

Dihydrofolate Reductase from human, Recombinant

Cat. No. NATE-0186

Lot. No. (See product label)

Introduction

Description

Dihydrofolate reductase, or DHFR, is an enzyme that reduces dihydrofolic acid to tetrahydrofolic acid, using NADPH as electron donor, which can be converted to the kinds of tetrahydrofolate cofactors used in 1-carbon transfer chemistry. In humans, the DHFR enzyme is encoded by the DHFR gene. It is found in the q11→q22 region of chromosome 5. Bacterial species possesses distinct DHFR enzymes (based on their pattern of binding diaminoheterocyclic molecules), but mammalian DHFRs are highly similar.

Applications

Dihydrofolate reductase (DHFR) is a key enzyme in thymidine synthesis. It catalyzes the reduction of dihydrofolate (DHF) to tetrahydrofolate (THF). At a much lower rate, it catalyzes the conversion of folate to THF. Since thymidine is a necessary substrate for DNA synthesis, DHFR is a target for anticancer drug development. Methotrexate is the prototype dihydrofolate reductase inhibitor. The enzyme from Creative Enzymes has been used in the inhibitory studies of Leishmaniasis donovani pteridine reductase 1 (PTR1). The enzyme has also been used as a positive control to measure the DHFR activity of a protein, MS0308, purified from Mycobacterium smegmatis. Human dihydrofolate reductase has been used in a study to investigate the stable expression of green fluorescent protein and the targeted disruption of thioredoxin peroxidase-1 gene in Babesia bovis. Human dihydrofolate reductase has also been used in a study to investigate the structural analysis of human dihydrofolate reductase as a binary complex.

Synonyms

DHFR; dihydrofolate reductase; DYR; DHFRP1; Tetrahydrofolate NADP+ oxidoreductase; EC 1.5.1.3; tetrahydrofolate dehydrogenase; pteridine reductase:dihydrofolate reductase; dihydrofolate reductase:thymidylate synthase; thymidylate synthetase-dihydrofolate reductase; folic acid reductase; folic reductase; dihydrofolic acid reductase; dihydrofolic reductase; 7,8-dihydrofolate reductase; NADPH-dihydrofolate reductase

Product Information

Species

Human

Source

E. coli

Form

Solution in 10 mM Tris pH 8, 1 mM EDTA, 0.5 mM DTT, 5 μM NADPH, protease inhibitors, and 50% glycerol.

EC Number

EC 1.5.1.3

CAS No.

131384-61-7

Molecular Weight

25 kDa

Purity

> 80% (SDS-PAGE)

Activity

> 1 units/mg protein

Concentration

0.02-0.06 mg/mL

Pathway

Cell Cycle, organism-specific biosystem; Cell Cycle, Mitotic, organism-specific

Pathway

Cell Cycle, organism-specific biosystem; Cell Cycle, Mitotic, organism-specific biosystem; E2F mediated regulation of DNA replication, organism-specific biosystem; E2F transcription factor network, organism-specific biosystem; Fluoropyrimidine Activity, organism-specific biosystem; Folate biosynthesis, organism-specific biosystem; Folate biosynthesis, conserved biosystem

Unit Definition

One unit will convert 1.0 μ mole of dihydrofolic acid to tetrahydrofolic acid in 1 minute at pH 7.5 at 22°C.

Storage and Shipping Information

Storage

–20°C