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ProductInformation

Z-Phe-Phe Fluoromethyl Ketone

Product Number **C 9109**
Storage Temperature –20 °C

Product Description

Molecular formula: $C_{27}H_{27}FN_2O_4$
Molecular weight: 462.5

Z-Phe-Phe Fluoromethyl Ketone (Z-FF-FMK) is an irreversible inhibitor of cathepsin B and cathepsin L. (Z = benzyloxycarbonyl)

Among the intracellular proteinases, thiol proteinases such as cathepsin B and cathepsin L, active at slightly acidic pH, play a role in lysosomal protein catabolism. Both have identical substrate specificity but 4 M urea at pH 5.0 will inactivate cathepsin B, while cathepsin L retains its activity under these conditions.[1]

Cathepsin B is a lysosomal cysteine protease involved in cellular protein turnover.[2] Cathepsin B has a high abundance and exhibits both endopeptidase and peptidyldipeptidase activity.[3,4] This enzyme has been implicated in several pathological conditions including arthritis and tumor metastasis.

Cathepsin L is the most powerful of the lysosomal proteinases and has a higher specific activity than cathepsin B in the degradation of physiological protein substrates. Cathepsin L, but not cathepsin B, can also generate kinins from high and low molecular weight kininogens in vitro.[5]

FMK is a trapping group responsible for irreversible inhibition but is non-cytotoxic. Inhibition occurs when the the FMK group covalently bonds to the –SH of an adjacent cysteine residue on the target protein.

Preparation Instructions

Prepare stock 20 mM solutions in dry (≥ 99.9 %) DMSO to maintain product stability. Also soluble in DMF.

Effective final concentration is estimated to be 50 µM.

Storage/Stability

Store product at –20 °C. It is reported to be stable at room temperature for one year in a desiccator.

Store stock solutions at –20 °C for 6-8 months. Allowing the material to warm to room temperature before use to ensure stability.

References

1. Kamboj, R. C., et al. A selective colorimetric assay for cathepsin L using Z-Phe-Arg-4-methoxy-beta-naphthylamide. Biochimie, **75,** 873-878 (1993).
2. Kirschke H, Barrett AJ. 1987. Lysosomal cysteine proteases. In: Glaumann H, Ballard FJ, eds. Lysosomes: Their role in protein breakdown. London: Academic Press. pp 193-238.
3. Aronson, N. N., Jr., and Barrett, A. J., The specificity of cathepsin B. Hydrolysis of glucagon at the C-terminus by a peptidyldipeptidase mechanism. Biochem. J., **171,** 759-765 (1978).
4. Fosang, A. J., et al., The interglobular domain of cartilage aggrecan is cleaved by PUMP, gelatinases, and cathepsin B. J. Biol. Chem., **267,** 19470-19474 (1992).
5. Desmazes, C., et al., Cathepsin L, but not cathepsin B, is a potential kininogenase. Biol. Chem., **382,** 811-815 (2001).

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