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Influence of MLS laser radiation on erythrocyte membrane fluidity and secondary structure of human serum albumin

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Abstract The biostimulating activity of low level laser radiation of various wavelengths and energy doses is widely documented in the literature, but the mechanisms of the intracellular reactions involved are not precisely known. The aim of this paper is to evaluate the influence of low level laser radiation from an multiwave locked system (MLS) of two wavelengths (wavelength = 808 nm in continuous emission and 905 nm in pulsed emission) on the human erythrocyte membrane and on the secondary structure of human serum albumin (HSA). Human erythrocytes membranes and HSA were irradiated with laser light of low intensity with surface energy density ranging from 0.46 to 4.9 J cm^{-2} and surface energy power density 195 mW cm^{-2} (1,000 Hz) and 230 mW cm^{-2} (2,000 Hz). Structural and functional changes in the erythrocyte membrane were characterized by its fluidity, while changes in the protein were monitored by its secondary structure. Dose-dependent changes in erythrocyte membrane fluidity were induced by near-infrared laser radiation. Slight changes in the secondary structure of HSA were also noted. MLS laser radiation influences the structure and function of the human erythrocyte membrane resulting in a change in fluidity.

Keywords Erythrocyte membrane · Human serum albumin · Laser therapy · MLS M1 system

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