

Product Information

Heparinase III from *Flavobacterium heparinum*

Lyophilized powder stabilized with approx. 25% (w/w) bovine serum albumin, ≥ 30 units/mg protein (enzyme + BSA)

H8891

Product Description

CAS Registry Number: 37290-86-1

Enzyme Commission (EC) Number: 4.2.2.8

Synonyms: Heparin Lyase III, Heparitinase I, Heparitinase from *Flavobacterium heparinum*

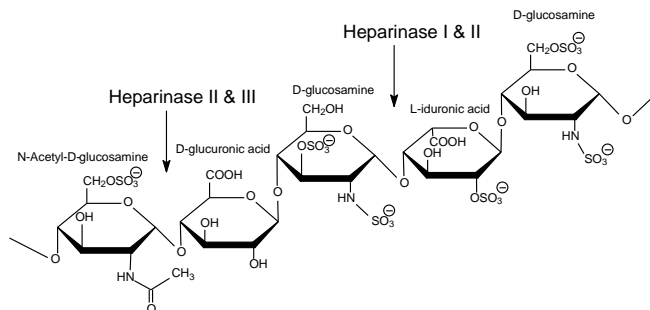
Storage Temperature: $-20\text{ }^{\circ}\text{C}$

pI:¹ 7.9

Optimal pH: 7.0

Molecular weight:² 73,540 Da

Heparinase is an enzyme used for degradation of various heparin substrates. The three forms of heparinase (I, II, and III, Cat. Nos. H2519, H6512, and H8891, respectively) have varying substrate specificities.³⁻⁵ Heparinase III cleaves at the 1 \rightarrow 4 linkages between hexosamine and glucuronic acid residues in heparan sulfate, to yield mainly disaccharides. The enzyme is not active towards heparin or low molecular weight heparins.



Various metal ions have been shown to activate and inhibit heparinase:⁶⁻⁹

- Ca^{2+} has been shown to activate heparinase.
- Cu^{2+} , Hg^{2+} , and Zn^{2+} appear to inhibit heparinase.

Several theses¹⁰⁻¹¹ and dissertations¹²⁻²⁰ have cited use of product H8891 in their research protocols.

Unit definitions

- The definition of an International Unit (IU) of heparinase is as follows: one IU will form 1 μmole of unsaturated uronic acid per minute.
- Sigma units are defined as the amount of enzyme that will form 0.1 μmole of unsaturated uronic acid per hour.
- Based on this information, one IU is equal to 600 Sigma units, despite the slight difference in assay temperatures.

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.

Storage/Stability

Store the product at $-20\text{ }^{\circ}\text{C}$.

Enzyme solutions of heparinase III at pH 6-7 remain active for a week at $-20\text{ }^{\circ}\text{C}$.

Preparation Instructions

This enzyme can be reconstituted to a concentration of 75-100 Sigma units/mL in 20 mM Tris-HCl, pH 7.5, containing 0.1 mg/mL BSA and 4 mM CaCl_2 .

References

1. Yang, V.C. *et al.*, *Biotechnol. Prog.*, **3(1)**, 27-30 (1987).
2. Godavarti, R. *et al.*, *Biochem. Biophys. Res. Comm.*, **225(3)**, 751-758 (1996).
3. Linhardt, R.J. *et al.*, *Biochemistry*, **29(10)**, 2611-2617 (1990).

4. Nader, H.B. *et al.*, *J. Biol. Chem.*, **265**(28), 16807-16813 (1990).
5. Nader, H.B. *et al.*, *Proc. Natl. Acad. Sci. USA*, **84**(11), 3565-3569 (1987).
6. Hovingh, P., and Linker, A., *Carbohydr. Res.*, **37**(1), 181-192 (1974).
7. Linker, A., and Hovingh, P., *Methods Enzymol.* (Complex Carbohydrates, Part B), **28**, 902-911 (1972).
8. Silverberg, I. *et al.*, *Carbohydr. Res.*, **137**, 227-238 (1985).
9. Ototani, N., *et al.*, *Carbohydr. Res.*, **88**(2), 291-303 (1981).
10. Henderson-Toth, Caitlin, "The formation of shear sensing mechanisms during embryonic vascular development: the role of the glycocalyx". McGill University, M.Sc. thesis, p. 27 (2011).
11. Liao, Wei, "An Open-well Organs-on-chips Device for Engineering the Blood-Brain-Barrier". Massachusetts Institute of Technology, M.S. thesis, p. 63 (2020).
12. Diop, Rokhaya, "Effects of Laminar Fluid Shear Stress on the Function of Adult Stem Cells". University of California, San Francisco / University of California, Berkeley, Ph.D. dissertation, p. 40 (2013).
13. Pourainafar, Hamid Reza, "Characterization of Anti-Enteroviral Activity of Heparan Sulphate Mimetic Compounds". Swinburne University of Technology, Ph.D. dissertation, p. 128 (2012).
14. Tari, Parisa Karimi, "Assessing the Role of LRRTMs in Synapse Development and Function". University of British Columbia, Ph.D. dissertation, p. 28 (2014).
15. Furini, Giulia, "The interactome of transglutaminase-2 in kidney fibrosis: Uncovering a mechanism for TG2 unconventional secretion in chronic kidney disease". Nottingham Trent University, Ph.D. dissertation, p. 64 (2017).
16. Wischusen, Jennifer, "Ultrasound Microbubbles for Molecular Imaging and Drug Delivery: detection of Netrin-1 in Breast Cancer & Immunomodulation in Hepatocellular Carcinoma". Université de Lyon, Ph.D. dissertation, p. 89 (2017).
17. Dhume, Shreya H., "Mechanisms of synapse development, plasticity and cognition of hippocampal neuronal pathways by Leucine-rich-repeat transmembrane neuronal proteins". University of Manitoba, Ph.D. dissertation, p. 101 (2021).
18. McAllister, Nicole Marie, "Chikungunya virus binds sulfated glycosaminoglycans as attachment factors using specific residues in the E2 glycoprotein". University of Pittsburgh, Ph.D. dissertation, pp. 122-123 (2021).
19. Shah, Vikash Kumar, "Epithelial Sodium Channel (ENaC) and the endothelial glycocalyx act synergistically to increase endothelial cell stiffness and downregulate nitric oxide production". University of Otago, Ph.D. dissertation,, p. 46 (2021).
20. Sorin, Marie, "Structural studies of BK and JC polyomavirus interactions with their receptors". Nantes Université / Eberhard Karls Universität Tübingen, Ph.D. dissertation,, p. 59 (2022).

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