the authors to conclude that miR-2861 has an important role in controlling the generation of the cells responsible for bone formation and that defects in the processing of its precursor can cause osteoporosis.

More information: A novel microRNA targeting HDAC5 regulates osteoblast differentiation in [mice](#) and contributes to primary osteoporosis in humans, view this article at:

[www.jci.org/articles/view/3983...wTvdY50uyZkh8Uji59Po](http://www.jci.org/articles/view/3983...wTvdY50uyZkh8Uji59Po)

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