

# Purified Dermatan / Chondroitin B Sulfate Chains From Human Recombinant Endocan / ESM-1

## Essential Notes

**Cat. Number:** LIDS-1001-10U

**Size:** 10 µg / 100 µl

**Formulation:** solution in PBS

**Storage:** -20°C

**Applications:** Bioassays,  
Standard for quantification,  
Molecular interactions

## Description

Endocan also called endothelial cell specific molecule 1 (ESM-1) is a proteoglycan of 50 kDa carrying a unique chain of glycosaminoglycan of chondroitin B / dermatan sulfate type (Bechard et al. 2001; Sarrazin et al. 2010). Endocan / ESM-1 binds through its DS / CS chain to pro-angiogenic molecules such as HGF/SF and regulated their activity. This CS / DS proteoglycan is a biomarker of endothelial dysfunction in cancer and sepsis.

## Source

Dermatan sulfate chains from purified human recombinant endocan / ESM-1 were released from the core protein by  $\beta$ -elimination, purified by successive ion-exchange and gel filtration chromatographies as described in Sarrazin et al. 2010a.

## Quantity

10 µg per vial.

## Formulation

In a solution in phosphate buffer saline (PBS) pH7.4.  
The DS specific, IdoA-containing disaccharides contribute 30% of the chain (15% of which are 2-O-sulfated) and are mostly clustered in tetra- (35%), hexa- (12%), and octa- (5%) saccharide domains.

## Storage

We recommend that all products should be stored at -20°C upon receipt.

If made up into solutions, avoid repeated freeze-thaw cycles. Stock solutions should be prepared in appropriate aliquots and stored frozen.

## Applications

- Bioassays
- Molecular interactions

Optimal dilutions should be determined for each application by end-user.

## ■ References

- Lassalle et al. (1996)** ESM-1 is a novel human endothelial cell-specific molecule expressed in lung and regulated by cytokines. *J. Biol. Chem.* 271:20458-20464.
- Bechard et al. (2001a)** Endocan is a novel CS/DS proteoglycan that promotes HGF/SF mitogenic activity. *J. Biol. Chem.* 276:48341-48349.
- Sarrazin et al. (2010a)** Characterization and binding activity of the chondroitin/dermatan sulfate chain from Endocan, a soluble endothelial proteoglycan. *Glycobiology.* 20:1380-1388.
- Scherpereel et al. (2003)** Overexpression of endocan induces tumor formation. *Cancer Res.* 63:6084-6089.

## ■ BACKGROUND

Endocan, also known as endothelial cell-specific molecule (ESM-1), was originally discovered in endothelial cells from the lungs by Lassalle and collaborators (Lassalle et al. 1996). Structurally, endocan is a dermatan sulfate proteoglycan of 50 kDa that is freely circulating in blood (Bechard et al. 2001a; Sarrazin et al. 2010a). Endocan / ESM-1 binds CD11a/CD18 integrin (also called LFA-1 for Leukocyte Function-associated Antigen-1) on human leukocytes inhibiting consequently its binding to ICAM-1 and transendothelial migration (Bechard et al. 2001b; De Freitas Caires et al. 2009). Moreover, endocan / ESM-1 has been recently described as a biomarker of tip cells (Sarrazin et al. 2010b). The expression of endocan / ESM-1 is upregulated by pro-inflammatory molecules such as tumor necrosis factor alpha (TNF $\alpha$ ), and pro-angiogenic molecules such as vascular endothelial growth factor (VEGF) and fibroblast growth factor 2 (FGF-2) (Grigoriu et al. 2006; Sarrazin et al. 2006; Maurage et al. 2009). Endocan / ESM-1 binds via its dermatan sulfate chain to hepatocyte growth factor/scatter factor (HGF/SF) (Bechard et al. 2001a; Sarrazin et al. 2010b). Elevated blood levels of endocan / ESM-1 has been reported in patients with lung and kidney cancers as well as in patients with severe sepsis (Bechard et al. 2001b; Scherpereel et al. 2003; Grigoriu et al. 2006; Scherpereel et al. 2006; Sarrazin et al. 2010b; Leroy et al. 2010).

## ■ Endocan Background Bibliography

- Abid et al. (2006)** Vascular endocan is preferentially expressed in tumor endothelium. *Microvasc. Res.* 72:136-145.
- Bechard et al. (2001a)** Endocan is a novel CS/DS proteoglycan that promotes HGF/SF mitogenic activity. *J. Biol. Chem.* 276:48341-48349.
- Bechard et al. (2001b)** Human ESM-1 binds directly to the integrin CD11a/CD18 (LFA-1) and blocks binding to ICAM-1. *J. Immunol.* 167:3099-3106.
- Lassalle et al. (1996)** ESM-1 is a novel human endothelial cell-specific molecule expressed in lung and regulated by cytokines. *J. Biol. Chem.* 271:20458-20464.
- Leroy et al. (2010)** Vascular endocan (ESM-1) is markedly overexpressed in clear cell renal cell carcinoma. *Histopathology* 56:180-187.
- Maurage et al. (2009)** Endocan expression and localization in human glioblastomas. *J. Neuropathol. Exp. Neurol.* 68:836-844.
- Sarrazin et al. (2006)** Endocan or endothelial cell specific molecule-1 (ESM-1): a potential novel endothelial cell marker. *BBA Reviews in cancer* 1765:25-37.
- Sarrazin et al. (2010a)** Characterization and binding activity of the chondroitin / dermatan sulfate chain from Endocan, a soluble endothelial proteoglycan. *Glycobiology.* 20:1380-1388.
- Sarrazin et al. (2010b)** Endocan as a biomarker of endothelial dysfunction in cancer. *J. Canc. Sci. Ther.* 2:47-52.
- Scherpereel et al. (2003)** Overexpression of endocan induces tumor formation. *Cancer Res.* 63:6084-6089.
- Scherpereel et al. (2006)** Endocan, a new endothelial marker in human sepsis. *Crit. Care Med.* 34:532-537.
- Tsai et al. (2002)** Cloning and characterization of the human lung ESM-1 promoter. *J. Vasc. Res.* 39:148-159.

## ■ Companion products

- Anti-human endocan/ESM-1 mAb (C-ter) ; clone MEP14 : **LIA-1001**
- Anti-human endocan/ESM-1 mAb (N-ter) ; clone MEP21 : **LIA-0902**
- DIYEK EndoMark H1 (ImmunoAssay against human endocan) : **LIK-1101**
- Human recombinant endocan/ESM-1 50 kDa : **LIP-1001**
- Human recombinant endocan/ESM-1 20 kDa : **LIP-1002**

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