

**Technology**

Use of Duffy blood group antigen for diagnosis, therapy, or prevention of bone loss

Inventor

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Key Features

- Identified gene shown to influence osteoporosis
- Identified gene could regulate formation and activity of osteoclasts
- Potential for early diagnosis or as a novel drug target for prevention and treatment

Stage of Development

Reduced to practice with successful demonstration in animal models

Keywords

- Diagnostic
- Osteoporosis
 - Duffy blood group
 - Antigen
 - Osteoclast
 - Bone loss

Patent Status

Patent application has been filed

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Utility of Duffy Blood Group Antigen in the Diagnosis and Treatment of Osteoporosis (VA Reference No. 07-135)

Potential diagnostic test or drug target for osteoporosis and other bone wasting diseases

Technology

The Department of Veterans Affairs has identified the use of the Duffy blood group antigen (a RBC antigen and receptor molecule) as a diagnostic test or drug target for the treatment of osteoporosis and other bone wasting diseases.

Description

VA researchers have identified that the Duffy blood group antigen on chromosome 1 has been shown to act as the Duffy Antigen/Receptor for Chemokines (DARC) by binding and internalizing chemokine ligands. This technology is related to the Duffy blood group antigen's ability to regulate the function of osteoclasts during osteoclast-mediated bone resorption, which greatly affects bone density in individuals. A series of DARC polymorphisms has been identified that correlate with increased and decreased bone density. Anti-DARC antibodies have also been shown to affect the formation of osteoclasts in cell culture. This work implies that inhibiting the Duffy blood group antigen and/or its down stream-signaling pathway could be used as a means to regulate formation and activity of osteoclasts to treat osteoporosis and other bone wasting diseases.

Competitive Advantage

Current therapies for osteoporosis inhibit osteoclast-mediated bone resorption to successfully prevent bone loss in a subset of patients. There is a strong need for other therapies for the prevention and treatment of osteoporosis for all affected individuals by decreasing bone loss but also by increasing bone density.

This invention:

- Could lead to development of small molecules, peptides inhibitors, or neutralizing antibodies to block the binding of chemokine to Duffy blood group antigen for therapeutic applications.
- Could provide novel drug targets for osteoporosis prevention and treatment.
- Could potentially identify individuals who are at risk for osteoporosis through a simple blood test based on polymorphisms in Duffy blood group antigen.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).

