Study of the Influence of Terahertz Radiation and a Magnetic Field on Blood Characteristics

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The problem of organism protection from damaging impact of new terahertz-radiating devices integrated into practice is as important as a searching of new methods and ways of therapy and maintenance of wide-spread diseases with help of EMR. In this project I irradiated rat blood by the gyrotron microwaves at 263 GHz to find non-thermal impact of THz radiation. Moreover, analyses of samples and theoretical calculations of the amount of radiation reaches each vial were done. My research contains several methods: determining of amount of ATP using bioluminescent ATP measurement, assessment of EPM of erythrocytes in buffer solution under the DC impact, estimation of lipid peroxidation speed from the malondialdehyde content. The impact of low and high yield differs heavily. Minimal radiation power reduces EPM of erythrocytes and activates lipoperoxidation. However the opposite effect also exists being difficult to explain. Under the high radiation power EPM and ATP amount grow, lipoperoxidation slows down. This effect can be used in therapy but surely demands further investigation. Powerful radiation probably provides the process of assimilation and fights free radicals. Anyway, this exploration has great prospects and various directions. I think that reducing EMP of erythrocytes takes place in within a context of oxidative changes in lipids. But I have an alternative hypothesis explaining the effect of non-ionizing terahertz cure on red blood cells. It lies in the fact that the radiation itself can be inert with respect to the tissues, and a constant magnetic field from gyrotron cryomagnet plays a crucial role in this influence. The study of this effect continues.

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