

〈特別講演〉

アポトーシスの科学

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The Cellular and Molecular Biology of Apoptosis

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Abstract

“Apoptosis” is the name given by Kerr *et al.* to morphological change culminating in cell death by a process clearly distinct from necrosis. Not only in morphology but also in function, apoptosis is distinctly different from necrosis. Apoptosis is relevant to a range of biological processes, including differentiation, development, cell maturation, and immunologic function, together with cell injury induced by a spectrum of physical and chemical agents. Abnormal manifestation of the apoptotic activity might result in carcinogenesis, infectious diseases such as AIDS, autoimmune diseases, neural disorders such as Alzheimer disease, and cell death induced by radiation or ultraviolet rays. A number of factors are able to cause apoptosis through various intracellular signal transduction pathways. Onset of execution processes of apoptosis is decided by the expression of several genes, and the execution processes progress in association with many biochemical and cytological changes such as cell shrinkage, chromatin condensation and internucleosomal DNA fragmentation. Apoptosis, cell proliferation and differentiation share not only the common genes but also the basic mechanisms, and work together to regulate and maintain homeostasis of a multicellular organism.

Key words: apoptosis, programmed cell death.