

# OSTEOSCOOP

News on current events in osteoporosis and rheumatology

## Inhibin A stimulates bone mass and strength: news from the ovary-bone axis

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Bone turnover is tightly regulated to maintain sufficient bone mass and strength to prevent fracture during normal physical activity. In diseases of bone loss, such as osteoporosis, decreased bone mass and strength, leading to nontraumatic fractures of the spine, hip, and other bones, are common and the result of an imbalance in bone turnover.

Hypogonadism is one of the most common causes of osteoporosis. In women, this is widely attributed primarily to the loss of gonadal steroids that occurs during the menopausal transition. However, many other gonad-derived factors, including the inhibins, contribute to the regulation of bone turnover and bone quality. Inhibins are heterodimeric proteins in the TGF  $\beta$ -superfamily originally identified based on their ability to suppress pituitary FSH secretion. Previous demonstration that inhibins have direct effects on osteoblast and osteoclast development *in vitro* prompted Perrien et al [1] to test whether inhibin A (InhA) regulates bone mass *in vivo*, by using a transgenic model of inducible human InhA expression.

InhA increased total body bone mineral density, increased bone volume, and improved biomechanical properties at the proximal tibia in intact mice, and also prevented the loss of BMD and bone volume and strength associated with gonadectomy at both the spine and proximal tibia. In addition, InhA increased mineral apposition rate, double-labeled surface, and serum osteocalcin levels *in vivo* and osteoblastogenesis *ex vivo* without affecting osteoclast number or activity.

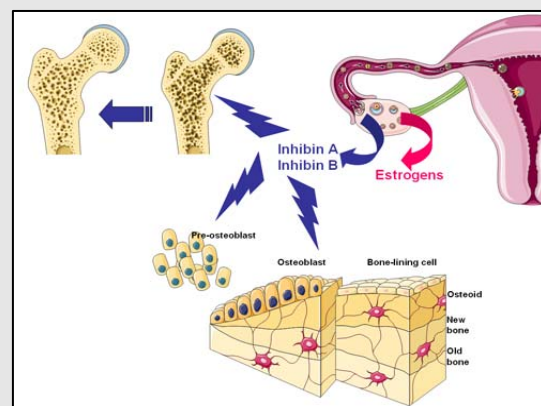
These results demonstrate novel stimulatory effects of InhA on the skeleton *in vivo* and provide evidence demonstrating that gonadal factors other than sex steroids play an important role in regulating bone mass and strength and, combined with previous clinical data, suggest that gonadal InhA may be a component of the normal endocrine repertoire that regulates bone quality.

1. Perrien DS. et al. *Endocrinology*. 2007;148:1654-1665.

### Inhibin A stimulates bone mass and strength

Inhibins are secreted by the ovary and, like estrogens, this secretion decreases after menopause. Inhibin A has a direct effect on bone. It stimulates osteoblastogenesis, and increases bone volume and mineralization without affecting osteoclast activity.

Inhibin A is a component of the normal endocrine repertoire that regulates bone quality. Decrease in inhibin A is likely to participate in postmenopausal osteoporosis.



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