

论 文

用Fura-2测定突触体内游离Ca<sup>2+</sup>浓度及Ca<sup>2+</sup>通道激动剂和阻断剂的影响

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摘要:

用Fura-2测定大鼠突触体内游离Ca<sup>2+</sup>浓度,探讨Ca<sup>2+</sup>通道激动剂和阻断剂对突触体内钙浓度的影响。测得突触体内Ca<sup>2+</sup>浓度为200~400 nmol/L。观察了不同浓度KCl,CaCl<sub>2</sub>,NMDA和谷氨酸对突触体内Ca<sup>2+</sup>增加的影响以及维拉帕米及MgCl<sub>2</sub>对KCl和NMDA引起钙内流的阻断作用。本实验提供一个研究突触体内Ca<sup>2+</sup>变化的准确而稳定的方法,并对测定中几个影响因素加以讨论。

关键词: 新型钙离子荧光指示剂(Fura-2) 突触体 N-甲基-D-天冬氨酸(NMDA) 钙通道激动剂 钙通道阻断剂

ESTIMATION OF FREE CALCIUM LEVEL WITHIN SYNAPTOSOMES BY USING FURA—2 AND THE EFFECT OF CALCIUM CHANNEL AGONIST AND ANTAGONIST

H Gao and YP Feng

Abstract:

The cytosolic free calcium concentration [Ca<sup>2+</sup>]<sub>i</sub> in synaptosomes was determined with the fluorescent indicator fura-2, the effects of calcium channel agonist and antagonist on intracellular Ca<sup>2+</sup> level were studied. The cytosolic ionized calcium concentrations in resting status were between 200 nmol/L and 400 nmol/L. Cytosolic Ca<sup>2+</sup> was elevated following increases in Ca<sup>2+</sup> concentration in the medium, plasma membrane depolarizations induced by KCl, and the addition of glutamate and NMDA. On the other hand, the increase of cytosolic Ca<sup>2+</sup> induced by KCl was decreased by verapamil and that induced by NMDA was decreased by MgCl<sub>2</sub>. A few critical problems in [Ca<sup>2+</sup>]<sub>i</sub> detection were also discussed.

Keywords: Synaptosome N-methyl-D-aspartate (NMDA) Calcium channel agonist Calcium channel antagonist Fura-2

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- ▶ 突触体
- ▶ N-甲基-D-天冬氨酸(NMDA)
- ▶ 钙通道激动剂
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