For rabbits exposed to near-field 2450 MHz CW microwaves, it has been shown that the minimum cataractogenic power density is 150 mW/cm^2 for 100 min which produces a maximum SAR of 138 W/kg in the vitreous body. A retrolental temperature above 41°C was necessary for production of lens opacities in these rabbits. There is a cataractogenic power density- or SAR-duration threshold for which no cataract in laboratory animals may be expected no matter how long the duration of an acute single exposure.

Although there are case reports of cataracts in humans following accidental exposure to microwave radiation and clinical reports suggesting that posterior capsule changes in the lens were more prominent in microwave workers than in controls, only a small number of epidemiological studies of cataracts in humans with mixed results have appeared in the literature.

The microwave auditory effect is a high peak power phenomenon that occurs at low average power. The impinging microwave pulse, upon absorption by soft tissues in the head, produces a rapid rise in tissue temperature, which initiates a thermoelastic wave of acoustic pressure that travels by bone conduction to the inner ear and activates the cochlear receptors via the same mechanism for normal hearing. There is little data, however, regarding this effect on the middle and inner ears' hearing apparatus or the central nervous system from exposure to these microwave pulses. Threshold microwave auditory response would have an insignificant effect upon the hearing apparatus. However, any consequence from exposure to low level pulsed microwave radiation over a prolonged period of time has not been investigated systematically.

Exposure of central and peripheral neural tissue to RF and microwave radiation can produce electrophysiological changes. Changes in evoked potentials and spontaneous activities have been reported to occur for both CW and modulated exposures. It should be noted that the observed electrophysiological effects occurred at average SARs that ranged from 5 to 81.5 W/kg; the highest SAR was associated with pulse-modulated exposure.

As mentioned before, at lower SAR levels, the effects of RF and microwave radiation on BBB permeability and lens ultrastructure remain controversial. Disagreement in laboratory findings persist among even recent investigations, especially at lower SAR levels (0.016-2.6 W/kg). In addition, extrapolation from *in vitro* experiments to intact animal is speculative. Nevertheless, these results suggest that repeated and/or high power pulsed microwave radiation may be capable of causing damage that is not related to average temperature elevation.

Several *in vitro* studies of carcinogenesis at the cellular level using mouse fibroblast cultures showed neoplastic transformation occurring only following combined treatment of microwave at an average SAR of 4.4 W/kg and the cancer promoter, TPA.

Two of the recent epidemiological reports showed no excess cancer mortality and three studies gave excess relative risks that ranged from 1.4-2.1. Among the latter, the finding by Grayson [1996] was diluted by a small sample size. The highest risk ratio (2.1) was associated with a small cluster [Mascarinec and Cooper, 1993]. The study by Milham [1988] had soldering fumes as a confounding factor within the study group. All of them suffered from a lack of realistic measures of RF or microwave exposure. These difficulties reduce their usefulness for risk analysis. In addition, two older studies also did not uncover a positive association. Clearly, an urgent need for epidemiological studies of RF effects on mobile telephone users is better dosimetry and exposure assessment.