

血管平滑筋由来サルコレンマ分画に見られる 膜結合 ATPase 活性の特性化

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Characterization of Membrane-Bound Adenosinetriphosphatase Activity of Sarcolemma-Enriched Fraction from Vascular Smooth Muscle

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ABSTRACT: Membrane-bound adenosinetriphosphatase (ATPase) activities of the sarcolemma-enriched fraction from bovine aorta were characterized. The membranes, isolated by a sucrose density gradient method, were enriched about 31-fold in sodium- and potassium-stimulated, magnesium-dependent ATPase (Na, K-ATPase) activity, and about 8-fold in 5' -nucleotidase activity compared to the homogenate, suggesting that the isolated membranes were substantially enriched with the sarcolemma. The membranes exhibited about 31, 33 and 42 $\mu\text{mol Pi/mg protein/h}$ of Na, K-ATPase, magnesium-dependent ATPase and calcium dependent ATPase activities, respectively, in the presence of 4 mmol/l ATP. The sarcolemma enriched membranes required considerably high concentrations of well-known inhibitors for Na, K-ATPase such as vanadate (more than 1 $\mu\text{mol/l}$), lanthanum (more than 1 mmol/l) and calcium (10 mmol/l), to induce a significant inhibition in the Na, K-ATPase activity. Treatments of the membrane with physical disruptions and sodium dodecyl sulfate or deoxycholate reduced the total Na, K-ATPase activity, and did not expose fully the ouabain sensitivity of the Na, K-ATPase. These results indicate that there are marked differences in the properties of the ATPase between vascular smooth muscle sarcolemma and cardiac sarcolemma.

抄録 牛大動脈から得られるサルコレンマに富む分画の ATPase の特性化を検討した。この分画は 31 $\mu\text{mol/Pi/mg protein}$ の Na, K-ATPase, 33 $\mu\text{mol/Pi/mg protein}$ の Mg-ATPase, 42 $\mu\text{mol Pi/mg protein}$ の Ca-ATPase, 活性を示した。Na, K-ATPase はよく知られている阻害剤バナジウム酸, ランタン, カルシウムの有意な阻害作用発現にはかなりの高濃度を必要とした。分画膜小胞を物理的, 化学的に壊しても Na, K-ATPase のウアバイン感受性を高める

ことはなかった。結果は血管平滑筋からの分画膜 ATPase と心筋とのそれとにかなりの異なりがあることを示した。

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