Active Alkaline Phosphatase, Tissue-nonspecific (ALPL)

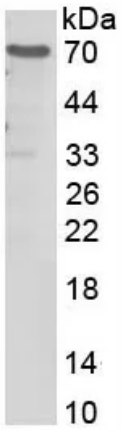
Catalog#:PHM12604

概述（Summary）

别称（Alternative Names）	BALP; BSAP; HOPS; AP-TNAP; TNSALP; Bone Alkaline Phosphatase; Alkaline Phosphatase,Tissue-Nonspecific Isozyme; Alkaline Phosphatase, Liver/Bone/Kidney
纯度（Purity）	Greater than 90% as determined by reducing SDS-PAGE.
内毒素（Endotoxin level）	Please contact with the lab for this information
蛋白构建（Construction）	【Phe18-Gly503】
Accession #	P09242
表达宿主（Host）	293F
种属（Species）	Mus musculus (Mouse)
预测分子量（Predicted MW）	55.2 kDa
制剂（Form）	Lyophilized from a 0.2 μm filtered solution of PBS, pH7.4, containing 0.01% SKL, 1mM DTT, 5% Trehalose and Proclin300.
运输方式（Shipping）	The product is shipped with ice bag. Upon receipt, store it immediately at the temperature listed below.
稳定性&储存（Stability &Storage）	12 months at -20°C to -80°C in lyophilized state.6 months at -20°C to -80°C under sterile conditions after reconstitution.7-10 days at 2°C to 8°C under sterile conditions after reconstitution.Please minimize freeze-thaw cycles.
复溶（Reconstitution）	Reconstitute in 10mM PBS (pH7.4) to a concentration of 0.1-1.0 mg/mL. Do not vortex.
背景介绍（References）	Alkaline phosphatase that metabolizes various phosphate compounds and plays a key role in skeletal mineralization and adaptive thermogenesis. Has broad substrate specificity and can hydrolyze a considerable variety of compounds: however, only a few substrates, such as diphosphate (inorganic pyrophosphate; PPi), pyridoxal 5'-phosphate (PLP) and N-phosphocreatine are natural substrates. Plays an essential role in skeletal and dental mineralization via its ability to hydrolyze extracellular diphosphate, a potent mineralization inhibitor, to

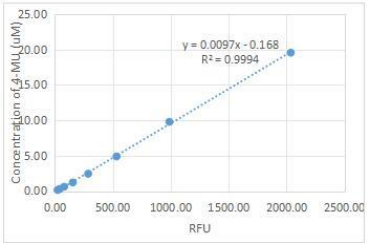
phosphate: it thereby promotes hydroxyapatite crystal formation and increases inorganic phosphate concentration. Acts in a non-redundant manner with PHOSPHO1 in skeletal mineralization: while PHOSPHO1 mediates the initiation of hydroxyapatite crystallization in the matrix vesicles (MVs), ALPL/TNAP catalyzes the spread of hydroxyapatite crystallization in the extracellular matrix. Also promotes dephosphorylation of osteopontin (SSP1), an inhibitor of hydroxyapatite crystallization in its phosphorylated state; it is however unclear whether ALPL/TNAP mediates SSP1 dephosphorylation via a direct or indirect manner. Catalyzes dephosphorylation of PLP to pyridoxal (PL), the transportable form of vitamin B6, in order to provide a sufficient amount of PLP in the brain, an essential cofactor for enzymes catalyzing the synthesis of diverse neurotransmitters. Additionally, also able to mediate ATP degradation in a stepwise manner to adenosine, thereby regulating the availability of ligands for purinergic receptors. Also capable of dephosphorylating microbial products, such as lipopolysaccharides (LPS) as well as other phosphorylated small-molecules, such as poly-inosine:cytosine (poly I:C). Acts as a key regulator of adaptive thermogenesis as part of the futile creatine cycle: localizes to the mitochondria of thermogenic fat cells and acts by mediating hydrolysis of N-phosphocreatine to initiate a futile cycle of creatine dephosphorylation and phosphorylation. During the futile creatine cycle, creatine and N-phosphocreatine are in a futile cycle, which dissipates the high energy charge of N-phosphocreatine as heat without performing any mechanical or chemical work.

电泳图（SDS-PAGE image）



Greater than 90% as determined by reducing SDS-PAGE.

活性图（Bioactivity image）



RFU	4-MU (uM)
2035.62	19.53
987.32	9.77
531.52	4.88
286.52	2.44
154.42	1.22
79.52	0.61
41.54	0.31
22.43	0.15

Figure 1. The standard curve of 4-Methylumbelliferone

One unit of enzyme activity is defined as the 1 µg of enzyme required to convert 1 pmol of 4-Methumbelliferly phosphate to 4-Methylumbelliferone in 1 min.

Specific Activity (pmol/min/µg)= $\frac{\Delta RFU * F}{T * N}$

△RFU=Adjusted for Substrate Blank

F=Conversion Factor (convert from standard curve of 4-Methylumbelliferone (4-MU))

T= Time

N=Amount of enzyme

Four distinct genes encode alkaline phosphatases (APs) in humans. The ALPL gene encodes the liver/bone/kidney isozyme, also known as the tissue nonspecific AP (TNAP). In comparison, ALPI, ALPP and ALPPL2 encode intestinal, placental and placental-like or germ cell APs, respectively. The serum levels of human APs are useful tumor markers. There are many mutations in the ALPL gene, leading to different forms of hypophosphatasia, characterized by poorly mineralized cartilage and bones. The native ALPL is a glycosylated homodimer attached to the membrane through a GPI-anchor. The activity assay of recombinant mouse ALPL was measured by its ability to cleave a peptide substrate, 4-Methumbelliferly phosphate. The reaction was performed in 50 mM Tris, 1 mM MgCl2, pH 9.0 (assay buffer), ainitiated by addition 50 µl of 0.3 ug/ml ALPL (diluted by assay buffer) to 50 µL of 50 uM substrate. Read at excitation and emission wavelengths of 365 nm and 445 nm (top read), respectively, in kinetic mode for 5 minutes. The specific activity of recombinant mouse ALPL is >11000 pmol/min/µg.

注意事项（Note）

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