Phospho-MEK1 (Thr292) Antibody

Cat. No. CG1306

Applications:	**WB, IHC, ELISA**
Detected MW:	**43 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Rabbit IgG**

BACKGROUND

Extracellular signal-regulated protein kinases (ERKs) are members of the mitogen-activated protein kinase (MAPK) family and play an important role in intracellular signaling pathways that lead to the division or differentiation of a number of cell types. This is probably attributable to their ability to phosphorylate a variety of transcription factors and other signaling and structural proteins. Three closely related mammalian ERKs have been identified with ERK1 and ERK2 being the most widely distributed. ERKs are in turn activated by highly specific MAPK (or ERK) kinases (MEK1 or MEK2). Both MEK1 and MEK2 are closely related, dual-specificity tyrosine/threonine protein kinases. They activate ERKs by phosphorylation of a Tyr and a Thr residue in a conserved TEY motif. MEKs and ERKs are activated through protein-tyrosine kinase- and G protein-coupled receptors. The tyrosine kinase-mediated activation involves Ras and the MEK kinase c-Raf, which phosphorylates Ser217 and Ser221 in MEK1 (or corresponding Ser residues in other MEKs). Approximately 30% of all human cancers have a constitutively activated MAPK pathway, and constitutive activation of MEK1 results in cellular transformation. In addition, MEK can be activated by Mos and Tpl2 in some specific cells.[1]

MEK signaling was regulated by both phosphorylation and scaffolding proteins. Except for the Raf, Mos, and Tpl2, several other kinases were found to phosphorylated MEK. MEKK1 has been implicated in regulation of a parallel but distinct cascade that leads to phosphorylation of JNK. It was shown that MEKK1 can interact and phosphorylate both MEK1 and MEK2, but cannot activate downstream ERK2. Thus, other mechanisms may be involved in determining information flow through the MAP kinase and related pathways.[2] In addition, it was found that phosphorylation of S298 of MEK1 by p21-activated kinase (PAK) is a site of convergence for integrin and growth factor signaling, which is influenced by FAK and Src signaling. It is suggested that FAK/Src-dependent, PAK1-mediated phosphorylation of MEK1 on S298 is central to the organization and localization of active Raf–MEK1–MAPK signaling complexes, and that formation of such complexes contributes to the adhesion dependence of growth factor signaling to MAPK.[3] However, phosphorylation of Thr286 on MEK1 by Cdk5 and Thr286 and Thr292 by Cyclin B-Cdc2 resulted in inhibition of MEK1 kinase activity and ERK1/2 activation.[4,5] On the other hand, The scaffolding protein KSR constitutively binds to MEK. In response to mitogenic stimulation, the KSR/MEK complex is recruited from the cytosol to the cell membrane, where it can now interact with activated Raf-1 and ERK to facilitate the signal flux through the kinase module Raf →MEK →ERK. Another example is MP-1, a small scaffold that ties MEK and ERK together. MP-1 also binds to p14, an endosomal protein, which targets the MEK/ERK/MP-1 signalling complex to late endosomes.[6]

References:
1. Zheng, C.F. & Guan, K.F.: EMBO J. 13:1123:31, 1994
2. Xu, S. et al: Proc. Natl. Acad. Sci. USA 92:6808-12, 1995
3. Slack-Davis, J.K. et al: J. Cell Biol. 162:281-91, 2003
4. Sharma, P. et al: J. Biol. Chem. 277:528-34, 2002
5. Harding, A. et al: J. Biol. Chem. 278:16747-54, 2003
6. O'Neil, E. & Kolch, W. : Br. J. Cancer 90:283-8, 2004

TECHNICAL INFORMATION

Source:
Phospho-MEK1 (Thr292) Antibody is a rabbit antibody raised against a short peptide from human MEK1 sequence surrounding and containing phospho-Thr292.

Specificity and Sensitivity:
This antibody detects endogenous phosphorylated MEK1 (Thr292) proteins without cross-reactivity with other family members.

Storage Buffer: Rabbit IgG in phosphate buffered saline (without Mg2+ and Ca2+), pH 7.4, 150mM NaCl, 0.02% sodium azide and 50% glycerol.

Storage:
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

APPLICATIONS

Application:	*Dilution:
WB	1:500-1:1,000
IP	n/d
IHC	1:50-1:100
ICC	n/d
FACS	n/d
ELISA	1:10,000

**Optimal dilutions must be determined by end user.*

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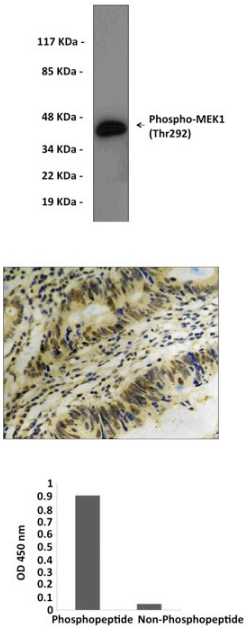
QUALITY CONTROL DATA



Top: Western blot analysis of extracts from K562 cells.
Middle: Immunohistochemistry analysis of paraffin-embedded Human colon carcinoma.
Bottom: ELISA for Immunogen Phosphopeptide (left) and Non-Phosphopeptide (right).