Revision 1

Store at -20C

#8960

Thymidine Kinase 1 Antibody

Cell Signaling TECHNOLOGY®

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For Research Use Only. Not for Use in Diagnostic Procedures.

Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
W, IP	H Mk	Endogenous	26	Rabbit	#P04183	7083

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	1:50

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA and 50% glycerol. Store at –20°C. Do not aliquot the antibody.

Specificity/Sensitivity

Thymidine Kinase 1 Antibody recognizes endogenous levels of total TK1 protein. This antibody does not cross-react with TK2 protein.

Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Gly213 of human TK1 protein. Antibodies are purified by protein A and peptide affinity chromatography.

Background

Thymidine kinases play a critical role in generating the DNA synthetic precursor deoxythymidine triphosphate (dTTP) by catalyzing the phosphotransfer of phosphate from ATP to deoxythymidine (dT) and thymidine (T) in the cell. There are two known thymidine kinases, cytoplasmic thymidine kinase 1 (TK1) and mitochondrial thymidine kinase 2 (TK2) (1,2). Unlike TK2, which is not modulated by the cell cycle, TK1 expression and activity is regulated in a cell cycle-dependent manner, accumulating during G1-phase to peak levels in S-phase before being degraded prior to cell division (3,4). Stability, but not activity, may be regulated via phosphorylation of TK1 at Ser13 by Cdc2 and/or Cdk2, but the precise mode of regulation remains elusive (5). These observations indicate that TK1 might be a useful marker of cell proliferation; however, recent studies have shown that TK1 plays a more significant role in the DNA damage response (6). Genotoxic stress promotes increased TK1 expression and kinase activity resulting in reduced cellular apoptosis and enhanced DNA repair efficiency (6). More importantly, numerous studies show that TK1 expression and activity are upregulated during neoplasia and disease progression in humans, and increased serum levels of TK1 correlate with poor prognosis and decreased survival in patients with various types of advanced tumors (7-12).

Background References

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4. Littlefield, J.W. (1966) *Biochim Biophys Acta* 114, 398-403.
5. Chang, Z.F. et al. (1998) *J Biol Chem* 273, 12095-100.
6. Chen, Y.L. et al. (2010) *J Biol Chem* 285, 27327-35.
7. Hannigan, B.M. et al. (1993) *Cancer Biother* 8, 189-97.
8. Pan, Z.L. et al. (2010) *J Cancer Res Clin Oncol* 136, 1193-9.
9. Chen, Y. et al. (2010) *Int J Clin Oncol* 15, 359-68.
10. Konoplev, S.N. et al. (2010) *Am J Clin Pathol* 134, 472-7.
11. Xu, Y. et al. (2012) *Tumour Biol* 33, 475-83.
12. Alegre, M.M. et al. (2012) *J Oncol* 2012, 575647.

Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

Applications Key

W: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: Human **Mk:** Monkey

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