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Induction of apoptosis of tumor cells by binase

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Abstract

An induction of apoptosis by RNase from Bacillus intermedius (binase) and its mutants characterized with low catalytic activity (Lys 26Ala and His 101Glu) in human myelogenic erythroleukemia K562 cells, human lung carcinoma A549 cells and human peripheral blood mononuclear cells was studied. For the first time selective apoptogenic effects of binase toward leukemic blood cells was determined. Neither antiproliferative nor apoptotic effects of binase were detected in normal human peripheral blood mononuclear cells. Formation of low molecular weight oligonucleosomal DNA fragments (less than 50 Kb) which are an early marks of apoptosis was registered in solid tumor cells treated by binase. Using mutant RNases it was shown that decrease of catalytic activity to 2.5% of wild type enzyme activity leads to the loss of apoptogenic properties of enzyme. Selective apoptogenicity of binase found towards malignant cells confirmed that antitumor agents based on bacterial RNases could be considered as an alternative to standard chemotherapeutic drugs.