

Osteoprotegerin Knockout Mice

Biomaterial – Mouse

Biomaterial Description

The Osteoprotegerin (OPG) knockout mice are a novel model for studying the role of OPG in bone metabolism and immune system regulation. These mice, homozygous for the knockout of the OPG gene, exhibit severe osteoporosis and hematopoietic dysregulation. OPG significantly impacts osteoclast differentiation and activation, inhibiting the formation and function of mature osteoclasts. This regulation is crucial for maintaining bone density and preventing conditions like osteoporosis. Additionally, OPG influences B cell development and function.

Applications

- Osteoporosis Studies: Utilize these mice to explore the pathophysiology of osteoporosis and test potential treatments aimed at enhancing bone density and preventing bone loss.
- Autoimmune Disease Research: Investigate the role of OPG in autoimmune diseases, leveraging the enhanced proliferation of pro-B cells and accumulation of transitional B cells observed in OPG-deficient mice.
- Cardiovascular Research: Study the mechanisms of atherosclerosis and vascular calcification, using the OPG knockout mice to develop and test novel cardiovascular therapies.
- Immunology: Examine the impact of OPG on adaptive immunity, focusing on the enhanced T cell stimulation by OPG-deficient dendritic cells to understand immune responses and develop immunomodulatory treatments.

Advantages

- Immune System Model: Understand the role of OPG in B cell development and function, as well as its impact on dendritic cell-mediated T cell stimulation.
- Versatile Research Tool: These mice can be used in a wide range of studies, from bone biology to immune system modulation.

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Authors

Edward Clark

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