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Accumulation of Medium Chain Acyl-CoAs during β -Oxidation of Long Chain Fatty Acid by Isolated Peroxisomes from Rat Liver

Fumie Hashimoto(橋本フミ恵), Yasuko Furuya(古屋泰子),
and Hidenori Hayashi(林 秀徳)*

Department of Pathological Biochemistry, Faculty of Pharmaceutical Sciences,
Josai University, Keyakidai, Sakado, Saitama 350-0295, Japan

We have reported fatty alcohol synthesis accompanied with chain elongation in liver peroxisomes (Biochim. Biophys. Acta, 1346, 38 (1997)). In the present experiment, we studied what kind of acyl-CoA(s) destined to be utilized as primer for fatty alcohol synthesis accumulate(s) during peroxisomal β -oxidation. Peroxisomes were prepared from rat liver treated with clofibrate, a peroxisome proliferator, and incubated with [U- 14 C]palmitate, in order to investigate acyl-CoAs after β -oxidation. At 1 mM concentration, MgATP increased β -oxidation activity, but inhibited β -oxidation at concentrations higher than 1 mM. After incubation of peroxisomes with palmitate, various acyl-CoAs were formed. Among medium-chain labelled acyl-CoAs, octanoyl-CoA was mainly detected. These results indicate that octanoyl-CoA accumulates during β -oxidation of palmitate. When peroxisomes were incubated with [9,10- 3 H] palmitate and [9,10- 3 H] stearate, among medium-chain acyl-CoAs, octanoyl-CoA and decanoyl-CoA were mainly detected, respectively, suggesting the occurrence of at least 4 cycles of β -oxidation of both fatty acids by peroxisomes.