

Nonthermal effects of extremely high-frequency microwaves on chromatin conformation in cells in vivo-dependence on physical, physiological, and genetic factors

I.Y. Belyaev, V.S. Shcheglov, E.D. Alipov and V.D. Ushakov. "Nonthermal effects of extremely high-frequency microwaves on chromatin conformation in cells in vivo-dependence on physical, physiological, and genetic factors." 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)): 2172-2179.

There is a substantial number of studies showing biological effects of microwaves of extremely high-frequency range [i.e., millimeter waves (MMWs)] at nonthermal intensities, but poor reproducibility was reported in few replication studies. One possible explanation could be the dependence of the MMW effects on some parameters, which were not controlled in replications. The authors studied MMW effects on chromatin conformation in *Escherichia coli* (*E. coli*) cells and rat thymocytes. Strong dependence of MMW effects on frequency and polarization was observed at nonthermal power densities. Several other factors were important, such as the genotype of a strain under study, growth stage of the bacterial cultures, and time between exposure to microwaves and recording of the effect. MMW effects were dependent on cell density during exposure. This finding suggested an interaction of microwaves with cell-to-cell communication. Such dependence on several genetic, physiological, and physical variables might be a reason why, in some studies, the authors failed to reproduce the original data of others.

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