BioVendor - Laboratorní medicína a.s.
Karásek 1767/1
621 00 Brno-Řečkovice a Mokrá Hora

Date of issue: 08.07.2020

PRODUCT DATASHEET

Pyruvate Kinase M2 Human E. coli

Cat. No.: RD172345100
Type: Recombinant protein
Size: 0.1 mg
Source: E. coli
Species: Human

Description

Total 539 AA. MW: 58.9 kDa (calculated). UniProtKB acc.no. P14618 (Ser2-Pro531). N-terminal His-tag (9 extra AA). Protein identity confirmed by LC-MS/MS.

Other names

Pyruvate kinase isozymes M1/M2, Cytosolic thyroid hormone-binding protein, CTHBP, Opa-interacting protein 3, OIP-3, Pyruvate kinase 2/3, Pyruvate kinase muscle isozyme, Thyroid hormone-binding protein 1, THBP1, Tumor M2-PK, PKM, OIP3, PK2, PK3, PKM2

Introduction to the molecule

Pyruvate kinase isoenzyme type M2 (PKM2, also called PK2, Thyroid-hormone binding protein, and Tumor M2-PK) is a phosphotyrosine-binding protein, as evidenced by the observation that nuclear PKM2 binds to tyrosine-phospohorylated-catenin and activates catenin. PKM2 is one of four pyruvate kinase isoenzymes which differ widely in their occurrence according to the type of tissue, their kinetic characteristics and regulation mechanism. PKM2 may exist in both, tetrameric and dimeric forms. Each monomer of PKM2 consists of 531 amino acids and can be subdivided into four domains: the N-domain, the A-domain, the B-domain and the C-domain. The molecular weight of the PKM2 monomer is 58 kD. PKM2 is encoded by the PKM gene and is the product of 2 mutually exclusive alternatively spliced exons (exon 9 and 10). Pyruvate kinase isoenzyme type M2 is expressed in some differentiated tissues, such as lung, fat tissue, retina, pancreatic islets as well as in all cells with a high rate of nucleic acid synthesis, which include all proliferating cells, such as normal proliferating cells, embryonic cells, adult stem cells and especially tumor cells. Immunohistological staining of Tumor M2-PK in various rat and human tumors (breast, renal, lung, colon, rectal and skin tumors) revealed that increased Tumor M2-PK in tumor cells is a general metabolic alteration during tumorigenesis and correlated with malignancies of the tumors. Tumor M2-PK levels are increased in EDTA-plasma samples from patients with solid tumors at various sites, including renal, lung, breast cancers, renal cell carcinoma and testicular cancer. Elevation of serum PKM2 levels was reported in patients with colon cancer, breast cancer, urological tumors, lung carcinoma, cervical cancer and gastrointestinal tumor. Recent studies describe the clinical utility of the determination of Tumor M2-PK in the patients with colorectal cancer (CRC). Regarding serum biomarkers, due to the heterogenous nature of CRC, a single biomarker is unlikely to have sufficient sensitivity or specificity for use as a stand-alone diagnostic screening test and panel of markers may be more effective. A three biomarker panel was identified that has high sensitivity and specificity for early stage of CRC. This model consisting of Dickkopf-3 (DKK3), Insulin like growth factor binding protein 2 (IGFBP2) and Pyruvate kinase M2 (PKM2), raising the possibility for its use as non-invasive blood diagnostic or screening test. Tumor M2-PK was measured in the feaces of patients with colonoscopy-proven cancer of the colon and rectum. The feacal levels of Tumor M2-PK are significantly higher in patients with colorectal cancer than in the control group and determination of Tumor M2-PK in stool samples might be also a valuable new screening tool for colorectal cancer. Pyruvate kinase has been recognized as an attractive target for cancer therapy. In its metabolic role as terminal enzyme of glycolysis, its activity determines cellular energy level, redox homeostasis and ability to proliferate. Pyruvate kinase also regulates the final rate-limiting step of glycolysis and catalyzes the transfer of a phosphate group from phosphoenolpyruvate (PEP) to adenosine diphosphate. Tyrosine kinases may also be responsible for the Warburg effect in cancer, as they can phosphorylate glycolytic enzymes, including PKM2, and then promote tumor growth.

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Research topic
Animal studies, Oncology

Amino Acid sequence
MKHHHHHHAS KPHSEAGTAF IQTQQLHAAM ADTFLEHMCR LDIDSPPITA RNTGIICTIG PASRSVETLK EMIKSGMNVA RLNFSHGTHE YHAETIKNVR TATESFASDP ILYRPVAVAL DTKGPEIRTG LIKGSGTAEV ELKKGATLKI TLDNAYMEKC DENILWLDYK NICKVVEVGS KIYVDDGLIS LQVKQKGADF LVTEVENGGS LGSKKGVNLP GAAVDLPAVS EKDIQDLKFG VEQDVDMVFA SFIRKASDVH EVRKVLGEKG KNIKIISKIE NHEGVRRFDE ILEASDGIMV ARGDLGIEIP AEKVFLAQKM MIGRCNRAGK PVICATQMLE SMIKKPRPTR AEGSDVANAV LDGADCIMLS GETAKGDYPL EAVRMQHLIA REAEAAIYHL QLFEELRRLA PITSDPTEAT AVGAVEASFK CCSGAIIVLT KSGRSAHQVA RYRPRAPIIA VTRNPQTARQ AHLYRGIFPV LCKDPVQEAW AEDVDLRVNF AMNVGKARGF FKKGDVVIVL TGWRPGSGFT NTMRVVPVP

Purity
Purity as determined by densitometric image analysis: >90%

Endotoxin
< 0.1 EU/µg

Formulation:

Filtered (0.4 µm) and lyophilized in 0.5 mg/mL in 20mM TRIS, 50mM NaCl, pH 7.5

Reconstituion:
Add 200µl of deionized water to prepare a working stock solution of 0.5 mg/mL and let the lyophilized pellet dissolve completely. Product is not sterile! Please filter the product by an appropriate sterile filter before using it in the cell culture.

Shipping
At ambient temperature. Upon receipt, store the product at the temperature recommended below.

Storage, Stability/Shelf Life
Store the lyophilized protein at –80 °C. Lyophilized protein remains stable until the expiry date when stored at –80 °C. Aliquot reconstituted protein to avoid repeated freezing/thawing cycles and store at –80 °C for long term storage. Reconstituted protein can be stored at 4 °C for a week.

Quality control
BCA to determine quantity of the protein.

SDS PAGE to determine purity of the protein.

LAL to determine quantity of endotoxin.

Applications
ELISA, Western blotting

Note
This product is intended for research use only.

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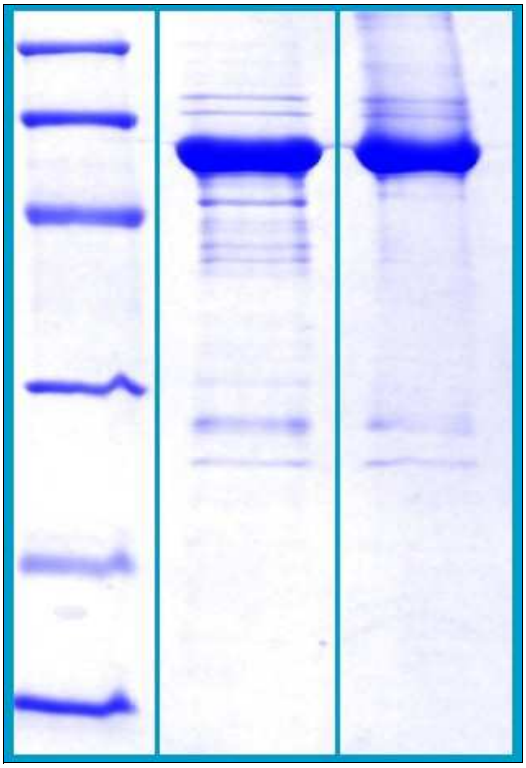

14% SDS-PAGE separation of Hu Pyruvate kinase M2:
1. M.W. marker – 97, 66, 45, 31, 21, 14 kDa
2. reduced and heated sample, 2.5µg/lane
3. non-reduced and non-heated sample, 2.5µg/lane

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