



## PRODUCT DATA SHEET

**Product:** Human Osteocalcin

**Cat. No.:** BP-011 (20 µg)

**Background:**

Osteocalcin, also known as Bone-Gla-Protein (BGP), is a single chain vitamin K-dependent protein produced by osteoblasts and found in high concentrations in bone. Post-translational modification by a vitamin K-dependent carboxylase produces three  $\gamma$ -carboxyglutamic acid residues at positions 17, 21 and 24. The mature protein contains 49 amino acids and a single intrachain disulfide bond joining Cys23 to Cys29. The secondary structure is highly calcium-dependent and contains 14%  $\alpha$ -helix, 20%  $\beta$ -sheet and 67% random form in the presence of calcium, and 1%  $\alpha$ -helix, 20%  $\beta$ -sheet and 79% random form in the absence of calcium.

BGP binds to phospholipids vesicles in the presence of calcium ions ( $K_d=6 \times 10^{-6}$  M). BGP also binds hydroxyapatite and is an efficient inhibitor of hydroxyapatite-seeded crystal growth, suggesting a regulatory role in bone mineralization. Although the fundamental role of BGP *in vivo* remains elusive, *in vitro* experimentation suggests roles in both bone resorption and bone formation. BGP has been shown to function as a chemo-attractant in an *in vitro* macrophage-mediated bone resorption system. The serum concentration of BGP has been linked to bone formation rates, and BGP levels are currently used in research assessment of osteoporosis and other metabolic bone disease states.

**Localization:**

Bone, plasma

**Mode of action:**

Unknown

**MW:**

5,800

**Extinction coefficient:**

$E_{1\text{ cm}, 280\text{ nm}}^{1\%} = 13.3$

**Structure:**

Single chain, one intrachain disulfide bond, Cys 23-29

**Isoelectric point:**

4.0-4.5

**Percent Carbohydrate:**

0%

**Post-translational modifications:**

Three glu-residues, 17, 21, 24

**Production:**

Prepared from extracts of acid-demineralized bone, using immunoaffinity chromatography.

**Format:**

Supplied in 0.02 M Tris, 0.15 M NaCl, 2 mM  $\text{CaCl}_2$ , pH 7.4. Concentration is 0.97 mg/mL.

**Storage:**

Store at or below  $-70^\circ\text{C}$ .

**Limitations:** For *in vitro* research use only. Not for use in diagnostics or in humans.

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