

Abstract

1. Anaerobic glycolysis in intact bloodstream *Trypanosoma brucei brucei* was studied. 2. Fructose, glucose and mannose were aerobically catabolized at rates of 3.4, 3.0 and 2.5 and anaerobically at rates of 0.38, 2.75 and 2.35 $\mu\text{mol hexose/hr}/10^8$ trypanosomes respectively. 3. Glycerol 3-phosphate and ADP accumulated approximately to the same level from anaerobic catabolism of the three hexoses. However, fructose catabolism stopped within 15-20 min but addition of glucose to these already immobilized trypanosomes temporarily caused a rapid characteristic drop in glycerol 3-phosphate level at a rate of 40 nmol/min/ 10^8 trypanosomes and correspondingly glucose 6-phosphate, glycerol and pyruvate levels were raised. 4. These observations are not consistent with the proposed requirements for the reverse glycerol kinase in anaerobic net ATP production. Instead, we propose a glycerol 3-phosphate:glucose transphosphorylase that catalyses the formation of glycerol and glucose 6-phosphate.