Abstracts

Cell membrane permeabilization of human erythrocytes by athermal 2450-MHz microwave radiation

G. Sajin, E. Kovacs, R.P. Moraru, T. Savopol and M. Sajin. "Cell membrane permeabilization of human erythrocytes by athermal 2450-MHz microwave radiation." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 2072-2075.

The effects of low-level microwaves (2.45 GHz) on the membrane of human erythrocytes were studied measuring the hemoglobin loss and osmotic resistance of erythrocytes exposed to different power densities (0.025-10.0 mW/cm/sup 2/) at different irradiation times. A significant increase of the hemoglobin loss by exposed erythrocytes as well as a strong dependence of the rate of the increase of hemoglobin loss on the initial level of spontaneous hemolysis were observed. It was found that at low power densities (0.84 and 1.36 mW/cm/sup 2/), the hemolysis degree increases quasi-linearily with the exposure time, while at higher density (5 mW/cm/sup 2/), this tendency is reversed after first 10 h of irradiation. It appears like long-term irradiation exerts a protective effect against spontaneous hemolysis caused by blood ageing. The osmotic fragility test performed on samples exposed to 5 mW/cm/sup 2/ at different irradiation times showed that the osmotic resistance of exposed erythrocytes increases in time, reaching a maximum at the end of irradiation (60 h), while the osmotic resistance of the controls is constant.

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