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Catalog #	Aliquot Size
D05-12G -05	5 µg
D05-12G -10	10 µg

DDR1 (S496A), Active

Recombinant human protein expressed in Sf9 cells

Catalog # D05-12G
Lot # T1017-2

Product Description

Recombinant human DDR1 (S496A) (444-end) protein was expressed by baculovirus in Sf9 insect cells using an N-terminal GST tag. The gene accession number is NM_001954.

Gene Aliases

CAK; CD167; DDR; EDDR1 (S496A); MCK10; NEP; NTRK4; PTK3; PTK3A; RTK6; TRKE

Formulation

Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 10mM glutathione, 0.1mM EDTA, 0.25mM DTT, 0.1mM PMSF, 25% glycerol.

Storage and Stability

Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles.

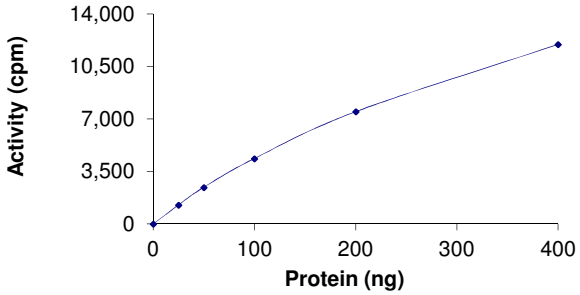
Scientific Background

DDR1 is a member of the subfamily of tyrosine kinase receptors with a homology region to the Dictyostelium discoideum protein discoidin I in its extracellular domain. DDR1 is widely expressed in normal and transformed epithelial cells and is activated by various types of collagen. Expression of DDR1 is restricted to epithelial cells, particularly in the kidney, lung, gastrointestinal tract, and brain and DDR1 is over-expressed in fast-growing invasive tumors of the breast, ovary, esophagus, brain and lung. Collagen type I mediated stimulation of DDR1 leads to activation of matrix metalloproteinase 2 and 9 as well as increased cell invasion.

References

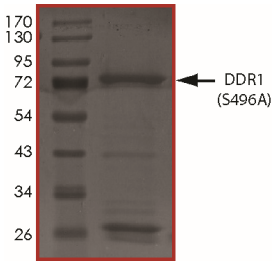
1. Di Marco. et.al: Molecular cloning of trkE, a novel trk-related putative tyrosine kinase receptor isolated from normal human keratinocytes and widely expressed by normal human tissues. J. Biol. Chem. 268: 24290-24295, 1993.
2. Yoshida, D. et al: The use of 3-D culture in peptide hydrogel for analysis of discoidin domain receptor 1-collagen interaction. Cell Adh Migr. 2007 Apr;1(2):92-8.

Specific Activity



The specific activity of DDR1 (S496A) was determined to be **1.8 nmol /min/mg** as per activity assay protocol.

Purity



The purity of DDR1 (S496A) was determined to be **>75%** by densitometry, approx. MW **77kDa**.

DDR1 (S496A), Active

Recombinant human protein expressed in Sf9 cells

Catalog #	D05-12G
Specific Activity	1.8 nmol/min/mg
Lot #	T1017-2
Purity	>75%
Concentration	0.1 µg/µl
Stability	1yr at –70°C from date of shipment
Storage & Shipping	Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

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Activity Assay Protocol

Reaction Components

Active Kinase (Catalog #: D05-12G)

Active DDR1 (S496A) (0.1μg/μl) was diluted with Kinase Dilution Buffer IV (Catalog #: K24-09) and assayed as outlined in sample activity plot. (Note: these are suggested working dilutions and it is recommended that the researcher perform a serial dilution of Active DDR1 (S496A) for optimal results).

Kinase Dilution Buffer IV (Catalog #: K24-09)

Kinase Assay Buffer II (Catalog #: K02-09) diluted at a 1:4 ratio (5X dilution) with final 50ng/μl BSA solution.

Kinase Assay Buffer II (Catalog #: K02-09)

Buffer components: 25mM MOPS, pH 7. 2, 12.5mM β-glycerol-phosphate, 20mM $MgC1_2$, 12.5mM $MnC1_2$, 5mM EGTA, 2mM EDTA. Add 0.25mM DTT to Kinase Assay Buffer prior to use.

[^{33}P]-ATP Assay Cocktail

Prepare 250μM [^{33}P]-ATP Assay Cocktail in a designated radioactive working area by adding the following components: 150μl of 10mM ATP Stock Solution (Catalog #: A50-09), 100μl [^{33}P]-ATP (1mCi/100μl), 5.75ml of Kinase Assay Buffer II (Catalog #: K02-09). Store 1ml aliquots at –20°C.

10mM ATP Stock Solution (Catalog #: A50-09)

Prepare ATP stock solution by dissolving 55mg of ATP in 10ml of Kinase Assay Buffer II (Catalog #: K02-09). Store 200μl aliquots at –20°C.

Substrate (Catalog #: A16-58)

AXLtide synthetic peptide substrate (CKKSRGDYMTMQIG) was diluted in distilled H_2O to a final concentration of 1mg/ml.

Assay Protocol

Step 1. Thaw [^{33}P]-ATP Assay Cocktail in shielded container in a designated radioactive working area.

Step 2. Thaw the Active DDR1 (S496A), Kinase Assay Buffer, Substrate and Kinase Dilution Buffer on ice.

Step 3. In a pre-cooled microfuge tube, add the following reaction components bringing the initial reaction volume up to 20μl:

- **Component 1.** 10μl of diluted Active DDR1 (S496A) (Catalog # D05-12G)
- **Component 2.** 5μl of 1 mg/ml stock solution of substrate (Catalog # A16-58)
- **Component 3.** 5μl distilled H_2O (4°C)

Step 4. Set up the blank control as outlined in step 3, excluding the addition of the substrate. Replace the substrate with an equal volume of distilled H_2O.

Step 5. Initiate the reaction by the addition of 5μl [^{33}P]-ATP Assay Cocktail bringing the final volume up to 25μl and incubate the mixture in a water bath at 30°C for 15 minutes.

Step 6. After the 15 minute incubation period, terminate the reaction by spotting 20μl of the reaction mixture onto individual pre-cut strips of phosphocellulose P81 paper.

Step 7. Air dry the pre-cut P81 strip and sequentially wash in a 1% phosphoric acid solution (dilute 10ml of phosphoric acid and make a 1L solution with distilled H_2O) with constant gentle stirring. It is recommended that the strips be washed a total of 3 intervals for approximately 10 minutes each.

Step 8. Count the radioactivity (cpm) on the P81 paper in the presence of scintillation fluid in a scintillation counter.

Step 9. Determine the corrected cpm by removing the blank control value (see Step 4) for each sample and calculate the kinase specific activity as outlined below.

Calculation of [P^{33}]-ATP Specific Activity (SA) (cpm/pmol)

Specific activity (SA) = cpm for 5 μl [^{33}P]-ATP / pmoles of ATP (in 5 μl of a 250 μM ATP stock solution, i.e., 1250 pmoles)

Kinase Specific Activity (SA) (pmol/min/μg or nmol/min/mg)

Corrected cpm from reaction / [(SA of ^{33}P-ATP in cpm/pmol)*(Reaction time in min)*(Enzyme amount in μg or mg)]*[(Reaction Volume) / (Spot Volume)]

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