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PDK4 Antibody (C-term)

Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AP7041B

Product Information

Application	WB, IHC-P, IF, E
Primary Accession	Q16654
Reactivity	Human, Mouse, Rat
Predicted	Bovine, Canine, Rabbit
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	46469
Antigen Region	382-410

Additional Information

Gene ID	5166
Other Names	[Pyruvate dehydrogenase (acetyl-transferring)] kinase isozyme 4, mitochondrial, Pyruvate dehydrogenase kinase isoform 4, PDK4, PDHK4
Target/Specificity	This PDK4 antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 382-410 amino acids from the C-terminal region of human PDK4.
Dilution	WB~~1:2000 IHC-P~~1:100~500 IF~~1:100 E~~Use at an assay dependent concentration.
Format	Purified polyclonal antibody supplied in PBS with 0.09% (W/V) sodium azide. This antibody is prepared by Saturated Ammonium Sulfate (SAS) precipitation followed by dialysis against PBS.
Storage	Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	PDK4 Antibody (C-term) is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	PDK4
Synonyms	PDHK4
Function	Kinase that plays a key role in regulation of glucose and fatty acid

	metabolism and homeostasis via phosphorylation of the pyruvate dehydrogenase subunits PDHA1 and PDHA2. This inhibits pyruvate dehydrogenase activity, and thereby regulates metabolite flux through the tricarboxylic acid cycle, down-regulates aerobic respiration and inhibits the formation of acetyl-coenzyme A from pyruvate. Inhibition of pyruvate dehydrogenase decreases glucose utilization and increases fat metabolism in response to prolonged fasting and starvation. Plays an important role in maintaining normal blood glucose levels under starvation, and is involved in the insulin signaling cascade. Via its regulation of pyruvate dehydrogenase activity, plays an important role in maintaining normal blood pH and in preventing the accumulation of ketone bodies under starvation. In the fed state, mediates cellular responses to glucose levels and to a high-fat diet. Regulates both fatty acid oxidation and de novo fatty acid biosynthesis. Plays a role in the generation of reactive oxygen species. Protects detached epithelial cells against anoikis. Plays a role in cell proliferation via its role in regulating carbohydrate and fatty acid metabolism.
Cellular Location	Mitochondrion matrix.
Tissue Location	Ubiquitous; highest levels of expression in heart and skeletal muscle.

Background

PDK4 inhibits the mitochondrial pyruvate dehydrogenase complex by phosphorylation of the E1 alpha subunit, thus contributing to the regulation of glucose metabolism.

References

References for protein:
1. Rosa, G., et al., Obes. Res. 11(2):176-182 (2003).
2.Razeghi, P., et al., Cardiology 97(4):203-209 (2002).
3.Rowles, J., et al., J. Biol. Chem. 271(37):22376-22382 (1996).
4.Gudi, R., et al., J. Biol. Chem. 270(48):28989-28994 (1995).

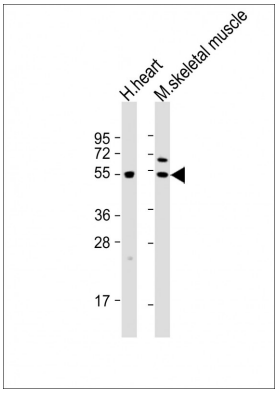
References for HeLa cell line:
1. Scherer WF, Syverton JT, Gey GO (May 1953). "Studies on the propagation in vitro of poliomyelitis viruses. IV. Viral multiplication in a stable strain of human malignant epithelial cells (strain HeLa) derived from an epidermoid carcinoma of the cervix". J. Exp. Med. 97 (5): 695–710. [PubMed:13052828].

2. Macville M, Schr□ck E, Padilla-Nash H, Keck C, Ghadimi BM, Zimonjic D, Popescu N, Ried T (January 1999). "Comprehensive and definitive molecular cytogenetic characterization of HeLa cells by spectral karyotyping". Cancer Res. 59 (1): 141–50. [PubMed: 9892199].
3. Rahbari R, Sheahan T, Modes V, Collier P, Macfarlane C, Badge RM (April 2009). "A novel L1 retrotransposon marker for HeLa cell line identification". BioTechniques 46 (4): 277–84. [PubMed: 19450234].

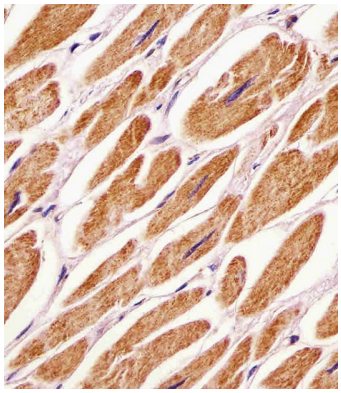
4. Capes-Davis A, Theodosopoulos G, Atkin I, Drexler HG, Kohara A, MacLeod RA, Masters JR, Nakamura Y, Reid YA, Reddel RR, Freshney RI (July 2010). "Check your cultures! A list of cross-contaminated or misidentified cell lines". Int. J. Cancer 127 (1): 1–8. [PubMed:20143388].

Images

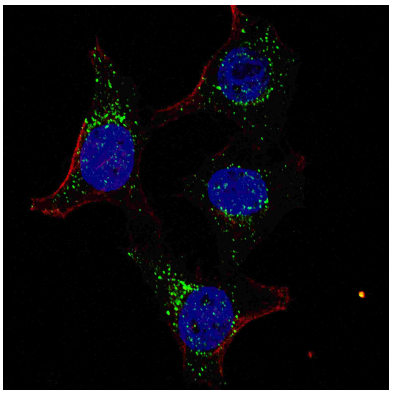
All lanes : Anti-PDK4 Antibody (C396) at 1:2000 dilution
Lane 1: human heart lysates Lane 2: mouse skeletal



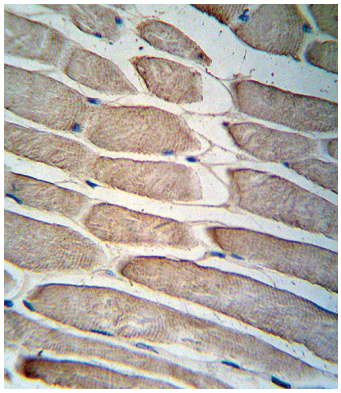
muscle lysates Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/10000 dilution Predicted band size : 46 kDa Blocking/Dilution buffer: 5% NFDM/TBST.



AP7041b staining PDK4 in human heart tissue sections by Immunohistochemistry (IHC-P - paraformaldehyde-fixed, paraffin-embedded sections). Tissue was fixed with formaldehyde and blocked with 3% BSA for 0. 5 hour at room temperature; antigen retrieval was by heat mediation with a citrate buffer (pH6). Samples were incubated with primary antibody (1/25) for 1 hours at 37°C. A undiluted biotinylated goat polyvalent antibody was used as the secondary antibody.

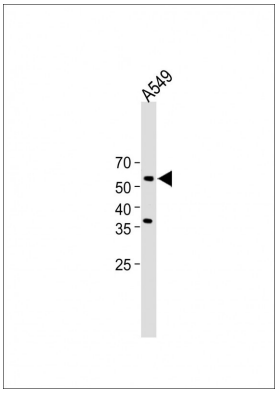


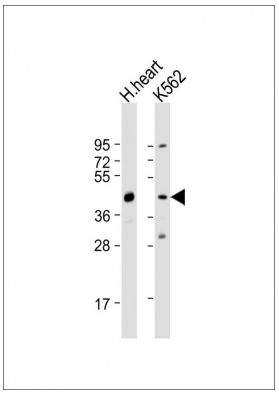
Fluorescent confocal image of HeLa cells stained with PDK4 (C-term) antibody. HeLa cells were fixed with 4% PFA (20 min), permeabilized with Triton X-100 (0.2%, 30 min). Cells were then incubated with AP7041b PDK4 (C-term) primary antibody (1:100, 2 h at room temperature). For secondary antibody, Alexa Fluor® 488 conjugated donkey anti-rabbit antibody (green) was used (1:1000, 1h). Nuclei were counterstained with Hoechst 33342 (blue) (10 µg/ml, 5 min). Note the highly specific localization of the PDK4 mainly to the cytoplasm.



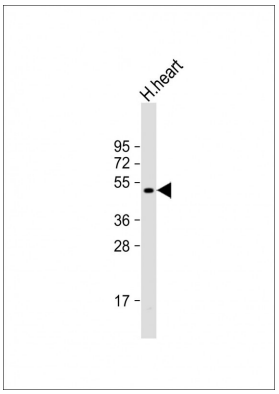
Formalin-fixed and paraffin-embedded human skeletal muscle reacted with PDK4 Antibody (C-term) (Cat. #AP7041b), which was peroxidase-conjugated to the secondary antibody, followed by DAB staining. This data demonstrates the use of this antibody for immunohistochemistry; clinical relevance has not been evaluated.

All lanes : Anti-PDK4 Antibody (C-term) at 1:1000 dilution Lane 1: A549 whole cell lysate Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated (ASP1615) at 1/15000 dilution. Observed band size : 50kDa Blocking/Dilution buffer: 5% NFDM/TBST.

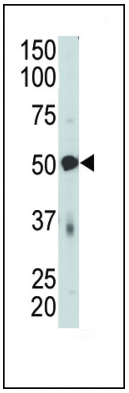




All lanes : Anti-PDK4 Antibody (C-term) at 1:2000 dilution Lane 1: human heart lysate Lane 2: K562 whole cell lysate Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/10000 dilution. Predicted band size : 46 kDa Blocking/Dilution buffer: 5% NFDM/TBST.

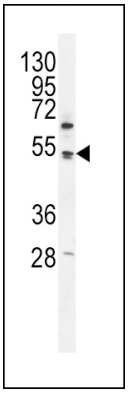


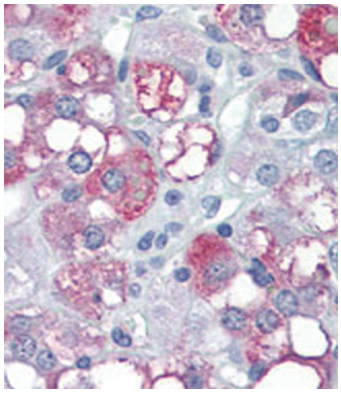
Anti-PDK4 Antibody (C-term) at 1:2000 dilution + human heart lysate Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/10000 dilution. Predicted band size : 46 kDa Blocking/Dilution buffer: 5% NFDM/TBST.



The PDK4 Antibody (C-term) (Cat# AP7041b) is used in Western blot to detect PDK4 in mouse skeletal muscle tissue lysate.

PDK4 Antibody (C396) (Cat. #AP7041b) western blot analysis in K562 cell line lysates (35ug/lane).This demonstrates the PDK4 antibody detected the PDK4 protein (arrow).





Formalin-fixed and paraffin-embedded human Adrenal tissue reacted with PDK4 Antibody (C-term) (Cat. #AP7041b), which was peroxidase-conjugated to the secondary antibody, followed by AEC staining. This data demonstrates the use of this antibody for immunohistochemistry; clinical relevance has not been evaluated.

Citations

- Aldosterone from endometrial glands is benefit for human decidualization
- Dietary supplementation with vitamin E and C attenuates dexamethasone-induced glucose intolerance in rats.
- PDH activation during in vitro muscle contractions in PDH kinase 2 knockout mice: effect of PDH kinase 1 compensation.
- Differential expression of metabolic genes essential for glucose and lipid metabolism in skeletal muscle from spinal cord injured subjects.
- Intrinsic protein kinase activity in mitochondrial oxidative phosphorylation complexes.
- Adaptive gene regulation of pyruvate dehydrogenase kinase isoenzyme 4 in hepatotoxic chemical-induced liver injury and its stimulatory potential for DNA repair and cell proliferation.
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- Type 1 diabetic cardiomyopathy in the Akita (Ins2WT/C96Y) mouse model is characterized by lipotoxicity and diastolic dysfunction with preserved systolic function.
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- CD36-dependent regulation of muscle FoxO1 and PDK4 in the PPAR delta/beta-mediated adaptation to metabolic stress.
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- Glucose oxidation modulates anoikis and tumor metastasis.
- Kruppel-like factor 15 regulates skeletal muscle lipid flux and exercise adaptation.
- Altered regulation of PDK4 expression promotes antiestrogen resistance in human breast cancer cells.
- Diacylglycerol kinase-δ regulates AMPK signaling, lipid metabolism, and skeletal muscle energetics.
- miR-211 functions as a metabolic switch in human melanoma cells.
- Regulation of PDK mRNA by high fatty acid and glucose in pancreatic islets.
- Increasing cardiac pyruvate dehydrogenase flux during chronic hypoxia improves acute hypoxic tolerance.
- Defects in the mitochondrial-tRNA modification enzymes MTO1 and GTPBP3 promote different metabolic reprogramming through a HIF-PPARγ-UCP2-AMPK axis.
- The microRNA-182-PDK4 axis regulates lung tumorigenesis by modulating pyruvate dehydrogenase and lipogenesis.
- Transforming Growth Factor β Mediates Drug Resistance by Regulating the Expression of Pyruvate Dehydrogenase Kinase 4 in Colorectal Cancer.

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- On the pivotal role of PPARα in adaptation of the heart to hypoxia and why fat in the diet increases hypoxic injury.
- BCKDK regulates the TCA cycle through PDC in the absence of PDK family during embryonic development
- FoxO1 inhibition alleviates type 2 diabetes-related diastolic dysfunction by increasing myocardial pyruvate dehydrogenase activity

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