

Shigatoxin 1 (13C4): sc-52726

BACKGROUND

Hemolytic uremic syndrome (HUS) is the number one cause of acute renal failure in children worldwide. HUS is characterized by microangiopathic hemolytic anemia, a low platelet count and diarrhea. Shigatoxins (Stxs) produced by *Shigella dysenteriae* type 1 and enterohemorrhagic *Escherichia coli* are the most common cause of HUS. Shigatoxin 1 (Stx1) is an *Escherichia coli* protein that increases arachidonate release and eicosanoid production in glomerular epithelial cells, thereby inhibiting protein synthesis. It also increases cytokine release by renal epithelial cells. Proximal tubule inflammatory cytokine production is stimulated by Stx1, which also stimulates IL-6 mRNA accumulation when it is overexpressed. Brain injury in HUS is related to Stx1 binding to globotriaosylceramide. Inhibition of p38 MAPK significantly reduces the inflammatory cytokine up-regulation of Stx-receptor synthesis and cell-surface expression, thereby decreasing Stx cytotoxicity.

REFERENCES

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2. Hughes, A.K., Stricklett, P.K. and Kohan, D.E. 1998. Shiga toxin-1 regulation of cytokine production by human proximal tubule cells. *Kidney Int.* 54: 1093-1106.
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4. Hughes, A.K., Ergonul, Z., Stricklett, P.K., Kohan, D.E. and Ergonul, Z. 2002. Molecular basis for high renal cell sensitivity to the cytotoxic effects of shigatoxin-1: upregulation of globotriaosylceramide expression. *J. Am. Soc. Nephrol.* 13: 2239-2245.
5. Ergonul, Z., Clayton, F., Fogo, A.B. and Kohan, D.E. 2003. Shigatoxin-1 binding and receptor expression in human kidneys do not change with age. *Pediatr. Nephrol.* 18: 246-253.
6. Eisenhauer, P.B., Jacewicz, M.S., Conn, K.J., Koul, O., Wells, J.M., Fine, R.E. and Newburg, D.S. 2004. *Escherichia coli* Shiga toxin 1 and TNF- α induce cytokine release by human cerebral microvascular endothelial cells. *Microb. Pathog.* 36: 189-196.
7. Harrison, L.M., van Haaften, W.C. and Tesh, V.L. 2004. Regulation of proinflammatory cytokine expression by Shiga toxin 1 and/or lipopolysaccharides in the human monocytic cell line THP-1. *Infect. Immun.* 72: 2618-2627.
8. Hughes, A.K., Schmid, D.I. and Kohan, D.E. 2004. Sex steroids do not affect shigatoxin cytotoxicity on human renal tubular or glomerular cells. *BMC Nephrol.* 3: 6.
9. Stricklett, P.K., Hughes, A.K. and Kohan, D.E. 2005. Inhibition of p38 mitogen-activated protein kinase ameliorates cytokine up-regulated shigatoxin-1 toxicity in human brain microvascular endothelial cells. *J. Infect. Dis.* 191: 461-471.

SOURCE

Shigatoxin 1 (13C4) is a mouse monoclonal antibody raised against Shigatoxin 1 of *E. coli* origin.

PRODUCT

Each vial contains 100 μ g IgG₁ in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

Shigatoxin 1 (13C4) is recommended for detection of the 1B subunit of Shigatoxin 1 of *E. coli* origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000); not recommended for detection of the 1A subunit.

Molecular Weight of Shigatoxin 1 catalytic A subunit: 27-32 kDa.

Molecular Weight of Shigatoxin 1 multimeric B subunits: 8 kDa.

Molecular Weight of holotoxin: 70 kDa.

SELECT PRODUCT CITATIONS

1. Naslavsky, N., McKenzie, J., Altan-Bonnet, N., Sheff, D. and Caplan, S. 2009. EHD3 regulates early-endosome-to-Golgi transport and preserves Golgi morphology. *J. Cell Sci.* 122: 389-400.
2. Teng, L., Lee, S., Ginn, A., Markland, S.M., Mir, R.A., DiLorenzo, N., Boucher, C., Prosperi, M., Johnson, J., Morris, J.G. and Jeong, K.C. 2019. Genomic comparison reveals natural occurrence of clinically relevant multidrug-resistant extended-spectrum- β -lactamase-producing *Escherichia coli* strains. *Appl. Environ. Microbiol.* 85 pii: e03030-18.

STORAGE

Store at 4° C, ****DO NOT FREEZE****. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.