



## Product Information

### Protein Disulfide Isomerase from bovine liver

Product Number **P 3818**  
Storage Temperature  $-20\text{ }^{\circ}\text{C}$

E.C. 5.3.4.1  
CAS# 37318-49-3  
Synonym: PDI

#### Product Description

Protein Disulfide Isomerase (PDI) from bovine liver is a homodimer with a molecular weight of 107 kDa (gel filtration) and the molecular weight of the monomer has been reported at 57 kDa (SDS-PAGE).<sup>1</sup> The isoelectric point (pI) is approximately 4.2 and the optimal pH for the reaction with RNase is 7.8. The enzyme is a glycoprotein with 12% total carbohydrate content, composed of 4.6% mannose, 2.5% galactose, 1.4% NANA, and 3.5% 2-acetamido-2-deoxyglucose.<sup>2</sup>

Protein disulfide isomerase is an enzyme involved in reactions between a thiol and a protein-disulfide. The most studied reactions have been the reduction of insulin and the reactivation of incorrectly disulfide bonded [scrambled] RNase. It was not clear in the literature whether these activities were due to the same enzyme or two different ones. The issue has been resolved and the following enzyme activities have been identified:<sup>3</sup>

protein disulfide isomerase	EC 5.3.4.1
thiol:protein disulfide oxidoreductase	EC 1.8.4.2
glutathione-insulin transhydrogenase	EC 1.8.4.2

Evidence indicates the primary role of PDI in the cell is post-translational processing of disulfide bonded proteins and this is in agreement with the high concentration of this enzyme in liver and pancreatic tissues.<sup>4</sup>

A possible use of this protein *in vitro* is aiding in the refolding of recombinant proteins to achieve their native state.<sup>5,6</sup>

The product is supplied as a lyophilized powder containing potassium phosphate buffer salts, stabilizer, and approximately 10% protein (Lowry).

Specific Activity: 100-400 units/mg protein

Unit Definition: One unit will cause a change in  $A_{650}$  of 0.01 per minute of a 1 mg/ml solution of insulin, in the presence of dithiothreitol at pH 7.5 at  $25\text{ }^{\circ}\text{C}$ .

#### Precautions and Disclaimer

This product is for laboratory research use only. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

#### Storage/Stability

It is recommended to store the product at  $-20\text{ }^{\circ}\text{C}$  and it is stable for at least 3 years.

Protein disulfide isomerase is fairly stable in solution at  $4\text{ }^{\circ}\text{C}$  at pH 7.5 at a concentration of 1 mg protein per ml. Approximately 80% of the activity is retained after 7 days at  $4\text{ }^{\circ}\text{C}$  or after 3 days at  $37\text{ }^{\circ}\text{C}$ .

#### References

1. Lambert, N., and Freedman, R.B., *Biochem. J.*, **213**, 225-234 (1983).
2. Carmichael, D.F. et al., *J. Biol. Chem.*, **252**, 7163-7167 (1977).
3. Land, S. et al., *Biochim. Biophys. Acta*, **747**, 197-199 (1983).
4. Bjelland, S., *Comp. Biochem. Physiol.*, **87B**, 907-914 (1987).
5. Gething, M-J., and Sambrook, J., *Nature*, **355**, 33-45 (1992).
6. Loferer, H., and Henneke, H., *TIBS*, **19**, 169-171 (1994).

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