

神経細胞アポトーシスにおけるアラキドン酸カスケードの役割

著者	樋口 善博
著者別表示	Higuchi Yoshihiro
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Role of arachdonate cascade in apoptosis of neronal cells

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Section

一般

Research Field

Structural biochemistry

Research Institution

Kanazawa University

Principal Investigator

HIGUCHI Yoshihiro Kanazawa University Graduate School of Medical Science, 大学院・医学研究科, 助手 (10019630)

Co-Investigator(Kenkyū-buntansha)

YOSHIMOTO Tanihiro Kanazawa University Graduate School of Medical Science, 大学院・医学系研究科, 教授 (60127876)

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Research Abstract

Glutamate caused GSH depletion inducing apoptosis through endogenously produced active oxygen species and thereby 1-2 Mbp giant DNA and high molecular weight DNA fragmentation prior to the internucleosomal DNA fragmentation seen in C6 rat glioma cells. During apoptosis induced by GSH-depletion, reactive oxygen species (ROS) caused lipid peroxidation associated with PK-C activation. AA promoted cell death by changing the apoptosis to

necrosis through lipid peroxidation initiated by lipid hydroperoxides produced by 12-lipoxygenase under the GSH depletion in C6 cells. Some ROS such as hydroperoxide produced by unknown pathway make hydroxy radicals and induce 8-OH-dG formation in the cells. The conversion of apoptosis to necrosis may be a possible event under GSH depleted conditions and a model of glial cell death. GSH depletion caused by glutamate induces 8-OH-dG formation. Polyunsaturated fatty acids enhanced lipid peroxidation associated with 8-OH-dG formation through a chain reaction. BSO, an inhibitor for GSH synthesis, also induced lipid peroxidation and consequently leads to 1-2 Mbp giant DNA fragmentation. Polyunsaturated fatty acids enhanced the giant DNA fragmentation and 3'-OH termini in chromosomal DNA promoting lipid peroxidation by a chain reaction under the GSH depletion induced by both glutamate and BSO. Ultraviolet (UV) radiation activated caspase-3 associated with cleavage of poly (ADP-ribose) polymerase in T-24 carcinoma cells,. UV induced apoptosis through no producing ROS, at least DCFH reactive ROS, activation of caspase-3 and internucleosomal DNA fragmentation. It is suggested that mechanism of cell death on GSH depletion -induced apoptosis is different from that of UV-induced apoptosis.

Research Products (20 results)

All Other

All Publications (20 results)

- [Publications] Higuchi, Y., Matsukawa, S.: "Active oxygen-mediated chromosomal 1-2 Mbp giant DNA fragmentation into internucleosomal DNA fragmentation in apoptosis of glioma cells induced by glutamate"Free Radic. Biol. Med.. 24. 418-426 (1998) ▼
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