

REFERENCES RELEVANT TO WIRELESS HEALTH IMPACTS

Cindy Sage, MA, Sage Associates

2012

References – Cancer, Neurological and Immune Dysfunction

- 1) International Agency for Research on Cancer, 2011. IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS. Press Release No. 208, May 31, 2011.
- 2) Baan et al, June 22, 2011, The Lancet Oncology, published on-line at DOI:10.1016/S147-2045 (11)70140-4
- 3) Glazer ZR. 1971. Bibliography of reported biological phenomena (effects) and clinical manifestations. Research attributed to microwave and radiofrequency radiation. Naval Medical Research Institute. Research Report Project MF12.524.015-00043, Report No. 2. Naval Medical Research Institute National Naval Medical Center, Bethesda, Maryland 20014, U.S.A. 4 October 1971 Second Printing, with Revisions, Corrections, and Additions: 20 April 1972 (Supersede3 AD No. 734391)
- 4) Raines JK. 1981. Electromagnetic field interactions with the human body: Observed effects and theories National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, Maryland 20771. . NASA Purchase Order No 5-751515B. NASA CR 166661 April 1981.
- 5) BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF) at www.bioinitiative.org, August 31, 2007.
- 6) Pathophysiology 16: Special Edition on EMF, 2009.

DNA Damage - Genotoxicity

- 7) Markova E Malmgren LOG Belyaev IY. Microwaves from mobile phones inhibit 53PB1 focus formation in human stem cells stronger than in differentiated cells: Possible mechanistic link to cancer risk. Environmental Health Perspectives On-line 22 October 2009 doi:10.1289/ehp.0900781
 - 8) Lai H and Singh NP 1995. Acute low intensity microwave exposure increases DNA single-strand breaks in rat brain cells. Bioelectromagnetics 16:207-210.
 - 9) Lai H and Singh NP 1996. Single- and double-strand DNA breaks in rat brain cells after acute exposure to radiofrequency electromagnetic radiation. International Journal of Radiation Biology 69:513-521.
 - 10) Lai, H. (2007). Section 6. Evidence for Genotoxic Effects. In Cindy Sage and David O. Carpenter (Eds.), *BioInitiative Report: A rationale for a biologically-based public exposure standard for electromagnetic fields (ELF and RFR)*. BioInitiative Working Group. www.bioinitiative.org
 - 11) Phillips, J., Singh, N.P., & Lai, H. (2009). Electromagnetic fields and DNA damage. *Pathophysiology*, 16, (2,3) 79-88.
 - 12) REFLEX. Final report. Risk evaluation of potential environmental hazards from low frequency electromagnetic field exposure using sensitive in vitro methods. 31 May 2004. Key Action 4 "Environment and Health". Quality of Life and Management of Living Resources. European Union
 - 13) Ruediger, H. (2009). Genotoxic effects of radiofrequency electromagnetic fields. *Pathophysiology* 16, (2,3), 89-102.s
 - 14) Nylund R, Leszczynski D. Mobile phone radiation causes changes in gene and protein expression in human endothelial cell lines and the response seems to be genome- and proteome-dependent. *Proteomics* 2006; 6 (17): 4769-80.
 - 15) Mashevich M, Folkman D, Kesar A, et al. Exposure of human peripheral blood lymphocytes to electromagnetic fields associated with cellular phones leads to chromo- somal instability. *Bioelectromagnetics* 2003; 24 (2): 82-90.
 - 16) Garaj-Vrhovac V Horvat D Koren Z, 1990. The effect of microwave radiation on the cell genome. *Mutation Research* 243:87-93.
 - 17) Garaj-Vrhovac V Horvat D Koren Z, 1991. The relationship between colony forming ability, chromosome aberrations and incidence of micronuclei in V70 chinese hamster cells exposed to microwave radiation. *Mutation Research* 263:143-149.
 - 18) Phillips J Ivaschuk Ishida-Jones T Jones R Campbell-Beachler M and Haggren W 1998. DNA damage in Molt-4 T-lymphoblastoid cells exposed to cellular telephone radiofrequency fields in vitro. *Bioelectrochemistry and Bioenergetics* 45: 103-110.
- Cancer**—————
- 19) Szmigielsky S Sobiczewska E Kubacki R. Carcinogenic potency of microwave radiation: overview of the problem and results of epidemiological studies on Polish military personnel. *Eur J Oncol* 2001; 6 (2): 193-9.
 - 20) Szmigielsky S. Cancer morbidity in subjects occupationally exposed to high frequency (radiofrequency and microwave) electromagnetic radiation. *Sci Total Environ* 1996; 180: 9-17.
 - 21) Richter ED, Berman T, Levy O, et al. Brain cancer with induction periods of less than 10 years in young military radar workers. *Arch Env Health* 2002; 57(4): 270-2.
 - 22) Goldsmith JR. Epidemiologic Evidence Relevant to Radar (Microwave) Effects. *Env Health Perspectives* 1997; 105: Suppl 6: 1579-87.

- 23) Goldsmith JR. Epidemiologic evidence of radiofrequency radiation (microwave) effects on health in military, broadcasting and occupational studies. *Int J Occup Environ Health* 1995 1 (1): 47-57.
- 24) Stein Y Levy-Nativ O Richter ED. A sentinel case series of cancer patients with occupational exposures to electromagnetic non-ionizing radiation and other agents. *Eur. J. Oncol.*, vol. 16, n. 1, pp. 21-54, 2011.
- 25) Dolk, H et al, 1997. Cancer incidence near radio and television transmitters in Great Britain. *American Journal of Epidemiology* 145(1): 1-9.
- 26) Hocking, B et al, 1996. Cancer incidence and mortality and proximity to TV towers *Medical Journal of Australia* 165(11-12): 601-605.
- 27) Hocking, B et al, 2000. Decreased survival for childhood leukemia in proximity to TV towers. Poster presented at the Annual Scientific Meeting of the Royal Australian College of Physicians in Adelaide, SA, Australia, May 2000.
- 28) Guy AW Chou CK Kunz LL Crowley J Krupp J, 1985. Effects of long-term low-level radiofrequency radiation exposure on rats. US Air Force School of Aerospace Medicine Brooks Air Force Base, Texas TR-85-64 Final Report August 1985. Approved for public release: distribution is unlimited.
- 29) Chou CK Guy AW Kunz LL Johnson RB Crowley JJ and Krupp JH, 1992. Long-term low-level microwave radiation of rats. *Bioelectromagnetics* 13: 469-496.
- 30) Repacholi MH Basten A Gebiski V Noonan D Finnie J and Harris AW, 1997. Lymphomas in Eμ-Pim 1 transgenic mice exposed to pulsed 900 MHz electromagnetic fields. *Radiation Research* 147: 631-640.
- 31) Sage Associates, 2004. An Overview of Low-Intensity Radiofrequency/Microwave Radiation Studies Relevant to Wireless Communications and Data. Bioelectromagnetics Society Annual Meeting, Washington DC, June 2004.

Fertility

- 33) Agarwal A, Desai NR, Makker K, et al. (2009) Effects of radiofrequency electromagnetic waves (RF-EMW) from cellular phones on human ejaculated semen: an in vitro pilot study. *Fertility and Sterility* 92(4):1318-25.
- 34) Agarwal A, Singh A, Hamada A, Kesari K (2011) Cell phones and male infertility: a review of recent innovations in technology and consequences. *Brazilian Journal of Urology* 37(4):432-54.
- 35) Aitken RJ, Bennetts LE, Sawyer D, Wiklendt AM, King BV (2005) Impact of radio frequency electromagnetic radiation on DNA integrity in the male germline. *International Journal of Andrology* 28(3):179-179.
- 36) Avendaño C, Mata A, Sanchez Sarmiento CA, Doncel GF (2011) Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation. *Fertility and Sterility* [Epub ahead of print]
- 37) Balmori A (2009) Electromagnetic pollution from phone masts. Effects on wildlife. *Pathophysiology* 16(2-3):191-9.
- 38) Behari J, Kesari KK (2006) Effects of microwave radiations on reproductive system of male rats. *Embryo Talk* 1 (Suppl.1):81-5.
- 39) Belyaev IY, Grigoriev YG (2007) Problems in assessment of risks from exposures to microwaves of mobile communication. *Radiatsionnaia biologiiia, radioecologiiia / Rossiiskaia akademiia nauk* 47(6):727-32.
- 40) Blank M, Goodman R (2011) DNA is a fractal antenna in electromagnetic fields. *International Journal of Radiation Biology* 87(4):409-15.
- 41) De Iulius GN, Newey RJ, King BV, Aitken RJ (2009) Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro. *PLoS One* 4(7):e6446.
- 42) Desai NR, Kesari KK, Agarwal A (2009) Pathophysiology of cell phone radiation: oxidative stress and carcinogenesis with focus on male reproductive system. *Reproductive Biology and Endocrinology* 7:114.
- 43) Eroglu O, Oztas E, Yildirim I, Kir T, Aydur E, Komesli G, Irkilata HC, Irmak MK, Peker AF) Eroglu O, Oztas E, Yildirim I, et al. (2006) Effects of electromagnetic radiation from a cellular phone on human sperm motility: an in vitro study. *Archives of Medical Research* 37(7):840-3.
- 44) Falzone N, Huyser C, Franken DR, Leszczynski D (2010) Mobile phone radiation does not induce pro-apoptosis effects in human spermatozoa. *Radiation Research* 174(2):169-76.
- 45) Falzone N, Huyser C, Becker P, Leszczynski D, Franken DR (2010) The effect of pulsed 900-MHz GSM mobile phone radiation on the acrosome reaction, head morphometry and zona binding of human spermatozoa. *International Journal of Andrology* 33:1-7. ALSO IN [from PubMed]:Falzone N, Huyser C, Becker P, Leszczynski D, Franken DR (2011) The effect of pulsed 900-MHz GSM mobile phone radiation on the acrosome reaction, head morphometry and zona binding of human spermatozoa. *International Journal of Andrology* 34(1):20-6.
- 46) Fejes I, Závaczki Z, Szöllosi J, Kolozsár S, Kovács L, Pál A (2004) Relationship between regular cell phone use and human semen quality. Abstracts of the 20th Annual Meeting of the ESHRE, Berlin, Germany, 27–30 June 2004. Also [From Pubmed]: Fejes I, Závaczki Z, Szöllosi J, et al. (2005) Is there a relationship between cell phone use and semen quality? *Archives of Andrology* 51(5):385-93.
- 47) Fragopoulou A, Grigoriev Y, Johansson O, et al. (2010) Scientific Panel on Electromagnetic Field Health Risks: Consensus points, recommendations, and rationales. *Reviews on Environmental Health* 25(4):307-17.
- 48) Girgert R, Gründker C, Emons G, Hanf V (2008) Electromagnetic fields alter the expression of estrogen receptor cofactors in breast cancer cells. *Bioelectromagnetics* 29(3):169-76.

- 49) Grigoriev YG, Grigoriev OA, Ivanov AA, et al. (2010) Confirmation studies of Soviet research on immunological effects of microwaves: Russian immunology results. *Bioelectromagnetics* 31(8):589-602.
- 50) Gul A, Celebi H, Uğraş S (2009) The effects of microwave emitted by cellular phones on ovarian follicles in rats. *Archives of Gynecology and Obstetrics* 280(5):729- 33.
- 51) Gutsch T, Mohamad Al-Ali B, Shamloul R, Pummer K, Trummer H (2011) Impact of cell phone use on men's semen parameters. *Andrologia* 43(5):312-6.
- 52) Hardell L, Carlberg M, Ohlson CG, Westberg H, Eriksson M, Hansson Mild K (2007) Use of cellular and cordless telephones and risk of testicular cancer. *International Journal of Andrology* 30(2):115-22.
- 53) Kesari KK, Kumar S, Behari J (2011) Effects of radiofrequency electromagnetic wave exposure from cellular phones on the reproductive pattern in male Wistar rats. *Applied Biochemistry and Biotechnology* 164(4):546-59.
- 54) Kilgallon SJ, Simmons LW (2005) Image content influences men's semen quality. *Biology Letters* 1(3):253-5.
- 55) Kim YW, Kim HS, Lee JS, et al. (2009) Effects of 60 Hz 14 microT magnetic field on the apoptosis of testicular germ cell in mice. *Bioelectromagnetics* 30(1): 66-72.
- 56) Lee JW, Kim KS, Lee SM, Eom SJ, Troitsky RV (2002) A novel design of thermal anomaly for mammary gland tumor phantom for microwave radiometer. *IEEE Transactions on Bio-medical Engineering* 49(7):694-9.
- 57) Magras IN, Xenos TD (1997) RF radiation-induced changes in the prenatal development of mice. *Bioelectromagnetics* 18(6):455-61.
- 58), 59) 60) Lee GM, Neutra RR, Hristova L, Yost M, Hiatt RA (2002) A nested case-control study of residential and personal magnetic field measures and miscarriages. *Epidemiology* 13(1):21-31. Erratum in *Epidemiology* 2003 4(2):255. Comment in 59) *Epidemiology*. 2002 Jan;13(1):1-4. 60) *Epidemiology*. 2002 Mar;13(2):237-8.
- 61) *Epidemiology*. 2002 May;13(3):372.
- 62) Makker K, Varghese A, Desai NR, Mouradi R, Agarwal A (2009) Cell phones: modern man's nemesis? *Reproductive Biomedicine Online* 18(1):148-57.
- 63) Otitoloju AA, Obe IA, Adewale OA, Otubanjo OA, Osunkalu VO (2010) Preliminary study on the induction of sperm head abnormalities in mice, *Mus musculus*, exposed to radiofrequency radiations from global system for mobile communication base stations. *Bulletin of Environmental Contamination and Toxicology* 84(1):51-4.
- 64) Panagopoulos DJ, Margaritis LH (2008) Mobile telephony radiation effects on living organisms. In: Harper AC, Buress RV, eds. *Mobile Telephones*. Nova Science Publishers, Inc: 107-49.
- 65) Sage C, Johansson O, Sage SA (2007) Personal digital assistant (PDA) cell phone units produce elevated extremely-low frequency electromagnetic field emissions. *Bioelectromagnetics* 28(5):386-92.
- 66) Salama N, Kishimoto T, Kanayama HO (2010) Effects of exposure to a mobile phone on testicular function and structure in adult rabbit. *International Journal of Andrology* 33(1):88-94. Comment in: *International Journal of Andrology* 33(1):95; author reply 96- 7.
- 67) Sheynkin Y, Jung M, Yoo P, Schulsinger D, Komaroff E (2005) Increase in scrotal temperature in laptop computer users. *Human Reproduction* 20(2):452-5.
- 68) Sommer AM, Grote K, Reinhardt T, Streckert J, Hansen V, Lerchl A (2009) Effects of radiofrequency electromagnetic fields (UMTS) on reproduction and development of mice: a multi-generation study. *Radiation Research* 171(1):89-95.
- 69) Wdowiak A, Wdowiak L, Wiktor H (2007) Evaluation of the effect of using mobile phones on male fertility. *Annals of agricultural and environmental medicine: AAEM* 14(1):169-72.
- 70) Yan JG, Agresti M, Bruce T, Yan YH, Granlund A, Matloub HS (2007) Effects of cellular phone emissions on sperm motility in rats. *Fertility and Sterility* 88(4):957-64.

Brain Cancer, Acoustic Neuroma –Melanoma_____

- 71) INTERPHONE Study Group, World Health Organization. Brain tumour risk in relation to mobile telephone use: results of the INTERPHONE international case-control study, May 2010, *International Journal of Epidemiology*, 1-20.doi:10.1093/ije/dyq079
- 72) INTERPHONE Study Group. Acoustic neuroma risk in relation to mobile telephone use: Results of the INTERPHONE international case-control study, doi: 10.1016/j.canep.2011.05.012, Available online 23 August 2011. <http://www.sciencedirect.com/science/article/pii/S1877782111000944>
- 73) Hardell, L., Carlberg, M., Soderqvist, F., & Hansson Mild, K.(2008). Meta-analysis of long-term mobile phone use and the association with brain tumours. *International Journal of Oncology*, 32, 1097-1103.
- 74) Hardell, L., Carlberg, M., & Hansson Mild, K. (2009). Epidemiological evidence for an association between use of wireless phones and tumor diseases. *Pathophysiology*, 16, (2,3) 113-122.
- 75) Hardell, L., & Sage, C. (2008). Biological effect from electromagnetic field exposure and public exposure standards. *Biomedicine & Pharmacotherapy*, ;62, 104-109.
- 76) Myung SK Ju W McDonnell DD Lee YJ Kazinets G Cheng CT Moskowitz JM (2008). Mobile Phone Use and Risk of Tumors: A Meta-Analysis. *J Clin Oncol* 27. © 2009 by American Society of Clinical Oncology. doi/10.1200/JCO.2008.21.6366

- 77) Kan, P., Simonsen, S.E., Lyon, J.L. & Kestle, J.R. (2008). Cellular phone use and brain tumor: a meta-analysis. *Journal of Neurooncology*, 86, 71-78.
- 78) Hardell L Carlberg M Hansson Mild K Eriksson M (2011) Case-control study on the use of mobile and cordless phones and the risk for malignant melanoma in the head and neck region. *Pathophysiology* Vol. 18, (4) 325-333.
- 79) Hallberg O Johansson O (2011) Increasing rates of head melanoma in Nordic countries, *Pathophysiology* Vol. 18 (4) 313-315.
- 80) Sage, C (2010). Tragedy of the commons revisited: the new wireless commons. *Reviews on Environmental Health* Vol 25 (4) 319-325. Walter de Gruyter, Berlin, New York.
- 81) Fragopoulou, A., Grigoriev, Y., Johansson, O., Margaritis, L.H., Morgan, L., Richter, E., Sage, C. 2010. Scientific Panel on Electromagnetic Field Health Risks: Consensus Points, Recommendations, and Rationales. Scientific Meeting: Seletun, Norway, November 17-21, 2009. *Reviews on Environmental Health* Vol 25, No. 4, 2010.

Children more sensitive _____

- 82) WHO. (2002). *Children's health and environment: A review of evidence. A joint report from the European Environment Agency and World Health Organization*. <http://www.who.int/peh-emf>
- 83) Gee, D. (2009). *Late Lessons from Early Warnings: Toward realism and precaution with EMF*. *Pathophysiology*, 16 (2,3), 217-231.

Need for New Biologically-based Public Exposure Standards _____

- 84) Hardell, L., & Sage, C. (2008). Biological effect from electromagnetic field exposure and public exposure standards. *Biomedicine & Pharmacotherapy*, 62, 104-109.
- 85) Sage C. Carpenter DO (2009). Public Health Implications of Wireless Technologies. *Pathophysiology* 16 (2009) 233–246
- 86) Carpenter DO Sage CL. 2008. Setting Prudent Public Health Policy for Electromagnetic Field Exposures. *Reviews on Environmental Health* 23(2) 91-117.

US Department of Justice Americans with Disabilities (ADA Testimony January 2011 by Cindy Sage, MA, Sage Associates)

References

- ANSI/IEEE standards adopted in 1992 (C95.1-1992) and 1999 revisions June 2001 SC-4 Committee Minutes
- BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF) at www.bioinitiative.org, August 31, 2007.
- Christ A Gosselin MC Christophoulou M Kühn S Kuster N. Age dependent tissue-specific exposure of cell phone users. *Physics in Medicine and Biology*, Volume 55, Issue 7, pp. 1767–1783, 7 April 2010, online March 5
- EPRI, 2010. A Perspective on Radio-Frequency Exposure Associated With Residential Automatic Meter Reading Technology, Electric Power Research Institute, Palo Alto, CA.
- Federal Communications Commission, 1997. FCC Bulletin OET 65 97-01 Guidelines Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.
- Hondou T Ueda T Sakat Y Tanigwa N Suzuki T Kobayashi T Ikeda K. Passive Exposure to Mobile Phones: Enhancement of Intensity by Reflection, *Journal of the Physical Society of Japan* Vol. 75, No. 8, August, 2006, 084801 (2006) The Physical Society of Japan
- Hondou T, Rising Level of Public Exposure to Mobile Phones: Accumulation through Additivity and Reflectivity. *Journal of the Physical Society of Japan*, Vol. 71, No. 2, February, 2002, pp. 432–435 (2002) The Physical Society of Japan.
- The Institute of Electrical and Electronic Engineers, Inc. 1999. IEEE Standards Coordinating Committee 28, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields 3 kHz to 300 GHz. December, 1998.
- Khurana VG Hardell L Everaert J Bortkiewicz A Carlberg M Ahonen M, 2010. Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations. *Int Journal of Occupational Environmental Health* 2010;16:263– 267
- Kundi M Hutter HP Mobile phone base stations—Effects on wellbeing and health. *Pathophysiology* 16 (2009) 123–135
- Markova E Malmgren LOG Belyaev IY. Microwaves from mobile phones inhibit 53PB1 focus formation in human stem cells stronger than in differentiated cells: Possible mechanistic link to cancer risk. *Environmental Health Perspectives* On-line 22 October 2009 doi:10.1289/ehp.0900781
- National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radiofrequency

Electromagnetic Fields," NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3. Copyright NCRP, 1986, Bethesda, Maryland 20814

National Toxicology Program Fact Sheet, (2009). *Cell Phone Radiofrequency Radiation Studies*, (September 2009).

Sage Associates, Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters, January 1, 2011.
<http://sagereports.com/smart-meter-rf/>

Vermeeren G Gosselin MC Gosselin Kuhn S Kellerman V Hadmen A Gati A Joseph W Wiart J Meyer F Kuster N Martens L. The influence of the reflective environment on the absorption of a human male exposed to representative base station antennas from 300 MHz to 5 GHz, *Phys. Med. Biol.* 55 (2010) 5541–5555 doi:10.1088/0031-9155/55/18/018

Wiart, J., Hadjem, A., Wong, M.F., & Bloch, I. (2008). Analysis of RF exposure in the head tissues of children and adults. *Physical Medicine & Biology*, 53, 3681-3695.