THRESHOLDS OF BIOLOGICAL ACTION OF ULTRASOUND

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The caracter of regulative and reparative processes in the cell depends upon the extent to which intercellular medium is changed and, therefore, upon the extent of changes in the cell membrane permeability which is, in turn, dependent on the duration and intensity of ultrasonic (US) action. Hence, the threshold for the biological action of US is the intensity below which there appear to be no changes in the permeability of membranes. The threshold does not exeed 10 $mW \cdot cm^{-2}$ (1 MHz). In an interval of higher US intensities the changes in the structure and function of the cell are not visible, which is due to the development of regulative processes compensating the consequences of the change of membrane permeability during ultrasound irradiation. The upper intensity boundary of this interval, the exceeding of which leads to the appearance of visible US effects can be accepted as another "registrating" threshold ($\approx 0{,}1$ $W \cdot cm^{-2}$). The biological US effects are reversible in the particular interval of US intensities of $\geqslant 0{,}1$ $W \cdot cm^{-2}$. The upper boundary of this interval (≈ 1 $W \cdot cm^{-2}$) can be taken as another threshold. Exceeding this threshold results in pronounced destructive changes in the cells. Which of these thresholds is to be taken as the threshold of biological action of US depends upon what should be taken as a result of US action on biological systems.