

Anti-WISP2/CCN5 Therapy Against Bone Loss

Tech ID: 34600 / UC Case 2026-391-0

ABSTRACT

Researchers at the University of California, Davis have developed a novel nanobody specific for WISP2 that restores skeletal stem cell function to treat bone loss and promote bone growth in age-related bone diseases.

FULL DESCRIPTION

This technology involves the development of nanobodies—small antigen-binding fragments—targeted against WISP2, a protein upregulated in aged skeletal stem cells (SSCs) that impairs bone repair. These nanobodies can be formulated as pharmaceuticals for topical or injectable use to treat bone diseases by restoring SSC function, inhibiting bone loss, promoting new bone growth, and accelerating fracture healing. The approach addresses intrinsic stem cell aging and skeletal regeneration failures linked to age-related conditions such as osteoporosis, osteonecrosis, and osteoarthritis.

APPLICATIONS

- ▶ Treatment of osteoporosis and other age-related bone diseases such as osteonecrosis and osteoarthritis.
- ▶ Therapies to promote bone growth and increase bone density in elderly patients.
- ▶ Accelerated healing solutions for bone fractures including bicortical fractures.
- ▶ Pharmaceutical formulations for regenerative medicine and orthopedics.
- ▶ In vitro applications to restore or study skeletal stem cell function.

FEATURES/BENEFITS

- ▶ Targets intrinsic aging mechanisms in skeletal stem cells to enhance bone regeneration.
- ▶ Decoupled from bone resorption mechanisms.
- ▶ Compared to available anabolic therapies it acts at stem cell level, potentially enabling long-term efficacy (without limited use requirement).
- ▶ Restores stem cell osteogenic capacity and differentiation ability. Reduces inflammatory microenvironments that contribute to bone loss.
- ▶ Supports both local and systemic administration with flexible formulations (gel or injectable).
- ▶ Promotes bone density, strength, and accelerates fracture healing.
- ▶ Achieves high specificity for WISP2, minimizing off-target effects.
- ▶ Addresses the root causes of bone loss rather than just alleviating symptoms.
- ▶ Counteracts the age-related decline in skeletal stem cell function, improving bone repair.
- ▶ Reduces excessive osteoclast activity responsible for bone resorption.
- ▶ Overcomes limitations of treatments that ignore local skeletal microenvironment factors.

CONTACT

Raj Gururajan

rgururajan@ucdavis.edu

tel: 530-754-7637.



INVENTORS

- ▶ Ambrosi, Thomas
- ▶ Chen, Kun
- ▶ Zhao, Liming

OTHER INFORMATION

KEYWORDS

aging, bone density, bone growth, bone loss, fracture healing, nanobody, osteoporosis, skeletal stem cells, WISP2, wound repair

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Medical**
 - ▶ Disease: Musculoskeletal Disorders
 - ▶ Stem Cell
 - ▶ Therapeutics
- ▶ **Nanotechnology**
 - ▶ NanoBio

► Reduces the high incidence of fractures and skeletal disorders in aging populations.

► [Research Tools](#)

► [Antibodies](#)

PATENT STATUS

Patent Pending

RELATED CASES

2026-391-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [A Novel Antibody Treatment of Drug-induced, Age- and Disease-Related Bone Loss](#)

University of California, Davis

Technology Transfer Office

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:

530.754.8649

techtransfer@ucdavis.edu

<https://research.ucdavis.edu/technology-transfer/>

Fax:

530.754.7620

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