

论著

## 磷酸化PKC $\delta$ 参与6-OHDA诱导的多巴胺能神经细胞凋亡

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**摘要** 目的: 观察磷酸化PKC $\delta$ 在6-OHDA诱导的大鼠PC12细胞株凋亡过程中所起的作用, 探讨帕金森病发病的可能分子机制。方法: 体外培养多巴胺能神经细胞株PC12细胞, 观察PKC激动剂和抑制剂对6-OHDA毒性作用的影响, 分别用TUNEL染色和透射电镜法观察细胞凋亡, Western免疫印迹法观察磷酸化PKC $\delta$ 的表达。结果: PKC $\delta$ 激活剂PMA加重6-OHDA的毒性作用, 使细胞凋亡率上升。PKC $\delta$ 抑制剂Rottlerin可抑制PKC $\delta$ 的磷酸化, 减轻6-OHDA引起的细胞凋亡。总PKC抑制剂Bis和钙依赖性PKC抑制剂G 6976不能减轻6-OHDA引起的细胞凋亡。结论: 在6-OHDA诱导PC12细胞凋亡的过程中, PKC $\delta$ 的磷酸化是重要环节之一, PKC $\delta$ 可能直接参与帕金森病人的神经元凋亡过程。

**关键词** [多巴胺](#); [蛋白激酶C](#); [帕金森病](#)

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## Phosphorylation PKC $\delta$ participates in apoptosis of PC12 cells induced by 6-hydroxydopamine

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### Abstract

<FONT face=Verdana>AIM: To observe the effect of phosphorylation protein kinase C delta (PKC $\delta$ ) on the procedure of PC12 cells apoptosis induced by 6-hydroxydopamine(6-OHDA) and to investigate the potential molecular pathogenesis of Parkinson disease. METHODS: TUNEL staining and transmission electron microscope were applied to measure apoptosis when dopaminergic PC12 cells exposed to the excitomoters and inhibitors of PKC before 6-OHDA for 18 hours. The expression of phosphorylation of PKC $\delta$  was detected by Western blotting.

<BR>RESULTS: PMA, an activating agent of PKC $\delta$ , significantly increased PC12 cell apoptosis induced by 6-OHDA. Rottlerin, an inhibitor of PKC $\delta$ , protected PC12 cells apparently. As contrast, bisindolylmaleimide I, an inhibitor of general PKC and G 6976, the inhibitor of calcium-dependent PKC, did not show any protective role.

CONCLUSION: The phosphorylation PKC $\delta$  is one of the important links in the process of PC12 cell apoptosis induced by 6-OHDA. PKC $\delta$  may directly participate in neurodegeneration process in parkinsonian. </FONT>

**Key words** [Dopamine](#) [Protein kinase C](#) [Parkinson disease](#)

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