

## **Abstract**

1. The production of pyruvate, glycerol and glycerol-3-phosphate by intact and digitonin-permeabilized *Trypanosoma brucei brucei* has been studied with glucose or the glycolytic intermediates as substrates. 2. Under aerobic conditions hexosephosphates gave maximal glycolysis in the presence of 40-60 micrograms digitonin/10(8) trypanosomes while the triosephosphates gave it at 20-30 micrograms digitonin/10(8) trypanosomes. 3. In the presence of salicylhydroxamic acid, and the glycolytic intermediates, permeabilized trypanosomes produced equimolar amounts of pyruvate and glycerol-3-phosphate and no glycerol. Under the same conditions, glucose catabolism produced glycerol in addition to pyruvate and glycerol-3-phosphate. 4. In the presence of salicylhydroxamic acid and ATP or ADP intact trypanosomes produced equimolar amounts of pyruvate and (glycerol plus glycerol-3-phosphate) with glucose as substrate. 5. A carrier for ATP and ADP at the glycosomal membrane is implicated. 6. It is apparent that glycerol formation is regulated by the ATP/ADP ratio and that it needs intact glycosomal membrane and the presence of glucose.