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ProductInformation

L-Histidine

Product Number **H8000**
Store at Room Temperature

Product Description

Molecular Formula: $C_6H_9N_3O_2$
Molecular Weight: 155.2
CAS Number: 71-00-1
pI: 7.64[1]
pK_a: 1.80 (COOH), 9.33 (NH_2),
6.04 (imidazole group)[1]
Specific Rotation: +12.6° to +14.0°
(11 mg/ml, 6 M HCl)
Synonyms: (S)-α-amino-1H-imidazole-4-propanoic acid, glyoxaline-5-alanine, His, H

The essential amino acid L-histidine is one of the three amino acids with a basic side chain, and is very hydrophilic in character. It contains an imidazole group in the side chain. Because the pK_a of the imidazole group is close to physiological pH, the imidazole moiety can be either uncharged or positively charged, depending on the local environment. This property makes histidine residues of exceptional interest in the active sites of many proteins, such as hemoglobin and myoglobin, where the imidazole ring can readily alternate between the charged (imidazolium) and uncharged (imidazole) states to participate in bond formation and breakage. Histidine is biosynthesized from ATP, 5-phosphoribosyl-1-pyrophosphate (PRPP), and glutamine. In turn, histidine is degraded to glutamate by histidase, urocanase, and imidazolonepropionase via the formation of urocanate, 4-imidazolone 5-propionate, and N-formiminoglutamate.[3,4]

L-Histidine has been used to study cultures of the human T-lymphoblastic leukemia cell line MOLT-4 to study modulation of apoptosis.[5] Exogenous histidine has been shown to enhance the biosynthesis of lovastatin by cultured *Aspergillus terreus*.[6] Histidine has been utilized as a single nitrogen source to probe swarming in *Pseudomonas aeruginosa* on agar.[7] An *in vivo* study has used L-histidine to diminish the net secretory response of the small intestine of of cholera toxin-challenged mice.[8]

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in 0.5 M HCl (50 mg/ml) yielding a clear, colorless solution. The solubility of this product in water (25 °C) has been reported to be 41.6 mg/ml.[1]

References

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3. Biochemistry, 3rd ed., Stryer, L., W. H. Freeman (New York, NY: 1988), pp. 19-20, 505, 587-588.
4. Textbook of Biochemistry with Clinical Correlations, 5th ed., Devlin, T. M., ed., Wiley-Liss (New York, NY: 2002), pp. 97, 395, 816-817.
5. Franek, F., et al., Antiapoptotic and proapoptotic action of various amino acids and analogs in starving MOLT-4 cells. Arch. Biochem. Biophys., **398(1)**, 141-146 (2002).
6. Hajjaj, H., et al., Lovastatin biosynthesis by *Aspergillus terreus* in a chemically defined medium. Appl. Environ. Microbiol., **67(6)**, 2596-2602 (2001).
7. Kohler, T., et al., Swarming of *Pseudomonas aeruginosa* is dependent on cell-to-cell signaling and requires flagella and pili. J. Bacteriol., **182(21)**, 5990-5996 (2000).
8. Peterson, J. W., et al., Cholera toxin-induced PGE(2) activity is reduced by chemical reaction with L-histidine. Biochim. Biophys. Acta, **1537(1)**, 27-41 (2001).

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