

# p-CaMKI (Thr 177)-R: sc-28438-R

## BACKGROUND

The  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinases (CaM kinases) are a structurally related subfamily of serine/threonine kinases that includes CaMKI, CaMKII and CaMKIV. CaMKII is a ubiquitously expressed serine/threonine protein kinase that is activated by  $\text{Ca}^{2+}$  and calmodulin (CaM) and has been implicated in regulation of the cell cycle and transcription. There are four CaMKII isozymes, designated  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\delta$ , which may or may not be co-expressed in the same tissue type. CaMKIV is stimulated by  $\text{Ca}^{2+}$  and CaM, but phosphorylation by a CaMK is also required for full activation. Stimulation of the T cell receptor CD3 signaling complex with an anti-CD3 monoclonal antibody leads to a 10-40 fold increase in CaMKIV activity. An additional kinase, CaMKK, functions to activate CaMKI through the specific phosphorylation of the regulatory threonine residue at position 177.

## REFERENCES

1. Tombes, R.M., et al. 1995.  $\text{G}_1$  cell cycle arrest apoptosis are induced in NIH/3T3 cells by KN-93, an inhibitor of CaMKII (the multifunctional  $\text{Ca}^{2+}$ /CaM kinase). *Cell Growth Differ.* 6: 1063-1070.
2. Hama, N., et al. 1995. Calcium/calmodulin-dependent protein kinase II down-regulates both calcineurin and protein kinase c-mediated pathways for cytokine gene transcription in human T cells. *J. Exp. Med.* 181: 1217-1222.
3. Baltas, L.G., et al. 1995. The cardiac sarcoplasmic reticulum phospholamban kinase is a distinct  $\delta$ -CaM kinase isozyme. *FEBS Lett.* 373: 71-75.
4. Tokumitsu, H., et al. 1995. Characterization of a CaM-kinase cascade: molecular cloning and expression of calcium/calmodulin-dependent protein kinase kinase. *J. Biol. Chem.* 270: 19320-19324.
5. Park, I.K., et al. 1995. Activation of  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinase (CaM-kinase) IV by CaM-kinase kinase in Jurkat T lymphocytes. *J. Biol. Chem.* 270: 30464-30469.
6. Tashima, K., et al. 1996. Overexpression of  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinase II inhibits neurite outgrowth of PC-12 cells. *J. Neurochem.* 66: 57-64.

## CHROMOSOMAL LOCATION

Genetic locus: CAMK1 (human) mapping to 3p25.1; Camk1 (mouse) mapping to 6 E3.

## SOURCE

p-CaMKI (Thr 177)-R is a rabbit polyclonal antibody raised against a short amino acid sequence containing phosphorylated Thr 177 of CaMKI of human origin.

## STORAGE

Store at  $4^{\circ}\text{C}$ , \*\*DO NOT FREEZE\*\*. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

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

## PRODUCT

Each vial contains 200  $\mu\text{g}$  IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-28438 P, (100  $\mu\text{g}$  peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

## APPLICATIONS

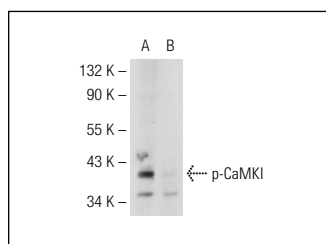
p-CaMKI (Thr 177)-R is recommended for detection of Thr 177 phosphorylated CaMKI of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu\text{g}$  per 100-500  $\mu\text{g}$  of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for CaMKI siRNA (h): sc-38947, CaMKI siRNA (m): sc-38948, CaMKI shRNA Plasmid (h): sc-38947-SH, CaMKI shRNA Plasmid (m): sc-38948-SH, CaMKI shRNA (h) Lentiviral Particles: sc-38947-V and CaMKI shRNA (m) Lentiviral Particles: sc-38948-V.

Molecular Weight of p-CaMKI: 45 kDa.

Positive Controls: HL-60 whole cell lysate: sc-2209, mouse brain extract: sc-2253 or HeLa whole cell lysate: sc-2200.

## DATA



p-CaMKI (Thr 177)-R: sc-28438-R. Western blot analysis of CaMKI phosphorylation in untreated (A) and  $\lambda$  protein phosphatase treated (B) HeLa whole cell lysates.

## SELECT PRODUCT CITATIONS

1. Si, J., et al. 2008. Activated  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinase II is a critical regulator of myeloid leukemia cell proliferation. *Cancer Res.* 68: 3733-3742.
2. Tinsley, C.J., et al. 2011. A role for the CAMKK pathway in visual object recognition memory. *Hippocampus*. E-Published.
3. Egawa, T., et al. 2011. Caffeine activates preferentially  $\alpha$ 1-isoform of 5'AMP-activated protein kinase in rat skeletal muscle. *Acta Physiol.* 201: 227-238.
4. Abbott, M.J., et al. 2011. AMPK $\alpha$ 2 deficiency uncovers time dependency in the regulation of contraction-induced palmitate and glucose uptake in mouse muscle. *J. Appl. Physiol.* 111: 125-134.