

# Adaptive character of liver glucokinase

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1. Glucokinase is one of four glucose phosphorylating enzymes present in rat liver. Its distinctive features are a high  $K_m$  for glucose (high- $K_m$  isozyme) and a rather narrow substrate specificity. In contrast, the other three enzymes, collectively called hexokinases or low- $K_m$  isozymes, exhibit low  $K_m$  values for glucose and a wider substrate specificity. 2. Glucokinase is present in the liver of mammals (with some exceptions), amphibians and lower reptiles. It is absent from higher reptiles and birds. The presence or absence of glucokinase may represent an evolutionary adaptation to feeding habits and other physiological peculiarities. Differences in the immunological behavior and in the kinetic parameters of glucokinases from different taxa suggest the operation of divergent evolution. 3. The levels of glucokinase in rat liver depend strictly on the supply of carbohydrate in the diet. Glycogen phosphorylase and glycogen synthetase behave similarly, whereas other carbohydrate-metaboliz