

Alkaline phosphatase/ALPL Protein, Rat, Recombinant (His & SUMO)

General Information

Synonyms:	Alpl;Phosphoamidase;Phosphocreatine phosphatase;TNSALP;TNAP;Alkaline phosphatase liver/bone/kidney isozyme;Alkaline phosphatase, tissue-nonspecific isozyme;AP-TNAP; tissue-nonspecific isozyme
Protein Construction:	18-501 aa
Species:	Rat
Expression Host:	E. coli
Accession:	P08289
Molecular Weight:	69.5 kDa (predicted)
AA Sequence:	FVPEKEKDPYSYWRQQAQETLKNALKLQKLNTNVAKNIIMFLGDGMGVSTVTAARILKGQLHHNTGEETRLEM DKFPFVALSKTYNTNAQVPDSAGTATAYLCGVKANEGTVGVSAATERTRCNTTQGNEVTSILRWAKDAGKSV GIVTTTRVNHATPSAAYAHSADRDWYSDNEMPPEALSQGCKDIAYQLMHNKIDIDVIMGGGRKYMYPKNRT DVEYELDEKARGTRLDGLDLISIWKSFKPRHKHSHYVWNRTPELLALDPSRVDYLLGLFEPGDMQYELNRNLT DPSLSEMVEVALRILTKNPKGFFLLVEGGRIDHGHHEGKAKQALHEAVEMDEAIGKAGTMTSQKDTLTVVTAD HSHVFTFGGYTPRGNSIFGLAPMVSDTDKPKFTAILYGNPGYKVVVDGERENVSMVDYAHNNYQAQSAVPL RHETHGGEDVAVFAKGPMALLHGVHEQNYIPVMAYASCIGANLDHCAWAS

QC Testing

Biological Activity:	Activity has not been tested. It is theoretically active, but we cannot guarantee it. If you require protein activity, we recommend choosing the eukaryotic expression version first.
Purity:	> 90% as determined by SDS-PAGE.
Endotoxin:	< 1.0 EU/μg of the protein as determined by the LAL method.
Formulation:	Tris-based buffer, 50% glycerol

Preparation and Storage

Reconstitution:

A Certificate of Analysis (CoA) containing reconstitution instructions is included with the products. Please refer to the CoA for detailed information.

Stability & Storage:

Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C. For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

Protein Background

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.

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