



SHP-2 (224-529)/PTPN11. E.coli Active Enzyme

BACKGROUND

SHP-2, also known as Tyrosine-protein phosphatase, non-receptor type 11 (PTPN11), Protein-tyrosine phosphatase 2C, PTP-2C, PTP-1D, SH-PTP3 and SH-PTP2 is protein tyrosine phosphatase which relays signals from growth factor receptors to Ras and other effectors. Germline PTPN11 mutations underlie ~50% of Noonan Syndrome (NS), a developmental disorder associated with an elevated risk of juvenile myelomonocytic leukemia (JMML). Somatic PTPN11 mutations were recently identified in ~35% of JMML patients; these mutations introduce amino acid substitutions that are distinct from those found in NS. These myeloid leukemias include activating mutations as in the RAS family members, and in the receptor tyrosine kinases KIT and FLT3, loss of function of NF-1 mutants, and gain-of-function mutations in the hematopoietic phosphatase SHP-2. Although these mutations collectively account for as many as 50% of cases of AML, with rare exception, only one of these is mutant in any given patient. This epidemiologic observation suggests that these mutations can be viewed as a complementation group and that any one of these is sufficient to contribute proliferative and survival advantage to a leukemic cell.

ACTIVITY

8.0 nmole/min/ μ g of enzyme; Determined using pNPP; Reaction conditions: 50 μ M pNPP, 20 min incubation at 30°C, 5 μ g enzyme.

PURITY

>95% pure as determined by SDS-PAGE

APPLICATIONS

Enzyme activity assay standard

ORDERING INFORMATION

CATALOG NUMBER

X1663E

SIZE

20 μ g

CUSTOMER STORAGE

Product should be stored at -80°C.
Aliquot to avoid freeze/thaw cycles

FORMULATION

Provided in 25 mM Tris-HCl, 75 mM NaCl, pH 8.0, 0.05% Tween, 1 mM DTT and 50% glycerol 2 mM EDTA, 10 mM glutathione.

SHIP CONDITIONS

Ship on dry ice, freeze upon arrival

STABILITY

Products are stable for one year from purchase when stored properly

CONCENTRATION

Lot specific, see vial

SOURCE

Recombinant enzyme produced in E. coli

ASSAY METHODS

MATERIALS

1. Assay Buffer: 50 mM HEPES, pH 7.4, 100 mM NaCl, 2 mM EDTA, 3 mM DTT
2. Stop solution: 2M K₂CO₃
3. 190 mM pNPP
4. Microtiter plate
5. Microtiter plate reader capable of measurements at 405 nm
6. Water bath or incubator at 30°C

PROCEDURE

1. Prepare reaction mixture:
 - a. 73 μ l assay buffer
 - b. 26 μ l pNPP (Final concentration of pNPP is 50 mM)
 - c. 1 μ l of SHP-2
2. Mix well and start reaction at 30°C in water bath and incubate for 10 min.
3. Add 100 μ l per well of 2 M K₂CO₃ to stop the reaction.
4. Read absorbance at 405 nm using a microtiter plate reader.

REFERENCES

- [1] Ahmad S., Banville D.L., Zhao Z., Fischer E.H., Shen S.H.;
A widely expressed human protein-tyrosine phosphatase containing src homology 2 domains.;
Proc. Natl. Acad. Sci. U.S.A. 90:2197-2201(1993).
- [2] Vogel W., Lammers R., Huang J., Ullrich A.;
Activation of a phosphotyrosine phosphatase by tyrosine phosphorylation.; Science 259:1611-1614(1993).
- [3] Adachi M., Sekiya M., Miyachi T., Matsuno K., Hinoda Y., Imai K., Yachi A.;
Molecular cloning of a novel protein-tyrosine phosphatase SH-PTP3 with sequence similarity to the src-homology region 2.; FEBS Lett. 314:335-339(1992).
- [4] Bastien L., Ramachandran C., Liu S., Adam M.;
Cloning, expression and mutational analysis of SH-PTP2, human protein-tyrosine phosphatase. Biochem. Biophys. Res. Commun. 196:124-133(1993).
- [5] Freeman R.M. Jr., Plutzky J., Neel B.G.;
Identification of a human src homology 2-containing protein-tyrosine-phosphatase: a putative homolog of Drosophila corkscrew.; Proc. Natl. Acad. Sci. U.S.A. 89:11239-11243(1992).
- [6] Bennett A.M., Tang T.L., Sugimoto S., Walsh C.T., Neel B.G.;
Protein-tyrosine-phosphatase SHPTP2 couples platelet-derived growth factor receptor beta to Ras. Proc. Natl. Acad. Sci. U.S.A. 91:7335-7339(1994).
- [7] Salomon A.R., Ficarro S.B., Brill L.M., Brinker A., Phung Q.T., Ericson C., Sauer K., Brock A., Horn D.M., Schultz P.G., Peters E.C.;
Profiling of tyrosine phosphorylation pathways in human cells using mass spectrometry.; Proc. Natl. Acad. Sci. U.S.A. 100:443-448(2003).
- [8] Kharitonov A., Chen Z., Sures I., Wang H., Schilling J., Ullrich A.;
A family of proteins that inhibit signalling through tyrosine kinase receptors.; Nature 386:181-186(1997).
- [9] Hof P., Pluskey S., Dhe-Paganon S., Eck M.J., Shoelson S.E.;
Crystal structure of the tyrosine phosphatase SHP-2.; Cell 92:441-450(1998).
- [10] Tartaglia M., Mehler E.L., Goldberg R., Zampino G., Brunner H.G., Kremer H., van der Burgt I., Crosby A.H., Ion A., Jeffery S., Kalidas K., Patton M.A., Kucherlapati R.S., Gelb B.D.;
Mutations in PTPN11, encoding the protein tyrosine phosphatase SHP-2, cause Noonan syndrome.; Nat. Genet. 30:465-469(2001).