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Glucose-induced Regulation of Na,K-ATPase activity in pancreatic β-cells in the presence and absence of intolerance to the nutrient

PhD Thesis

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Na,K-ATPase is responsible for the maintenance of plasma membrane gradients of K^+ and Na^+. It has been suggested that glucose contributes to the regulation of Na,K-ATPase activity in pancreatic β-cell. However, the physiological role of glucose-induced regulation of Na,K-ATPase activity and the mechanisms underlying its effect have not been clarified yet.

The main objective of this work was to investigate the effect of glucose on Na,K-ATPase activity in pancreatic β-cell, in the presence and absence of intolerance to glucose.

It was concluded that, in control rats, glucose induced an inhibition of Na,K-ATPase activity and that AMPK and PKC may play a role in the cascade of events underlying glucose-evoked regulation of the pump. In intolerant rats glucose-induced Na,K-ATPase activity regulation was impaired. Moreover, a differential pattern of isoenzymatic distribution and dysfunctions of the cascade of events evoked by glucose in pancreatic β-cell from intolerant rats are both contributing for this impairment.