Method of Preventing Bone Loss and Periodontal Disease

Tech ID: 27144 / UC Case 2016-206-0

ABSTRACT

A method of controlling mammalian epoxy fatty acids levels in order to regulate the RANK, RANK-L, and OPG anti-inflammatory triad, thereby limiting inflammation, cancer, arthritic disease, and bone loss while promoting bone growth, remodeling, and regeneration.

FULL DESCRIPTION

Bone homeostasis is maintained by a balance between bone resorption by osteoclasts and bone formation by osteoblasts. The anti-inflammatory system triad composed of RANK, RANK-L, and OPG orchestrates bone homeostasis by selectively activating osteoclasts and osteoblasts in a regulated fashion. In chronic osteolytic inflammatory diseases, such as periodontitis, the failure of endogenous resolution pathways seem to lead to bone loss and tissue destruction. Precise regulation of the RANK, RANK-L, and OPG triad promises a solution to this disease and many others.

Researchers at the University of California, Davis have developed a method to regulate the RANK, RANK-L, and OPG signaling pathway. This method regulates the signaling system to limit inflammation, cancer, arthritic disease, and bone loss while promoting bone growth, remodeling, and regeneration. This method is based on the elevation and regulation of epoxy fatty acid (EpFA) levels, which is accomplished by the inhibition of the enzyme, soluble epoxide hydrolase (sEH). This method has proven effective to reduce bone loss in mice infected with periodontitis. Bioactive compounds are available that can be used topically for periodontal disease and have good pharmacokinetics and high oral availability for oral administration.

APPLICATIONS

- Subjects having osteoporosis or periodontal disease
- Subjects having a bone fracture or broken bone
- Subjects who are exhibiting symptoms of bone loss
- Subjects who are suffering bone loss
- Subjects who may benefit from promotion of bone growth or regeneration

FEATURES/BENEFITS

- Cost effective treatment
- Low potential for side effects
- Promotes the understanding of a crucial inflammatory system

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,564,914	01/31/2023	2016-206

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OTHER INFORMATION

KEYWORDS

bone homeostasis, bone loss, bone growth, bone regeneration, inflammation, RANK, RANK-L, OPG, osteolytic, osteitis fibrosa cystica, osteoclasts, osteoblasts, cancer, arthritic disease, epoxy fatty acids

CATEGORIZED AS

- **Medical**
  - Disease: Cancer

- Disease: Metabolic/Endocrinology

RELATED CASES

2016-206-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Multi-Target Inhibitors for Pain Treatment
- Improved Dioxin Detection and Measurement
- Detection System for Small Molecules
- Small Molecule sEH Inhibitors to Treat Alpha-Synuclein Neurodegenerative Disorders
- Soluble Epoxide Hydrolase-Conditioned Stem Cells for Cardiac Cell-Based Therapy
- Beneficial Effects of Novel Inhibitors of Soluble Epoxide Hydrolase as Adjuvant Treatment for Cardiac Cell-Based Therapy
- Antibodies: Bacillus Delta Endotoxin PAbs
- Antibodies: Bromacil Herbicide PAbs
- Novel Neuropathy Treatment Using Soluble Epoxide Inhibitors
- Novel and Specific Inhibitors of p21
- Antibodies for Pseudomonas (P.) aeruginosa
- Antibodies: Urea Herbicide Pabs
- Bioavailable Dual sEH/PDE4 Inhibitor for Inflammatory Pain
- Chemical Synthesis of Lipid Mediator 22-HDoHE and Structural Analogs
- Antibodies: Triazine Herbicide Pabs
- Optimized Non-Addictive Biologics Targeting Sodium Channels Involved In Pain Signaling
- Soluble Epoxide Hydrolase Inhibitors For The Treatment Of Arrhythmogenic Cardiomyopathy And Related Diseases
- A New Pharmaceutical Therapy Target for Depression and Other Central Nervous System Diseases

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