



Research article

## Superoxide dismutases from the camel plasma: Purification and characterization of two copper/zinc isoforms

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### Abstract

Superoxide dismutase (SOD) is a metalloenzyme that represents the initial defense line versus oxidative stress as it dismutates the superoxide ions to hydrogen peroxide and molecular oxygen. SODs have broad medical applications in clinical nutrition, cosmetics and pharmaceuticals. Here, two superoxide dismutases designated camel plasma superoxide dismutase 1 (CPSOD1) and camel plasma superoxide dismutase 2 (CPSOD2) were purified from camel plasma using ammonium sulfate fractionation and chromatography on anion exchanger and gel filtration columns. CPSOD1 had a native molecular weight of about 240 kDa, whereas two bands with molecular weights of 65 kDa and 55 kDa were found on SDS-PAGE suggesting it to be heterotetramer. CPSOD2 exhibited monomeric structure with molecular weight of 60 kDa. The *pI* values are evaluated at pH 6.9 and pH 6.2 for the two SODs.  $\text{CoCl}_2$ ,  $\text{CuCl}_2$ ,  $\text{MgCl}_2$ ,  $\text{NiCl}_2$  and  $\text{ZnCl}_2$  activated CPSOD1 and CPSOD2 while  $\text{CaCl}_2$ ,  $\text{FeCl}_2$  and  $\text{MnCl}_2$  inhibited them. The activity of both isoenzymes is inhibited with KCN and  $\text{H}_2\text{O}_2$ . CPSOD1 and CPSOD2 are proposed to be copper/zinc containing isoenzymes.