# DESCRIPTION

**Mouse myeloma cell line, NS0**

**Mouse OPG**
- Glu22-Leu401 (Gln138Arg) (Accession # Q6PI12)

**Human IgG1 (Pro100-Lys330) (Thr276Ala)**

**6-His tag**

**N-terminal Sequence** Glu22

**Analysis** Disulfide-linked homodimer

**Predicted Molecular Mass** 70.9 kDa (monomer)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>SDS-PAGE</th>
<th>85-95 kDa, reducing conditions</th>
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**Activity** Measured by its ability to inhibit TRAIL-mediated cytotoxicity using L-929 mouse fibroblast cells treated with TRAIL. The ED_{50} for this effect is 3-15 ng/mL in the presence of 12 ng/mL of cross-linked Recombinant Human TRAIL/TRNFL0 (Catalog #s 375-TL and MAB050).

**Endotoxin Level** <0.10 EU per 1 µg of the protein by the LAL method.

**Purity** >95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.

**Formulation** Lyophilized from a 0.2 µL filtered solution in PBS. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

**Reconstitution** Reconstitute at 100 µg/mL in sterile PBS.

**Shipping** The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

**Stability & Storage** Use a manual defrost freezer and avoid repeated freeze-thaw cycles.
- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

## BACKGROUND

Osteoprotegerin (OPG), also called OCIF (osteoclastogenesis inhibitory factor) is a secreted 55-60 kDa protein that regulates bone density (1-3). As a member of the tumor necrosis factor receptor (TNFR) superfamily of proteins, it is designated TNFRSF11B (1-4). Mouse OPG cDNA encodes 401 amino acids (aa) including a 21 aa signal peptide and a 380 aa mature soluble protein with four TNFR domains, two death domains and a heparin rich TNFR domains are essential for ligand interaction, while a cysteine at the C-terminus mediates homodimerization (4). Mature mouse OPG shares 86%, 94%, 86% and 83% amino acid sequence identity with human, rat, equine and bovine OPG, respectively. OPG is widely expressed and constitutively released as a homodimer by mesenchymal stem cells, fibroblasts and endothelial cells (1, 2, 5, 7). Regulation of its expression by estrogen, parathyroid hormone and cytokines is complex and changes with age (2). OPG has been called a decoy receptor for the TNF superfamily ligands, TRANCE (tumor necrosis factor receptor activator of NFκB ligand), and TRAIL (TNF-related apoptosis-inducing ligand), which also bind TNF family receptors RANK and TRAIL receptors 1-4, respectively (2, 6). TRAIL decreases the release of OPG from cells that express it, while OPG inhibits TRAIL-induced apoptosis (5, 6). Expression of RANK L on the cell surface, and thus its ability to stimulate osteoclastogenesis, is regulated by OPG by intracellular and extracellular mechanisms (7).

Within osteoblasts, interaction of the basic domain of OPG with RANK L in the Golgi inhibits RANK L secretion (7). Extracellularly, OPG binding to RANK L results in clathrin-mediated internalization and degradation of both proteins (7, 8). Binding of OPG by syndecan-1 heparin sulfates on multiple myeloma cells also results in OPG internalization and degradation, contributing to bone loss (6, 9). OPG deficiency can cause juvenile Paget’s disease in humans, and insufficient OPG to balance with RANK L and RANK can produce osteoporosis and vascular calcification in both mice and humans (2, 10, 11).

### References: