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# Certificate of Analysis and Data Sheet Recombinant Human Heparanase-1

**Catalog No.**  
228-10775

**Source**  
*CHO cells.*

### ***Introduction:***

Heparanase is an endo  $\beta$ -D-glucuronidase, which degrades heparin sulfate side chains of heparan sulfate proteoglycans (HSPGs) in the extracellular matrix. Heparanase plays an important role in ECM degradation, facilitating the migration and extravasation of tumor cells and inflammatory leukocytes (1,2,3). Upon degradation, heparanase releases growth factors and cytokines that stimulate cell proliferation and chemotaxis (4,5). Heparanase is a heterodimer comprised of a 50 kDa subunit harboring the active site and a 8 kDa subunit. It is produced as a latent 65 kDa precursor and proteolytically processed to its active form (1,6). Heparanase is highly expressed in myeloid leukocytes (i.e. neutrophils) in platelets and in human placenta. Human heparanase was found to be upregulated in various types of primary tumors, correlating in some cases with increased tumor invasiveness and vascularity and with poor prospective survival (7,8).

### ***Description***

Recombinant Heparanase protein HPA1 is produced in CHO cells.  
The protein is purified by several orthogonal chromatography steps.

### ***Formulation***

LDS-PAGE buffer

140 mM Tris buffer pH 8.5, 10% Glycerol, 2% LDS, 0.015%, EDTA, 1.88% (v/v) of 1% Serva Blue G250 and 0.625% (v/v) of 1% Phenol red

### ***Concentration***

1 $\mu$ g /ml

### ***Application***

Positive control for western blot analysis.

Use 20  $\mu$ l of recombinant human heparanase 1 (HPA1) per lane, as a control

### ***Storage***

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

**Avoid repeated freeze-thaw cycles.**

**The products are furnished for LABORATORY RESEARCH USE ONLY.  
Not for diagnostic or therapeutic use.**



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### **Reference**

1. I. Vlodavsky, Y. Friedmann, M. Elkin, H. Aingorn, R. Atzmon, R. Ishai-Michaeli, M. Bitan, O. Pappo, T. Peretz, I. Michal, L. Spector, I. Pecker. 1999. Mammalian heparanase: gene cloning, expression and function in tumor progression and metastasis. *Nat. Med.* 5: 793–802.
2. I. Vlodavsky, Y. Friedman. 2001. Molecular properties and involvement of heparanase in cancer metastasis and angiogenesis. *J. Clin. Invest.* 108: 341–347.
3. C.R. Parish, C. Freeman, M.D. Hulett. 2001. Heparanase: a key enzyme involved in cell invasion. *Biochem. Biophys. Acta* 1471: M99–M108.
4. I. Vlodavsky, G. Korner, R. Ishai-Michaeli, P. Bashkin, R. Bar-Shavit, Z. Fuks, 1990. Extracellular matrix-resident growth factors and enzyme: Possible involvement in tumor metastasis and angiogenesis. *Cancer Metastasis Rev.* 9: 203-226.
5. P. Bashkin, S. Doctrow, M. Klagsbrun, C.M. Svahn, J. Folkman, I. Vlodavsky. 1989. Basic fibroblast growth factor binds to subendothelial extracellular matrix and is released by heparitinase and heparin-like molecules. *Biochemistry* 28: 1737-1743.
6. M.B. Fairbanks, A.M. Mildner, J.W. Leone, G.S. Cavey, W.R. Mathews, R.F. Drong, J.L. Slightom, M.J. Bienkowski, C.W. Smith, C.A. Bannow, R.L. Heinrikson. 1999. Processing of the human heparanase precursor and evidence that the active enzyme is a heterodimer. *J. Biol. Chem.* 274: 29587–29590.
7. A. Koliopanos, H. Friess, J. Klee., X. Shi, Q. Liao, I. Pecker, I. Vlodavsky, A. Zimmermann, M.W. Buchler. 1992. Heparanase expression in primary and metastatic pancreatic cancer. *Cancer Res.* 61: 4655–4659.
8. K. Gohji, H. Hirano, M. Okamoto, S. Kitazawa, M. Toyoshima, J. Dong, Y. Katsuoka, M. Nakajima. 2001. Expression of three extracellular matrix degradative enzymes in bladder cancer. *Int. J. Cancer* 95: 295–301.

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