Overview of RF Genotoxicity Research

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One of the major issues in the area of electromagnetic field bioeffects is whether or not radiofrequency radiation, in the range of frequencies being used in wireless technologies and mobile/cell telephones, is genotoxic. While there have been a number of reviews, including those which present relative numbers of positive versus negative results, one of the most extensive reviews was that published in December, 2003 [Meltz, M. L., "Radiofrequency Exposure and Mammalian Cell Toxicity, Genotoxicity, and Transformation," Bioelectromagnetics 6: S196–S213]. This review went beyond comparing pluses and minuses, and addressed technical deficiencies found in many of the published papers. Genotoxicity has been of significant importance in the chemical and drug industries; positive results observed in validated in vitro assays are a signal to manufacturers (and regulators) that the chemical/drug they are hoping to develop (or which is already in the environment) has at least the potential to cause mutations in cells in vivo. This suggests that the chemical therefore has the potential to be an initiator in the carcinogenic process, although this may or may not lead to a tumor in an animal, and further may or may not lead to a tumor in a person. A positive result in one in vitro assay is never by itself enough to make a decision; in addition, exposure of animal models to gain additional information about tumor formation before making a decision about carcinogenic potential is considered essential. The results of the above listed paper, which examined data from studies up to and including those published in the year 2002, was that the overwhelming weight of the evidence did not support the hypothesis that RF exposures at different frequencies and exposure levels (SARS) caused toxicity, genotoxic (DNA and chromosomal) damage, synergistic interactions with genotoxic chemicals, phenotypic mutations (limited data), or micronuclei (although suggestive evidence indicating the possibility was available at that time). This presentation will extend the genotypic summary to include more recent publications, including those from the REFLEX program, to see if the weight of evidence has been changed or further supported.