SANTA CRUZ BIOTECHNOLOGY, INC.

CTR1 (h): 293 Lysate: sc-113094

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The activity of a diverse subset of enzymes relies on the essential nutrient copper. Copper uptake requires tight regulation to ensure that sufficient copper is present in the cell to drive vital cellular processes, while avoiding the accumulation of copper to toxic levels. In *Saccharomyces cerevisiae*, copper regulation involves several proteins. Fre1, a surface reductase, reduces and mobilizes copper outside the cell, while the CTR1 and CTR3 proteins function as copper transport proteins within the plasma membrane. Regulation of these proteins occurs at the transcriptional level. Under copper-deficient conditions, Mac1 binds to copper response elements (CuREs) within promoters, which contain the consensus sequence GCTC, to activate the transcription of CTR1, CTR3, and Fre1. Mac1 also mediates CTR1 degradation. In human, CTR1 also mediates the uptake of cisplatin, a chemotherapeutic drug, and may modulate the sensitivity and toxicity of this drug.

REFERENCES

1. Yamaguchi-Iwai, Y., Serpe, M., Haile, D., Yang, W., Kosman, D.J., Klausner, R.D. and Dancis, A. 1997. Homeostatic regulation of copper uptake in yeast via direct binding of Mac1 protein to upstream regulatory sequences of Fre1 and CTR1. J. Biol. Chem. 272: 17711-17718.
2. Serpe, M., Joshi, A. and Kosman, D.J. 1999. Structure-function analysis of the protein-binding domains of Mac1p, a copper-dependent transcriptional activator of copper uptake in *Saccharomyces cerevisiae*. J. Biol. Chem. 274: 29211-29219.
3. Pena, M.M., Koch, K.A. and Thiele, D.J. 1998. Dynamic regulation of copper uptake and detoxification genes in *Saccharomyces cerevisiae*. Mol. Cell. Biol. 18: 2514-2523.
4. Jamison McDaniels, C.P., Jensen, L.T., Srinivasan, C., Winge, D.R. and Tullius, T.D. 1999. The yeast transcription factor Mac1 binds to DNA in a modular fashion. J. Biol. Chem. 274: 26962-26967.
5. Pena, M.M., Puig, S. and Thiele, D.J. 2000. Characterization of the *Saccharomyces cerevisiae* high affinity copper transporter CTR3. J. Biol. Chem. 275: 33244-33251.
6. Yonkovich, J., McKenndry, R., Shi, X. and Zhu, Z. 2002. Copper ion-sensing transcription factor Mac1p post-translationally controls the degradation of its target gene product CTR1p. J. Biol. Chem. 277: 23981-23984.
7. Ishida, S., Lee, J., Thiele, D.J. and Herskowitz, I. 2002. Uptake of the anticancer drug cisplatin mediated by the copper transporter CTR1 in yeast and mammals. Proc. Natl. Acad. Sci. USA 99: 14298-14302.

CHROMOSOMAL LOCATION

Genetic locus: SLC31A1 (human) mapping to 9q32.

PRODUCT

CTR1 (h): 293 Lysate represents a lysate of human CTR1 transfected 293 cells and is provided as 100 µg protein in 200 µl SDS-PAGE buffer.

RESEARCH USE

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

APPLICATIONS

CTR1 (h): 293 Lysate is suitable as a Western Blotting positive control for human reactive CTR1 antibodies. Recommended use: 10-20 µl per lane.

Control 293 Lysate: sc-110760 is available as a Western Blotting negative control lysate derived from non-transfected 293 cells.

CTR1 (FL-190): sc-66847 is recommended as a positive control antibody for Western Blot analysis of enhanced human CTR1 expression in CTR1 transfected 293 cells (starting dilution 1:100, dilution range 1:100-1:1,000).

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-rabbit IgG-HRP: sc-2004 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible goat anti-rabbit IgG-HRP: sc-2030 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048.

STORAGE

Store at -20° C. Repeated freezing and thawing should be minimized. Sample vial should be boiled once prior to use. Non-hazardous. No MSDS required.

PROTOCOLS

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