

DUSP3 Protein, Human, Recombinant

General Information

Synonyms:	dual specificity phosphatase 3;VHR
Protein Construction:	A DNA sequence encoding the human VHR (P51452)(Met 1-Pro 185)was expressed and purified with two additional amino acids (Gly & Pro) at the N-terminus. Predicted N terminal: Gly
Species:	Human
Expression Host:	Baculovirus Insect Cells
Accession:	P51452
Molecular Weight:	20.6 kDa (predicted); 21 kDa (reducing condition, due to glycosylation)

QC Testing

Biological Activity:	Measured by hydrolysis of 250 μ M 3-O-methyl fluorescein phosphate (OMFP). The specific activity is $>1.0 \mu\text{mol}/\text{min}/\text{mg}$.
Purity:	$> 95 \%$ as determined by SDS-PAGE
Endotoxin:	$< 1.0 \text{ EU}/\mu\text{g}$ of the protein as determined by the LAL method.
Formulation:	Lyophilized from a solution filtered through a $0.22 \mu\text{m}$ filter, containing 20 mM Tris, 500 mM NaCl, 10% glycerol, pH 8.0.Typically, a mixture containing 5% to 8% trehalose, mannitol, and 0.01% Tween 80 is incorporated as a protective agent before lyophilization.

Preparation and Storage

Reconstitution:
A Certificate of Analysis (CoA) containing reconstitution instructions is included with the products. Please refer to the CoA for detailed information.

Stability & Storage:

It is recommended to store recombinant proteins at -20°C to -80°C for future use. Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C . For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

Protein Background

Vaccinia H1-related phosphatase (VHR) is classified as a dual-specificity phosphatase (DUSP), and the other name is dual-specificity phosphatase 3 (DUSP3). DUSPs are a heterogeneous group of protein phosphatases that can dephosphorylate both phosphotyrosine and phosphoserine/phosphothreonine residues within the one substrate. Unlike typical DUSPs, VHR lacks mitogen-activated protein kinase (MAPK)-binding domain, and shows poor activity

against MAPKs. VHR often act on bisphosphorylated protein substrates, it displays a strong preference for dephosphorylating phosphotyrosine residues over phosphothreonine residues. VHR has been identified as a novel regulator of extracellular regulated kinases (ERKs). VHR is responsible for the rapid inactivation of ERK following stimulation and for its repression in quiescent cells. VHR is a negative regulator of the Erk and Jnk pathways in T cells and, therefore, may play a role in aspects of T lymphocyte physiology that depend on these kinases.

Reference

- Todd J.L,et al.(1999) Extracellular regulated kinases (ERK) 1 and ERK2 are authentic substrates for the dual-specificity protein-tyrosine phosphatase VHR. A novel role in down-regulating the ERK pathway. J. Biol. Chem. 274: 13271-80.
- Alonso A,et al.(2001) Inhibitory role for dual specificity phosphatase VHR in T cell antigen receptor and CD28-induced Erk and Jnk activation. J Biol Chem. 276(7): 4766-71.
- Schumacher MA,et al.(2002) Structural basis for the recognition of a bisphosphorylated MAP kinase peptide by human VHR protein Phosphatase. Biochemistry. 41(9): 3009-17.
- Patterson KI,et al.(2009) Dual-specificity phosphatases: critical regulators with diverse cellular targets. Biochem J. 2009 Mar 15;418(3): 475-89.

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