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## **Melatonin and radioprotection from genetic damage: in vivo/in vitro studies with human volunteers.**

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### **Abstract**

Peripheral blood samples were collected from human volunteers at 0 (5-10 min before), and at 1 and 2 h after a single oral dose of 300 mg of melatonin. At each time point, (i) the concentration of melatonin in the serum and in the leukocytes was determined, and (ii) the whole blood was exposed in vitro to 150 cGy of <sup>137</sup>Cs gamma radiation, and the lymphocytes were cultured with mitogenic stimulation to determine the extent of radiation-induced genetic damage, viz, chromosome aberrations and micronuclei. For each volunteer, the results showed a significant increase in the concentration of melatonin in the serum and in the leukocytes at 1 h after the oral dose of melatonin, as compared to the sample collected at 0 h. The lymphocytes in the blood samples collected at 1 and 2 h after melatonin ingestion and exposed in vitro to 150 cGy gamma radiation exhibited a significant decrease in the incidence of chromosome aberrations and micronuclei, as compared with similarly irradiated lymphocytes from the blood sample collected at 0 h; the frequencies observed in the cells sampled at 2 h after the ingestion of melatonin were consistently lower when compared with those collected at 1 h. The data may have important implications for the protection of human lymphocytes from the genetic damage induced by free radical-producing mutagens and carcinogens.

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