

# Mat1 (1-309): sc-4237 WB

## BACKGROUND

Progression through the cell cycle requires activation of a series of enzymes designated cyclin dependent kinases (Cdks). The monomeric catalytic subunit, Cdk2, a critical enzyme for initiation of cell cycle progression, is completely inactive. Partial activation is achieved by the binding of regulatory cyclins such as cyclin D1, while full activation requires phosphorylation at Thr 160. The enzyme responsible for phosphorylation of Cdk2 on Thr 160 and also Cdc2 on Thr 161, designated Cdk-activating kinase (CAK), has been partially purified and shown to be comprised of a 42 kDa catalytic subunit, a 37 kDa regulatory subunit and a 36 kDa subunit of unknown function. The regulatory subunit is a novel cyclin (cyclin H) and is required for activation of Cdk7. This previously undescribed protein, now termed Mat1 p36, has been cloned as a protein that associates with the cyclin H-Cdk7 nuclear complex at all stages of the cell cycle. Cyclin H-Cdk7-Mat1 p36 complexes display kinase activity towards Cdk activation domains and the carboxy terminus of RNA polymerase II. Mat1 p36 appears to constitute the first example of an assembly factor essential for the formation of an active Cdk-cyclin complex.

## REFERENCES

1. Nurse, P. 1994. Ordering S phase and M phase in the cell cycle. *Cell* 79: 547-550.
2. Sherr, C.J. 1994. G<sub>1</sub> phase progression: cycling on cue. *Cell* 79: 551-555.
3. Hunter, T. and Pines, J. 1994. Cyclins and cancer II: cyclin D and Cdk inhibitors come of age. *Cell* 79: 573-582.
4. Kato, J.Y., Matsuoaka, M., Strom, D.K., and Sherr, C.J. 1994. Regulation of cyclin D-dependent kinase 4 (Cdk4) by Cdk4-activating kinase. *Mol. Cell. Biol.* 14: 713-721.
5. Matsuoaka, M., Kato, J.Y., Fisher, R.P., Morgan, D.O., and Sherr, C.J. 1994. Activation of cyclin-dependent kinase 4 (Cdk4) by mouse MO15-associated kinase. *Mol. Cell. Biol.* 14: 7265-7275.
6. Fisher, R.P., Jin, P., Chamberlin, H.M., and Morgan, D.O. 1995. Alternative mechanisms of CAK assembly require an assembly factor or an activating kinase. *Cell* 83: 47-57.
7. Yee, A., Nichols, M.A., Wu, L., Hall, F.L., Kobayashi, R., and Xiong, Y. 1995. Molecular cloning of Cdk7-associated human Mat1, a cyclin-dependent kinase-activating kinase (CAK) assembly factor. *Cancer Res.* 55: 6058-6062.
8. Tassan, J.P., Jaquenoud, M., Fry, A.M., Frutiger, S., Hughes, G.J., and Nigg, E.A. 1995. *In vitro* assembly of a functional human CDK7-cyclin H complex requires Mat1, a novel 36 kDa RING finger protein. *EMBO J.* 14: 5608-5617.

## SOURCE

Mat1 (1-309) is expressed in *E. coli* as a 38 kDa polyhistidine tagged fusion protein corresponding to amino acids 1-309 of human origin.

## PRODUCT

Mat1 (1-309) is purified from bacterial lysates (> 98%) by Ni<sup>++</sup> column chromatography; supplied as 10 µg in 0.1 ml SDS-PAGE loading buffer.

## APPLICATIONS

Mat1 (1-309) is suitable as a Western blotting control for sc-1600, sc-1601, sc-6234 and sc-6235.

## SELECT PRODUCT CITATIONS

1. Acevedo-Duncan, M., Patel, R., Whelan, S. and Bicaku E. 2002. Human glioma PKC- $\iota$  and PKC- $\beta$ II phosphorylate cyclin-dependent kinase activating kinase during the cell cycle. *Cell Prolif.* 35: 23-36.

## 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.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) or our catalog for detailed protocols and support products.