Cytogenetic Effects of Zinc Deficiency and Response to X-rays and Chemicals in Mice

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The frequency of sister chromatid exchange (SCE) in bone marrow cells of zinc-deficient mice was approximately twice as high as that in the control group in vivo. Mitomycin C treatment in the zinc-deficient groups increased SCE frequency to the same level as those in the control groups, whereas X-ray irradiation and 4-nitroquinoline 1-oxide treatment increased SCE frequency slightly in the zinc-deficient group compared with those in the control groups. However, there was no difference in chromosome aberration and mitotic index between zinc-deficient and control groups, although X-rays and mitomycin C induced structural anomalies in bone marrow cells in mice. These findings indicate that zinc deficiency may exert cytogenetic effects in vivo, but the susceptibility to mutagens of mice in the zinc-deficient state remains unclear.