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ABG3664: Glutathione Reductase from baker's yeast (S. cerevisiae)

Uniprot ID : P41921

Description

form : ammonium sulfate suspension

specific activity : 100-300 units/mg protein (biuret)

mol wt : 118 kDa

foreign activity G-6-PDH, 6-PGDH, and NADPH oxidase ≤0.01%
lipoamide dehydrogenase ≤0.1%

General description Glutathione reductase (GLR1) exists in mitochondrial and cytoplasmic isoforms. It shares sequence and structural homology to thioredoxin reductase, and is a flavin-containing oxidoreductase. Its active site is composed of a redox-active disulphide, and it requires NADPH for its catalytic activity. It is a widely present enzyme and is found in plants, bacteria, yeast, mice and humans.

Application
Glutathione Reductase (GR) from baker′s yeast has been used:

- in the glutathione assay to determine glutathione concentration.
- as a standard in the generation of calibration curve.
- as an antigen to measure plasma activity of GR.

Glutathione reductase (GR) from baker′s yeast (Saccharomyces cerevisiae) has been used-

- for quantifying the myocardial tissue glutathione content using a glutathione reductase-5,5′-dithiobis (2-nitrobenzoic acid)-based enzymatic recycling assay
- for the quantification of reduced glutathione (GSH) in the oocytes, using a slightly modified microglutathione assay, obtained from prepubertal gilts
- for the preparation of total GSSG (glutathione disulphide) + GSH measurement, where all available GSSG was reduced to GSH, in rat lens
- for the quantification of intracellular reduced glutathione (GSH) in the oocytes obtained from rats

Biochem/physiol Actions

Glutathione (γ-glutamylcysteinylglycine) is a ubiquitous tripeptide thiol which plays a crucial role in oxidative stress defence mechanism of the cell. Glutathione reductase (GLR1) is responsible for the reduction of the glutathione disulfide (GSSG) to reduced glutathione (GSH).
Glutathione reductase IGR) is a crucial flavoenzyme in the antioxidant defense system. Reduced glutathione (GSH) is used by glutathione peroxidase to detoxify hydrogen peroxide and in the process is converted to oxidized glutathione (GSSG). The GSSG is then recycled back to GSH by glutathione reductase (GR) using NADPH that is then converted to NADP+. The regenerated GSH is then available to detoxify more hydrogen peroxide. The enzyme uses FAD as a cofactor. GR and glutathione peroxidase may inhibit lipid peroxidation by functioning as antioxidant enzymes in sperm. Glutathione reductase shares a structural motif with a number of other proteins including aspartyl proteases, citrate synthase, EF hands, hemoglobins, lipocalins, and α/β hydrolases. GR is stimulated by melatonin and is reportedly irreversibly inhibited by a number of oxygen radical generating systems.

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Product Info

Amount : 100 Units
Purification : Purified by affinity chromatography
Content : One unit will reduce 1.0 µmole of oxidized glutathione per min at pH 7.6 at 25 °C.