Native Jack bean α (1-2,3,6)-Mannosidase

Cat. No. NATE-0438

Lot. No. (See product label)

Introduction

Description	α-Mannosidase is an acid hydrolase which is located in plant vacuoles and is thought to be involved with the turnover of N-linked glycoproteins. α-Mannosidase has been shown to inhibit the proliferation of B-lymphocytes. α-Mannosidase from Canavalia ensiformis is a tretamer composed of two subunits that each contain two components at 44 and 66 kDa.
Synonyms	α-mannosidase; α-D-mannosidase; p-nitrophenyl-α-mannosidase; α-D-mannopyranosidase; 1,2-α-mannosidase; 1,2-α-D-mannosidase; exo-α-mannosidase; EC 3.2.1.24; 9025-42-7; Mannosidase

Product Information

Source	Jack bean
Form	A sterile-filtered solution in 20 mM Tris-HCl, 20 mM NaCl, pH 7.5.
Molecular Weight	~190 kDa daltons.
Purity	Contaminating glycosidase activities are determined using p-nitrophenyl glycoside substrates and are reported when they are > 0.001% of the enzyme activity.
Activity	≥ 10 U/ml
Optimum pH	pH 4.0-4.5
Specificity	The enzyme has a broad substrate specificity, cleaving α (1-2, 3, and 6)-linked mannose residues from oligo-saccharides and glycoproteins. However, the enzyme exhibits some kinetic preference for 1-2, 3>6-linked residues. By using enzyme concentrations at about 50 U/ml and extended incubation times (up to 18 hours) at 37°C, complete removal of all α-linked mannose units from complex-type high mannose glycans can be achieved, giving rise to the core trisaccharide, Man β (1,4)-GlcNAc β (1,4)-GlcNAc as the end product. In order to expedite glycan sequencing studies, the sluggish activity of the Jack Bean enzyme toward α (1-6)-linked mannose residues can be overcome by using the enzyme in combination with the alpha mannosidase from Xanthomonas mannihotis which rapidly cleaves the 1-6 linkages. The mechanism of the enzyme has been investigated and has been shown to cleave the glycosidic bond between the two carbohydrate residues, forming a stable enzyme substrate intermediate. The enzyme-bound mannose residue can be transferred to other carbohydrate acceptors, with reasonable efficiency. In this manner the enzyme can be utilized for synthesis of novel mannose-containing glycans with a defined anomeric configuration. Interestingly, the jack bean mannosidase is a glycoprotein containing high-mannose type structures. Apparently, these glycan side chains are not accessible to the enzyme because they may be shielded from the catalytic site by the polypeptide. The carbohydrate side chains are required for proper protein folding and maintaining catalytic activity. The enzyme requires Zn2+ ions for activity and optimal stability, but the addition of Zn2+ to the incubation buffer is not usually required.

Storage and Shipping Information

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Stability	The enzyme is stable at 2-8°C and-20°C. The enzyme is unstable below pH 5.5 unless Zn2+ ions are present. It is stable between 6.0-8.5 for 17 hours at 37°C. Ag+ and Hg2+ are potent inhibitors of enzyme activity.