

## Cathepsin L1 Protein, Human (HEK293, C-His)

Cat. No.:	HY-P7754A
Synonyms:	rHuCathepsin L1, His; Cathepsin L1; Major Excreted Protein; MEP; CTSL1; CTSL
Species:	Human
Source:	HEK293
Accession:	P07711 (T18-V333)
Gene ID:	1514
Molecular Weight:	Approximately 32.8 kDa

### PROPERTIES

AA Sequence	<pre> T L T F D H S L E A   Q W T K W K A M H N   R L Y G M N E E G W   R R A V W E K N M K M I E L H N Q E Y R   E G K H S F T M A M   N A F G D M T S E E   F R Q V M N G F Q N R K P R K G K V F Q   E P L F Y E A P R S   V D W R E K G Y V T   P V K N Q G Q C G S C W A F S A T G A L   E G Q M F R K T G R   L I S L S E Q N L V   D C S G P Q G N E G C N G G L M D Y A F   Q Y V Q D N G G L D   S E E S Y P Y E A T   E E S C K Y N P K Y S V A N D T G F V D   I P K Q E K A L M K   A V A T V G P I S V   A I D A G H E S F L F Y K E G I Y F E P   D C S S E D M D H G   V L V V G Y G F E S   T E S D N N K Y W L V K N S W G E E W G   M G G Y V K M A K D   R R N H C G I A S A   A S Y P T V H H H H H H           </pre>
Biological Activity	Measured by its ability to cleave the fluorogenic peptide substrate Z-LR-AMC. The specific activity is 121918.4296 pmol/min/μg, as measured under the described conditions.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 μm filtered solution of 20 mM NaAC, 150 mM NaCl, pH 4.5.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH <sub>2</sub> O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

## Background

Cathepsin L1 Protein, a thiol protease, emerges as a crucial player in the comprehensive degradation of proteins within lysosomes, impacting various cellular functions such as general protein turnover, antigen processing, and bone remodeling. Its involvement extends to the solubilization of cross-linked TG/thyroglobulin, facilitating the release of thyroid hormone thyroxine (T4) through limited proteolysis in the thyroid follicle lumen. Furthermore, Cathepsin L1 catalyzes the processing of prohormone proenkephalin into the active enkephalin peptide neurotransmitter within neuroendocrine chromaffin cells' secretory vesicles. In the thymus, it regulates CD4(+) T cell positive selection by generating MHCII-bound peptide ligands and mediates invariant chain processing in cortical thymic epithelial cells. Operating as a major elastin-degrading enzyme at neutral pH, Cathepsin L1 accumulates in the extracellular space of antigen-presenting cells, modulating the degradation of the extracellular matrix during inflammation. Additionally, its secreted form contributes to endostatin generation from COL18A1. Beyond its enzymatic roles, Cathepsin L1 is indispensable for cardiac morphology and function, as well as hair follicle morphogenesis, cycling, and epidermal differentiation. Moreover, it plays a vital role in maximizing steroidogenesis stimulated by TIMP1. In the context of microbial infection, especially in cells lacking TMPRSS2 expression, Cathepsin L1 facilitates the entry of human coronaviruses, such as SARS-CoV and SARS-CoV-2, through a slow acid-activated route by proteolysis of coronavirus spike (S) glycoproteins in lysosomes. This activity underscores its significance in host cell infection by these viruses.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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