

BIOXYTECH® GR-340™

Colorimetric Assay for Glutathione Reductase

For Research Use Only. Not For Use In Diagnostic Procedures.

Catalog No. 21018

INTRODUCTION

Glutathione reductase (GR, EC 1.6.4.2) is an ubiquitous enzyme which catalyzes the reduction of oxidized glutathione (GSSG) to glutathione (GSH). Glutathione reductase is essential for the glutathione redox cycle that maintains adequate levels of reduced cellular GSH. GSH serves as an antioxidant, reacting with free radicals and organic peroxides, in amino acid transport, and as a substrate for the glutathione peroxidases and glutathione S-transferases in the detoxification of organic peroxides and metabolism of xenobiotics, respectively (Dolphin, 1989).

This homodimeric enzyme is a member of the family of flavoprotein disulfide oxidoreductases. Each subunit has four domains; beginning at the N-terminus: an FAD-binding domain, an NADPH-binding domain, a central domain and an interface domain. The active sites of GR are at the dimeric interface. Since the GSSG binding site is composed of residues from both subunits, only the dimeric form is active (Bashir, 1995).



Oxidized glutathione is reduced by a multi-step reaction in which GR is initially reduced by NADPH forming a semiquinone of FAD, a sulfur radical and a thiol. The reduced GR (GRred) reacts with a molecule of GSSG resulting in a disulfide interchange which produces a molecule of GSH and the GRred-SG complex. An electron rearrangement in GRred-SG results in a second disulfide interchange, splitting off the second molecule of GSH and restoring the GR to the oxidized form (Massey, 1965).

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Methodology	Colorimetric
Specimen Requirements	Purified enzymes or clear supernate from cellular or tissue homogenate
Specificity	Assay is specific for glutathione reductase activity
Sensitivity	0.14 mU/mL (final concentration in the assay)
Assay Standard Curve Range	1-10 mU/ml (final concentration in the assay)
Tests per Kit	100 tests
Storage and Stability	Six months from date of manufacture when stored at 2° - 8°C
Kit Contents	<ul style="list-style-type: none">• Oxidized glutathione• NADPH (lyophilized)• Potassium phosphate buffer• Diluent