Hormone therapy for age-related muscle degeneration

Technology #cu15011

Progressive muscle wasting is prevalent among the aging population. To date, the only treatment for sarcopenia—age-related loss of muscle fitness and strength—is regulation of diet and exercise. The blood circulating levels of the multifunctional, osteoblast-derived hormone osteocalcin decline with age, and this is thought to have an effect on the decline in muscle function. This technology utilizes osteocalcin as a treatment for age-related muscle loss and other degenerative muscular disorders, as well as a therapy for general improvement of muscle function.

Osteocalcin can improve muscle function in a mouse model

Osteocalcin is a small protein comprised of 46-50 amino acid residues and is the most abundant non-collagenous protein in the mineralized bone matrix. It is an important regulator of glucose metabolism, and has been suggested as a potential treatment for diabetes. Osteocalcin also improves uptake of glucose by muscle and increases fatty acid oxidation and protein synthesis in muscle. Osteocalcin-deficient mice are prone to muscle wasting and have decreased muscle mass and function, as are mice that are deficient in osteocalcin’s receptor GPRC6A.

Osteocalcin injections have been shown to improve muscle function by up to 20% in a mouse model.

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Applications:
- Treatment for sarcopenia, or age-related muscle wasting
- Treatment for cachexia, or illness related muscle-wasting
- Treatment for diabetes-related muscle atrophy
- Treatment for muscle atrophy from diseases such as muscular dystrophy, ALS, Guillian-Barre Syndrome, Dejerine–Sottas syndrome, Charcot-Marie-Tooth syndrome, multiple sclerosis
Advantages:

- There are no FDA-approved therapies for muscle wasting
- Improves muscle’s ability to metabolize glucose, synthesize proteins, and oxidize fatty acids

Patent Information:

Patent Pending (WO/2016/081728)

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Related Publications:


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