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Metabolism of gama-tocopherol in the liver of male Sprague-dawley rat (Rattus norvegiens)

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Witamin E (VE) plays important roles in the physiological and biochemical processes of animals and humans. However, VE is a unique vitamin that has not been understood thoroughly because the metabolites of VE are very complicated and hard to be analyzed. This experiment was conducted to study the metabolism of γ-tocopherol, one of 8 VE isomers, in the liver post-mitochondrial supernatant (S9) of male Sprague-Dawley rat (Rattus norvegiens, SD-rat) using a novel approach. The results showed that an optimal reactive system of γ-tocopherol metabolism was composed of 5 mg/ml of S9, 8 µg/ml of γ-tocopherol, 1 mmol/ml of nicotine amide adenine dinucleotide phosphate (NADPH) and 45 min of reactive time at 35°C. The metabolites of γ-tocopherol could be successfully analyzed using gradient elution and reverse-phase high-performance liquid chromatography (RP-HPLC). The main metabolite was identified as ω -hydroxylate, a side chain of γ-tocopherol when the structure of γ-tocopherol metabolites was determined using gas chromatography-mass spectrometry (GC-MS). A conclusion was drawn that ω -hydroxylate, a main metabolite of γ-tocopherol, could be most utilized by SD-rat and other mammals.

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