



## GAK (1-360): sc-4257 WB

### BACKGROUND

Cyclins are the regulatory subunits of Cdc2 p34 and related cyclin-dependent kinases (Cdks) which play critical roles in the control of cell cycle progression. The catalytic subunit for cyclin A and B is Cdc2 p34 kinase. The Cdc2-cyclin B complex controls the G<sub>2</sub> to M transition whereas Cdc2-cyclin A regulates S phase progression. The G<sub>1</sub> to S transition, however, appears to be controlled by the G<sub>1</sub> cyclins. Cyclin D1 accumulates during G<sub>1</sub> and associates with Cdk2, Cdk4 and Cdk5. Cyclin E and Cdk2 interact during the G<sub>1</sub> to S transition. Cyclin G contains a typical N terminal cyclin box and a carboxy terminal domain sequence homologous to the tyrosine phosphorylation site of the epidermal growth factor receptor. Cyclin G expression is induced within three hours after growth stimulation and remains elevated with no apparent cell cycle dependency. A serine/threonine kinase, designated GAK for cyclin G associated kinase, has been identified. GAK has been shown to bind directly to cyclin G and to co-immunoprecipitate with Cdk5, which also associates with cyclin G.

### REFERENCES

1. Pines, J. and Hunter, T. 1990. Human cyclin A is adenovirus E1A associated protein p60 and behaves differently from cyclin B. *Nature* 346: 760-763.
2. Fang, F. and Newport, J.W. 1991. Evidence that the G<sub>1</sub>-S and G<sub>2</sub>-M transitions are controlled by different Cdc2 proteins in higher eukaryotes. *Cell* 66: 731-742.
3. Girard, F., Strausfeld, U., Fernandez, A., and Lamb, N.J.C. 1991. Cyclin A is required for the onset of DNA replication in mammalian fibroblasts. *Cell* 67: 1169-1179.
4. Koff, A., Cross, F., Fisher, A., Schumacher, J., Leguellec, K., Phillippe, M., and Roberts, J.M. 1991. Human cyclin E, a new cyclin that interacts with two members of the Cdc2 gene family. *Cell* 66: 1217-1228.
5. Matsushime, H., Ewen, M.E., Strom, D.K., Kato, J., Hanks, S.K., Rousel, M.F., and Sherr, C.J. 1992. Identification and properties of an atypical catalytic subunit (p34PSK-J3/Cdk4) for mammalian D type G<sub>1</sub> cyclins. *Cell* 71: 323-334.
6. Xiong, Y., Zhang, H., and Beach, D. 1992. D type cyclins associate with multiple protein kinases and the DNA replication and repair factor PCNA. *Cell* 71: 505-514.
7. Tamura, K., Kanaoka, Y., Jinno, S., Nagata, A., Ogiso, Y., Shimizu, K., Hayakawa, T., Nojima, H., and Okayama, H. 1993. Cyclin G: a new mammalian cyclin with homology to fission yeast Cig1. *Oncogene* 8: 2113-2118.
8. Kanaoka, Y., Kimura, S.H., Okazaki, I., Ikeda, M., and Nojima, H. 1997. GAK: a cyclin G associated kinase contains a tensin/auxilin-like domain. *FEBS Lett.* 402: 73-80.

### SOURCE

GAK (1-360) is expressed in *E. coli* as a 48 kDa tagged fusion protein corresponding to amino acids 323-514 of GAK of mouse origin.

### PRODUCT

GAK (1-360) is purified from bacterial lysates (>98%) by glutathione agarose affinity chromatography; supplied as 10 µg in 0.1 ml SDS-PAGE loading buffer.

### APPLICATIONS

GAK (1-360) is suitable as a Western blotting control for sc-7864.

### 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.