



## Hus1 (1-281): sc-4428 WB

### BACKGROUND

DNA damage or incomplete replication of DNA results in inhibition of cell cycle progression at the G<sub>1</sub>-S or G<sub>2</sub>-M checkpoints by conserved regulatory mechanisms. Rad17 is involved in regulation of cell cycle arrest at the G<sub>1</sub> checkpoint, whereas Chk1, Rad9 and Hus1 are involved in regulation of cell cycle arrest at the G<sub>2</sub> checkpoint. Overexpression of Rad17 results in p53 activation and an accumulation of cells in G<sub>1</sub> phase. Chk1 functions as an essential component in the G<sub>2</sub> DNA damage checkpoint by phosphorylating Cdc25C in response to DNA damage, thus inhibiting mitosis. Hus1 and Rad9 exhibit conserved function in fission yeast and higher eukaryotes. Hus1 has been shown to be phosphorylated in response to DNA damage, a process which requires Rad checkpoint genes. Rad9 is thought to be a candidate tumor suppressor gene because it is localized to human chromosome 11q13.1-13.2, which is a region containing a number of tumor suppressor loci.

### REFERENCES

1. Carr, A.M., Moudjou, M., Bentley, N.J., and Hagan, I.M. 1995. The Chk1 pathway is required to prevent mitosis following cell-cycle arrest at 'start'. *Curr. Biol.* 5: 1179-1190.
2. Lieberman, H.B., Hopkins, K.M., Nass, M., Demetrick, D., and Davey S. 1996. A human homolog of the *Schizosaccharomyces pombe* Rad9<sup>+</sup> checkpoint control gene. *Proc. Natl. Acad. Sci. USA* 93: 13890-13895.
3. Sanchez, Y., Wong, C., Thoma, R.S., Richman, R., Wu, Z., Piwnica-Worms, H., and Elledge, S.J. 1997. Conservation of the Chk1 checkpoint pathway in mammals: linkage of DNA damage to Cdk regulation through Cdc25. *Science* 277: 1497-1501.
4. O'Connell, M.J., Raleigh, J.M., Verkade, H.M., and Nurse, P. 1997. Chk1 is a Wee1 kinase in the G<sub>2</sub> DNA damage checkpoint inhibiting Cdc2 by Y15 phosphorylation. *EMBO J.* 16: 545-554.
5. Peng, C.Y., Graves, P.R., Thoma, R.S., Wu, Z., Shaw, A.S., and Piwnica-Worms, H. 1997. Mitotic and G<sub>2</sub> checkpoint control: regulation of 14-3-3 protein binding by phosphorylation of Cdc25C on Serine 216. *Science* 277: 1501-1505.
6. Kostub, C.F., Knudsen, K., Subramani, S., and Enoch, T. 1998. Hus1p, a conserved fission yeast checkpoint protein, interacts with Rad1p and is phosphorylated in response to DNA damage. *EMBO J.* 17: 2055-2066.
7. Wang, X., Guan, J., Hu, B., Weiss, R.S., Iliakis, G., Wang, Y. 2004. Involvement of Hus1 in the chain elongation step of DNA replication after exposure to camptothecin or ionizing radiation. *Nucleic Acids Res.* 32:767-775.
8. Smirnova, E., Toueille, M., Markkanen, E., Hubscher, U. 2005. The human checkpoint sensor and alternative DNA clamp Rad9-Rad1-Hus1 modulates the activity of DNA ligase I, a component of the long-patch base excision repair machinery. *Biochem. J.* 389 (Part 1): 13-17.
9. Helt, C.E., Wang, W., Keng, P.C., Bambara, R.A. 2005. Evidence that DNA damage detection machinery participates in DNA repair. *Cell Cycle* 4: 529-532.
10. Levitt, P.S., Liu, H., Manning, C., Weiss, R.S. 2005. Conditional inactivation of the mouse Hus1 cell cycle checkpoint gene. *Genomics* 86: 212-224.

### SOURCE

Hus1 (1-281) is expressed in *E. coli* as a 37 kDa tagged fusion protein corresponding to amino acids 1-281 of Hus1 of human origin.

### PRODUCT

Hus1 (1-281) is purified from bacterial lysates (>98%) by glutathione agarose affinity chromatography; supplied as 10 µg in 0.1 ml SDS-PAGE loading buffer.

### APPLICATIONS

Hus1 (1-281) is suitable as a Western blotting control for sc-8323.

### STORAGE

Store at -20° C; stable for one year from the date of shipment.

### RESEARCH USE

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