

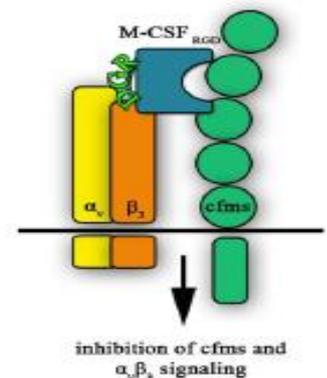
A Dual-Specific Anti-Resorptive Recombinant Protein for Bone Related Disorders

Osteoporosis (OP) is a common chronic skeletal disorder in aging individuals. In spite of the progress made in recent years, there is still a great demand for safer and more specific drugs for extended administration. Excessive bone resorption by osteoclasts is central to the pathogenesis of OP and other bone diseases. Thus, inhibition of osteoclast activity is a desired outcome in the treatment of bone and bone-related disorders. However, complete shutdown of resorption by current drugs and uncontrolled duration of activity increase the risk for hypocalcemia, atypical fractures and osteonecrosis of the jaw limiting their utilization and decreasing patient's compliance to their administration.

The combined expression of the M-CSF receptor c-FMS and $\alpha\beta_3$ integrin is unique to osteoclasts and signaling through these receptors is essential for their resorption machinery. Studies in animal models demonstrated that interfering with signaling through these receptors inhibits resorption but enables bone formation to go on.

The Technology

A new generation of bispecific proteins based on the natural ligand M-CSF as a scaffold to engineer novel c-fms/ $\alpha\beta_3$ integrin antagonists (dual specific antagonists), with the improved properties required for their application as anti-resorptive drugs in bone diseases and osteoporosis therapy. Current results demonstrated effective inhibition of osteoclast differentiation with the dual specific antagonists compared to a variant that targets c-fms alone. In an additional proof of concept, the product extensively downgraded bone resorption in ovariectomized female mouse osteoporosis model.



Advantages

- ✓ A novel approach with a unique mechanism of action for bone diseases in which controlled inhibition of resorption is required.
- ✓ Increased efficacy and specificity due to the targeting of cells expressing both receptors.
- ✓ A small protein enabling control of the compound concentration, retention and duration of action
- ✓ Targeting resorption through the $\alpha\beta_3$ integrin axis permits bone formation while decreasing and bone promoting drugs (Anabolic drugs).

Patent Status

Patent pending

Research Team

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Contact for Licensing and Investment Information

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