Revision 1

#70307 Store at -20C

Phospho-CAD (Ser1859) (D5O6C) Rabbit mAb

Cell Signaling TECHNOLOGY®

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Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
WB, IF-IC	H M R	Endogenous	240	Rabbit IgG	#P27708	790

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunofluorescence (Immunocytochemistry)	1:50

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at –20°C. Do not aliquot the antibody.

Specificity / Sensitivity

Phospho-CAD (Ser1859) (D5O6C) Rabbit mAb recognizes endogenous levels of CAD protein only when phosphorylated at Ser1859.

Source / Purification

Monoclonal antibody is produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Ser1859 of human CAD protein.

Background

CAD is essential for the *de novo* synthesis of pyrimidine nucleotides and possesses the following enzymatic activities: glutamine amidotransferase, carbamoyl-phosphate synthetase, aspartate transcarbamoylase, and dihydroorotase. Thus, the enzyme converts glutamine to uridine monophosphate, a common precursor of all pyrimidine bases, and it is necessary for nucleic acid synthesis (1). In resting cells, CAD is localized mainly in the cytoplasm where it carries out pyrimidine synthesis. As proliferating cells enter S phase, MAP Kinase (Erk1/2) phosphorlyates CAD at Thr456, resulting in CAD translocation to the nucleus. As cells exit S phase, CAD is dephosphorylated at Thr456 and phosphorylated at Ser1406 by PKA, returning the pathway to basal activity (2). Various research studies have shown increased expression of CAD in several types of cancer, prompting the development of pharmacological inhibitors such as PALA. Further studies have identified CAD as a potential predictive early marker of prostate cancer relapse (3).
mTORC1 is a protein kinase that works to regulate the growth and proliferation of cells by sensing and integrating various growth signals. S6 kinase 1 (S6K1) is a downstream ribosomal protein target of mTORC1 and directly phosphorylates Ser1859 on CAD. This phosphorylation stimulates the first three steps of the *de novo* primidine synthesis and thus helps to advance the cells' overall progression through S phase of the cell cycle (4,5).

Background References

1. Coleman, P.F. et al. (1977) *J Biol Chem* 252, 6379-85.
2. Sigoillot, F.D. et al. (2005) *J Biol Chem* 280, 25611-20.
3. Morin, A. et al. (2012) *FASEB J* 26, 460-7.
4. Ben-Sahra, I. et al. (2013) *Science* 339, 1323-8.
5. Robitaille, A.M. et al. (2013) *Science* 339, 1320-3.

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

WB: Western Blotting **IF-IC:** Immunofluorescence (Immunocytochemistry)

Cross-Reactivity Key

H: human **M:** mouse **R:** rat **Hm:** hamster **Mk:** monkey **Vir:** virus **Mi:** mink **C:** chicken **Dm:** D. melanogaster **X:** Xenopus **Z:** zebrafish **B:** bovine **Dg:** dog **Pg:** pig **Sc:** S. cerevisiae **Ce:** C. elegans **Hr:** horse **GP:** Guinea Pig **Rab:** rabbit **All:** all species expected

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