Power Density	**Reported Biological Effects**	**References**
0.168 - 1.053 µW/cm2	Irreversible infertility in mice after 5 generations of exposure to RFR from "antenna park"	Magras & Xenos, 1997
0.16 µW/cm2	Motor function, memory and attention of school children affected (Latvia)	Kolodynski, 1996
O.2 - 8 µW/cm2	Two-fold increase in childhood leukemia / RFR exposure to AM/FM towers	Hocking, 1996
1.0 µW/cm2	Whole body microwave irradiation of male mice caused a significant effect on the immune system	Fesenko, 1999
1.0 µW/cm2	Irradiation (5 hours) with low-power microwaves stimulates the immune potential of macrophages and T cells	Novoselova, 1999
1.3 - 5.7 µW/cm2	Two-fold increase in leukemia in adults from AM RF exposure	Dolk, 1997
~2-4 µW/cm2	Direct effect of RFR on ion channels in cells/opening of acetycholine channels	D'Inzeo, 1988
4-10 µW/cm2	Visual reaction time in children is slowed//lower memory function in tests	Chiang, 1989
5 - 10 µW/cm2	Impaired nervous system activity	Dumansky, 1974
10 µW/cm2 (0.0027 W/Kg SAR)	Changes in active avoidance conditioned reflex (behavioral change) after 0.5 hour exposure	Navakatikian, 1994
10-20 µW/cm2	Increase in micronuclei (abberant DNA form) found in workers chronically exposed to micro-waves at 1250-1350 MHz.	Garaj-Vrhovac, 1999
10 - 25 µW/cm2	Changes in the hippocampus of the brain	Belokrinitsky, 1982
30 µW/cm2 (0.015 W/Kg SAR)	Immune system effects - elevation of PFC count (antibody-producing cells)	Veyret, 1991
50 µW/cm2	An 18% reduction in REM sleep (important to memory and learning functions)	Mann, 1996
100µW/cm2	Changes in immune system function	Elekes, 1996
100 µW/cm2 (0.027 W/Kg SAR)	A 24% drop in testosterone after 6 hours expo-sure	Navakatikian, 1994
SAR	**Reported Biological Effects**	**References**
0.000021- .0021 W/Kg	Changes in cell cycle and cell proliferation (960 MHz GSM cell phone signal)	Kwee, 1997
0.0004 W/Kg	Cell phone RF caused changes in blood-brain barrier that protects brain from outside harmful chemicals and toxins (915 MHz GSM cell phone)	Salford, 1997
0.0004-0.008 W/Kg	915 MHz cell phone RF caused leakage in blood-brain barrier. Worst at lowest levels and worse with CW compared to PW with a maximum pa-thology around 8-50 Hz modulation. 55% of rats exposed to CW but not PW showed significant pathological changes in BBB at at higher SAR of 1.7-8.3 W/Kg	Persson, 1997
0.001 W/Kg	Non-thermal microwave disruption of weak bonds that maintain the active form of protein folding at 750 MHz continuous wave; may in-crease free radicals causing DNA damage and interfere with cell signalling that controls cell growth. HSP effect is equivalent to a 3 degree C. heating of tissue.	de Pomerai, 2000

0.0027 W/Kg	Changes in active avoidance conditioned reflex (behavioral change) after 0.5 hour exposure	Navakatikian, 1994
0.0024 W/Kg to 0.024 W/Kg	Digital cell phone signals at very low intensities cause DNA effects in human cells. DNA effects are direct DNA damage and the rate at which DNA is repaired.	Phillips, 1998
0.026 W/Kg	Activity of c-jun (oncogene product) was altered in cells after only 20 minutes exposure to cell phone signal (TDMA) showed an average 38% decrease	Ivaschuk, 1997
0.0317 W/Kg	Decrease in eating and drinking	Ray & Behari, 1990
0.3-0.44 W/Kg	Attention function of brain/responses are speeded up	Preece, 2000 Koivisto et al, 2000
0.3-0.44 W/Kg	Cellular phone use results in changes to cognitive thinking/ mental tasks relaqted to memory retrieval	Krause et al, 2000
0.037 W/Kg	Hyperactivity caused by nitric oxide synthase inhibitor is countered by ultra-wide band pulses - 600/sec, 30 min	Seamans, 1999
0.005 to 0.05 W/Kg	Increase in calcium efflux	Dutta et al, 1989
0.121 W/Kg	Cardiovascular system/significant decrease in arterial blood pressure (hypotension)	Lu et al, 1999
0.14 W/Kg	Elevation of immune response at 100 µW/cm2	Elekes, 1996
0.141 W/Kg	Structural changes in testes/smaller diameter of seminiferous tubules in rats exposed to cell phone on speech transmission (but not stand-by mode) with exposure at one minute 3 times per hour for two hours per day for one month	Dasdag, 1999
0.13 - 1.4 W/Kg	Lymphoma cancer rate is 2 times normal with two ½ hour exposures per dy of cell phone RFR for 18 months (pulsed digital mobile phone signal 900 MHz)	Repacholi, 1997
0.26 W/Kg	Harmful effects to the eye/certain drugs can sensitize eyes to RFR	Kues, 1992
0.15-0.4 W/Kg	Statistically significant increase in malignant tumors at 480 µW/cm2	Chou, 1992
0.58 - 0.75 W/Kg	Decrease in brain tumors (836 MHz TDMA digital cell phone signal)	Adey, 1996
to 1.0 W/Kg (max)	Sleep patterns and EEG are changed with 900 MHz cell phone exposure during sleep	Borbely et al, 1999
0.6 and 1.2 W/Kg	Increase in DNA single and double strand breaks from RFR exposure (2450 MHz)	Lai & Singh, 1996
2 - 3 W/Kg	Cancer acceleration in skin and breast tumors	Szmigielski, 1982
	STANDARDS AND BACKGROUND LEVELS	
Power Density	**Standards**	
579 µW/cm2	800-900 MHz Cell Phone Signal Standard	ANSI/IEEE
1000 µW/cm2	PCS STANDARD for public exposure (as of September 1, 1997)	FCC, 1996
5000 µW/cm2	PCS STANDARD for occupational exposure	FCC, 1996
Power Density	Background Levels	
0.003 µW/cm2	Background Level Ambient background RF exposure in cities and suburbs in the 1990's	Mantiply, 1997
1-10 µW/cm2	Ambient RF exposure within 100-200 feet of cell/PCS antenna array	Sage, 1998, unpublished

	STANDARDS AND BACKGROUND LEVELS	
0.08 W/Kg	IEEE standard uncontrolled environment (whole body)	IEEE
0.4 W/Kg	IEEE standard controlled environment (whole body)	IEEE
1.6 W/Kg	FCC(IEEE) SAR limit over 1 gram of tissue (cell phone to ear)	FCC, 1996
Mobile Phone	**SAR Levels**	
2.93 W/Kg	Peak 1 gram SAR for adult male using mobile phone where average radiated power is 600 mW at 835 MHz	Gandhi, 1996
3.21 W/Kg	Peak 1 gram SAR for 10-year old child using mobile phone where average radiated power is 600 mW at 835 MHz	Gandhi, 1996
4.49 W/Kg	Peak 1 gram SAR for 5-year old child using mobile phone where average radiated power is 600 mW at 835 MHz	Gandhi, 1996
1.11 W/KG	Peak 1 gram SAR for adult male using mobile phone where average radiated power is 125 mW at 1900 MHz	Gandhi, 1996
0.90 W/KG	Peak 1 gram SAR for 10-year old child using mobile phone where average radiated power is 125 mW at 1900 MHz	Gandhi, 1996
0.97 W/KG	Peak 1 gram SAR for 5-year old child using mobile phone where average radiated power is 125 mW at 1900 MHz	Gandhi, 1996