Differentiation of Pheochromocytoma PC12 Cells Induced by Human Urine Extract and the Involvement of the Extracellular Signal–Regulated Kinase Signaling Pathway

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摘要

Abstract

OBJECTIVE: The aim of this study was to investigate the effects of a human urine preparation on the differentiation of tumor cells. DESIGN: The pheochromocytoma PC12 cells were used to examine the effects of a human urine preparation, CDA-2 on the induction of differentiation markers, neurofilaments, and compared with that induced by nerve growth factor (NGF). The MAPK/ERK kinase (MEK) inhibitor U0126 was used to examine the involvement of mitogen-activated protein kinase (MAPK) signaling pathway in this differentiation inducing effect. RESULTS: We find that CDA-2 could induce differentiation of pheochromocytoma PC12 cells, as evidenced by the markedly increased expression of neurofilaments to a level comparable to those induced by NGF. This phenomenon was accompanied by the phosphorylation of extracellular-signal-regulated kinase (ERK) and could be inhibited by the MEK inhibitor, U0126. CONCLUSIONS: Our results demonstrate the presence of active components in the human urine extract that can induce differentiation of PC12 cells and may involve the ERK signaling pathway. This may provide new insights for seeking novel differentiation agents and offer hope for cancer patients

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