

Product Information

Chitinase from *Streptomyces griseus*

Free of DNA contaminants, suitable for Microbiome research

SAE0158

Product Description

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

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* produces multiple chitinases of different molecular masses after growth induction with chitin as the carbon source.³

The enzymatic hydrolysis of chitin to *N*-acetyl-D-glucosamine involves 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 study of microbial communities has recently been revolutionized by the widespread adoption of culture-independent analytical techniques such as 16S rRNA gene sequencing and metagenomics. Since DNA contamination during sample preparation is a concern of these sequence-based approaches,⁴ DNA extraction reagents free of DNA contaminants are essential.

Purified Chitinase SAE0158 undergoes strict quality control testing to ensure the absence of detectable levels of contaminating DNA, using 35 cycles of PCR amplification of 16S and 18S rDNA, using universal primer sets.

The optimal reaction temperature is 37 °C.

Specific Activity: \geq 1000 units/g protein

Unit Definition

Unit Definition: One unit will liberate 1.0 mg of *N*-acetyl-D-glucosamine from chitin per hour at pH 6.0 at 25 °C in a 2-hour assay.

Storage/Stability

This product, as supplied, should be stored at -20 °C.

Preparation Instructions

Solutions of chitinase can be prepared in DNA-free water. Stock solutions of chitinase can be stored at -20 °C in frozen aliquots.

Precautions and Disclaimer

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.

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. Eisenhofer, R. *et al.*, *Trends Microbiol.*, **27(2)**, 105-117 (2019).

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