Abstracts

Effects of 2450-MHz Microwave Energy on the Blood-Brain Barrier: An Overview and Critique of Past and Present Research

W.M. Williams, S.-T. Lu, M. Del Cerro, W. Hoss and S.M. Michaelson. "Effects of 2450-MHz Microwave Energy on the Blood-Brain Barrier: An Overview and Critique of Past and Present Research." 1984 Transactions on Microwave Theory and Techniques 32.8 (Aug. 1984 [T-MTT] (Special Issue on Electromagnetic-Wave Interactions with Biological Systems)): 808-818.

The dynamics and complexity of the blood-brain barrier (BBB) make it a very difficult system for study. The variety of techniques employed to assess microwave effects on the barrier all appear subject to limitations in either sensitivity or applicability. Inconsistencies in tracer characteristics, experimental design, and in the microwave parameters employed, i.e., microwave system used (pulsed or continuous wave), field orientation relative to the exposed animal, frequency, power density, and duration of exposure, anesthesia or physical restraint, all have lead to difficulties in interpreting results and replication of experiments. Therefore, the technical approach, as well as data obtained, must be carefully scrutinized to avoid misinterpretation of results that may lead to erroneous conclusions. Recent studies by Williams et al. have endeavored to consolidate various technical approaches within a single study in order to more clearly interpret potential microwave-blood-brain barrier interactions and to minimize extraneous factors which may confound these effects. Our findings, as well as those of other investigators, fail to confirm previously published reports of increased blood-brain barrier permeability in rats following exposure to microwaves. Our findings, however, support the conclusion that suppression of BBB permeability occurs, and that this effect is mediated by temperature-dependent changes in endothelial cell function, and not by qualities unique to microwave energy.

❑ Return to main document.