LD Biopharma, Inc.
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- PRODUCT DATA SHEET -

Name of Product: Recombinant Human PHGDH Protein
Catalog Number: HRP-0828
Manufacturer: LD Biopharma, Inc. USA

Introduction

Human D-3 phosphoglycerate dehydrogenase (PHGDH) gene encodes the enzyme which is involved in the early steps of L-serine synthesis in animal cells. L-serine is required for D-serine and other amino acid synthesis. The enzyme requires NAD/NADH as a cofactor and forms homo-tetramers for activity. Mutations in PHGDH gene have been found in a family with congenital microcephaly, psychomotor retardation and other symptoms. Recent data indicated that PHGDH activities may also be involved in tumor cell growth regulation and controlling tumor-associated macrophages (M2) through α-ketoglutarate and mTORC1 signaling.

Full-length human PHGDH cDNA (533aa, Isoform-I) was constructed with codon optimization gene synthesis and expressed with 17aa T7 Tag and expressed in ***E. coli*** as inclusion bodies. The final product was refolded using our unique "*temperature-shift inclusion body refolding*" technology and chromatographically purified.

Gene Symbol:	PHGDH (SERA; PGDH3)
Accession Number:	NP_006614
Species:	Human
Size:	50µg / Vial
Composition:	0.5mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose, DTT and other.
Storage:	In Liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least two weeks.

Key References

Cai, Z. et al. ***Targeting PHGDH reverses the immunosuppressive phenotype of tumor-associated macrophages through α-ketoglutarate and***

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mTORC1 signaling. Cell Mol Immunol (2024). doi：10.1038/s41423-024-01134-0

Martins-de-Souza,D., et al., ***Proteomic analysis identifies dysfunction in cellular transport, energy, and protein metabolism in different brain regions of atypical frontotemporal lobar degeneration***. J. Proteome Res. 11 (4), 2533-2543 (2012)

Locasale,J.W., et al., ***Phosphoglycerate dehydrogenase diverts glycolytic flux and contributes to oncogenesis***. Nat. Genet. 43 (9), 869-874 (2011)

Applications

1. May be used for in vitro PHGDH mediated signaling pathway regulation for cancer cell metastasis or M2 microphage activities study using intracellular delivery of recombinant human PHGDH protein with protein delivery reagent such as ProFectin.
2. May be used for PHGDH protein-protein interaction assay.
3. May be used as specific substrate protein for PHGDH specific kinase, and ubiquitin (Sumo pathway) related enzyme functional screening assays.
4. Potential therapeutic protein, which may be used for tumor cell immunotherapy by regulating tumor-associated macrophage activities.
5. As native human PHGDH immunogen for specific antibody production.

Quality Control

Purity: > 92 % by SDS-PAGE.

Recombinant Human PHGDH Protein Sequence. (58.3 kD)

MASMTGGQQMGRGEFGSMAFANLRKVLISDSLDPCCRKILQDGGLQVVEKQNLSKEELIAELQDCEGLIV
RSATKVTADVINAAEKLQVVGRAGTGVDNVDLEAATRKGILVMNTPNGNSLSAAELTCGMIMCLARQIPQ
ATASMKDGKWERKKFMGTELNGKTLGILGLGRIGREVATRMQSFGMKTIGYDPIISPEVSASFGVQQLPL
EEIWPLCDFITVHTPLLPSTTGLLNDNTFAQCKKGVRVVNCARGGIVDEGALLRALQSGQCAGAALDVFT
EEPPRDRALVDHENVISCPHLGASTKEAQSRCGEEIAVQFVDMVKGKSLTGVVNAQALTSAFSPHTKPWI
GLAEALGTLMRAWAGSPKGTIQVITQGTSLKNAGNCLSPAVIVGLLKEASKQADVNLVNAKLLVKEAGLN
VTTSHSPAAPGEQGFGECLLAVALAGAPYQAVGLVQGTTPVLQGLNGAVFRPEVPLRRDLPLLLFRTQTS
DPAMLPTMIGLLAEAGVRLLSYQTSLVSDGETWHVMGISSLLPSLEAWKQHVTEAFQFHF