Abstracts

A Possible Mechanism for the Influence of Electromagnetic Radiation on Neuroelectric Potentials

R.J. MacGregor. "A Possible Mechanism for the Influence of Electromagnetic Radiation on Neuroelectric Potentials." 1979 Transactions on Microwave Theory and Techniques 27.11 (Nov. 1979 [T-MTT]): 914-921.

This paper explores the idea that the electrical component of applied microwave and radiowave radiation might induce transmembrane potentials in nerve cells and, thereby, disturb nervous function and behavior. The paper estimates the transmembrane currents and potentials induced in nerve cells by applied electrical fields and currents. Estimates are made for steady and for oscillating stimulation. The primary conclusion is that intracranial electrical fields associated with low-intensity irradiation in the frequency range of 10/sup 6/-10/sup 10/ Hz may induce transmembrane potentials of tenths of millivolts (or more) and that, therefore, such externally applied fields may distrub normal nervous function through this mechanism. The paper also presents a discussion which indicates that the induced transmembrane potential should exhibit a maximum at about 10/sup 8/Hz. Although some researchers suggest that the direct mechanism explored here may not represent the main influence of microwaves and radiowaves on biological tissue, this model together with a recent model by Barnes and Hu suggest that the results so produced may indeed be significant.

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