PCK1 (Phospho-Ser90) Antibody

#58006

Number: 58006-1, 58006-2

Amount: 50μg/50μl, 100μg/100μl

Accession No. :NCBI Gene ID: 5105

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

Storage/Stability: Store at -20℃/1 year

Immunogen: The antiserum was produced against synthesized phosphopeptide derived from Human PCK1 around the phosphorylation site of serine90 .

Purification: The antibody was affinity-purified from rabbit antiserum by affinity-chromatography using epitope-specific phosphopeptide. The antibody against non-phosphopeptide was removed by chromatography using non-phosphopeptide corresponding to the phosphorylation site.

Specificity/Sensitivity:PCK1(Phospho-Ser90) antibody detects endogenous levels of PCK1 only when phosphorylated at serine90 .

Reactivity: Human

Applications:

Predicted MW: 70 KD

WB **:**1:500~1:1000 IHC:1:50-100

Background :

Phosphoenolpyruvate carboxykinase (PCK) is the rate-limiting enzyme of gluconeogenesis in the liver and kidney and converts oxaloacetate and GTP into phosphoenolpyruvate (PEP) and CO2 by adding a phosphate to pyruvate with concomitant aldol cleavage of CO2 from oxaloacetate [1,2]. In humans, cytosolic PCK1 shares 63.4% sequence identity with PCK2, which is located in the mitochondria [3]. Aberrant PCK expression occurs in many cancers. For instance, PCK1 is overexpressed in melanoma and colorectal cancer, and PCK2 is highly expressed in breast, colon and lung cancer cells[4-8]. In a recent study, it is reported that AKT in tumor cells phosphorylates cytosolic phosphoenolpyruvate carboxykinase 1 (PCK1) at S90[9]. Phosphorylated PCK1 translocates to the ER, where PCK1 uses GTP as a phosphate donor to phosphorylate Insig1 S207 and Insig2 S151. This phosphorylation reduces the binding of sterol to Insig1/2 and disrupts Insig-SCAP interaction, leading to SCAP/SREBP1 translocation to the Golgi apparatus and subsequent SREBP1 activation and downstream gene transcription for lipogenesis, tumor cell proliferation, and tumorigenesis in mice[9].

References:

1 Rohrig, F. & Schulze, A. The multifaceted roles of fatty acid synthesis in cancer. Nat Rev Cancer 16, 732-749, doi:10.1038/nrc.2016.89 (2016).

2 Burgess, S. C. et al. Cytosolic phosphoenolpyruvate carboxykinase does not solely control the rate of hepatic gluconeogenesis in the intact mouse liver. Cell metabolism 5, 313-320, doi:10.1016/j.cmet.2007.03.004 (2007).

3 Mendez-Lucas, A., Hyrossova, P., Novellasdemunt, L., Vinals, F. & Perales, J. C. Mitochondrial phosphoenolpyruvate carboxykinase (PEPCK-M) is a pro-survival, endoplasmic reticulum (ER) stress response gene involved in tumor cell adaptation to nutrient availability. J Biol Chem 289, 22090-22102, doi:10.1074/jbc.M114.566927 (2014).

4 Montal, E. D. et al. PEPCK Coordinates the Regulation of Central Carbon Metabolism to Promote Cancer Cell Growth. Mol Cell 60, 571-583, doi:10.1016/j.molcel.2015.09.025 (2015).

5 Vincent, E. E. et al. Mitochondrial Phosphoenolpyruvate Carboxykinase Regulates Metabolic Adaptation and Enables Glucose-Independent Tumor Growth. Mol Cell 60, 195-207, doi:10.1016/j.molcel.2015.08.013 (2015).

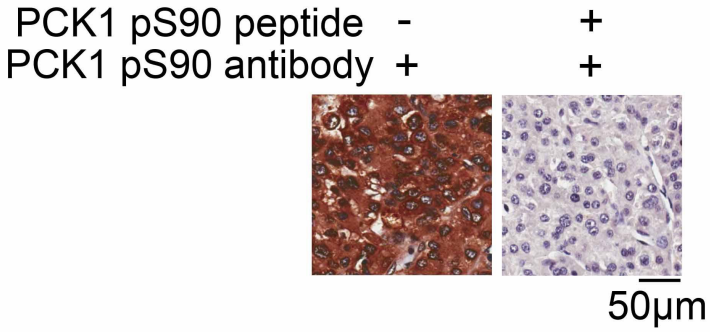
6 Li, Y. et al. Upregulation of cytosolic phosphoenolpyruvate carboxykinase is a critical metabolic event in melanoma cells that repopulate tumors. Cancer Res 75, 1191-1196, doi:10.1158/0008-5472.CAN-14-2615 (2015).

7 Zhao, J., Li, J., Fan, T. W. M. & Hou, S. X. Glycolytic reprogramming through PCK2 regulates tumor initiation of prostate cancer cells. Oncotarget 8, 83602-83618, doi:10.18632/oncotarget.18787 (2017).

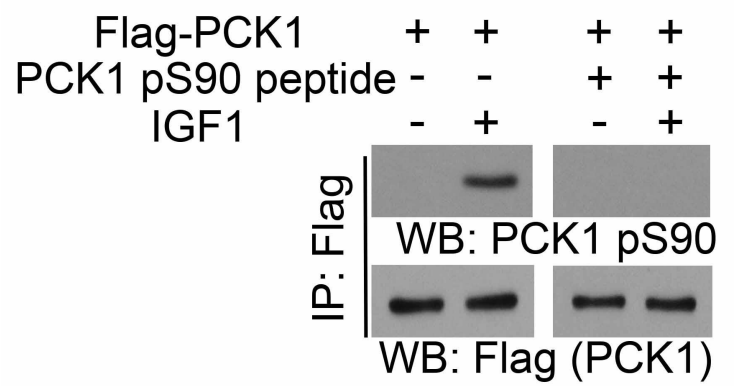
8 Gao, Y. et al. Quantitative proteomics by SWATH-MS reveals sophisticated metabolic reprogramming in hepatocellular carcinoma tissues. Sci Rep 7, 45913, doi:10.1038/srep45913 (2017).

9 Xu, D., et al., The gluconeogenic enzyme PCK1 phosphorylates INSIG1/2 for lipogenesis. Nature, 2020. 580(7804): p. 530-535.

Application in this Article



IHC analyses of human HCC samples were performed with the indicated antibodies in the presence or absence of a PCK1 pS90 blocking peptide.



Huh7 cells expressing Flag-PCK1 were treated with or without IGF1 (100 ng/ml) for 1 h. Immunoprecipitation and immunoblotting analyses were performed with the indicated antibodies in the presence or absence of a PCK1 pS90 blocking peptide.