

Biliverdin Reductase Protein



TECHNICAL SPECIFICATIONS

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Recombinant Rat Kidney Biliverdin Reductase Protein Product #: OSP-400

Scientific Background

Biliverdin reductase (BVR), Heme oxygenase (HO) and UDP-glucuronosyltransferases (UGTs) form the major erythrocytic heme catabolic pathway in humans and most mammalian species. BVR is an oxireductase which catalyzes the reduction of the γ -meso bridge of biliverdin to bilirubin. Recent studies indicate that BVR is a phosphoprotein and that phosphorylation is essential to the activity of BVR to reduce biliverdin to bilirubin. These studies also found that the enzyme is autophosphorylated and that phosphorylation is reversible. In mammals bilirubin can be both a neurotoxin and an antioxidant depending on its ratio to protein and concentration; has immunomodulatory properties; induces Aryl hydrocarbon receptor-mediated activation of cytochrome P450 1a1 expression and inhibits protein phosphorylation (1). BVR is unique among all enzymes characterized to date because BVR has dual pH/dual cofactor requirements. The reductase is highly conserved in its primary structure and molecular properties and uses NADH in the acidic range (peak activity at pH~6.7), whereas NADPH is utilized in the basic range (peak activity at pH ~8.7) (2). BVR is encoded by a single copy gene and the ~1.6kb BVR message is abundantly expressed in kidney, spleen, liver and brain as well as at lower levels in the thymus and minimal levels being detected in testis (3). The human BVR was found to resolve into four isoelectric zones and two molecular mass forms (40.7kDa and 39.6kDa) in the liver whereas variants were detected in the kidney (4).

Application Note

This protein is sold for use in Western blot analysis and should be resuspended with an appropriate amount of SDS-PAGE sample buffer for this purpose. For in house use, the product is resuspended to 1 μ g/ μ L with 20 μ L 1X sample buffer (e.g. Laemmli, U.K., (1970) Nature 227: 680-685) and is then diluted further to 0.01 μ g/ μ L with 1X sample buffer. In a 15 well mini-blot system, 50ng/well gives a good signal when using Stressgen's antibody OSA-400 at 1:200 as the primary antibody and a goat anti-rabbit IgG alkaline phosphatase conjugate (cat# SAB-301) at 1:1,000 for detection.

References

1. Mohammad S., Brigitte, A., Brown-Kipphut and Maines, M. D. (2001) *J. Biol. Chem.* 276: 10929-10934
2. Kutty, R. K. and Maines, M. D. (1981) *J. Biol. Chem.* 256: 3956-3962
3. McCoubrey, W. K. Jr., Cooklis, M. A. and Maines, M. D. (1995) *Gene* 106:235-240.
4. Maines, M. and Trakshel, G. (1993) *Arch. Biochem. Biophys.* 300: 320-326

Rev: 01/17/02

CERTIFICATE OF ANALYSIS

Biliverdin Reductase Protein

Product #: OSP-400

Size:

Lot #: B112412

Format: Rat kidney biliverdin reductase in TE buffer (0.01M Tris-HCl, pH 8.0, 1 mM EDTA). The protein is produced using an *E. coli* expression system (3).

Purity: Unpurified lysate

Protein Concentration: 1.0 mg/mL

Certified by: C. Thind
Date: 01/17/02

QC by: D. Doak
Date: 12/06/01

STORAGE & SHIPPING: Store frozen product at or below -70°C. Thawed product may be stored for 2-4 weeks at 4°C. For optimal storage, aliquot to smaller portions and store at -70°C. Avoid repeated freeze/thaw cycles. For maximum product recovery, after thawing, centrifuge the product vial before removing cap. Shipped on gel packs.



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