ProductInformation

SULFOTRANSFERASE 1A2*1 ISOZYME
Human, Recombinant

Product Number **S 8928**
Storage Temperature –70 °C

Product Description

This highly active cytosolic extract is produced from Sf-9 insect cells infected with a baculovirus strain containing the cDNA for human sulfotransferase 1A2*1 (SULT 1A2*1).

Sulfotransferases belong to the Phase II group of drug metabolizing enzymes. Two general classes of these enzymes exist in tissue fractions: the cytosolic enzymes that are important in drug metabolism, and the membrane-bound enzymes that are involved in the sulfonation of glycoproteins and glycosaminoglycans.[1] The human cytosolic sulfotransferase isozymes function as homodimers of 32-35 kDa subunits.

Sulfotransferase enzymes catalyze the conjugation of sulfate groups to a variety of xenobiotic and endogenous substrates that possess acceptor moieties such as hydroxyl and amine groups. The cofactor adenosine 3'-phosphate 5'-phosphosulfate (PAPS) (Prod. No. A 1651) is required for this enzymatic sulfonation:

$$\text{R-XH} + \text{PAPS} \xrightarrow{\text{Sulfotransferase}} \text{R-SO}_4 + \text{H}^+ + \text{adenosine 3',5'-diphosphate}$$

Although sulfonation generally causes molecules to lose biological activity, several documented examples indicate the addition of sulfate can lead to the formation of active metabolites, such as minoxidil, and reactive electrophiles, such as sulfonated N-hydroxy-2-acetylaminofluorene.[2,3] Sulfonation results in the enhanced renal excretion of the sulfate-conjugated metabolite.

Like the cytochrome P450 enzymes and UDP-glucuronosyltransferases, sulfotransferases show some degree of overlap in substrate specificity. The nomenclature of the different genes and their mRNA and protein products has recently been revised so that "SULT" is the accepted superfamily abbreviation.[4] Allelic variants of sulfotransferase enzymes do exist and studying their frequency and functional role in drug disposition is a very active area of research.

Vial Content: 250 µg protein. Supplied as a 0.4-10 mg/ml solution containing 1 mM potassium phosphate, pH 7.4, 0.1 mM EDTA, and 1 mM DTT.

SULT 1A2*1 Specific Activity: minimum 800 units/mg of protein.

Unit Definition: One unit will conjugate one picomole of p-nitrophenol per minute at pH 6.5 at 37 °C.

Storage/Stability

This SULT 1A2*1 product ships on dry ice and the product is stored at –70 °C. The product as supplied is stable for at least 18 months. To use the product, thaw rapidly and keep the product on ice until re-frozen. Note: It is recommended to aliquot this product for future use. Dilutions may be prepared with 5 mM potassium phosphate, pH 6.5, 1.5 mg/ml BSA, and 10 mM DTT.

Procedure

A procedure for the assay of sulfotransferases has been reported using ^{35}S-labeled PAPS and measuring ^{35}S-labeled conjugates formed during the enzymatic reaction.[5] The sulfotransferase isozymes exhibit overlap in substrate specificity. It may be important to perform experiments under linear conditions and define the kinetic parameters for substrate conjugation, before making conclusions about isozyme specificity. These enzymes also show significant substrate inhibition. Trying a variety of substrate concentrations is recommended.[5]

Sulfotransferase isozymes have been characterized in tissue fractions by measuring sulfate conjugation to various substrates attributed to them. The specific activity of the recombinant sulfotransferase 1A2*1 isozyme is determined using p-nitrophenol at a final concentration of 20 µM.

References

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2. Miller, J.A., Sulfonation in chemical carcinogenesis-history and present status. Chem. Bio. Interact., **92,** 329-341 (1994).
3. McCall, J. et al., Pyrimidine and triazine 3-oxide sulfates: a new family of vasodilators. J. Med. Chem., **26,** 1791-1793 (1983).
4. Raftogianis, R.B. et al., Phenol sulfotransferase pharmacogenetics in humans: association of common SULT1A1 alleles with TS PST phenotype. Biochem. Biophys. Res. Commun., **239,** 298-304 (1997).
5. Campbell, N.R. et al., Human liver phenol sulfotransferase: assay conditions, biochemical properties and partial purification of isozymes of the thermostable form. Biochem. Pharmacol., **36,** 1435-1446 (1987).

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