Abstracts

Theoretical analysis of voltage-gated membrane channels under GSM and DECT exposure

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In this work the response of a theoretical model of voltage-dependent membrane channels is analyzed for EM fields used in GSM and DECT cellular phones. A comparison between the effects of the two different communication protocols is performed, as well as an evaluation of the response of the model to temperature variations. In the simulations the conditions of exposure to EM fields generated by GSM and DECT mobile equipments, has been set starting from existing safety standards. Microscopic effects are investigated at the ionic channel's level inside cellular membranes. The obtained results show that both GSM and DECT signals have an evident effect on the behaviour of ionic channels, and seem to induce nonthermal effects. Maximum variations of around 30% in the open probability have been observed for sodium and potassium channels, and around 60% for calcium. The DECT signal seems to be more perturbing than the GSM signal on the calcium channel.

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