SANTA CRUZ BIOTECHNOLOGY, INC.

Shigatoxin (STX-1): sc-69865

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 upregulation of Stx-receptor synthesis and cell surface expression, thereby decreasing Stx cytotoxicity.

REFERENCES

1. Strockbine, N.A., Marques, L.R., Holmes, R.K. and O'Brien A.D. 1985. Characterization of monoclonal antibodies against Shiga-like toxin from *Escherichia coli*. Infect. Immun. 50: 695-700.
2. Hughes, A.K., Stricklett, P.K. and Kohan, D.E. 1998. Shigatoxin 1 regulation of cytokine production by human proximal tubule cells. Kidney Int. 54: 1093-1106.
3. Hughes, A.K., Stricklett, P.K. and Kohan, D.E. 2001. Shigatoxin 1 regulation of cytokine production by human glomerular epithelial cells. Nephron 88: 14-23.
4. Hughes, A.K., Ergonul, Z., Stricklett, P.K., Kohan, D.E. and Ergonal, 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. Hughes, A.K., Schmid, D.I. and Kohan, D.E. 2002. Sex steroids do not affect Shigatoxin cytotoxicity on human renal tubular or glomerular cells. BMC Nephrol. 3: 6.
6. 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.
7. Eisenhauer, P.B., Jacewicz, M.S., Conn, K.J., Koul, O., Wells, J.M., Fine, R.E. and Newburg, D.S. 2004. *Escherichia coli* Shigatoxin 1 and TNFα induce cytokine release by human cerebral microvascular endothelial cells. Microb. Pathog. 36: 189-196.
8. Harrison, L.M., van Haaften, W.C. and Tesh, V.L. 2004. Regulation of pro-inflammatory cytokine expression by Shigatoxin 1 and/or lipopolysaccharides in the human monocytic cell line THP-1. Infect. Immun. 72: 2618-2627.
9. Stricklett, P.K., Hughes, A.K. and Kohan, D.E. 2005. Inhibition of p38 mitogen-activated protein kinase ameliorates cytokine upregulated Shigatoxin 1 toxicity in human brain microvascular endothelial cells. J. Infect. Dis. 191: 461-471.

RESEARCH USE

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

SOURCE

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

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Shigatoxin (STX-1) is available conjugated to agarose (sc-69865 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-69865 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-69865 PE), fluorescein (sc-69865 FITC), Alexa Fluor® 488 (sc-69865 AF488), Alexa Fluor® 546 (sc-69865 AF546), Alexa Fluor® 594 (sc-69865 AF594) or Alexa Fluor® 647 (sc-69865 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-69865 AF680) or Alexa Fluor® 790 (sc-69865 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

APPLICATIONS

Shigatoxin (STX-1) is recommended for detection of Shigatoxin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000).

Molecular Weight of Shigatoxin holotoxin: 70 kDa.

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

Molecular Weight of Shigatoxin multimeric B subunit: 8 kDa.

RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048.

STORAGE

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

PROTOCOLS

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