

Product Information

Chitinase

from *Streptomyces griseus*

Product Number **C6137**

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

E.C. 3.2.1.14

CAS RN 9001-06-3

Synonyms: Chitodextrinase,

Poly(β -(1 \rightarrow 4)-[2-acetamido-2-deoxy-D-glucoside])
glycanohydrolase

Product Description

Chitinase is an extracellular complex of enzymes that degrade chitin.¹ Chitinases have been detected in many microorganisms and in plants.² In fungi, chitinases assist in morphogenesis, to break down the inherent chitin content of fungal cell walls. Plant chitinases help in resistance to fungal attack and counteracting fungal growth, by targeting those same fungal cell walls. In bacteria, bacterial chitinases assist in utilizing chitin as a carbon source and as an energy source.^{2,3}

Streptomyces griseus, such as the *S. griseus* HUT6037 strain, produces multiple chitinases of different molecular masses after growth induction with chitin as the carbon source.³ One publication has reported isolation of the principal chitinases C-1 and C-2 from *Streptomyces griseus* HUT 6037, with molecular mass values of $\sim 27\text{ kDa}$.⁴

The enzymatic hydrolysis of chitin to *N*-acetyl-D-glucosamine is performed by two consecutive enzyme reactions:

- The first reaction, chitodextrinase-chitinase, is a poly(β -(1 \rightarrow 4)-[2-acetamido-2-deoxy-D-glucoside])-glycanohydrolase, which removes chitobiose units from chitin.
- The second activity is *N*-acetyl-glucosaminidase-chitobiase, which cleaves the disaccharide to its monomer subunits, *N*-acetyl-D-glucosamine.

The optimal reaction temperature is $37\text{ }^{\circ}\text{C}$.

The product is an essentially salt-free lyophilized powder.

Specific Activity: ≥ 200 units/g solid

Unit Definition: One unit will liberate 1.0 mg of *N*-acetyl-D-glucosamine from chitin per hour at pH 6.0 at $25\text{ }^{\circ}\text{C}$ in a 2-hour assay.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

The product is soluble in 50 mM potassium phosphate, pH 6.0 (1 mg/mL), yielding a clear to hazy solution. One publication has reported preparation of stock solutions of this product in a buffer of 118 mM NaCl, 48 mM KCl, 2 mM CaCl_2 , 2 mM MgCl_2 , and 25 mM HEPES, pH 7.3, at 2 mg/mL. Aliquots of this stock solution may be stored at $-20\text{ }^{\circ}\text{C}$ for "up to a few months".⁵ We have not tested the latter conditions.

References

1. *CRC Handbook of Biochemistry and Molecular Biology: Proteins, Vol. II*, CRC Press, p. 405 (1976).
2. Kezuka, Y. *et al.*, *J. Mol. Biol.*, **358**(2), 472-484 (2006).
3. Tanabe, T. *et al.*, *J. Biosci. Bioeng.*, **89**(1), 27-32 (2000).
4. Mitsutomi, M. *et al.*, *J. Ferment. Bioeng.*, **80**(2), 153-158 (1995).
5. Sangaletti, R., and Bianchi, L., *J. Vis. Exp.*, **79**, 50649 (2013).

GCY,EM,RBG,GY,TA,MAM 10/18-1