

Characterization of Isoenzymes of Adenosine Triphosphate :D-Hexose 6-Phosphotransferase from Rat Liver

González,

Ureta,

Babul,

Rabajille,

Niemeyer,

Four isoenzymes of adenosine triphosphate (ATP):d-hexose 6-phosphotransferase have been separated from rat liver by DEAE-cellulose. Three of these isoenzymes (A-C) are similar to animal hexokinases inasmuch as they exhibit a low K_m for glucose (10^{-5} - 10^{-4} m) and the rate of phosphorylation of fructose is slightly higher than that of glucose. Isoenzyme D has been further purified by fractionation with ammonium sulfate and by chromatography on hydroxylapatite. This isoenzyme would correspond to glucokinase since it presents a high K_m for glucose (1.8×10^{-2} m), and a low activity with fructose as a substrate; it also catalyzes the phosphorylation of mannose and 2-deoxyglucose. The four isoenzymes use only ATP as phosphate donor, with K_m values of about 5×10^{-4} m. The independence of the affinity of glucokinase for glucose or ATP on the concentration of the other substrate is in agreement with the presence of two separate binding sites on the enzyme. The four isoenzymes are competitively