BIOCHEMICAL JOURNAL LETTERS

Effect of oxidized glutathione on the inhibition of glucose-6-phosphate dehydrogenase by NADPH

I was interested to read the recent correspondence [1, 2] concerning the proposal that GSSG, plus an unidentified 'cofactor', could relieve the inhibition of glucose-6-phosphate dehydrogenase by NADPH [3]. After reading [3], I spent a long time trying to demonstrate this effect in lysates of type A spinach chloroplasts, as part of our studies of glutathione and ascorbate metabolism in these organelles [4, 5]. Even using Zn^{2+} as an inhibitor of chloroplast glutathione reductase [4], I was unable to find any evidence for the effects reported in [1] and [3]. Chloroplast glucose-6-phosphate dehydrogenase activity, like that of liver, is believed to be regulated by $[\text{NADPH}]/[\text{NADP}^+]$ ratios (for a review see [6]). My observations are consistent with the view [2] that the reported effect of GSSG is an artefact. If it is not an artefact, then the effect cannot be demonstrated in all systems in which glucose-6-phosphate dehydrogenase is regulated by $[\text{NADPH}]/[\text{NADP}^+]$ ratios.

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