SPONTANEOUS INTERNUCLEOSOMAL DNA FRAGMENTATION IN ISOLATED NUCLEI

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January 2008

Electronic Journal of Natural Sciences;Jan2008,
Vol. 10 Issue 1, p13

Academic Journal

Article

Internucleosomal DNA fragmentation is recognized to be essential for vast majority of apoptotic deaths. It is accepted that this biochemical event is triggered in nuclei of dying cell by signals transmitted from cytoplasm in late apoptosis. In present study we attempt to examine whether nuclei per se is capable to set on internucleosomal DNA fragmentation in cell-free system that eliminates translocation of apoptosis-associated signals from cytoplasm. It was found that in cell-free system nuclear DNA undergoes spontaneous non-random internucleosomal fragmentation attributive to apoptosis. The role of poly(ADP-ribosyl)ation in DNA fragmentation in isolated nuclei was examined. The data indicate upon suppression of poly(ADP-ribosyl)ating activity of thymocyte nuclei before the onset of internucleosomal DNA fragmentation. These results are consistent with hypothesis that PARP-1 (poly-ADP-ribosyl-polymerase) is involved in repressive mechanisms that keep the chromatin destruction in check and its inactivation might strongly influence the rate of internucleosomal DNA fragmentation serving to facilitate nuclear disintegration in apoptosis.