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THE DIETARY SUPPLEMENT CHROMIUM PICOLINATE INDUCES CHROMOSOME DAMAGE IN CHINESE HAMSTER OVARY CELLS.

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Chromium (III) has been proposed to be an essential trace mineral in animals and humans, functioning in the maintenance of normal levels of glucose and lipid metabolism. Chromium supplements available to consumers include chromium (III) chloride (CrCl<sub>3</sub>), chromium (III) nicotinate (CrNic) (U.S. Patent 5194615) and chromium (III) picolinate (CrPic) (U.S. Patent 4315927). We are interested in the ability of chromium supplements to cause DNA damage. Chinese hamster ovary AA8 cells were treated with varying amounts of particulate CrPic or CrNic for 24 hours. Cytotoxicity was determined by measurement of colony formation. Chromosome damage was measured as clastogenicity observed for cells in metaphase. Results were compared to those obtained in cells treated with ligands alone or with CrCl<sub>3</sub>. CrPic was found to cause significant chromosome damage at a non-toxic dose, and damage was dose-dependent. Treatment with CrPic producing 91 +/- 12 % colony survival resulted in 32 +/- 2% of metaphases with chromosome damage. CrNic, CrCl<sub>3</sub> and nicotinate did not cause chromosome damage at equivalent dose Chromosome damage induced by CrPic was inferred to arise from the ligand since picolinate alone caused damage at a non-toxic dose This study raises the question of the safety of chromium as a human dietary supplement. (Funded by PHS Grants #CA 34869 and #CA 59292 National Cancer Institute.)