

Bcl-xL inhibits the bone-resorbing activity of osteoclasts

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The B cell lymphoma 2 (Bcl-2) family member Bcl-xL has a well-characterized antiapoptotic function in lymphoid cells. However, its functions in other cells - including osteoclasts, which are of hematopoietic origin - and other cellular processes remain unknown. The authors of a recent study [1] report an unexpected function of Bcl-xL in attenuating the bone-resorbing activity of osteoclasts in mice. To investigate the role of Bcl-xL in osteoclasts, they generated mice with osteoclast-specific conditional deletion of Bcl-x.

Although the Bcl-x knockout mice grew normally with no apparent morphological abnormalities, they developed substantial osteopenia at 1 year of age, which was caused by increased bone resorption. Bcl-x deficiency increased the bone-resorbing activity of osteoclasts despite their high susceptibility to apoptosis, whereas Bcl-xL overexpression produced the opposite effect. In addition, Bcl-x knockout osteoclasts displayed increased levels of vitronectin and fibronectin expression.

These results suggest that Bcl-xL attenuates osteoclastic bone-resorbing activity through the decreased production of extracellular matrix proteins, such as vitronectin and fibronectin, and thus provides evidence for a novel cellular function of Bcl-xL.

1. Iwasawa M et al. *J Clin Invest.* 2009;119:3149-3159.

The antiapoptotic protein Bcl-xL inhibits the bone-resorbing activity of osteoclasts in mice

The control of the number and activity of osteoclasts is essential to ensure appropriate bone resorption. It was recently evidenced that antiapoptotic protein Bcl-xL, which belongs to the Bcl-2 family, plays a major role in osteoclasts in reducing their activity. In the absence of Bcl-xL in the osteoclasts, mice have osteopenia. Osteoclasts missing Bcl-xL synthesize more extracellular matrix proteins such as vitronectin and fibronectin, which are important modulators of bone resorption.

