

Phosphofructokinase is responsible for the fructose 2,6-bisphosphate inhibition of hexokinase in tissue extracts

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Mammalian and yeast hexokinases were reported to be reversibly inhibited by fructose 2,6-bisphosphate in the presence of cytosolic proteins (H. Niemeyer, C. Cerpa, and E. Rabajille (1987) Arch. Biochem. Biophys. 257, 17-26). Reinvestigation of this finding using a radioassay with [¹⁴C]glucose as substrate showed no effect of fructose 2,6-bisphosphate on hexokinase activity of rat liver cytosols. Detailed reexamination of the spectrophotometric assay resulted in the observation that the fructose 2,6-bisphosphate-dependent inhibition was a function of the cytosolic phosphoglucose isomerase and phosphofructokinase activities compared to the amount of glucose-6-phosphate dehydrogenase used as auxiliary enzyme. The diminution or loss of the fructose 2,6-bisphosphate-dependent inhibition produced in aged cytosols was restored by addition of crystalline muscle phosphofructokinase, as well as by decreasing the amount of glucose-6-phosphate dehydrogenase in the assay. When phosphoglucose isomer