ラット中の主要なメバロン酸二リン酸脱炭酸酵素の組織分布

道原明宏、赤﨑健司、家森幸男、辻　宏

Biol. Pharm. Bull., **24** (11), 1231-1234 (2001)

Tissue Distribution of a Major Mevalonate Pyrophosphate Decarboxylase in Rats

Akihiro Michihara, Kenji Akasaki, Yukio Yamori*, and Hiroshi Tsuji

ABSTRACT: The 45- and 35-kDa subunits of mevalonate pyrophosphate decarboxylase (MPD) have been purified from rat liver. In this study, we examined the relationship between 45- and 35-kDa MPD and the tissue distribution of a major MPD in rat liver. When the crude extract of rat liver fed on normal chow was subjected to immunoblot analysis using anti-45 kDa MPD antibody, only the 45- kDa band was detected. In a pulse-chase experiment using anti-rat 45-kDa MPD antibody, there was no precursor-product relationship between the 45- and the 35-kDa MPD. In immunoprecipitation, more than 85% of MPD activity in the rat liver was depleted from the crude extract with an excess of the above antibody. When 45-kDa MPD contents in tissues were analyzed by immunoblotting, a single protein band with an apparent molecular weight of 45 kDa was detected in all tissues. The specific protein content of 45-kDa MPD in liver was markedly higher than in other tissues. The activity/amount ratio varied among brain, liver, and testis, being significantly highest in the liver. From these data, it is suggested that 45-kDa MPD serves as a major enzyme involved in cholesterol biosynthesis in rat liver and that a tissue-specific regulator or isozyme of 45-kDa MPD is present in rat liver.

抄録　今回我々は、45kDa と 37kDaメバロン酸二リン酸脱炭酸酵素 (MPD) の関係、並びに45kDa MPD の組織分布を調べた。抗45kDa MPD 抗体を用いてパルスチェイスを行った結果、37kDa MPDは45kDa MPDの前駆体でないことが明らかになった。さらに免疫沈降した結果、ラット肝抽出液から８５％のMPD活性を消失させた。これらの結果より、ラット肝に存在する45kDa MPDはコレステロール合成に関与する主要な酵素であることが示された。次に組織分布を調べた結果、すべての組織において45kDa の位置に単一バンドが検出された。特に肝において45kDa MPDの多くが含まれていた。脳、肝、精巣中のMPD比活性を算出した結果、肝において著しく高い比活性の値を示した。これらの結果より、ラット肝には45kDa MPDのアイソフォーム、あるいは組織特異的調節機構の存在が示唆された。

* Graduate School of Human and Environmental Studies, Kyoto University
京都大学大学院人間・環境学研究科