Influence of glycogen content on the effect of 2,4-dinitrophenol on the synthesis of p-aminohippurate by rat liver slices

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The effect of 2,4-dinitrophenol (DNP) on the synthesis of p-aminohippurate (PAH) by rat liver slices under several experimental conditions was studied. A concentration of 0.025 mM DNP inhibits PAH synthesis, and this effect is less pronounced with high glycogen content in the tissue. Fructose 1,6-diphosphate and pyruvate also counteract partially the inhibitory effect of DNP in slices with low glycogen content. At higher concentrations of DNP (0.1 mM), high glycogen content still protects PAH synthesis; fructose 1,6-diphosphate protects only if glycogen level is high and pyruvate exerts no significant protection. The anaerobic suppression of PAH synthesis is counteracted neither by high glycogen content nor by addition of fructose 1,6-diphosphate and pyruvate. Exogenous adenosine triphosphate (ATP) does not protect against DNP. Moreover, ATP by itself inhibits the synthesis of PAH.