Elder, J.A.. (2003). Ocular effects of radiofrequency energy. Bioelectromagnetics. 24. S148-S161. 10.1002/bem.10117. Radiofrequency (RF) energy has been reported to cause a variety of ocular effects, primarily cataracts but also effects on the retina, cornea, and other ocular systems. Cataracts have been observed in experimental animals when one eye was exposed to a localized, very high RF field and the other eye was the unexposed control. The results show that 2450 MHz exposures for >or=30 min at power densities causing extremely high dose rates (>or=150 W/kg) and temperatures (>or=41 degrees C) in or near the lens caused cataracts in the rabbit eye. However, cataracts were not observed in the monkey eye exposed to similar exposure conditions, reflecting the different patterns of energy absorption (SAR, specific absorption rate) distribution, due to their different facial structure. Since the monkey head is similar in structure to the human head, the nonhuman primate study showed that the incident power density levels causing cataracts in rabbits and other laboratory animals cannot be directly extrapolated to primates, including human beings. It is reasonable to assume that an SAR that would induce temperatures >or=41 degrees C in or near the lens in the human eye would produce cataracts by the same mechanism (heating) that caused cataracts in the rabbit lens; however, such an exposure would greatly exceed the currently allowable limits for human exposure and would be expected to cause unacceptable effects in other parts of the eye and face. Other ocular effects including corneal lesions, retinal effects, and changes in vascular permeability, have been observed after localized exposure of the eye of laboratory animals to both continuous wave (CW) and pulsed wave (PW) exposures, but the inconsistencies in these results, the failure to independently confirm corneal lesions after CW exposure, the failure to independently confirm retinal effects after PW exposure, and the absence of functional changes in vision are reasons why these ocular effects are not useful in defining an adverse effect level for RF exposure. While cataracts develop after localized exposure of the eye at SARs >or= 150 W/kg, whole body exposure at much lower levels (14-42 W/kg) is lethal to rabbits. Two studies reported cataracts in this animal after 30 daily exposures at SARs at the upper end of the lethal range, e.g., 38-42 W/kg; however, long term exposure of rabbits (23 h/day, 6 months) at 1.5 W/kg (17 W/kg in the rabbit head) did not cause cataracts or other ocular effects. A long term (1-4 years) investigation of monkeys exposed at high SARs (20 and 40 W/kg to the monkey face) found no cataracts or other ocular effects or change in visual capability. The results of these long term studies support the conclusion that clinically significant ocular effects, including cataracts, have not been confirmed in human populations exposed for long periods of time to low level RF energy. The results of four recent human studies show that there is no clear evidence of an association between RF exposure and ocular cancer.