

## Product Information

### Cathepsin L

from human liver

Product Number **C6854**

Storage Temperature  $-20^{\circ}\text{C}$

EC 3.4.22.15

#### Product Description

Cathepsin L is a lysosomal enzyme in the peptidase family C1 (papain family of thiol proteases). It has a higher specific activity than cathepsin B or cathepsin H in the degradation of a variety of physiological protein substrates.<sup>1,2</sup> Cathepsin L plays a major role in the lysosomal proteolysis of both cellular and endocytosed macromolecules. It is rapidly and irreversibly inhibited by the diazomethane inhibitors Z-Phe-Phe-CHN<sub>2</sub> or Z-Phe-Ala-CHN<sub>2</sub>, is readily inhibited by the epoxide inhibitor E-64, and is reversibly inhibited by leupeptin.<sup>1,3</sup> Cathepsin L is unstable at neutral pH, but is relatively stable in the range 4.5 to 5.5.<sup>1</sup> The enzyme is a dimer of a heavy (175 amino acids) and a light chain (42 amino acids) linked by disulfide bonds.

Cathepsin L is the first human proteinase shown to catalytically inactivate  $\alpha_1$  proteinase inhibitor.<sup>4</sup> Research has suggested that it plays a role in the pathological proteolysis of elastin, in the normal development and function of human endometrium, and in embryo development.<sup>5,6</sup> Because cathepsin L is capable of degrading protein constituents of the extracellular matrix, this enzyme is thought to play a crucial role in tumor progression, metastasis,<sup>7,8</sup> and other disorders where the destruction of the matrix is the major cause of disease.<sup>9</sup> Cathepsin L also appears to be involved in MHC class II antigen presentation.<sup>10</sup>

Cathepsin L is supplied in 20 mM malonate, pH 5.5, with 1 mM EDTA and 400 mM NaCl.

Specific Activity: >0.5 unit/mg protein

Unit Definition: One unit of Cathepsin L is defined as the amount of enzyme that hydrolyzes one micromole of Z-Phe-Arg-AFC per minute at  $25^{\circ}\text{C}$  at pH 5.5.

Final concentrations in the reaction buffer for the assay are 400 mM sodium acetate, pH 5.5, with 4 mM EDTA and 8 mM DTT.

#### Precautions and Disclaimer

This product is for laboratory research use only. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

#### Storage/Stability

This product ships on dry ice and storage at  $-20^{\circ}\text{C}$  is recommended. Avoid repeated freeze-thaw cycles. Do not store in a frost-free freezer.

#### Product Profile

Cathepsin L is prepared from human liver tissue shown to be non-reactive for HbsAG, antiHbC, and negative for anti-HIV 1 and 2 by FDA approved tests.

#### References

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5. Alfonzo, S., et al., *Development*, **124**, 3415-3425 (1997).
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