

## Cathepsin S Protein, Mouse, Recombinant (His)

### General Information

Synonyms:	cathepsin S;Cat S;Cats
Protein Construction:	A DNA sequence encoding the full length of mouse CTSS (AAB94925.1) (Met 1-Ile 340) was expressed, with a C-terminal polyhistidine tag. Predicted N terminal: Val 18
Species:	Mouse
Expression Host:	HEK293 Cells
Accession:	AAB94925.1
Molecular Weight:	37.6 kDa (predicted); 33-38 kDa. (reducing conditions)

### QC Testing

Biological Activity:	Measured by its ability to cleave the fluorogenic peptide substrate, Mca-RPKPVENval-WRK (Dnp)-NH <sub>2</sub> . The specific activity is >300 pmoles/min/μg. (Activation description: The enzyme achieves its activity under acidic pH)
Purity:	> 90 % as determined by SDS-PAGE
Endotoxin:	< 1.0 EU/μg of the protein as determined by the LAL method.
Formulation:	Supplied as sterile 12.5 mM MES, 75 mM NaCl, 50% Glycerol, pH6.5.

### 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:

It is recommended to store the product under sterile conditions at -20°C to -80°C. Samples are stable for up to 12 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

#### Shipping:

Proteins are shipped with blue ice.

### Protein Background

Cathepsin S (CTSS), one of the lysosomal proteinases, has many important physiological functions in the nervous system, especially in process of extracellular matrix degradation and endocellular antigen presentation. CTSS is synthesized as inactive precursor of 331 amino acids consisting of a 15-aa signal peptide, a propeptide of 99 aa, and a mature polypeptide of 217 aa. It is activated in the lysosomes by a proteolytic cleavage of the propeptide. Cathepsin S is expressed in the lysosome of antigen presenting cells, primarily dendritic cells, B-cells and macrophages. Compared with other lysosomal cysteine proteases, cathepsin S has displayed some unique characteristics. Cathepsin S is most well known for its critical function in the proteolytic digestion of the invariant

chain chaperone molecules, thus controlling antigen presentation to CD4+ T-cells by major histocompatibility complex (MHC) class II molecules or to NK1.1+ T-cells via CD1 molecules. Cathepsin S also appears to participate in direct processing of exogenous antigens for presentation by MHC class II to CD4+ T-cells, or in cross-presentation by MHC class I molecules to CD8+ T-cells. In addition, although direct evidence is still lacking, in its secreted form cathepsin S is implicated in degradation of the extracellular matrix, which may contribute to the pathology of a number of diseases, including arthritis, atherosclerosis, neurological diseases and chronic obstructive pulmonary disease.

### Reference

- Liu W, et al. (2004) Cysteine protease cathepsin S as a key step in antigen presentation. *Drug News Perspect.* 17(6): 357-63.
- Thurmond RL, et al. (2005) Cathepsin S inhibitors as novel immunomodulators. *Curr Opin Investig Drugs.* 6(5): 473-82.
- Wang DM, et al. (2008) Cathepsin S in pathogenesis of neurological diseases. *Zhejiang Da Xue Xue Bao Yi Xue Ban.* 37(4): 422-6.

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