

## Homocysteine – a probable substrate for glutathione peroxidase of human serum

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### Abstract

Using hydrogen peroxide as a reduction substrate, the distribution of two thiol peroxidase activities (with reduced homocysteine and glutathione as thiol substrates) within the human serum protein fractions was studied. Both activities were identified for fractions precipitated by low ammonium sulfate saturation (0-35%) that corresponds to literature data on the human extracellular glutathione peroxidase (Gpx3). When the concentration of reduced homocysteine is increased, the  $K_{M\ app}$  for  $H_2O_2$  and  $V_{max\ app}$  increase proportionally to each other (retaining the ratio  $V_{max\ app}/K_{M\ app}$ ) that is indicative of the ping-pong mechanism. Sigmoid dependence of the enzymatic reaction rate upon thiol concentration was revealed in cases of homocysteine and glutathione, confirming cooperative binding of thiol, that is a predictable property of homotetrameric enzyme. The data obtained indirectly support the hypothesis that the homocysteine peroxidase activity, found earlier in human serum, belongs to Gpx3.