

Publication

Alpha 1-adrenergic stimulation of ketogenesis and fatty acid oxidation is associated with inhibition of lipogenesis in rat hepatocytes

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 3188596**Author(s)** STARK, B; KELLER, U**Author(s) at UniBasel** [Keller, Ulrich O.](#) ;**Year** 1987**Title** Alpha 1-adrenergic stimulation of ketogenesis and fatty acid oxidation is associated with inhibition of lipogenesis in rat hepatocytes**Journal** Experientia**Volume** 43**Number** 10**Pages / Article-Number** 1104-1106**Keywords** Animals, Fatty Acids/*metabolism, Ketone Bodies/*biosynthesis, Lipids/*biosynthesis, Liver/drug effects/*metabolism, Male, Norepinephrine/pharmacology, Oxidation-Reduction, Palmitic Acid, Palmitic Acids/metabolism, Prazosin/pharmacology, Rats, Rats, Inbred Strains, Receptors, Adrenergic, alpha/*physiology

The effect of norepinephrine on fatty acid synthesis ($^3\text{H}_2\text{O}$ incorporation into fatty acids), on fatty acid oxidation to CO_2 and on ketogenesis was studied in isolated hepatocytes of fed rats. After incubation with norepinephrine (50 μM), lipogenesis was lower (5.7 ± 1.1 nmoles $^3\text{H}_2\text{O}$ incorporated into fatty acids/mg dry weight/30 min) than in controls (7.5 ± 1.7 ; $n = 6$, p less than 0.02). In contrast, ($1\text{-}^{14}\text{C}$) palmitate conversion into total ketone bodies was increased to 10.9 ± 1.8 nmoles/mg/30 min with norepinephrine, vs 8.5 ± 1.6 in controls (p less than 0.05), and more ($1\text{-}^{14}\text{C}$) palmitate was converted to $^{14}\text{CO}_2$ with norepinephrine than in controls (1.48 ± 0.10 nmoles/mg/30 min vs 1.06 ± 0.11 , p less than 0.05). The inhibitory effect of norepinephrine on lipogenesis was abolished by addition of the alpha 1-receptor blocker prazosin, but not by alpha 2 or beta-blockers. The results demonstrate that the ketogenic effect of norepinephrine is coupled with an inhibitory effect on lipogenesis which may be explained by diminished activity of acetyl-CoA carboxylase, diminished formation of malonyl-CoA and decreased activity of carnitine palmitoyl transferase I.

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