

DNA Breaks Induction by Mimosine

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Mouse erythroleukemic F4 N cells were treated with mimosine, etoposide, Fe(II)-EDTA, and Cu(II) in the presence of ascorbate. DNA was isolated and subjected to agarose gel electrophoresis and the size and distribution of the DNA fragments produced by the agents were compared. With increasing concentration of Cu(II) the production of DNA fragments was increased without decrease of the average length of the fragments, and their sizes were similar to those produced by etoposide as expected for cleavage of DNA at the nuclear matrix attachments sites. In contrast, mimosine and Fe(II) produced fragments of random size and with the progression of the reaction the average length of the fragments decreased. These results indicate that mimosine cuts DNA in a random fashion, regardless of its higher order chromatin organization. A conclusion is drawn that the DNA fragments obtained after mimosine treatment are a result of mimosine-assisted, Fe(II) dependent Fenton-like reactions randomly cutting chromosomal DNA.

Key words: Mimosine, DNA Breaks, Nuclear Matrix