Docket #: S21-068

Engineered Molecules to Activate Cartilage Regeneration

Stanford researchers have invented a novel nanobody-based platform for specific activation of bone and cartilage regeneration. Musculoskeletal disorders like osteoarthritis affect millions of people worldwide and patients with osteoarthritis suffer from painful, irreversible degeneration of their articular cartilage. Extensive damage to articular cartilage often requires invasive joint replacements for treatment. Recent research by the inventors has demonstrated that activation of BMP2 (Bone Morphogenetic Protein 2) signaling can stimulate regeneration of articular cartilage. However, current approaches of activating BMP2 signaling have considerable inflammatory off-target effects. This new nanobody-based platform offers high affinity and specificity in stimulating regeneration of bone and cartilage, resulting in reduced dosage needs and avoiding harmful off-target effects.

Applications

- Stem Cell Therapy/Regenerative Medicine
- Musculoskeletal disorders
- Osteoarthritis

Advantages

- Easily developable
- High applicability
- High affinity
- High specificity

Publications

- Murphy, M. P., Koepke, L. S., Lopez, M. T., Tong, X., Ambrosi, T. H., Gulati, G. S., ... & Chan, C. K. (2020) Articular cartilage regeneration by activated skeletal stem cells. Nature medicine, 26(10), 1583-1592.

Patents

- Published Application: WO2022256201
- Published Application: 20240270854

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