Abstracts

Effects of Electromagnetic Fields on Isolated Nerve and Muscle Preparations

C.-K. Chou and A.W. Guy. "Effects of Electromagnetic Fields on Isolated Nerve and Muscle Preparations." 1978 Transactions on Microwave Theory and Techniques 26.3 (Mar. 1978 [T-MTT]): 141-147.

An S-band waveguide exposure system was designed to study the electromagnetic fields on the isolated tissues. The temperature of the exposed tissue was maintained at a constant temperature by circulating temperature controlled Ringer's solution through the waveguide. Isolated frog sciatic nerves, cat saphenous nerves, rabbit vagus nerves and superior cervical ganglia, as well as rat diaphragm muscles were placed in the waveguide either parallel or perpendicular to the electric field of the TE/sub 10/ mode. Compound action potentials of nerves or contractile tensions of muscles were recorded before, during and after the 2450-MHz microwave irradiation. Results showed no significant change in characteristics of nerves or muscles exposed to CW specific absorption rate (SAR) of 0.3-1500 W/kg and pulsed peak SAR of 0.3-220 kW/kg. The effects observed during high-power radiation were reproducible by changing the solution temperature. No direct field stimulation of nerves or muscles was observed during microwave irradiation.

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