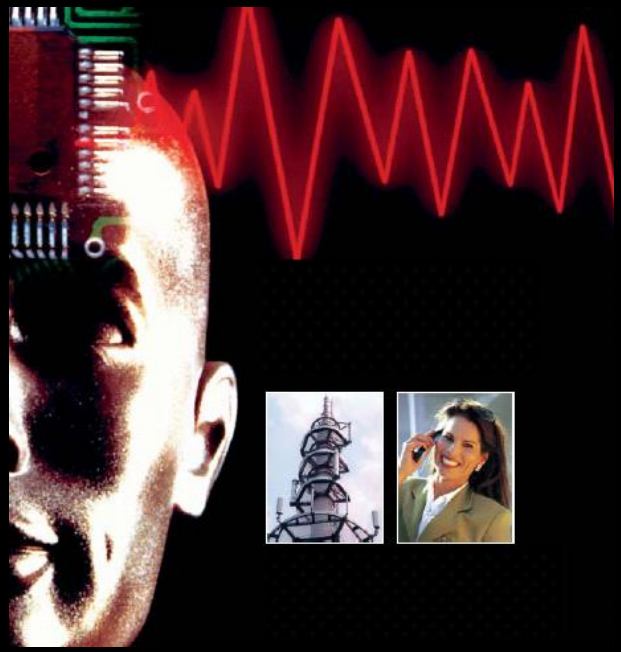
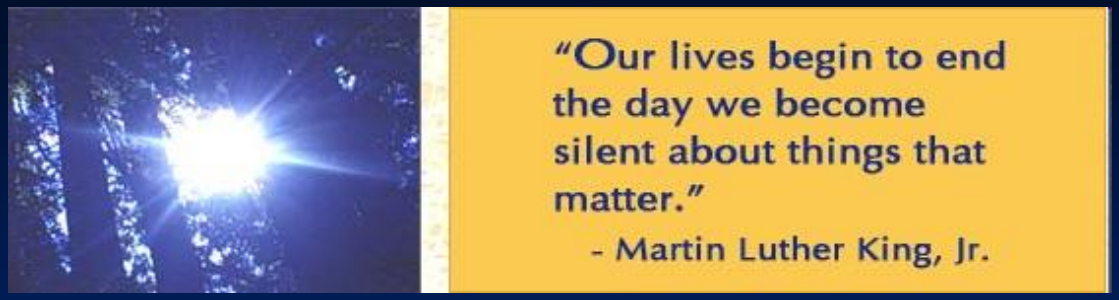
Electromagnetic Fields and Cancer

Cancer Strategies Conference
Scottsdale, AZ
March 25 – 27, 2011



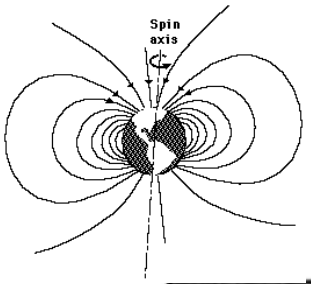
Karl Maret M.D., B.Sc.(EE), M.Eng.
President, Dove Health Alliance
kmaret@cruzio.com

Overview of Lecture

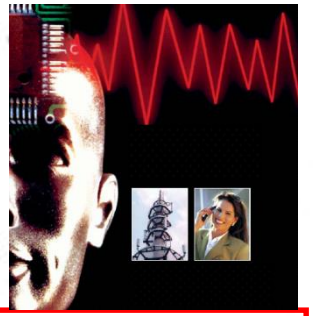


- Nature of Electromagnetic Radiation in our Lives
- The Health Impacts of ELF and Microwave Technologies
- Exposure Standards too High, exclude Non-Thermal Effects
- Importance of EMF Exposure Prevention and Cancer
- Healing Mitochondropathy in German Model of Cancer

MAGNETIC ENVIRONMENT OF MAN



EXTERNAL ENVIRONMENT



INTERNAL ENVIRONMENT

NATURAL (Earth's) MAGNETIC FIELD

MAN-MADE MAGNETIC FIELDS

INTERNAL COMPONENT

EXTERNAL COMPONENT

STATIC FIELDS

TIME-VARYING FIELDS

STATIC FIELDS

TIME-VARYING FIELDS

Paleomagnetic, Archeomagnetic Fields, Field-Reversals, Long-range Control on Organic Evolution, etc.

Primary Control by Sun modified by Space, Magnetic Storms, Pulsations, etc.

Magnet Industry, Electrolytic Industry NMR Imaging Nuclear Accelerators, etc.

Superhigh Frequency e.g. TV, Radar, Microwave, etc., Superhigh Voltage Transmission, Large Currents, etc.

Paramagnetic Effects from Molecular Iron in Liver, etc., Effects from Iron dust in Lungs, Stomach etc.

Induction from time-varying Electric Fields in Brain, Heart, Eye, etc.

The Magnetic Environment of man

Earth's Magnetosphere

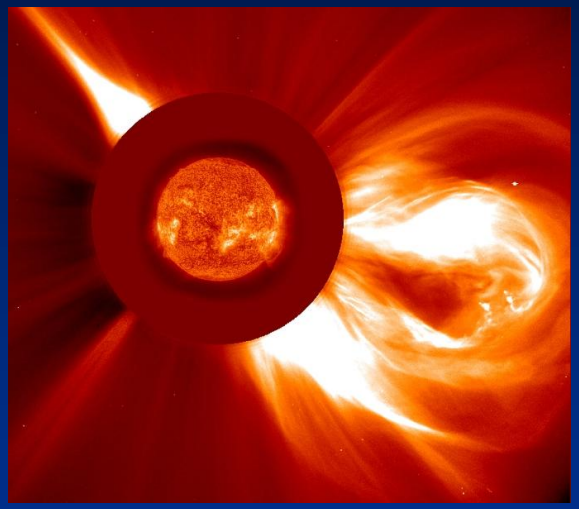


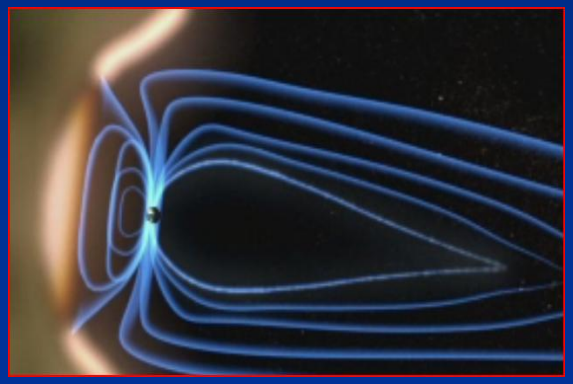
The natural magnetic field of our earth is important for all life forms as a navigational and orientation field.
Migratory birds, whales, bees and many other animals use the geomagnetic field for finding their way.
It also protects us against solar emissions.

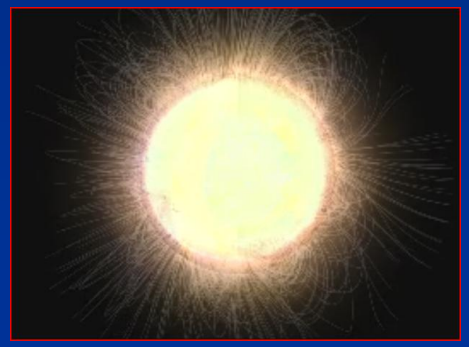
Our Modern Technologies are Exceedingly Vulnerable to disruption by Abnormal Solar Activity









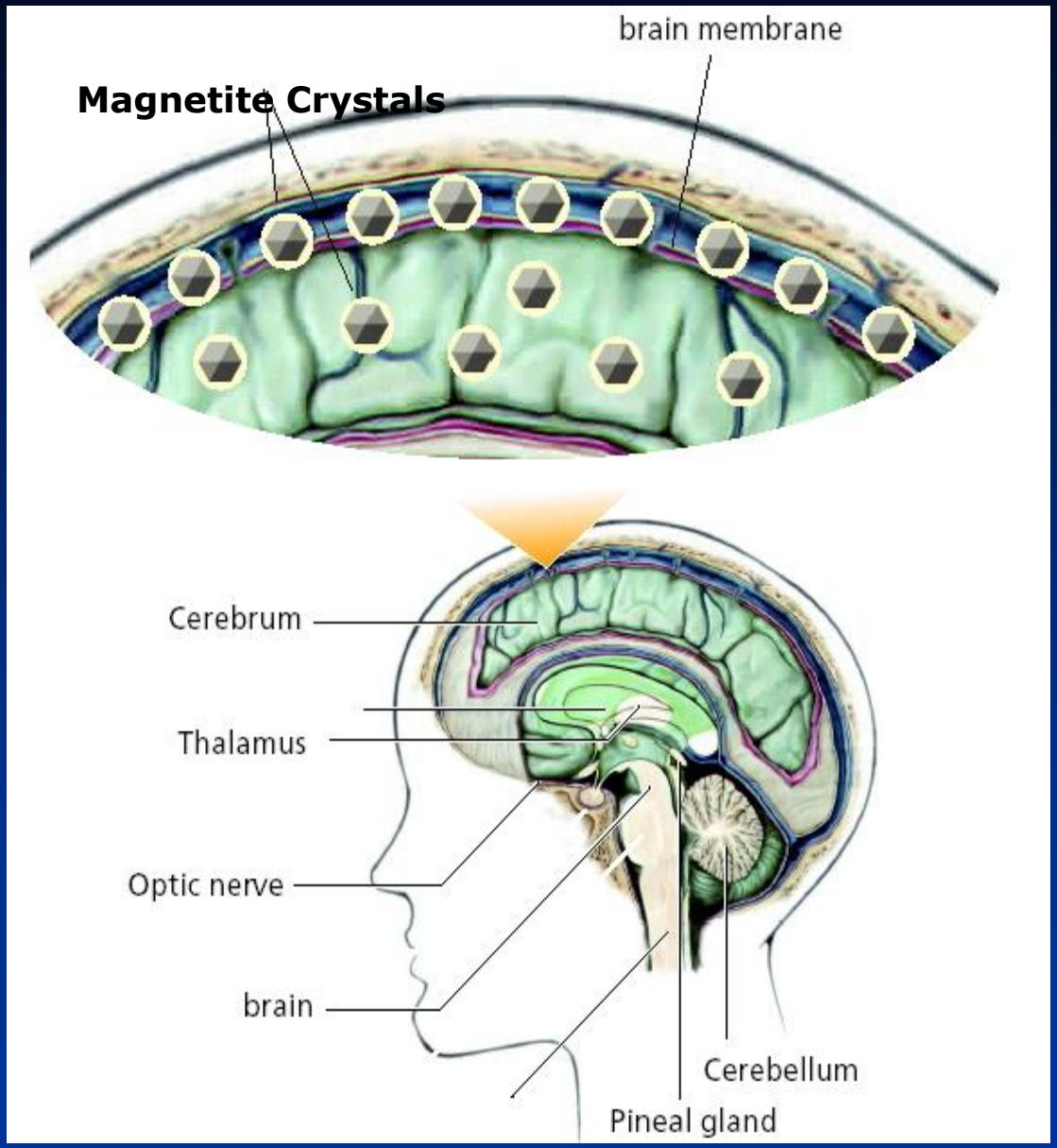


Magnetite Crystals in Human Brain

5 million crystals/gram
In Brain tissue

100 million crystals/gram
in brain membranes

Magnetite crystals allows us to have a magnetic sense and be oriented to the earth's magnetic field. Also affected by artificial fields



Source: Kirschvink JL: Bioelectromagnetics 17(3):187-194, 1996

Our Brain operates at same Frequencies as Earth's Schumann Cavity Resonances

The neurons involved in emotion, thinking, memory and reaction use oscillating calcium ion and neurotransmitter signals primarily in the frequency range below 50 Hz, as shown by a typical EEG spectrum, Figure 6.

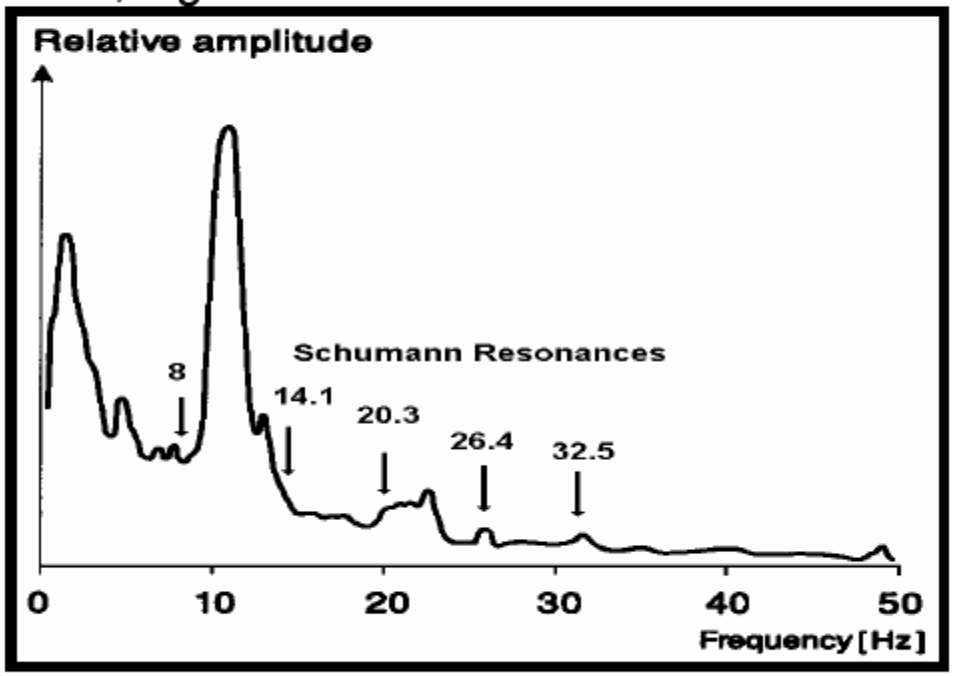
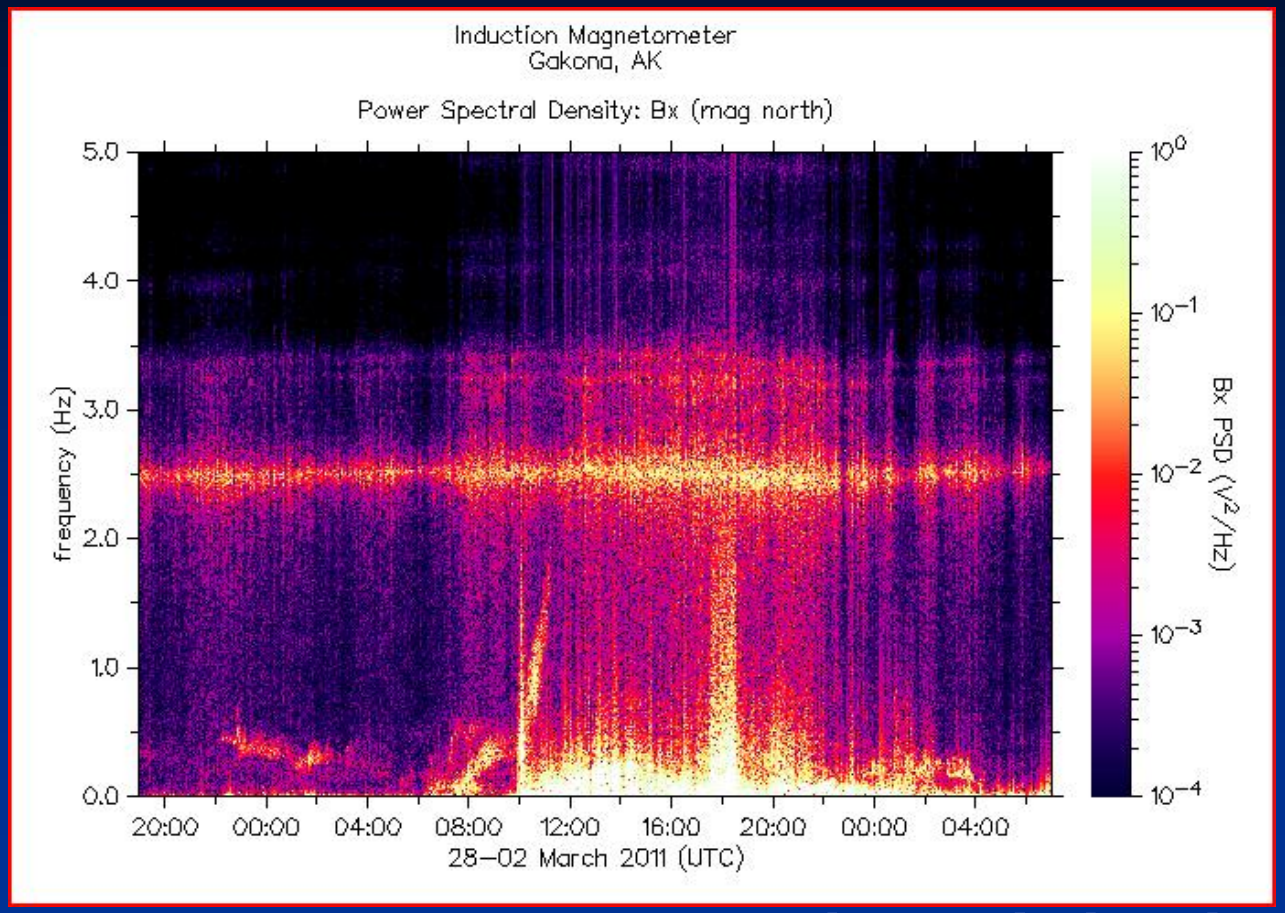


Figure 6: A typical EEG spectrum, with the Schumann Resonance peaks superimposed.

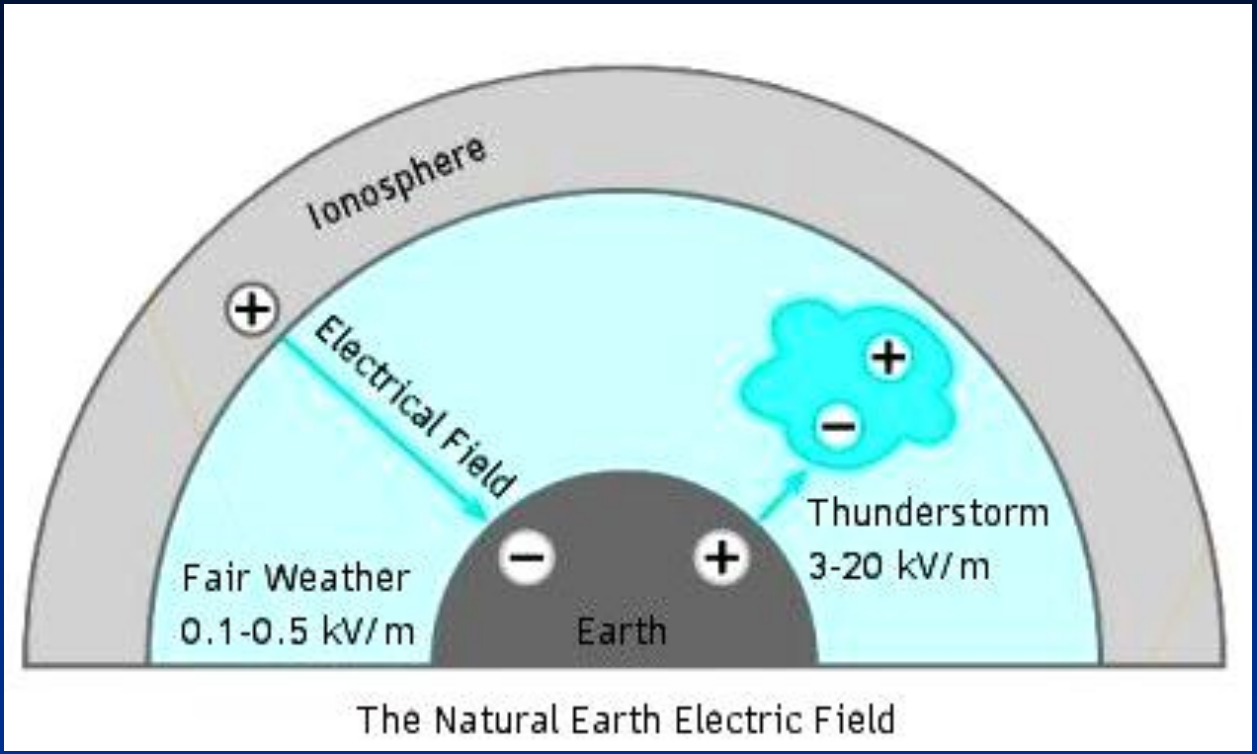
Alaska Aurora Magnetometer Changes after Sunspots or Coronal Mass Ejections



www.haarp.alaska.edu

Frequencies in the Brain's Delta Band can affect us Collectively

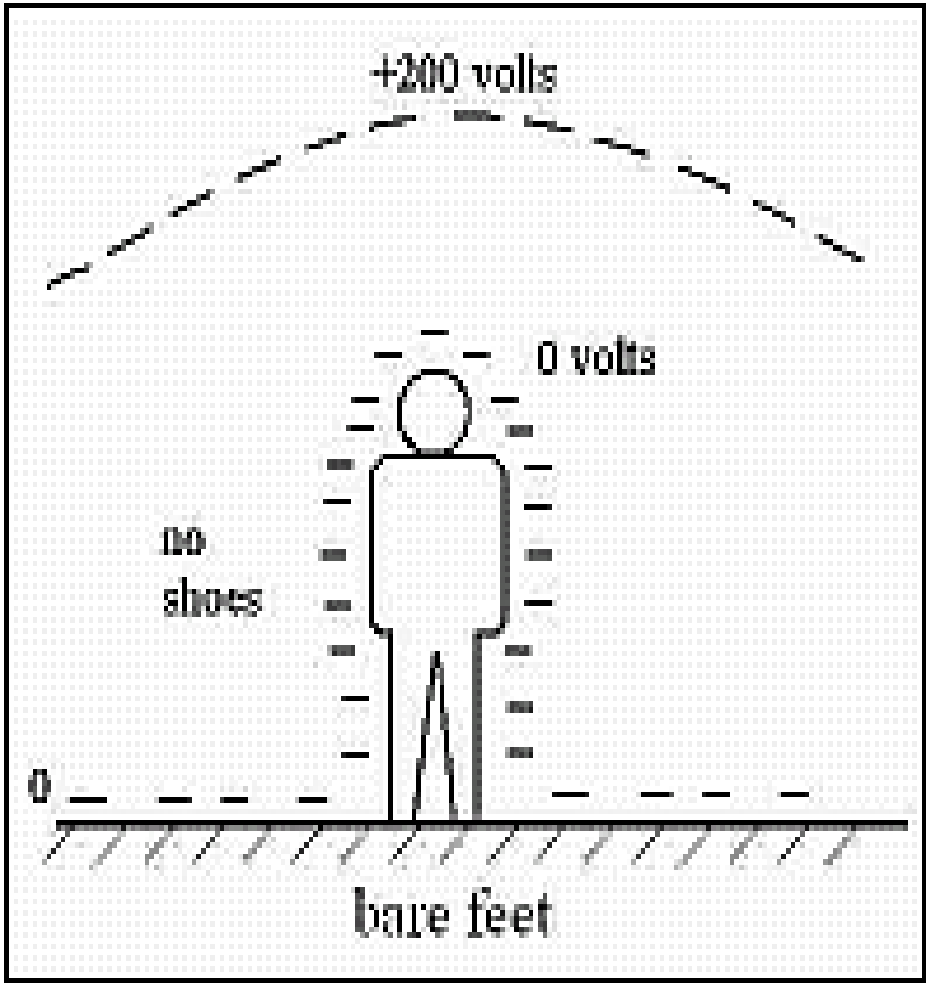
The Earth also has an Electric Field between Ground and the Ionosphere



The Natural Earth Electric Field

Cause of air electricity and atmospheric field is cosmic rays and solar wind hitting atmosphere. The 100/sec lightening strikes all over the earth contribute to the negative electron charge on the ground.

The Electrical Field in Atmosphere



There is a Natural Voltage Gradient in the atmosphere of 130-270 V/m

Walking barefoot on the ground ensures you are at Earth Potential

Animals and Humans are very Sensitive to ULF & ELF Fields

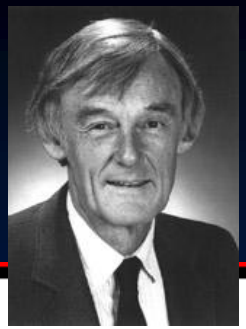


Table 2: Bioelectric sensitivities to ELF fields, Adey (1990).

	Function	Tissue Gradient	Imposed field
Sharks and rays	Navigation and predation	10^{-8} V/cm	DC to 10 Hz
Birds	Navigation	10^{-7} V/cm	0.3 gauss
	Circadian rhythms	10^{-7} V/cm	10 Hz, 2.5 V/m
Monkeys	Subjective time estimations	10^{-7} V/cm	7 Hz, 10 V/m
Humans	Circadian rhythms	10^{-7} V/cm	10 Hz, 2.5 V/m
	Comparison With Intrinsic Cell and Tissue Neuroelectric Gradients		
Membrane potential	10^{5} V/cm		
Synaptic potential	10^{3} V/cm		
Electroencephalogram	10^{-1} V/cm		

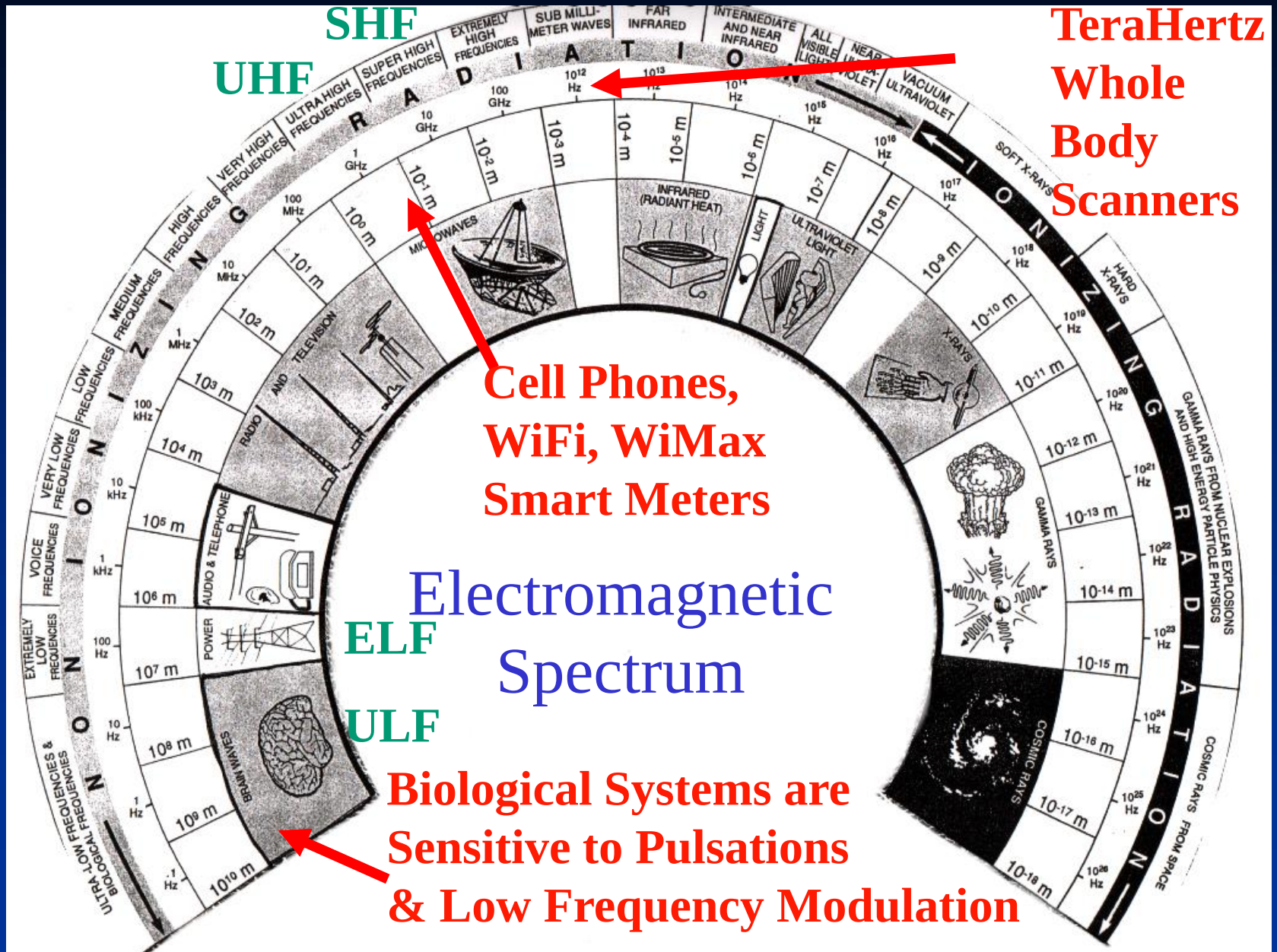
- Human circadian rhythms are affected by ULF, low amplitude tissue voltage gradients, lower than EEG and membrane potential gradients

Reference: Adey, W.R., 1990: "Nonlinear electrodynamics in cell membrane transductive coupling". In: Membrane Transport and Information Storage. Publ. Alan R Liss Inc. pp1-27.

Brief Overview of Types of Fields

- Static Electric (ex. carpet charge) and Static Magnetic Fields (DC current) : not be covered
- Alternating Current Electric Fields (ELF): V/m
  - Transmission Power Lines, house wiring, electric blankets, appliances,
- Alternating Current Magnetic Fields (ELF): mG
  - Transformers, motors, Electric Clocks, appliances, etc
- Radio Frequency Radiation (RF/MW incl. Radar)
  - Cell phones, WiFi, TV, AM/FM Radio, Smart Meters
  - Frequency and Power Density, SAR values important

Background to Electromagnetism



Dangers of Electricity and EMFs

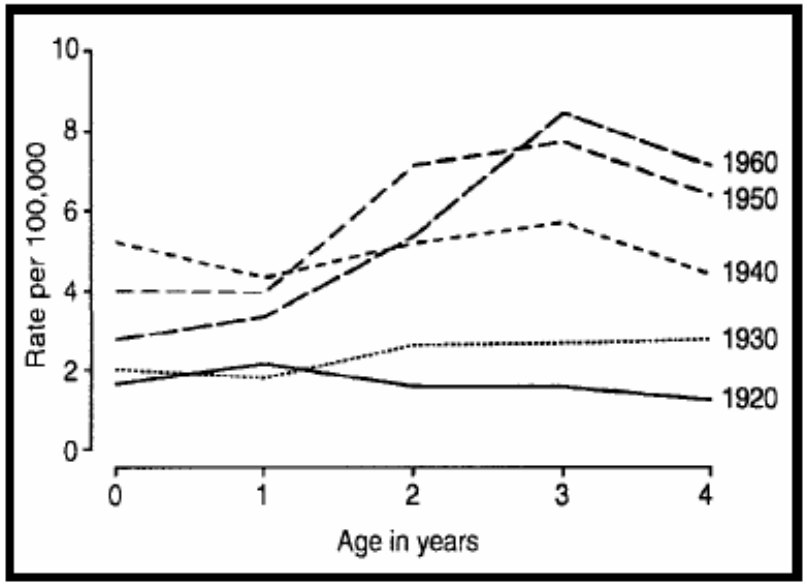


The International Agency for Research on Cancer (IARC) classified EMF as a “possible human carcinogen”, or a Group 2B carcinogen.

Reference: IARC. (2002) Working Group on the Evaluation of Carcinogenic Risks to Humans. Non-ionizing radiation, Part 1: Static and extremely low-frequency (ELF) electric and magnetic fields. *Monographs on the Evaluation of Carcinogenic Risks to Humans*. Lyon: International Agency for Research on Cancer. vol 80.

Childhood Leukemia & US Electrification

- Electrification appeared to be accompanied by a rising incidence of Childhood Leukemia (Milham Hypothesis)



Childhood leukaemia mortality for the United States whites by single years of age 0-4, for each 10 years from 1920, Milham and Ossiander (2001).

Reference: Milham, S and Ossiander, E.M., 2001: "Historical evidence that residential electrification caused the emergence of the childhood leukemia peak". Medical Hypotheses 56(3): 1-6.

See also: www.neilcherry.com/documents/90_b2_EMR_is_a_Universal_Genotoxic_Carcinogen_11-01.pdf

Childhood Leukemia & Electrification

There are several studies showing epidemiological associations between leukemia incidence /mortality and electrification

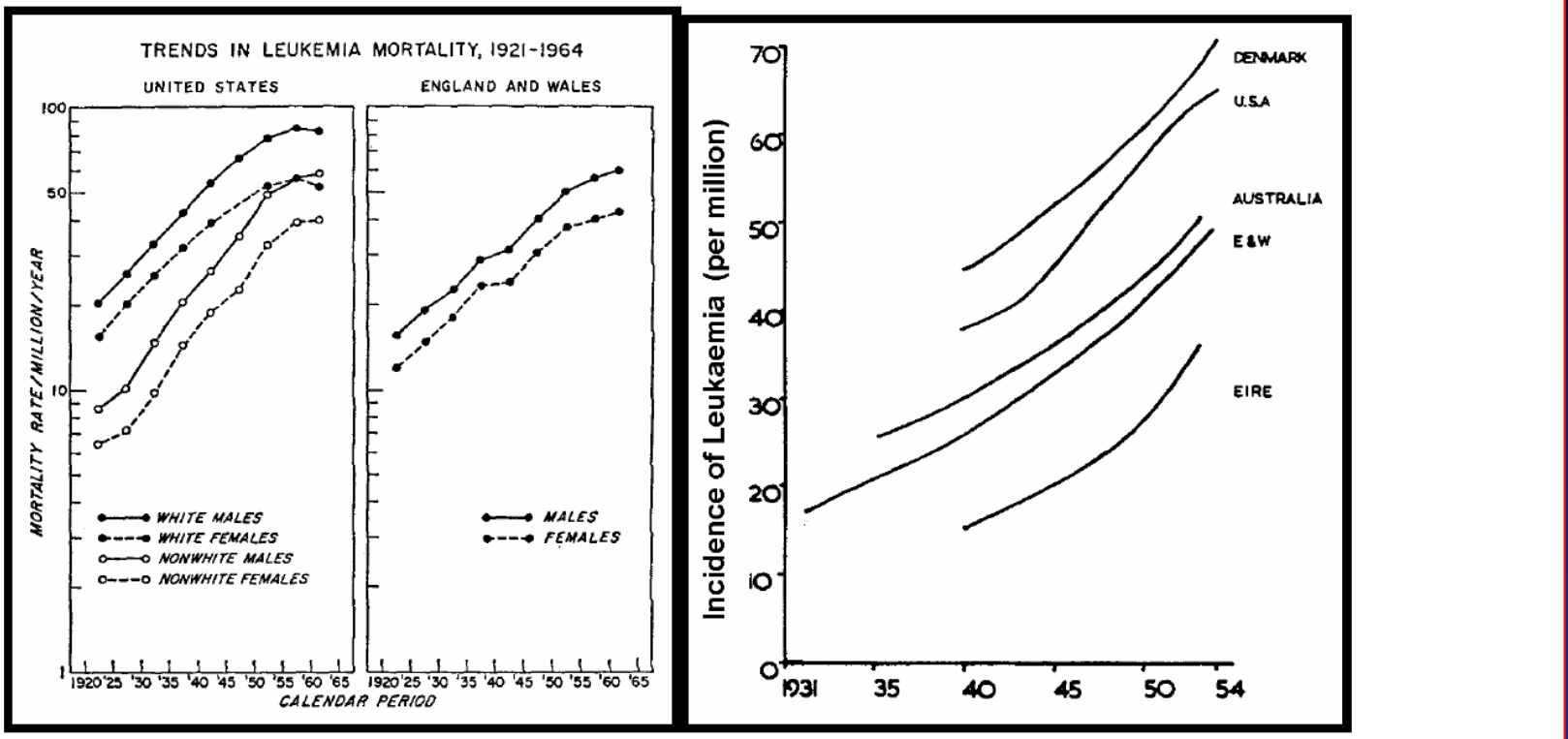


Figure 1: Historical trends in leukaemia mortality for several groups and countries, Fraumeni, and Miller (1966), left, and Burnet (1958), right.

Reference: Neil Cherry (2002) : Evidence in support of the *a priori* hypothesis that Electromagnetic Radiation across the spectrum is a Ubiquitous Universal Genotoxic Carcinogen. (see refs there)
Source: www.neilcherry.com/documents/90_b2_EMR_is_a_Universal_Genotoxic_Carcinogen_11-01.pdf

Extremely Low Frequencies (60 Hz) from Power Lines can lead to Leukemia

Evidence that Electromagnetic fields from high voltage powerlines and in buildings, are hazardous to human health, especially to young children

Dr Neil Cherry

Source: www.neilcherry.com/documents/90_e1_EMR-ELF_health_effects_09-02.pdf

ELF EMFs decrease Antioxidant Enzyme Systems

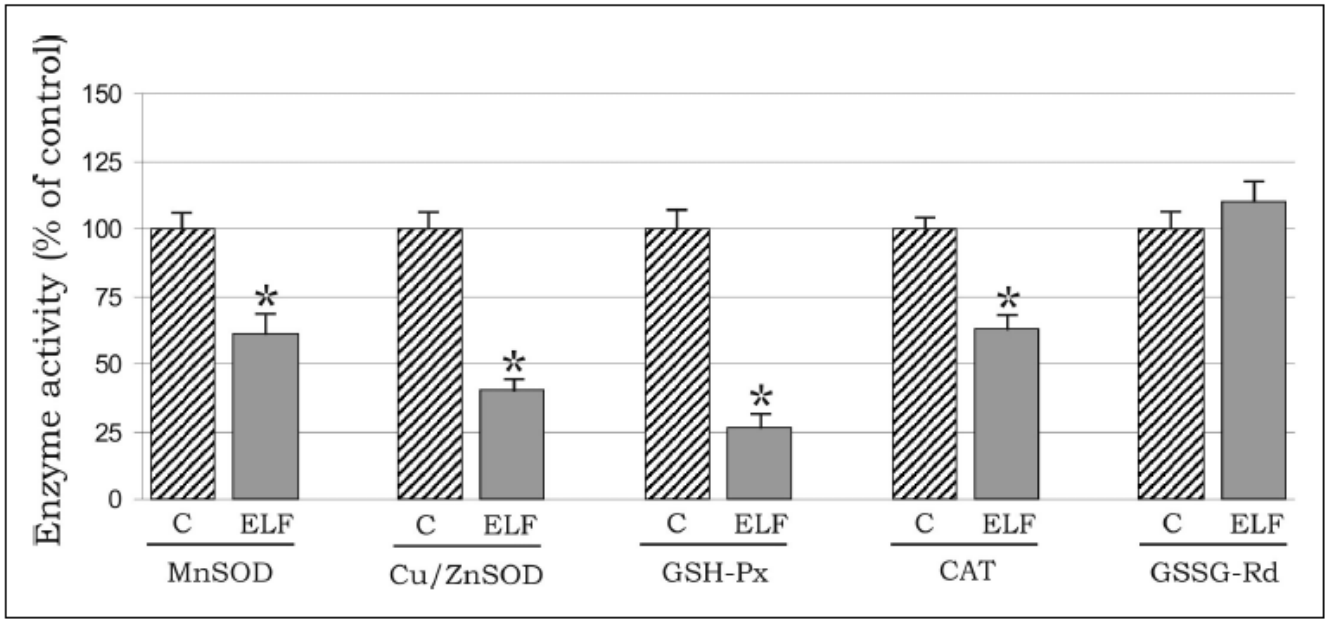
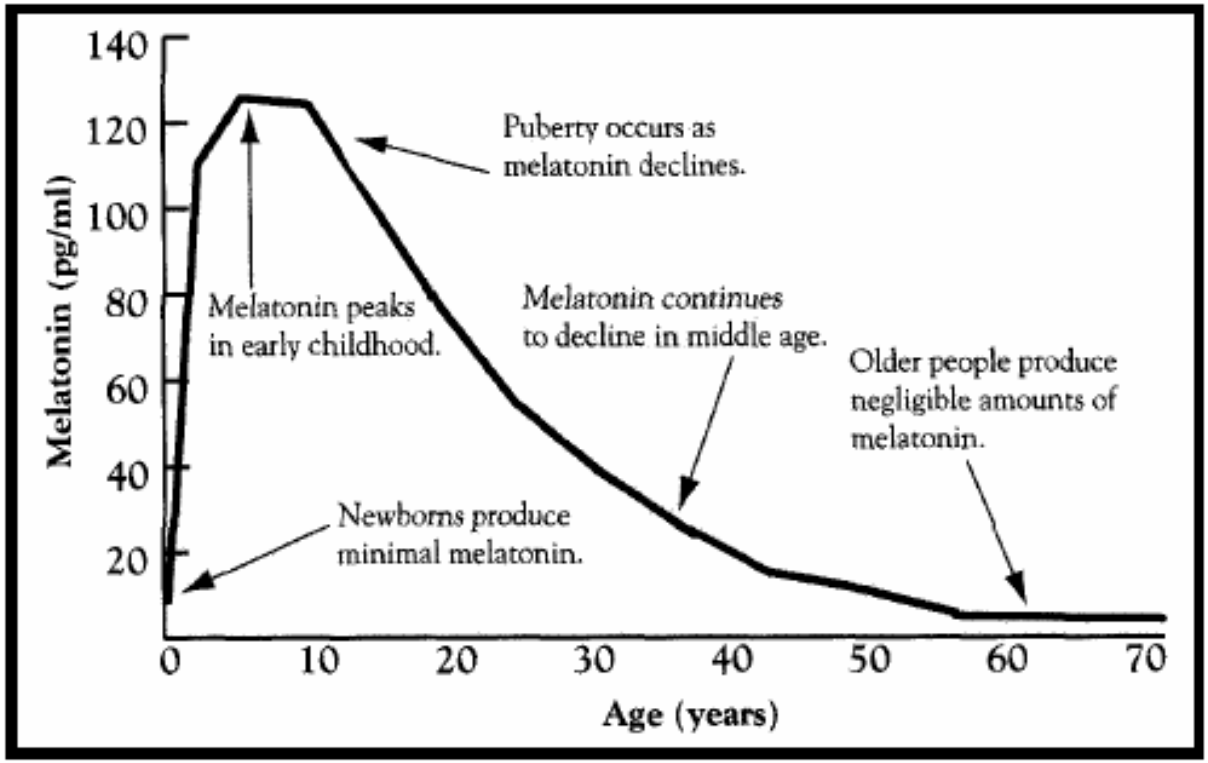


Fig. 2. Antioxidative enzyme activities in 3T3 L1 cell culture media after 48 h of incubation. Data are given as percentages of the initial value (mean ± SEM); initial activities of MnSOD, Cu/ZnSOD, CAT, GSH-Px and GSSG-Rd in the control group are 1.21 ± 0.07 NU/ml, 3.36 ± 0.11 NU/ml, 162.7 ± 10.32 IU/ml, 132.7 ± 11.1 µmol $NADPH_2$/ml and 1.09 ± 0.07 IU/, respectively. *P < 0.05 *vs.* the control group.

In Cell cultures after 48 hours Incubation & EMF Exposure

Source: K. Zwirska-Korczala et al: Effect of ELF Electromagnetic Fields on Cell Proliferation, Antioxidant Enzyme Activities and Lipid Peroxidation in 3T3-L1 Preadipocytes – An *in vitro* Study. J. Physiol. Pharmacol. 56, Supp 6:101 108 (2005)
Available: http://www.jpp.krakow.pl/journal/archive/12_05_s6/pdf/101_12_05_s6_article.pdf

Melatonin Production varies throughout Life and is Suppressed by EMFs



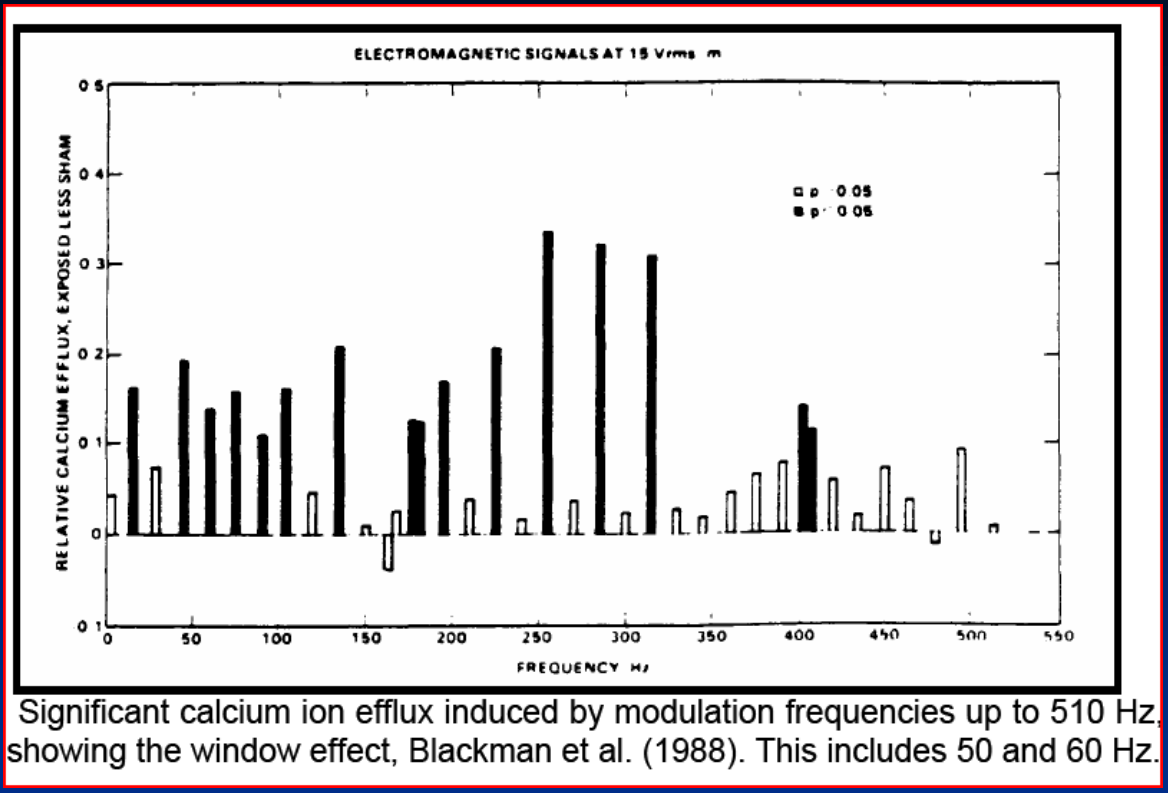
Melatonin production is very low at birth, peaks in early childhood and declines from puberty onwards, Reiter and Robinson (1995).

Reiter, R.J. and Robinson, J, 1995: "Melatonin: Your body's natural wonder drug". Publ. Bantam Books, New York.

- Melatonin also has Antioxidant effects in body
- Thought to be a mechanism for adverse health effects in older people

See also: B.Wilson et al: Evidence for ELF EM Fields on Human Pineal Gland Function. J. Pineal Res. 9:259-269 (1990)

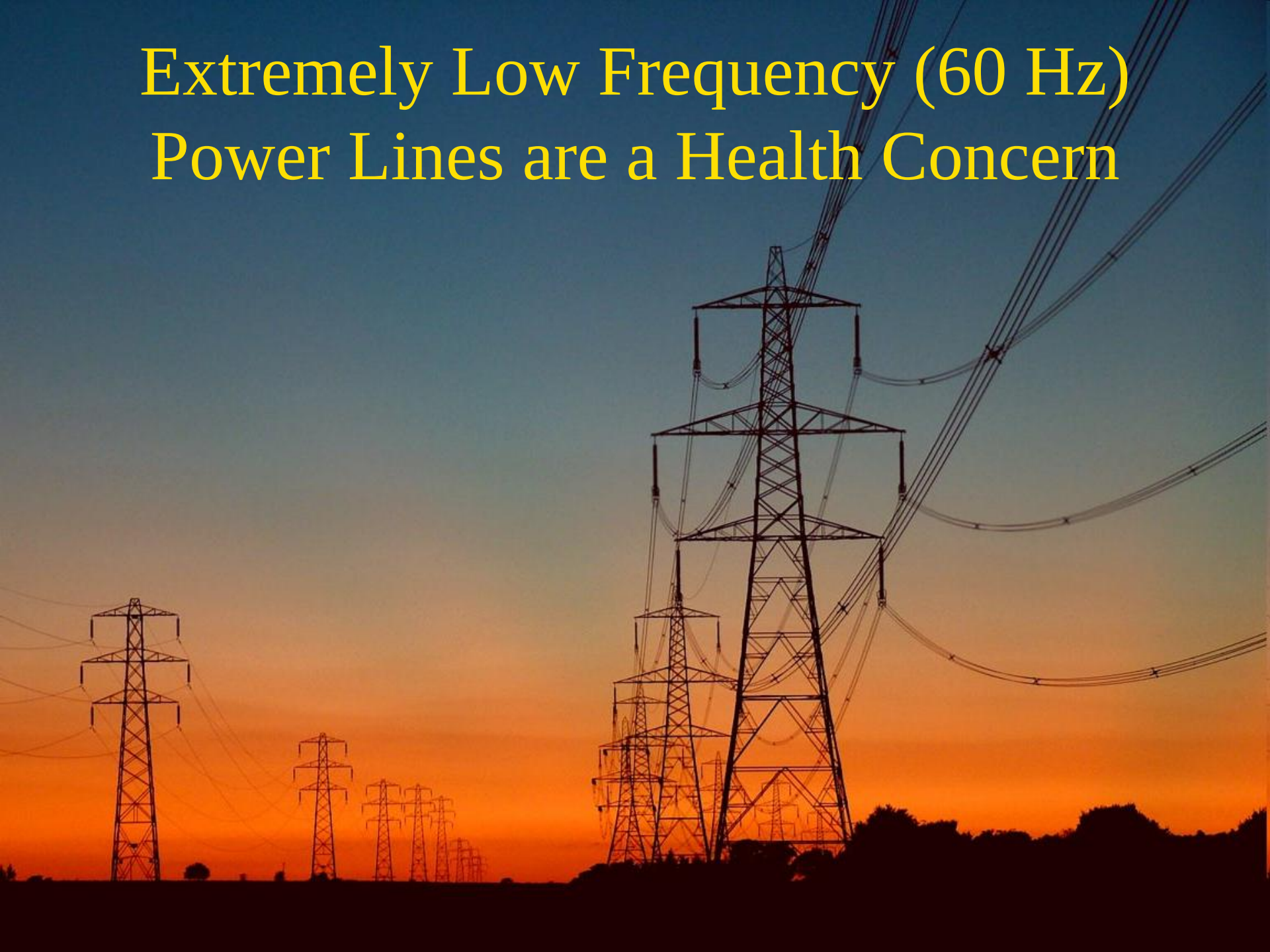
Windowing Effects seen with EMFs



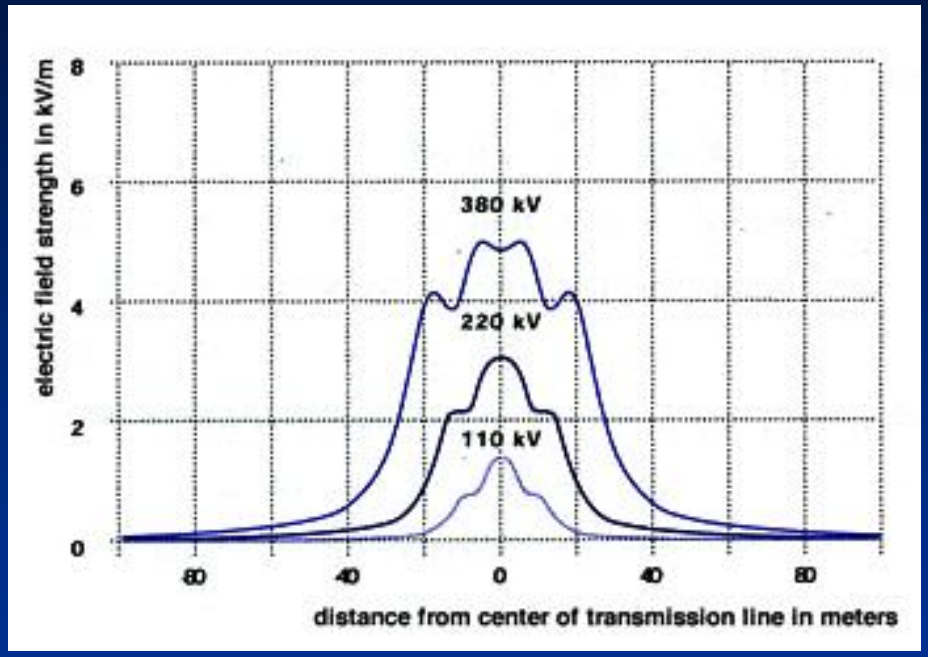
Significant calcium ion efflux induced by modulation frequencies up to 510 Hz, showing the window effect, Blackman et al. (1988). This includes 50 and 60 Hz.

- Calcium ion efflux from cells seen at specific frequency and Power Level windows (biological resonance effect windows)
- Reference: Blackman, C.E., 1990: "ELF effects on calcium homeostasis". In "Extremely low frequency electromagnetic fields: The question of cancer", BW Wilson, RG Stevens, LE Anderson Eds, PubI. Battelle Press Columbus: 1990; 187-208.

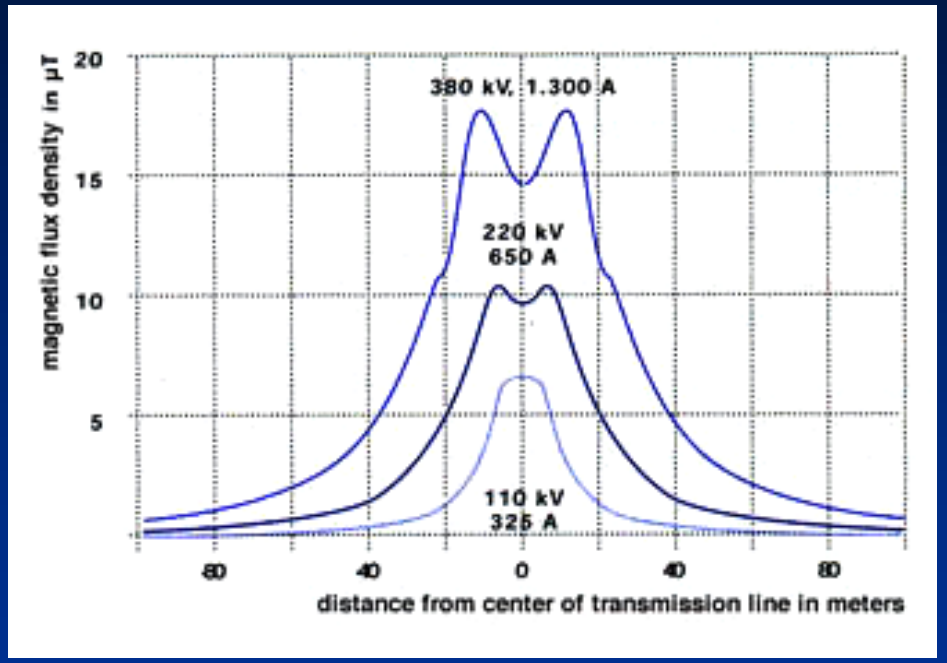
Extremely Low Frequency (60 Hz) Power Lines are a Health Concern



AC Transmission Line Fields Expand with Higher Power Voltages



Electrical Field



Magnetic Field

Best to be 80 meters (>200 feet away)

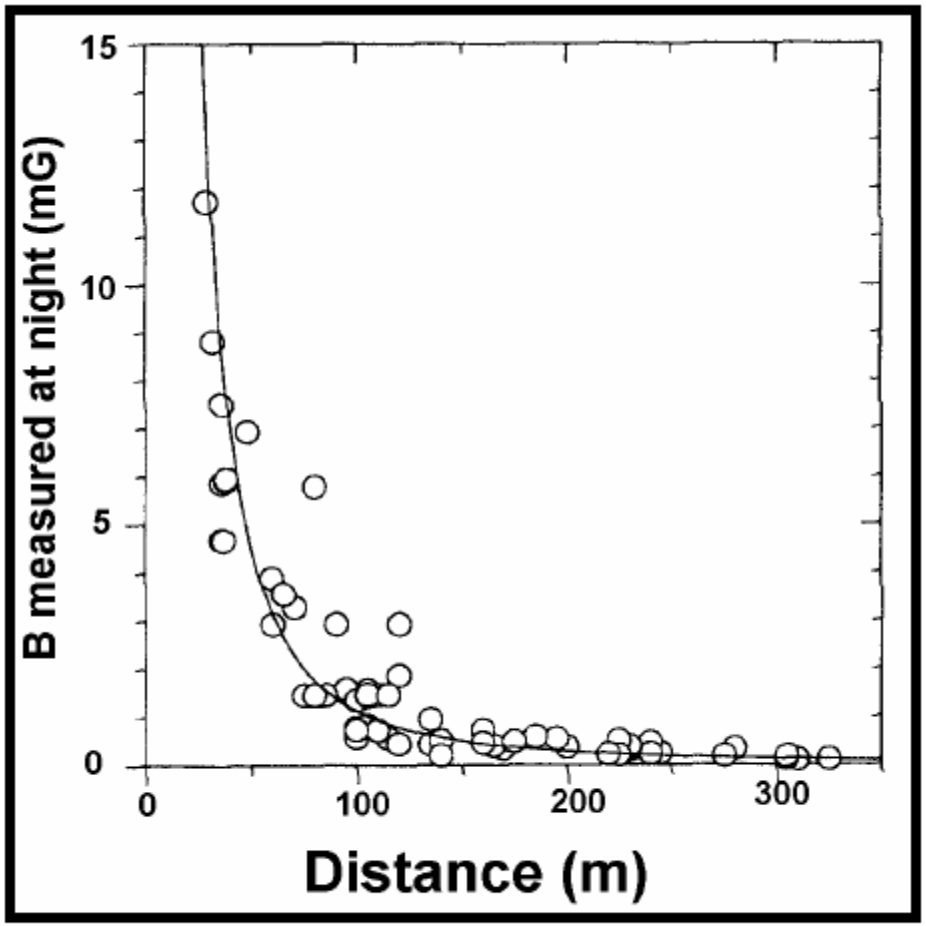
AC Transmission Line Fields



	electric field strength in V/m	magnetic field strength in nT
380 kV transmission line	2,000 – 7,000	5,000 – 15,000 50 mG – 150 mG
220 kV transmission line	1,000 – 6,000	5,000 – 14,000 50 mG – 140 mG
110 kV distribution line	1,000 – 2,000	5,000 – 20,000 50 mG – 200 mG
underground line	--	10,000 – 30,000 100 mG – 300 mG

Table: High –tension Transmission Lines and Their AC Electric and Magnetic Field Strength

Distance away from Power Lines gives Lower Exposure (Norway)



Geometric means of nighttime individual magnetic fields for 65 children living in the vicinity of a 300 kV powerline in Norway, Vistnes et al. (1997).

Electrical Workers are more at Risk for Unusual Cancers

Table 3: Male breast cancer associated with EMR exposure.

Group	SIR/RR/OR	95%CI(p-value)	Reference
Electrical Occupations	OR = 1.8	1.0-3.7	Demers et al. (1991)
Electricians, telephone linemen, electric power workers.	OR = 6.0	1.7-21	"
Radio communication workers.	OR = 2.9	0.8-10	"
Electronic workers	Increased Risk		Guenel et al. (1993)
Swedish Railway workers	RR = 4.9	1.6-11.8	Floderus, Tornqvist and Stenhund (1994)

Source: www.neilcherry.com/documents/90_e1_EMR-ELF_health_effects_09-02.pdf

ELF EMF Standards are too high

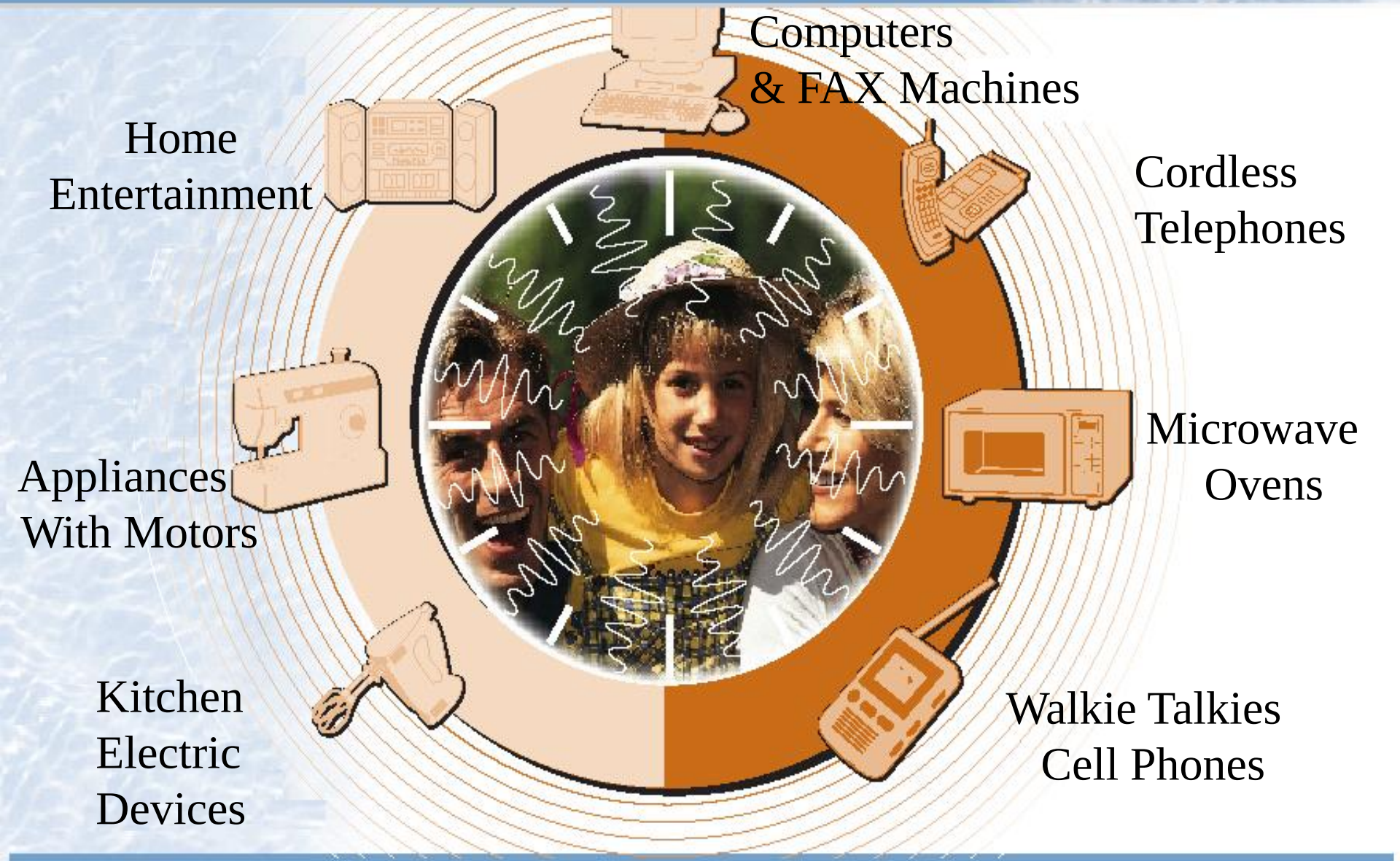
- Current standards do not protect people from many well established biological and health effects.
- 1998 International Commission for Non-Ionizing Radiation Protection (ICNIRP) guideline for public exposure to 60 Hz is 833.3mG. These are set to avoid electric shock.
- Childhood leukemia is significantly elevated at 2 mG relative to “unexposed” reference groups RR =2.0, 95% CI: 1.0 – 4.1

Source: www.neilcherry.com/documents/90_e1_EMR-ELF_health_effects_09-02.pdf

Exposure Criteria for Low Frequency AC Magnetic Fields

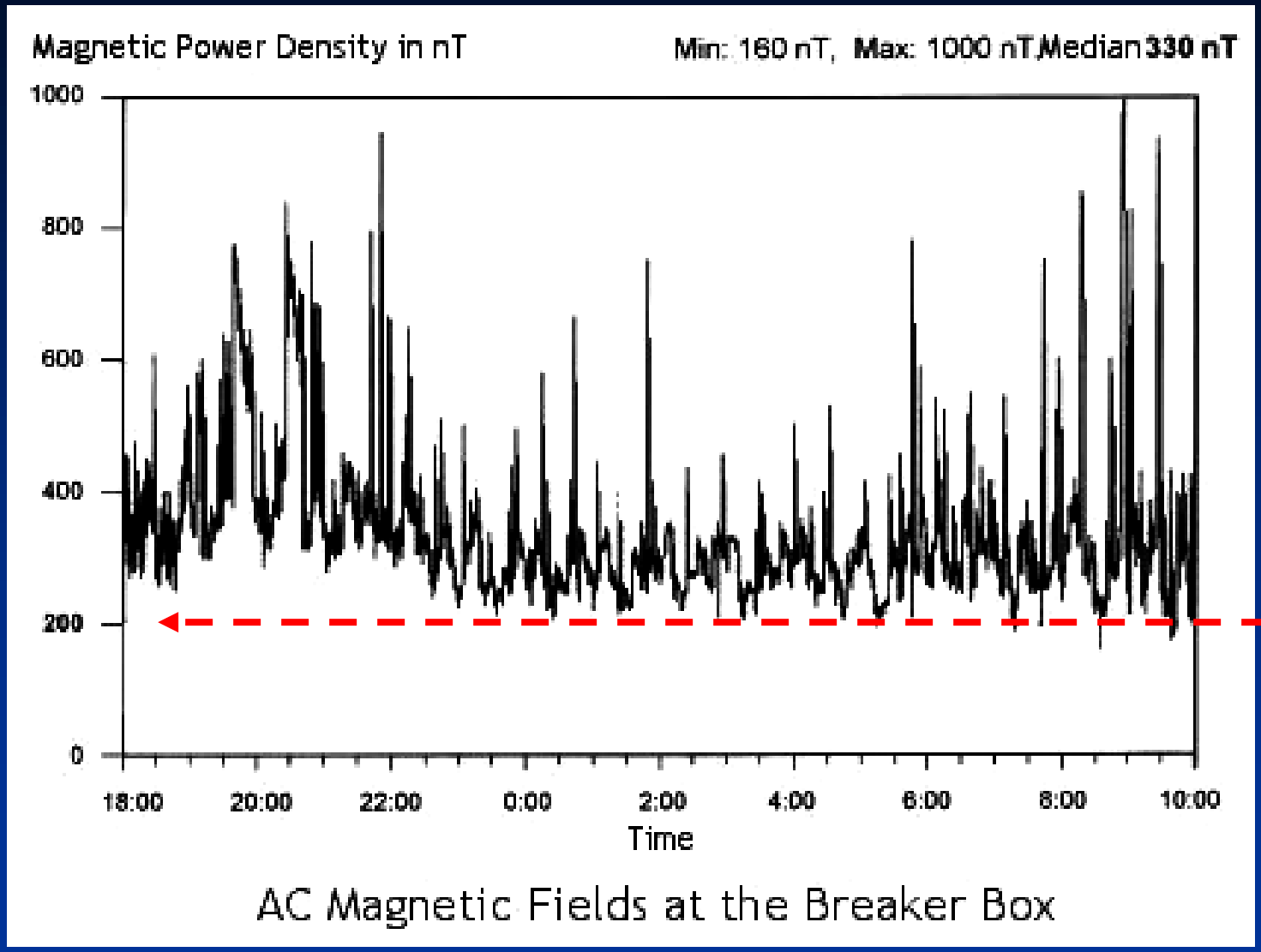


EXPOSURE CRITERIA



Must see Cell Phones in Context of All Electromagnetic Exposure

Magnetic Fields vary over 24 hours



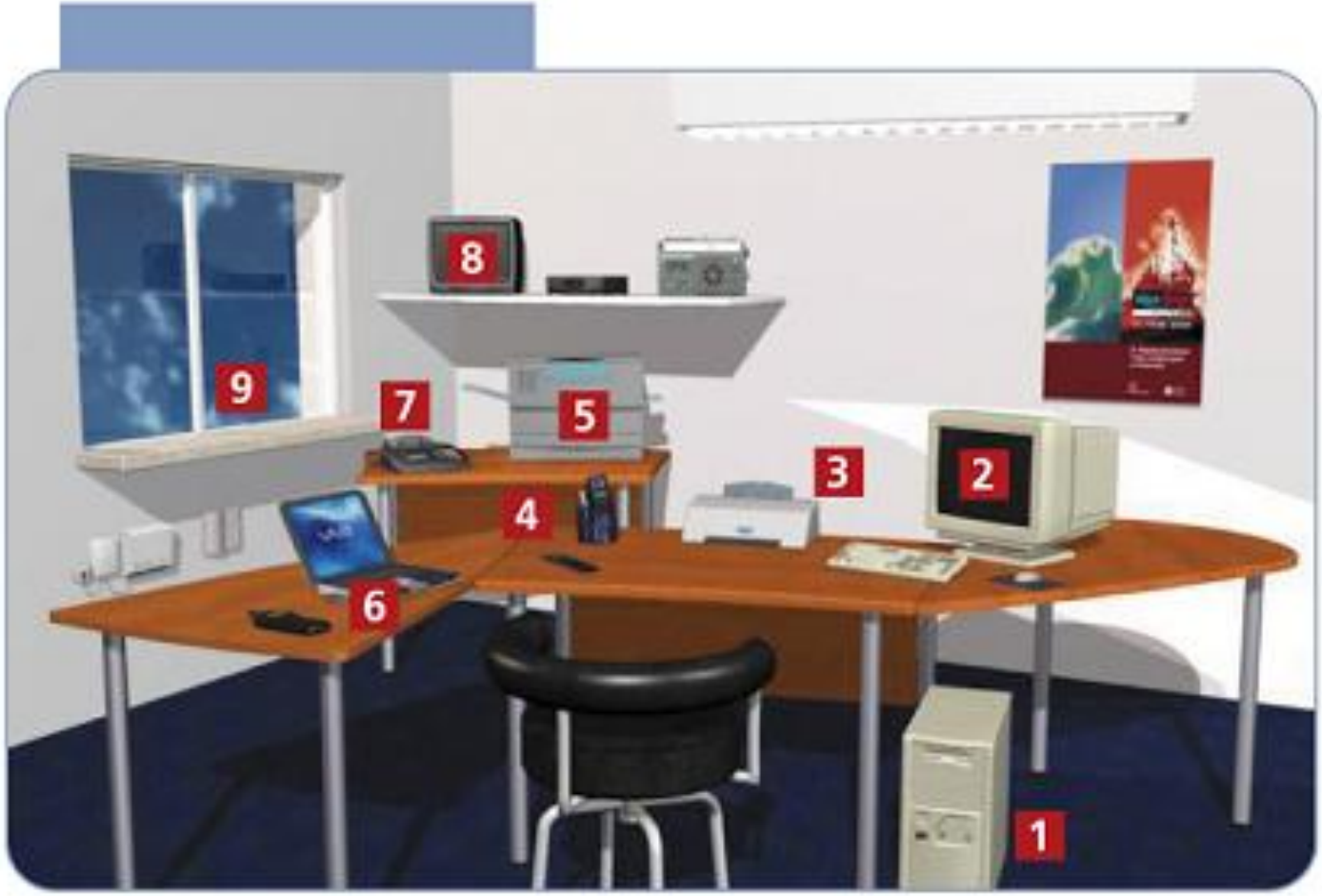
2 mG = 200nT is safe level

EMF Sources in Bedroom



1 Electric Clock
2 Metal Bed Parts
3 Telephone
4 Loudspeakers
5 TV
6 Sat-Receiver

EMF Sources in Office



1 Computer
2 Monitor
3 Printer
4 DECT-Telefon
5 Copier
6 Laptop
7 Telefon/Telefax
8 TV
9 Wireless-LAN

Computer Monitor Magnetic Field



How much Alternating Magnetic Field Strength is Safe ?

2-3 milliGauss is the generally accepted limit of ELF magnetic field exposure from a health perspective, but no one tells you that the average hair dryer, vacuum cleaner, or can opener you use EMITS AN AMAZING 300 mG or more!!!

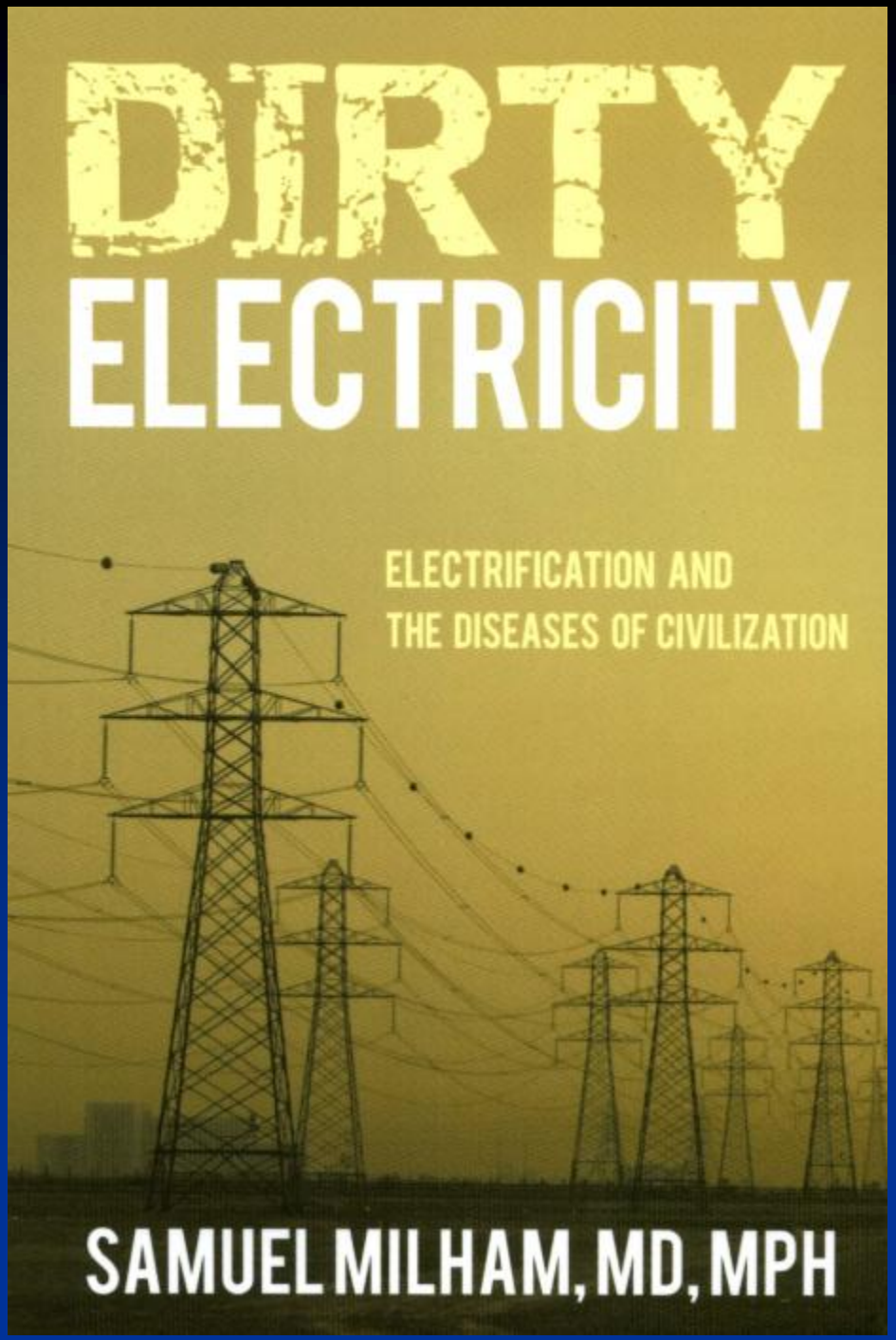




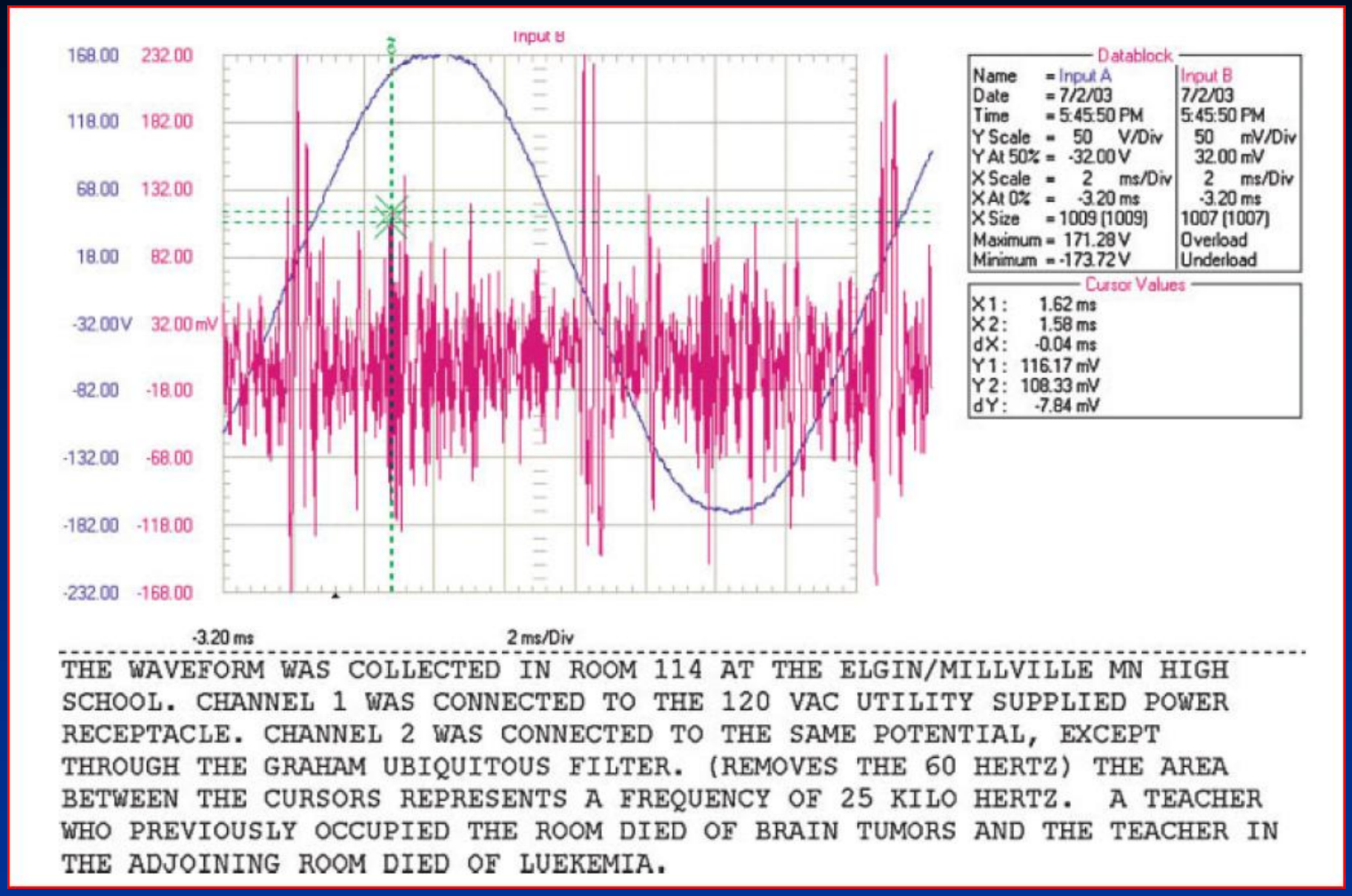


Dirty Electricity

- Caused by the electrical transients in the wiring
- Implicated in Diabetes, Cancer and Multiple Sclerosis
- Can be filtered out with Graham-Stetzer Filters



What Dirty Electricity Looks Like



THE WAVEFORM WAS COLLECTED IN ROOM 114 AT THE ELGIN/MILLVILLE MN HIGH SCHOOL. CHANNEL 1 WAS CONNECTED TO THE 120 VAC UTILITY SUPPLIED POWER RECEPTACLE. CHANNEL 2 WAS CONNECTED TO THE SAME POTENTIAL, EXCEPT THROUGH THE GRAHAM UBIQUITOUS FILTER. (REMOVES THE 60 HERTZ) THE AREA BETWEEN THE CURSORS REPRESENTS A FREQUENCY OF 25 KILO HERTZ. A TEACHER WHO PREVIOUSLY OCCUPIED THE ROOM DIED OF BRAIN TUMORS AND THE TEACHER IN THE ADJOINING ROOM DIED OF LUEKEMIA.

- See also: www.electricalpollution.com/

Dirty Electricity in the Home

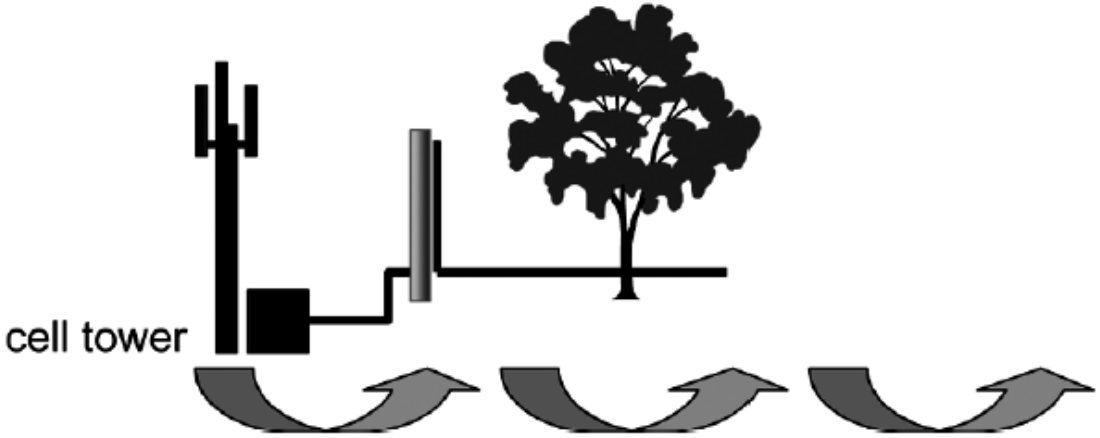
Sources of Dirty Electricity

- computers
- variable speed motors
- television sets
- entertainment units
- energy efficient lighting
- energy efficient appliances
- dimmer switches
- power tools
- arcing on hydro wires
- neighbors
- cell phone antennas
- broadcast antennas









Cancer and Dirty Electricity

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE (2008)

A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School

Samuel Milham, MD, MPH*,† and L. Lloyd Morgan, BS‡





- Conclusion: The cancer incidence in the teachers at this school is unusually high and is strongly associated with high frequency voltage transients, which may be a universal carcinogen, similar to ionizing radiation.

- Source: Am J Industrial Medicine, Vol 51, No 8, pp 579-586, 2008

Electromagnetic Hypersensitivity: Biological Effects of Dirty Electricity with Emphasis on Diabetes and Multiple Sclerosis

MAGDA HAVAS

Environmental and Resource Studies, Trent University, Peterborough, Ontario, Canada

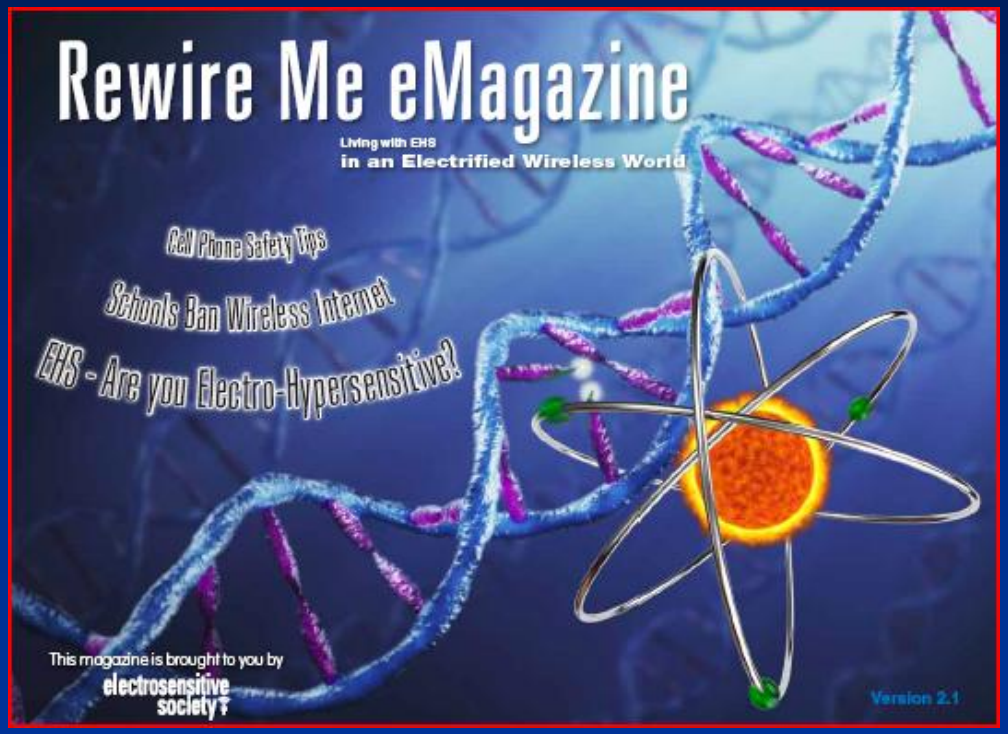
Electromagnetic Biology and Medicine, 25: 259–268, 2006
Copyright © Informa Healthcare

- Larger Studies are needed to study health impacts especially in diabetes, MS & Chronic diseases
- Power companies have so far been unwilling to look at this research or suggest cleaning up the power



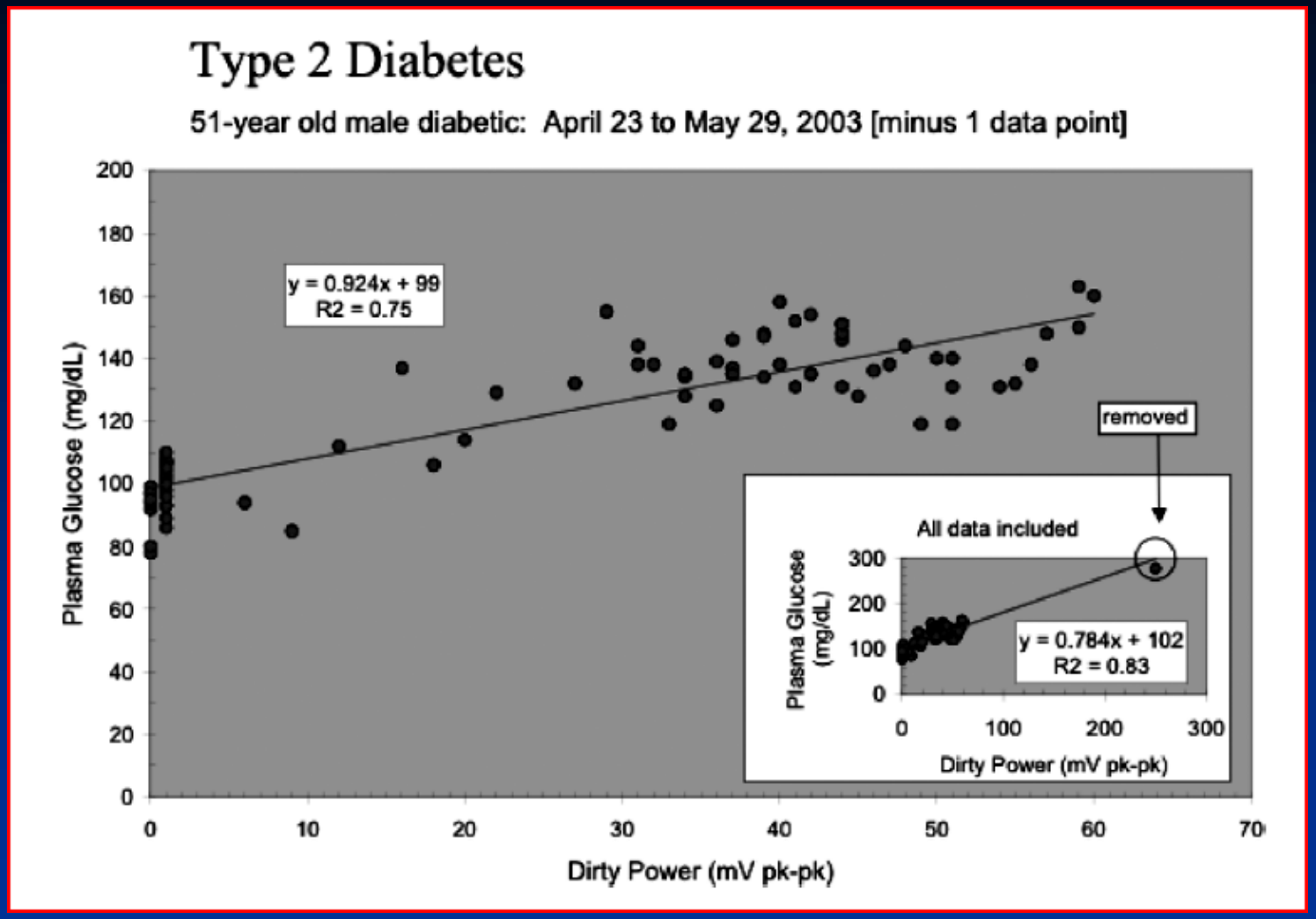
Magda Havas PhD

- Trent University researcher in Canada
- Now puts out an e-magazine
- Contact www.magdahavas.com



http://www.electrosensitivesociety.com/rewire-me-emagazine/

Blood Sugar Elevation & Dirty Electricity



- Blood sugar rises with Higher Dirty Electricity
- Research of Dr. Magda Havas, Trent University, Canada

EMFs and Diabetes

Bioelectromagnetics 25:160–166 (2004)

An Extremely Low Frequency Magnetic Field Attenuates Insulin Secretion From the Insulinoma Cell Line, RIN-m

Tomonori Sakurai,[1] Akira Satake,[1] Shoichiro Sumi,[1] Kazutomo Inoue,[1] and Junji Miyakoshi[2]*

- Electrical Fields may influence Blood Sugar rise
- Electrical Pollution in Power Lines is possible cause
- House Wiring acts as Antennas for Transients
- We are seeing an Epidemic of Diabetes in U.S.

2008: Sakurai Tomonori; Yoshimoto Miwa; Koyama Shin; Miyakoshi Junji
Exposure to extremely low frequency magnetic fields affects insulin-secreting cells.
Bioelectromagnetics 2008;29(2):118-24.

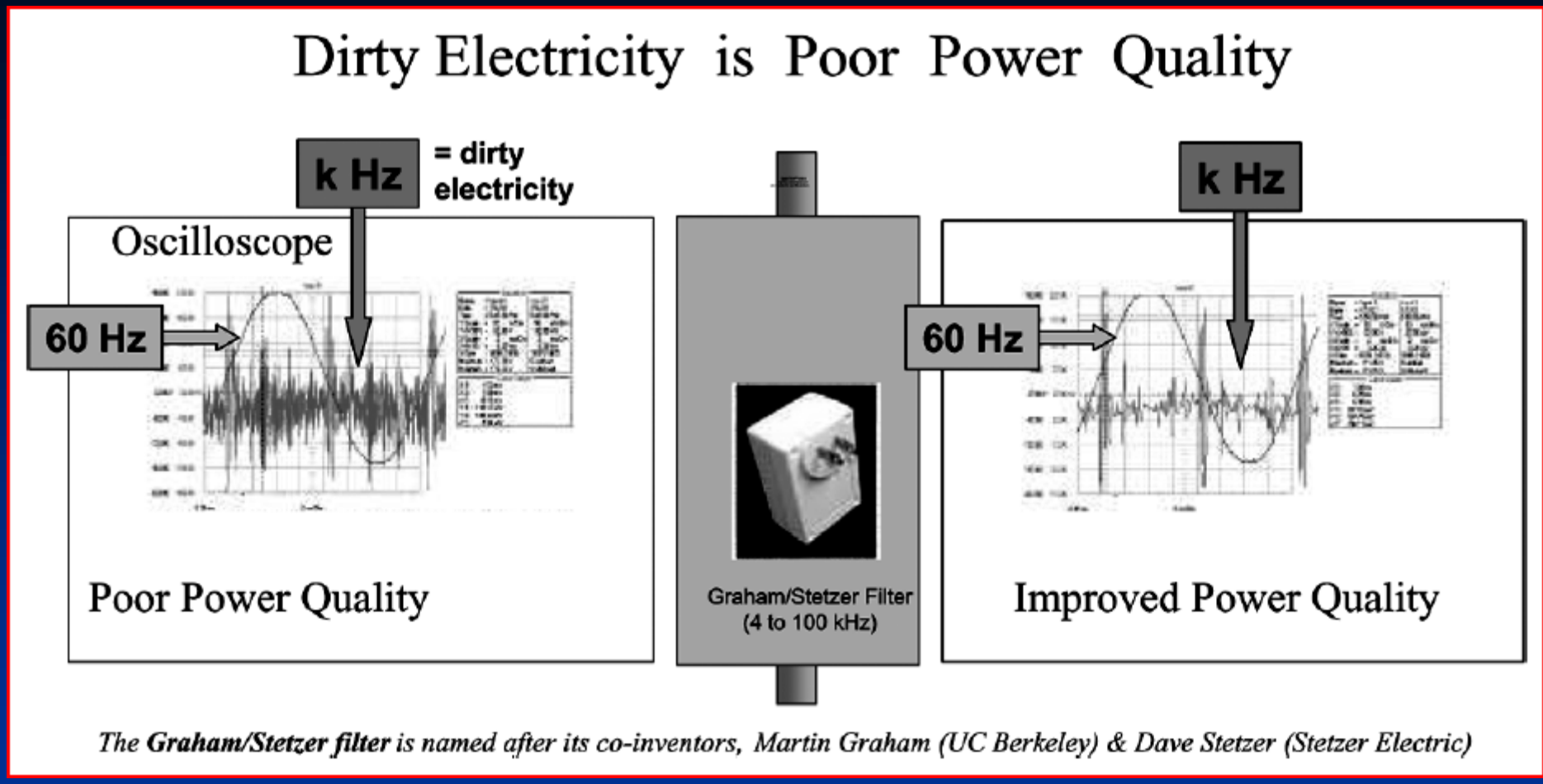


Dirty Electricity Meters



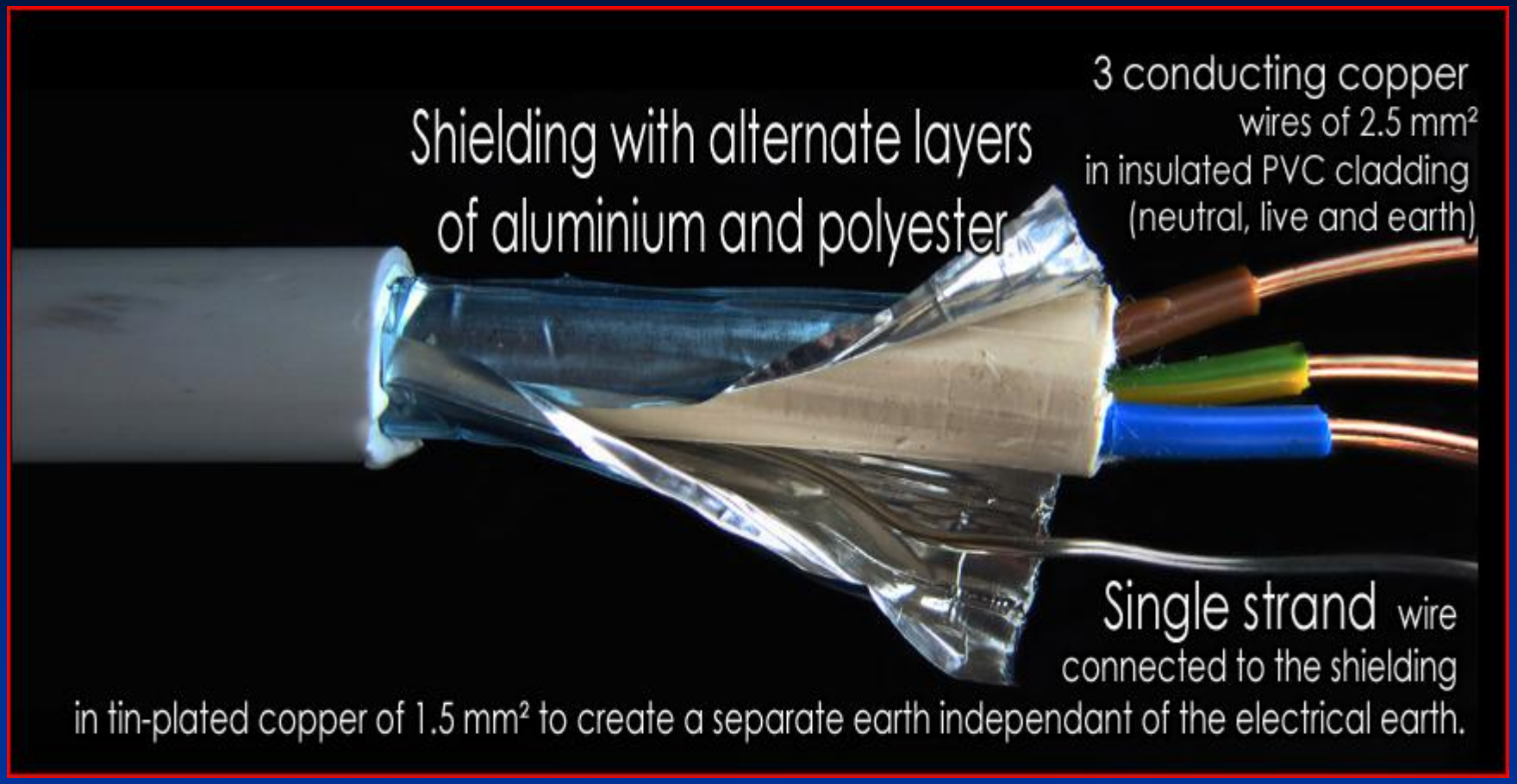
- Developed by Dr. Graham - EE prof. Emeritus at UC Berkeley and Mr Stetzer
- Measure the Noise Transients riding on top of the AC Power in home Wiring
- Can be used to determine filtering needs.
- Source: www.stetzerelectric.com/meter/

Dirty Electricity can be Filtered Out

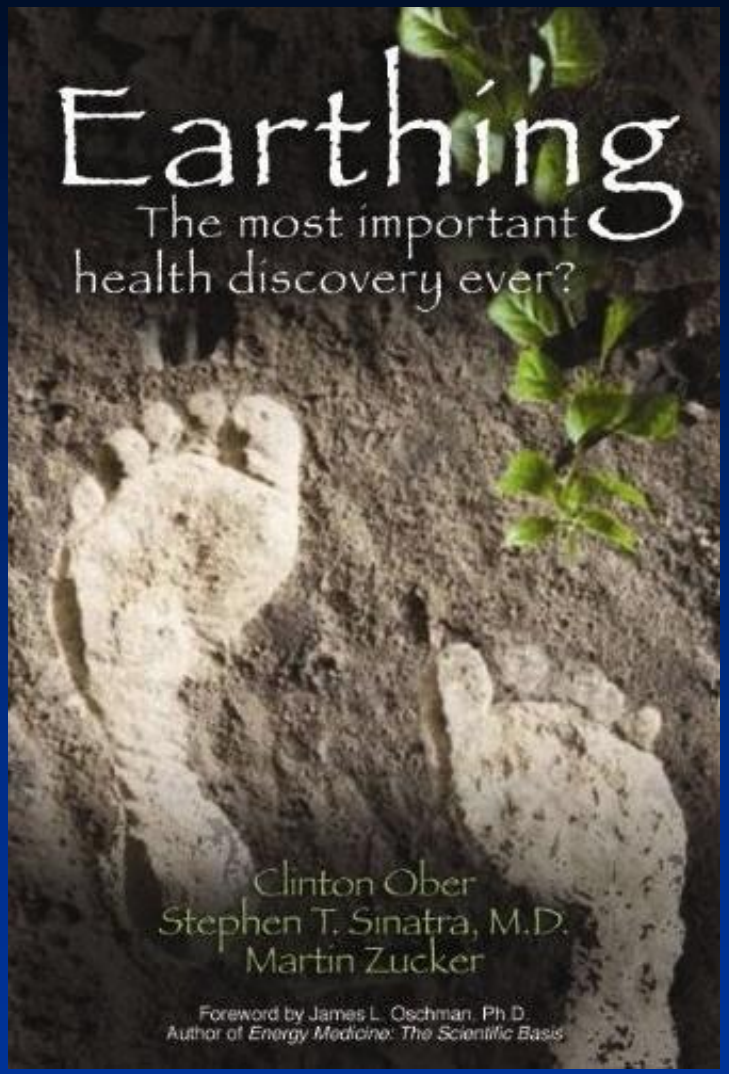


- Created by switching power supplies, dimmer switches, motors and other switching transients
- Is in the KiloHertz region and is radiated from wiring in home

Shielded Cables: Reducing EM Fields in your Home



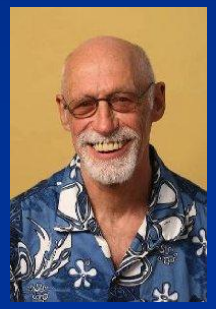
Earthing or Grounding



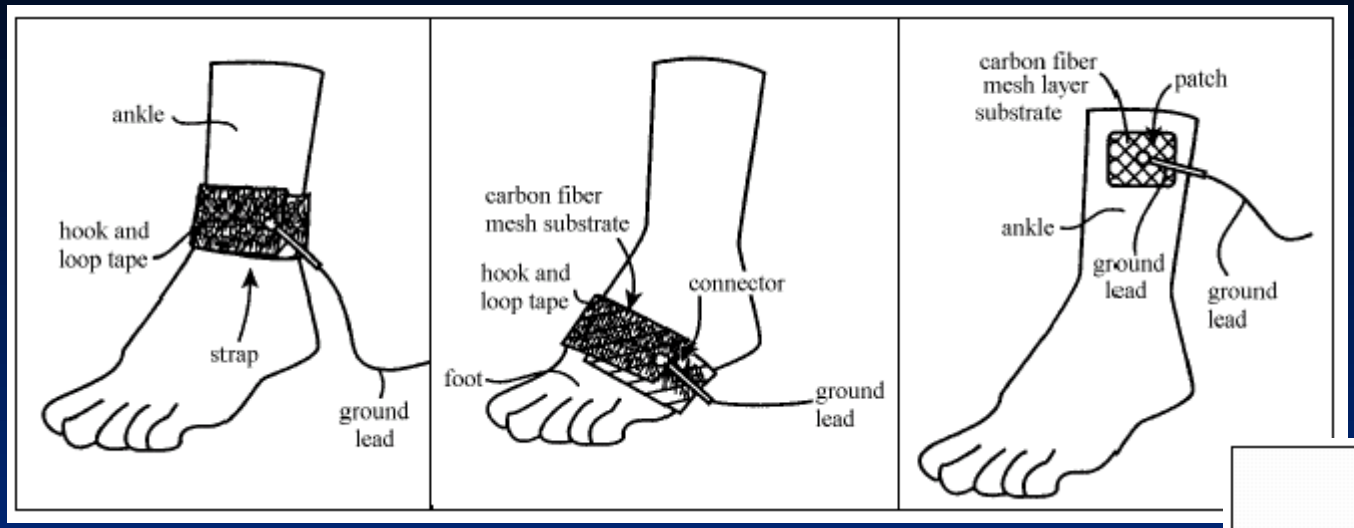
- Has many health benefits
- Can sleep grounded on special conductive sheets
- Helps with abnormal cortisol rhythms
- www.earthinginstitute.net



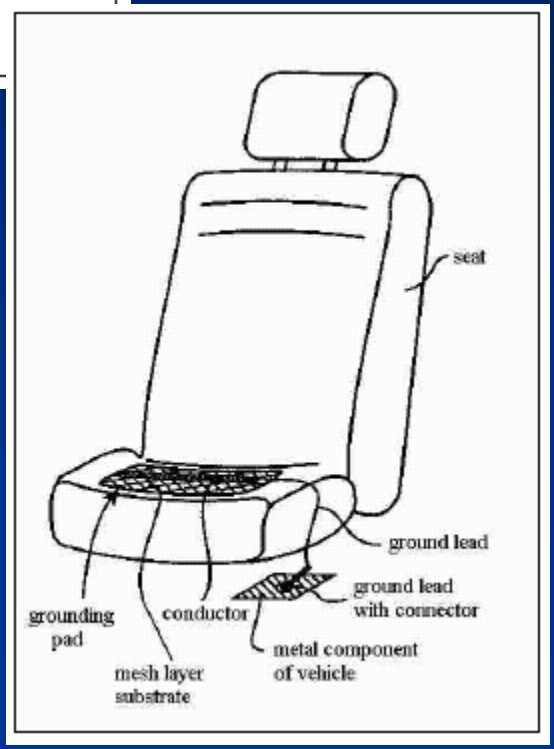




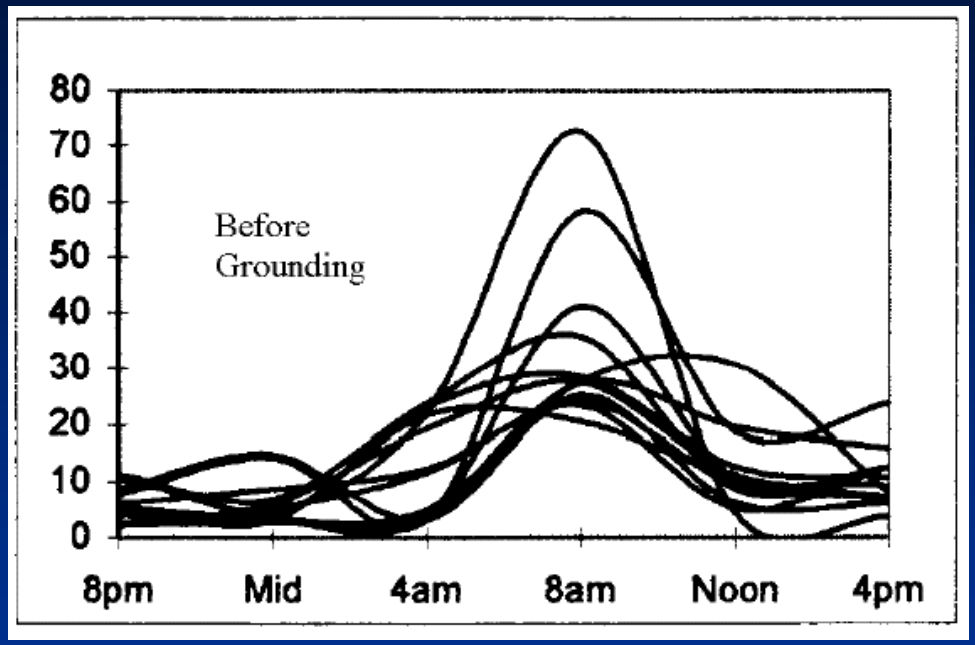
Ground the Body with a Strap

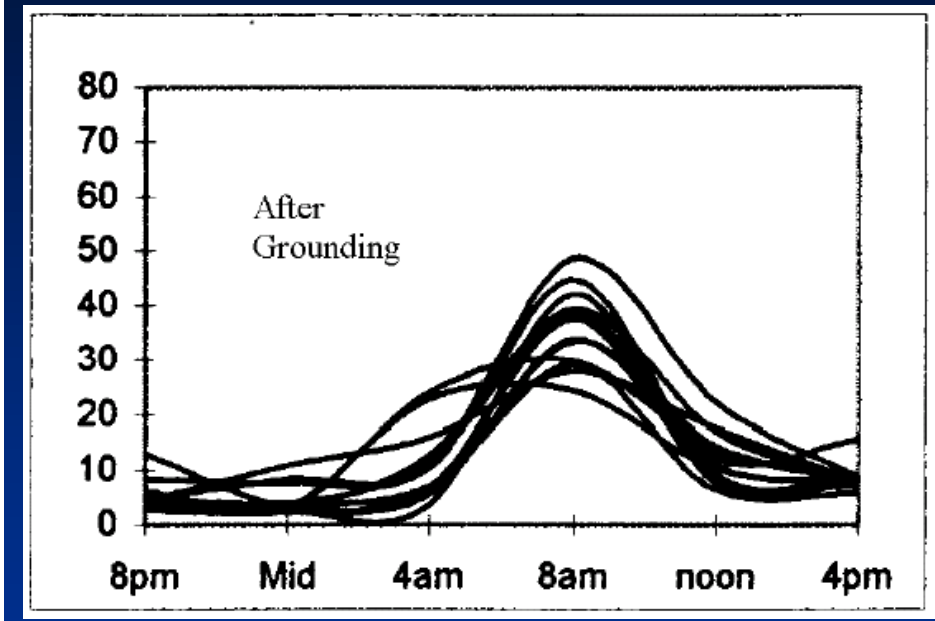


Grounding while in the Car



Body's Daily Cortisol "Stress Hormone" Rhythm





Many stressed people have high nightly cortisol levels

Cortisol rhythms became normalized after grounding

Health Benefits with Grounding

- Deeper sleep, awaken more refreshed
- Less joint pain and inflammation
- Easier menstrual periods, less hot flashes
- Less leg cramping, less irritability
- Less backache
- More even tempered, greater sense of well-being
- Reduced jet lag
- Free electrons from grounding appear to decrease free radical damage in the body

Sleep is improved with Grounding



- 85% went to sleep faster
- 93% reported better sleep quality
- 100% reported feeling more rested after awakening
- 82% reported reduced muscle stiffness
- 74% reduction of elimination of joint and back pain

Minimize ELF Field Exposure

1. *Know the EMFs in your home and work environment.*

   Buy electrical and magnetic field meters (Trifield)

2. *Diminish your exposure to the EMFs you find.*

   Reduce Exposure With Distance – be under 2 mG exposure

   Turn off unnecessary devices – saves power & protects

   Don't sleep near electric clocks or with electric blankets

   Keep distance from Transformers, Power Adaptors, Motors

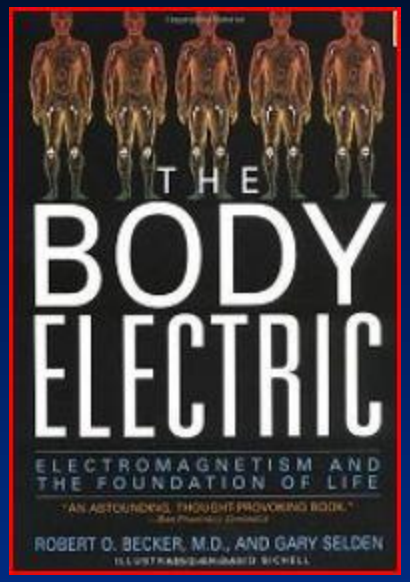
   Use remote demand switch to cut off power when sleeping

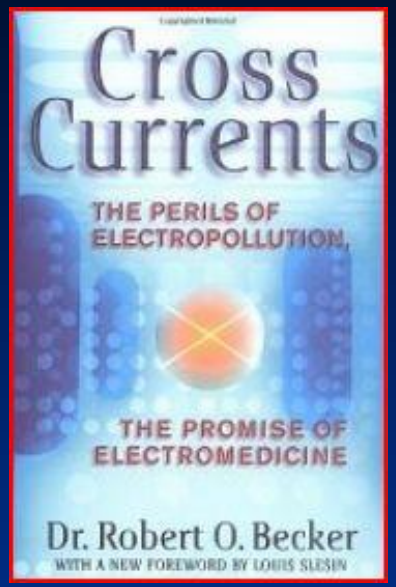
   Avoid living in home within 500 feet of transmission power lines.

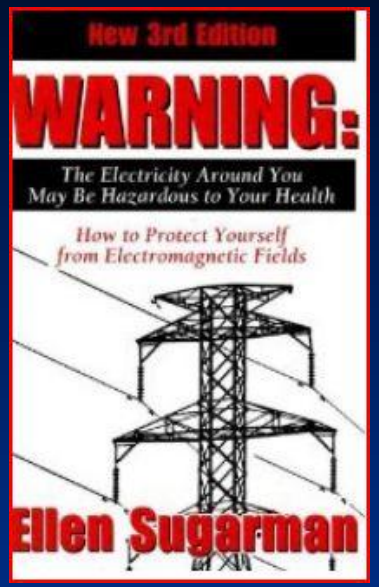
   Filter Dirty Power with Power Line Filters

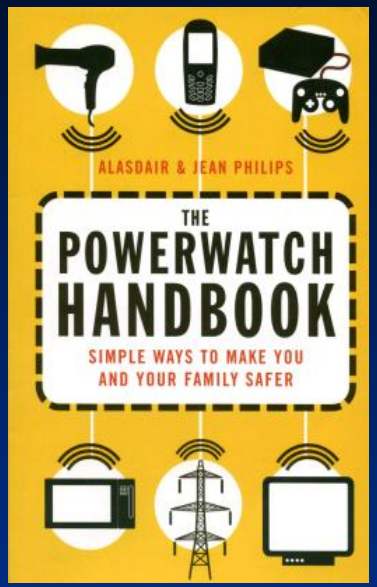
3. *Consider Grounding,* especially while sleeping
4. *Have Safe Wiring in Home including Shielded Cable*

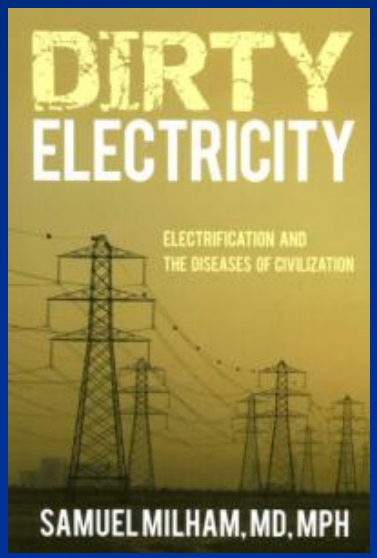
Many Books discuss our Electromagnetic Nature and Hazards of EMFs

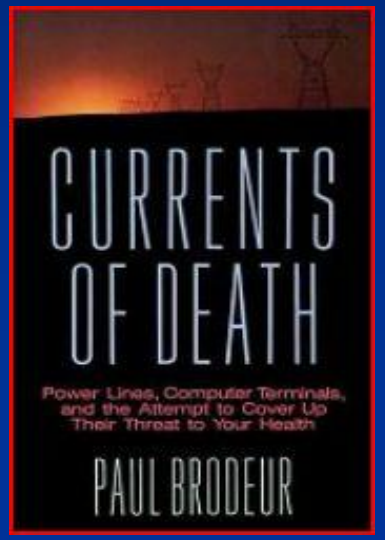


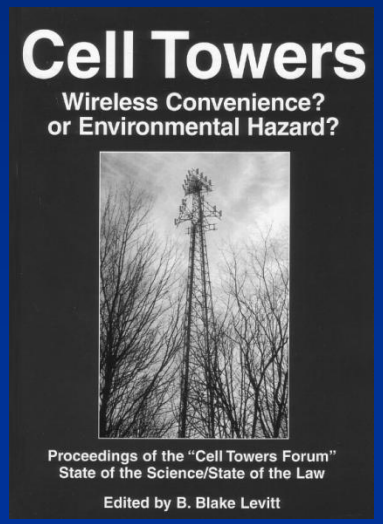


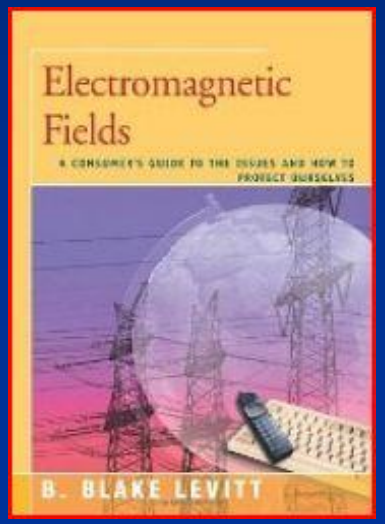












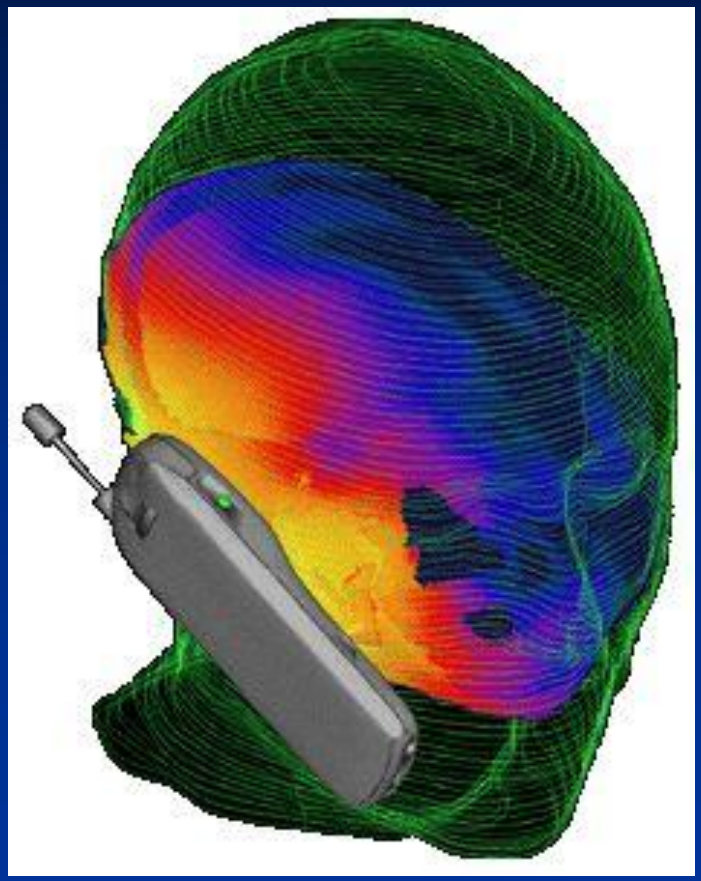
High Frequency Electromagnetic Radio Frequency Radiation (RFR)

This is the contemporary problem !



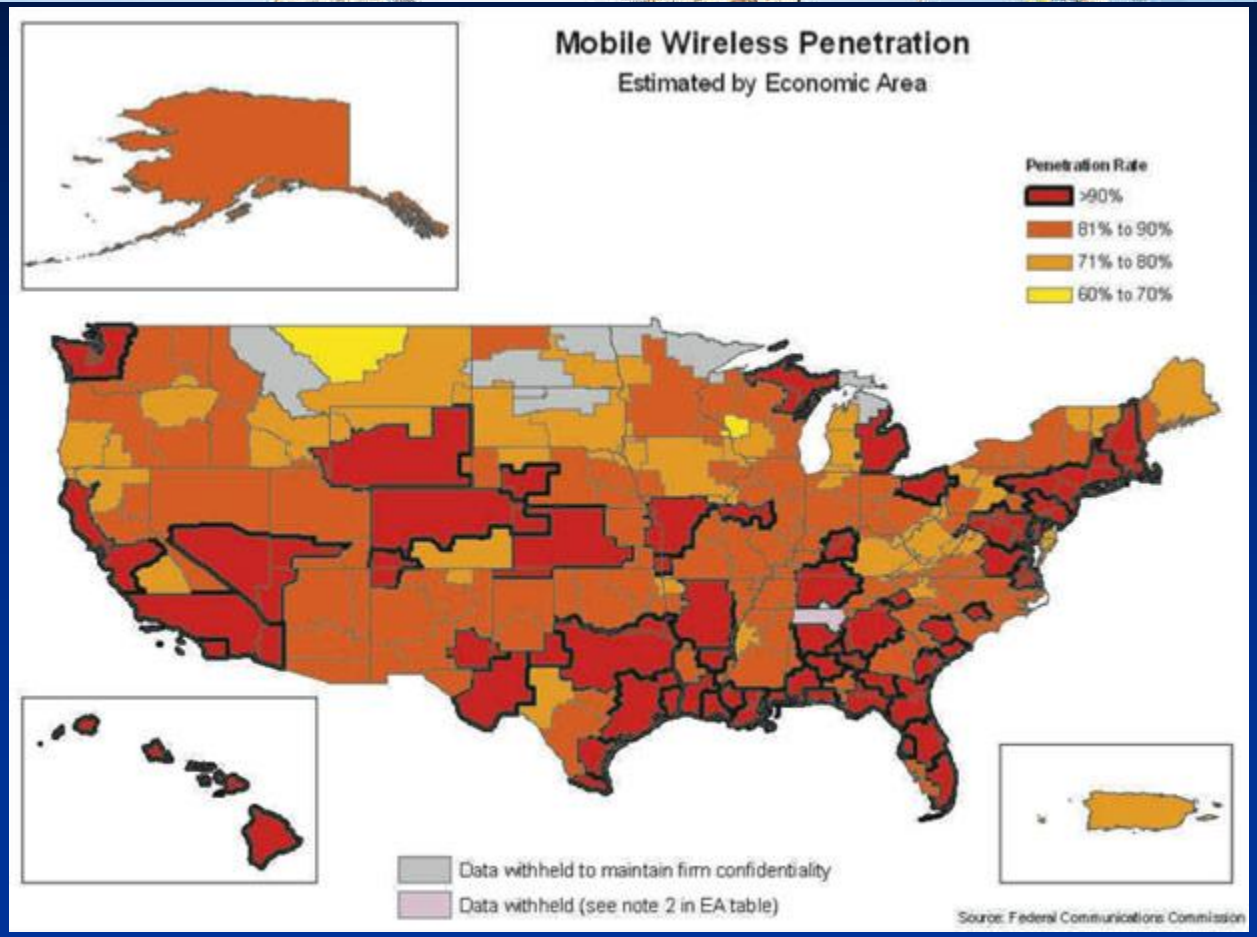
We are now all living in a Wireless World with Ongoing Microwave Exposure





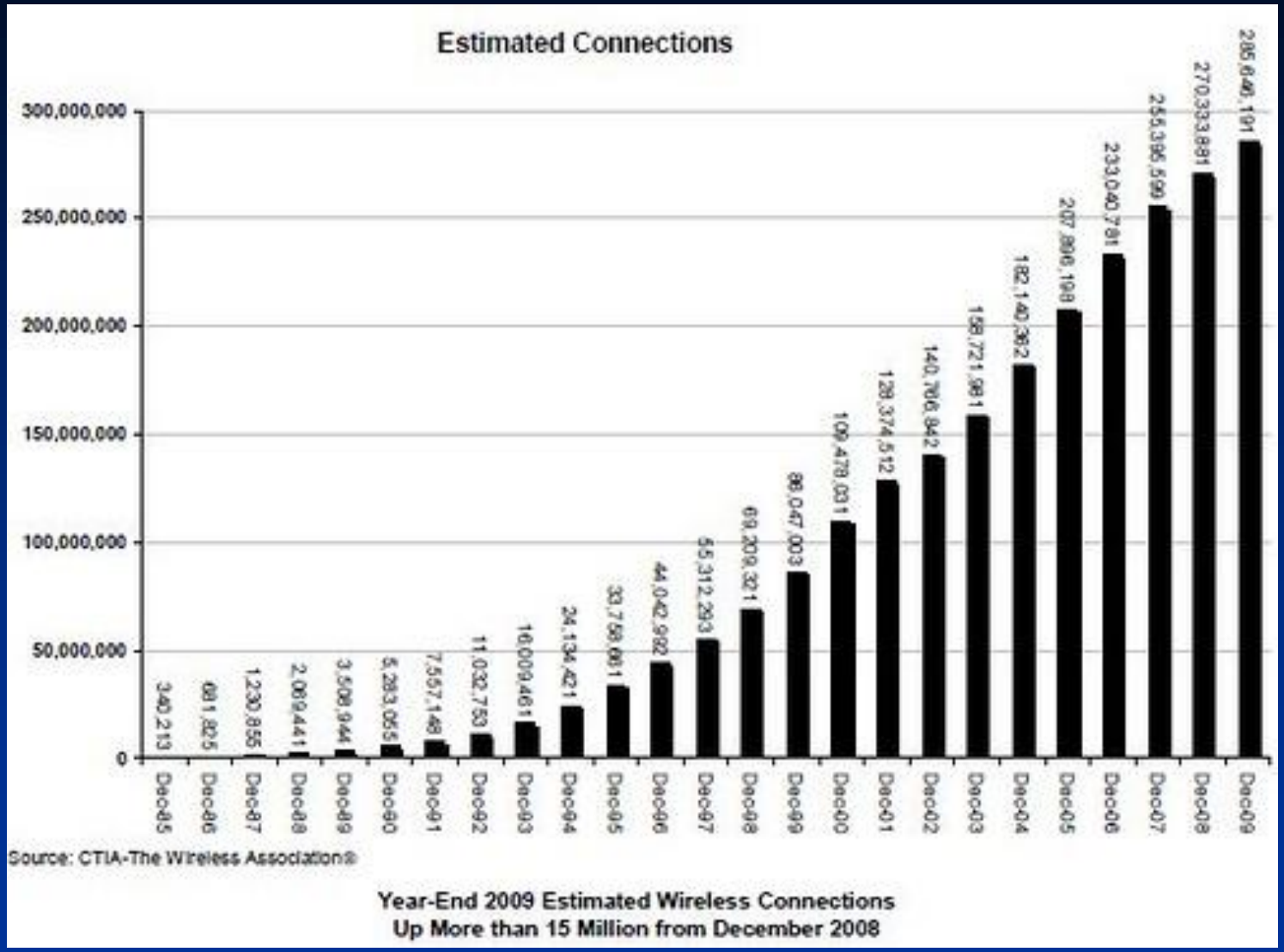
In 2011 Wireless is Virtually Everywhere





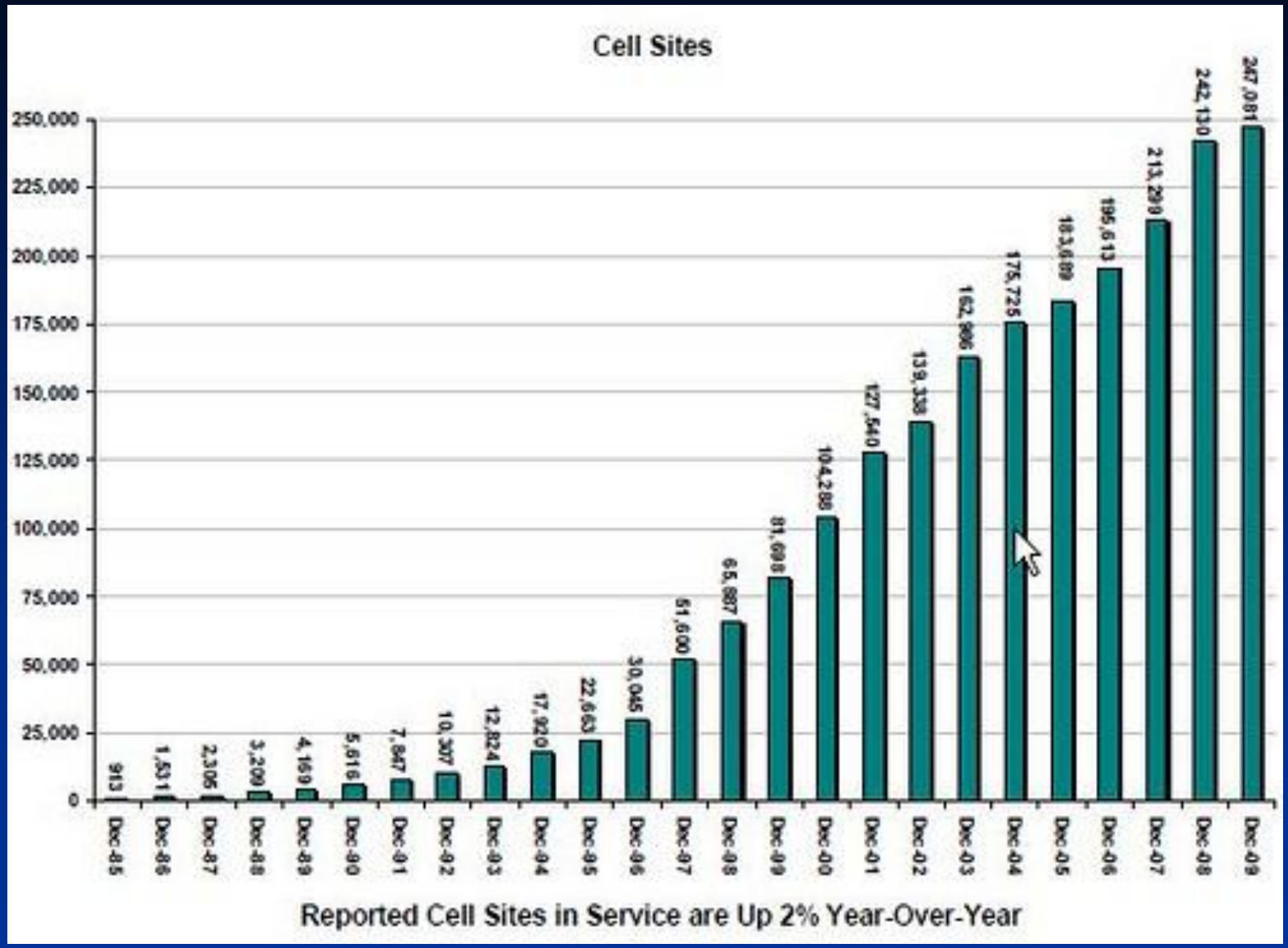
Map as of May 2010

2009 U.S. Wireless Penetration at 91%



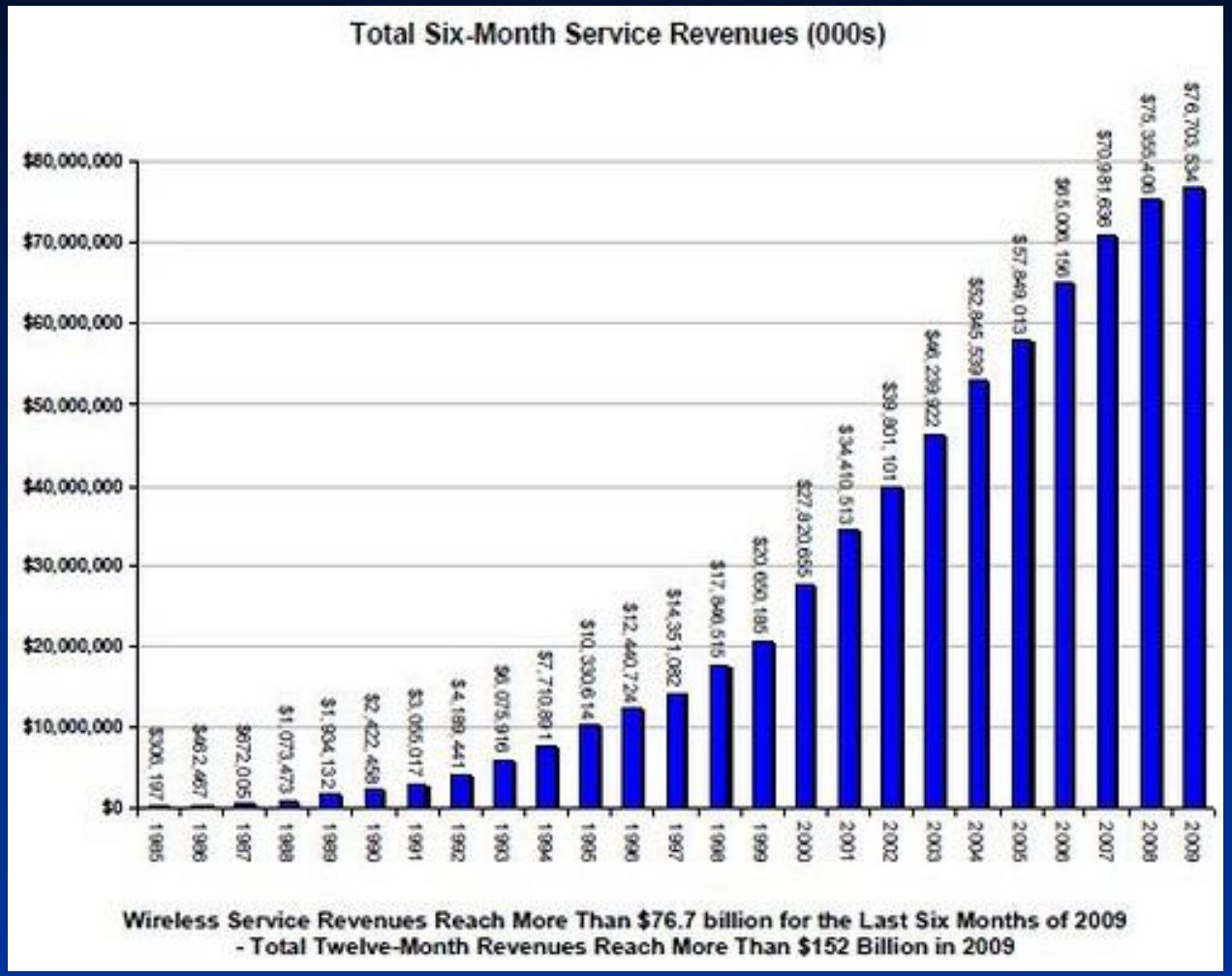
Source: www.dailywireless.org

2009 U.S. Cell Sites radiating Microwaves



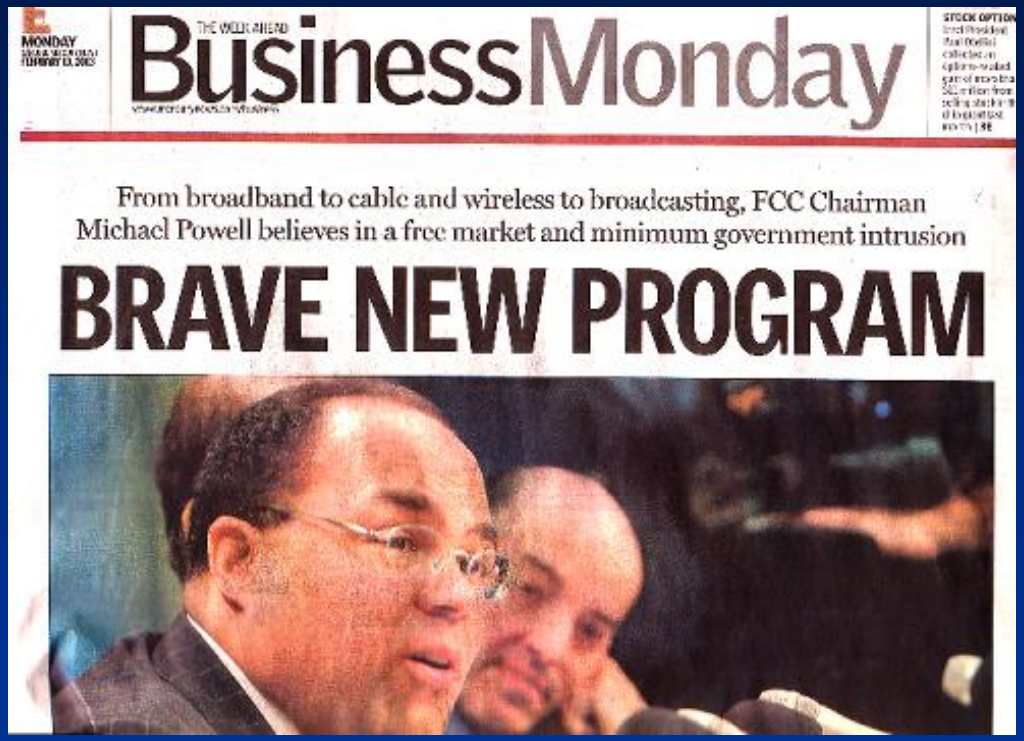
Source: www.dailywireless.org

2009 Wireless Service Annual Revenue = $153 Billion (Health Concerns minimized)



Source: www.dailywireless.org

Government won't regulate Wireless Technologies under new FCC proposals. The Market will Decide !



MONDAY

THE WEEK AHEAD

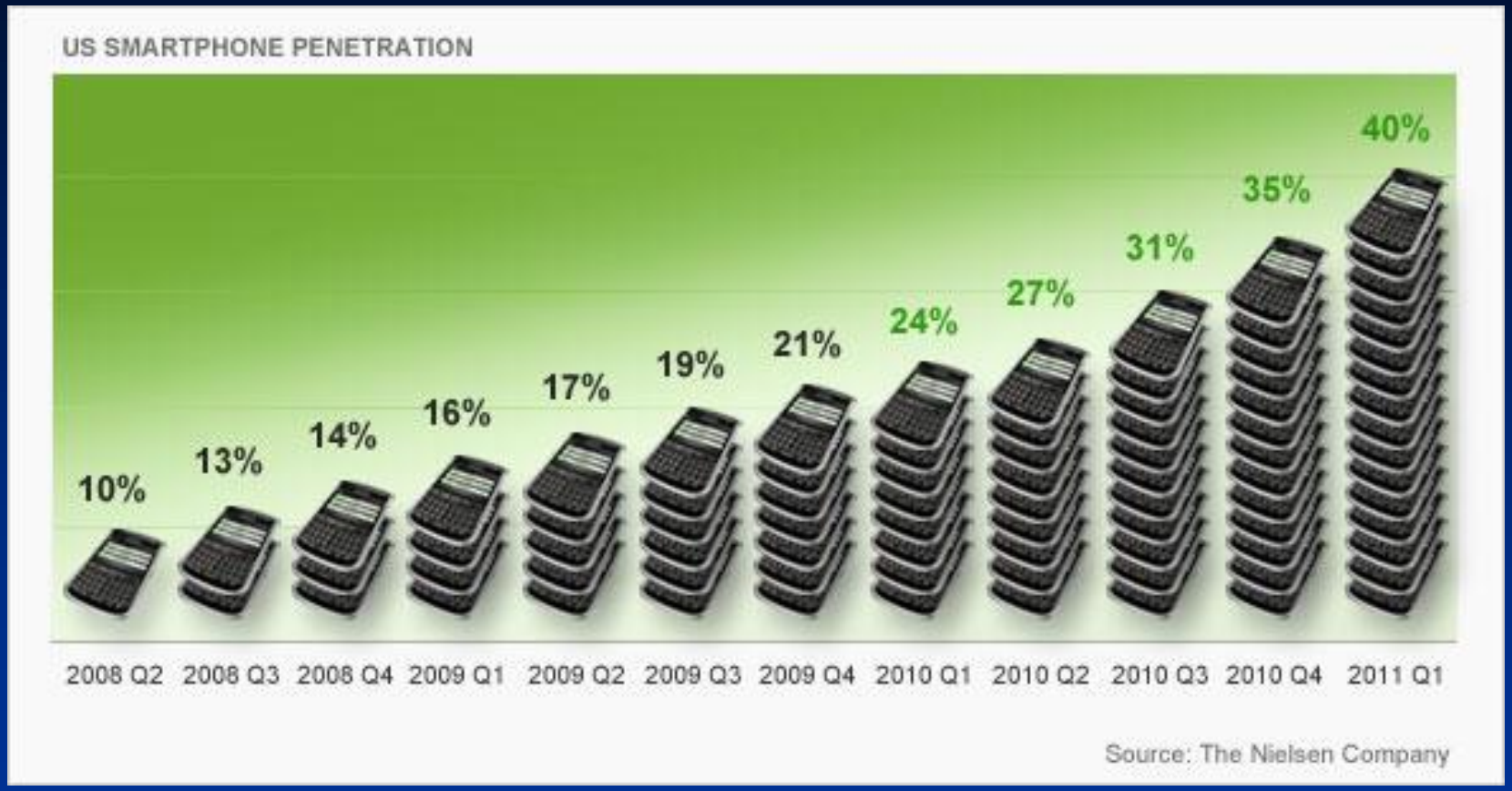
BusinessMonday

From broadband to cable and wireless to broadcasting, FCC Chairman Michael Powell believes in a free market and minimum government intrusion

BRAVE NEW PROGRAM

FCC Chairman, Michael Powell, Secretary of State Colin Powell's son

The Latest Trend is Smart Phones which have a more Health Damaging Radiation



- Prof Adlkofer of European REFLEX Study considers 3G and 4G cellphones to be more damaging to our health

THE JERUSALEM POST > Health / Santé

Our Newspapers & Magazines

28 02 2011

Radiation effect must be checked before 4G system is okayed

By JUDY SIEGEL AND EHUD ZION WALDOCKS

Officials say upgrading infrastructure to for 4G cellular phones could increase use of such technologies and increase public's exposure to radiation.

The Health and Environmental Protection ministries told the Communications Ministry on Sunday that they will oppose the expansion of cellular phone infrastructure to accommodate "fourth-generation" (4G) devices, at least until any health effects from theradiation are examined in depth.

The directors-general of the two ministries, Dr. Ronni Gamzu and Alona Schefer Caro, called on Communications Ministry Director-General Eden Bar-Tal to coordinate with them on the issue.



Photo by: Ariel Jerozolimski

Microwave Background Radiation will be Increasing to Accommodate Data Flow

2 inch Cube
Antenna for
new Network



By 2013:
21.6 billion+ downloads of mobile apps

By 2015
18x more smartphone devices
30x more wireless data traffic
32x greater smartphone usage per urban kilometer

-Source: Bell Labs

What is coming Next? LightRadio™

2 inch Cube
Antenna for
new Network



- Alcatel-Lucent hopes to build the next 3G and 4G Network using these tiny microwave radiators to largely replace Cell Phone Towers traffic
- These will be smaller cells that basically will blanket the local environment with interconnected low power microwave communications.

How Much Microwave Radiation Today?





- In 1980, Background Microwave was 0.005 $\mu W/cm^2$
- Now in cities it is 0.4 to 100 $\mu W/cm^2$
- Background RFR has increased up to 20,000 times!!
- Potential Chronic Health Effects could add to medical costs

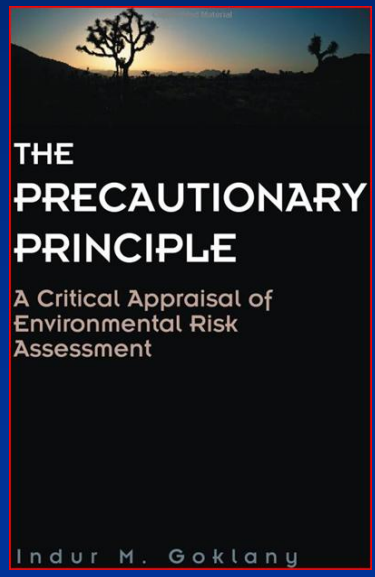
Precautionary Principle Recommended

"The precautionary principle applies where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen."

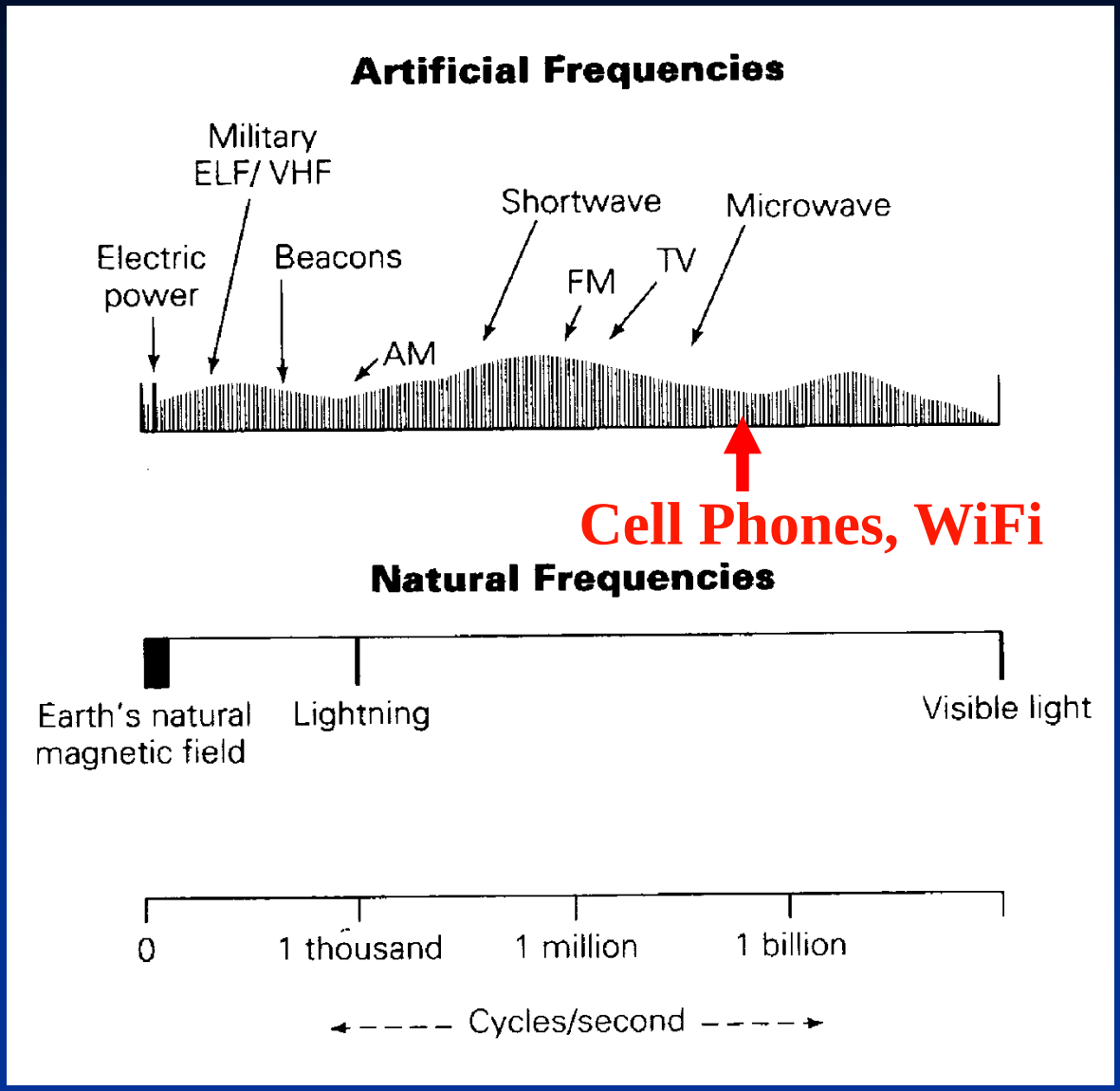
- From Vorsorgeprinzip (German) = "Foresight Principle"
- European Commission Communication on the Precautionary Principle 2nd February 2000

http://ec.europa.eu/environment/docum/20001_en.htm

http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf



Our changed Electromagnetic Spectrum



Current EM Field Environment

Original Natural State

Current Exposure Standards based on Thermal or Heating Effects only

Form Basis for all Current Safety Guidelines

Microwave Power Density (Radiated) set at
= 1000 $\mu W/cm^2$ @ 1.8 GHz
(Levels are Frequency Dependent)

Specific Absorption Rate (SAR) = 1.6 W/kg
For cell Phones (May be variations in individual absorption)

CONSIDERED BY MANY TO BE TOO HIGH



William Rea, MD

Founder & Director of the Environmental Health Center, Dallas

Past President, American Academy of Environmental Medicine

"Sensitivity to electromagnetic radiation is the emerging health problem of the 21st century. It is imperative health practitioners, governments, schools and parents learn more about it. The human health stakes are significant".

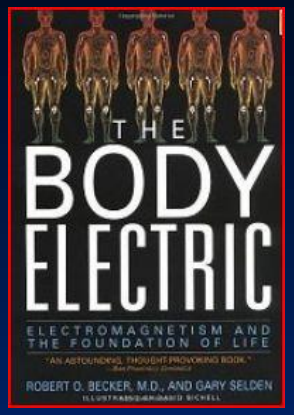


David Carpenter MD

Professor, Environmental Health Sciences, and Director, Institute for Health and the Environment, School of Public Health, University of Albany, SUNY - Co-author of Bioinitiative Report

"Studies of people have shown that both ELF and RF exposures result in an increased risk of cancer, and that this occurs at intensities that are too low to cause tissue heating. Unfortunately, all of our exposure standards are based on the false assumption that there are no hazardous effects at intensities that do not cause tissue heating. Based on the existing science, many public health experts believe it is possible we will face an epidemic of cancers in the future resulting from uncontrolled use of cell phones and increased population exposure to WiFi and other wireless devices. "

Robert O. Becker M.D (1923-2008)







2004

"I have no doubt in my mind that at the present time, the greatest polluting element in the earth's environment is the proliferation of electromagnetic fields. I consider that to be far greater on a global scale, than warming, and the increase in the chemical elements in the environment."

Are there Really Safe Levels ?



"The actual expose levels at which these genetic effects are shown are about 0.5 to 1.2 µW/ cm^2. These are not safe levels, they are just experimental levels that show that at extremely low levels genotoxic responses occur cell-by-cell. There is no safe threshold.“

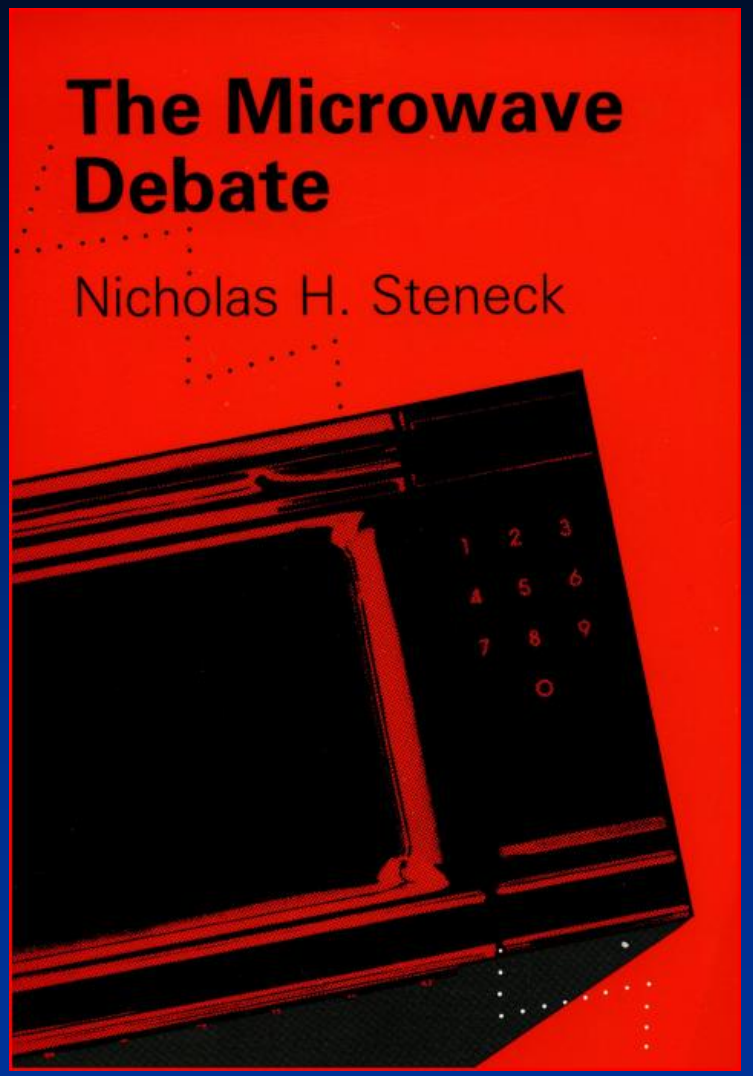
Dr. Neil Cherry, NZ EMF Researcher

(U.S. Power Density set at 580 -1000 µW/ $cm^{2)}$

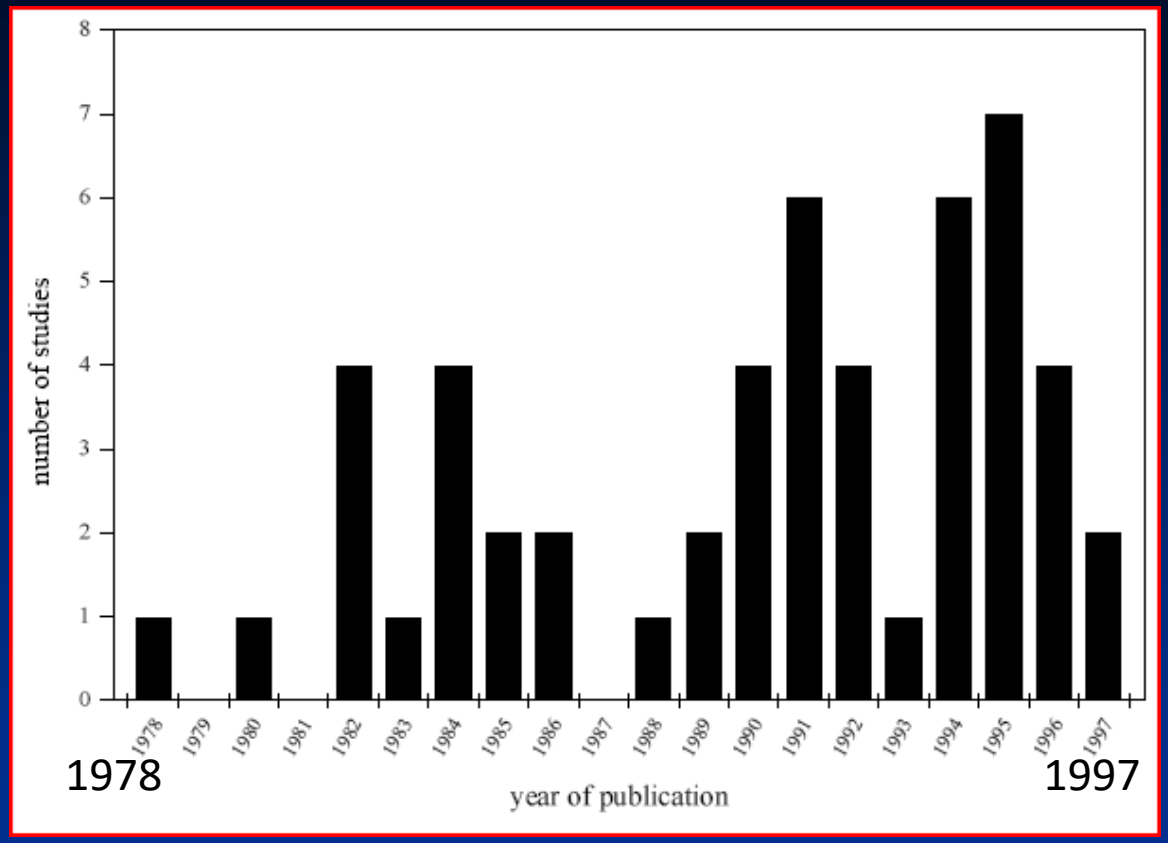
Prof Nicholas Steneck 1984

- He recognized that military and industry research have been the primary drivers of RF and microwave technology.

- "What community has the greatest interest in expanding the use of RF technology? The military and industry, whose values are most strongly represented in C95.1-1982 and other similar policy decisions. At heart C95.1-1982 is a military industrial standard."



Distribution of 52 Key Studies (1978 – 1997) of Biological Effects of RFR selected from Scientific Literature Review

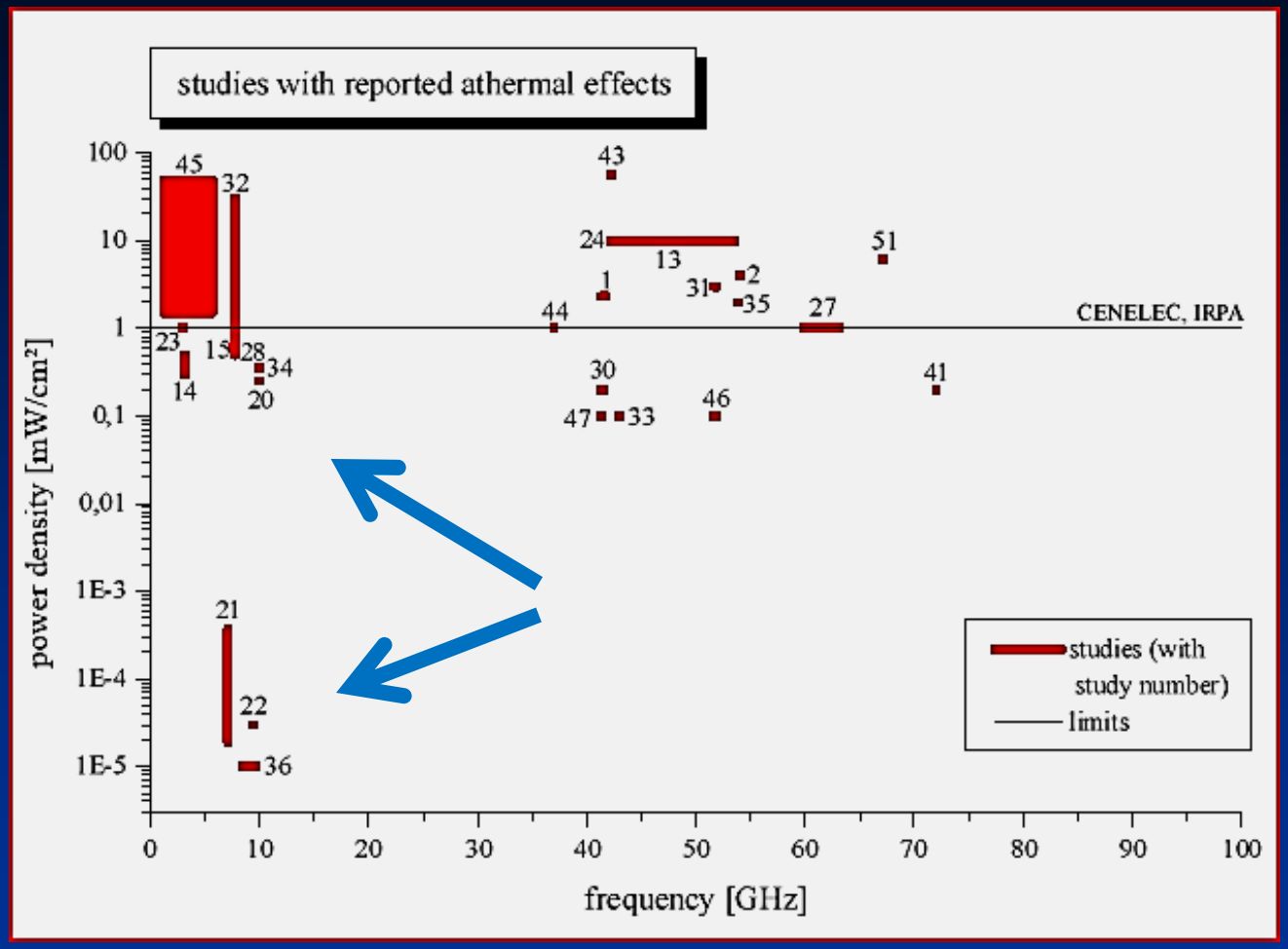


Many More studies since then but seldom carried out in the U.S.

- In 1996 EPA Radio Frequency Exposure Research was essentially eliminated as the US Federal Telecommunication Act was passed with tremendous lobbying by the Cell Phone Industry

Source: www.fgf.de/english/research_projects/reports/literature-context/ID_205_Kullnick_1998_en.pdf

Number of Selected Studies 1978 – 1997 of Non-thermal Biological Effects from a Scientific Literature Review



Many More studies since then.

- Significant number of studies showed biological effects at low power density levels below the existing IRPA guidelines

Source: www.fgf.de/english/research_projects/reports/literature-context/ID_205_Kullnick_1998_en.pdf

William van Bise 1978 Study on EEG

Physiol Chem Phys. 1978;10(5):387-98.

Low power radio-frequency and microwave effects on human electroencephalogram and behavior.

Bise W.

Abstract

In a pilot study of ten human subjects, temporary changes in brain waves and behavior were seen on exposure to power densities lower than 10(-12) W/cm2, which is substantially below typical urban levels. Frequencies included .1 to 960 MHz continuous and 8.5 to 9.6 GHz pulse-modulated waves. Since the relaxation frequency of protein-bound water is considered to fall between 100 and 1,000 MHz, absorptions and quantum effects may be the mechanistic basis for the electroencephalogram changes observed in most of the subjects produced by 10(-15) W/cm2 cw radio-frequency energy of between 130 and 960 MHz. Constructive and destructive interference patterns from standing waves within the skull possibly interact with the bioelectric generators in the brain, since electroencephalogram wave amplitudes and frequencies increased or decreased respectively at different radio wavelengths.

- Suggests that quantum effects may be reason for EEG changes at 10^{-6} µW/ cm^2, a level a million times below existing safety standard (1000 µW/ cm^2)

Major Sources of RFR "Electrosmog"

- Cell Phones



- DECT – Cordless Telephones



- Smart Meters – Home Area Networks



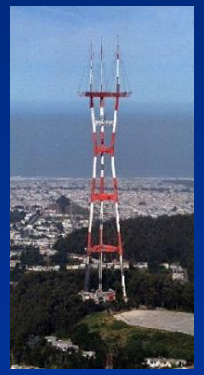
- Wi-Fi in Homes



- TeraHertz Airport Body Scanners



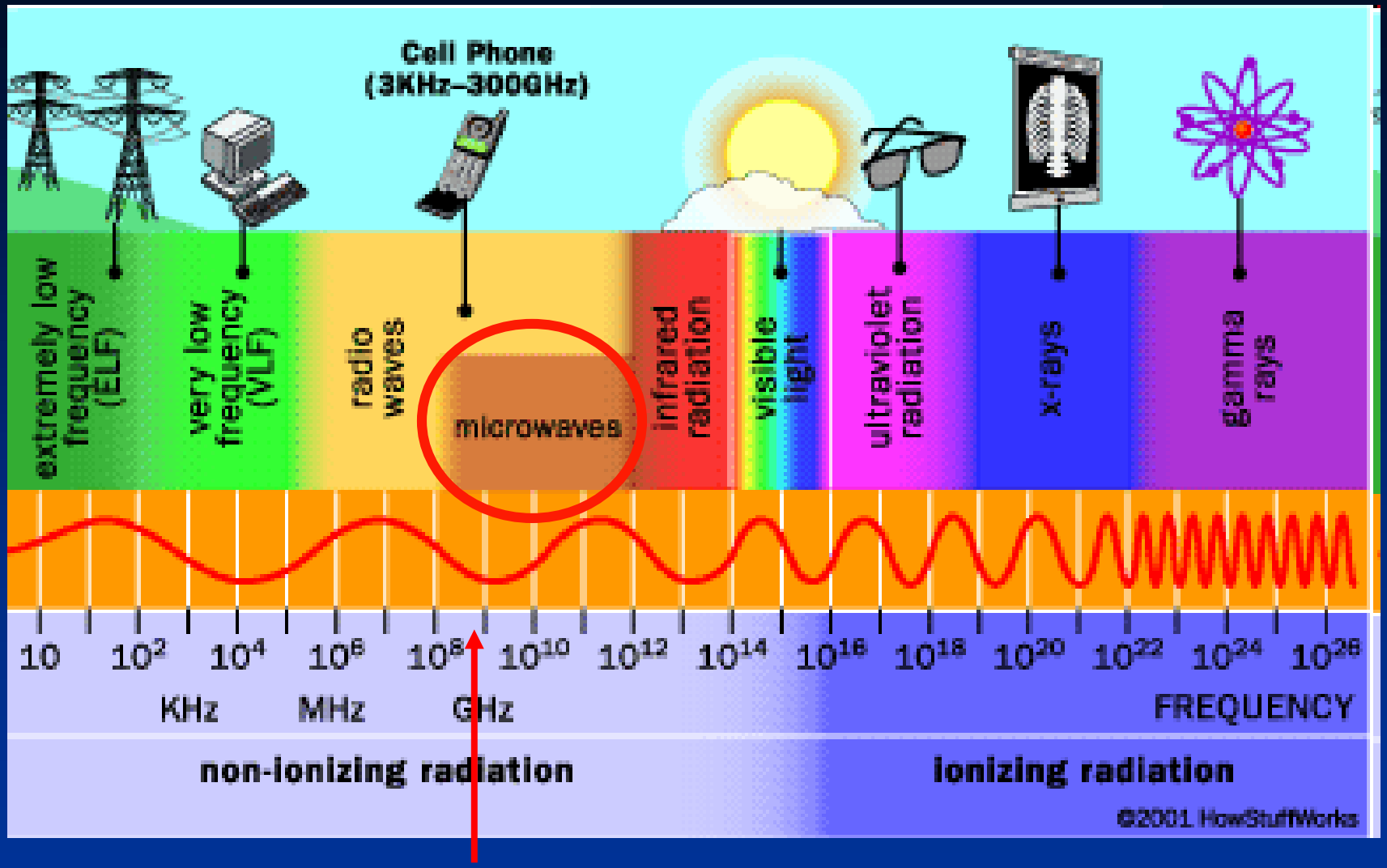
- High Power Radio & TV Towers



- Satellites – Communication, GPS



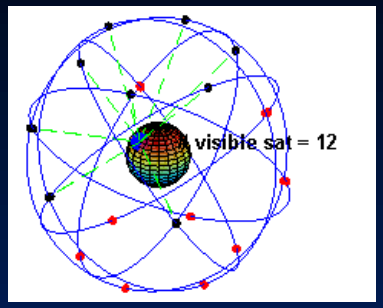
Smart Meters in Electromagnetic Spectrum



Smart Meters 902 - 928 MHz (~ 0.9 GHz) in California

GPS Satellite Communication







- 1.57542 GHz (L1) and 1.2276 GHz (L2)
- Transmits data at 1.023 million chips per sec
- GPS microwave signals reflect off surrounding terrain, buildings, walls → cause inaccuracies



GPS in cell phones



Portable GPS receivers



Used in Cars

TeraHertz Full Body Scanners Now in Use

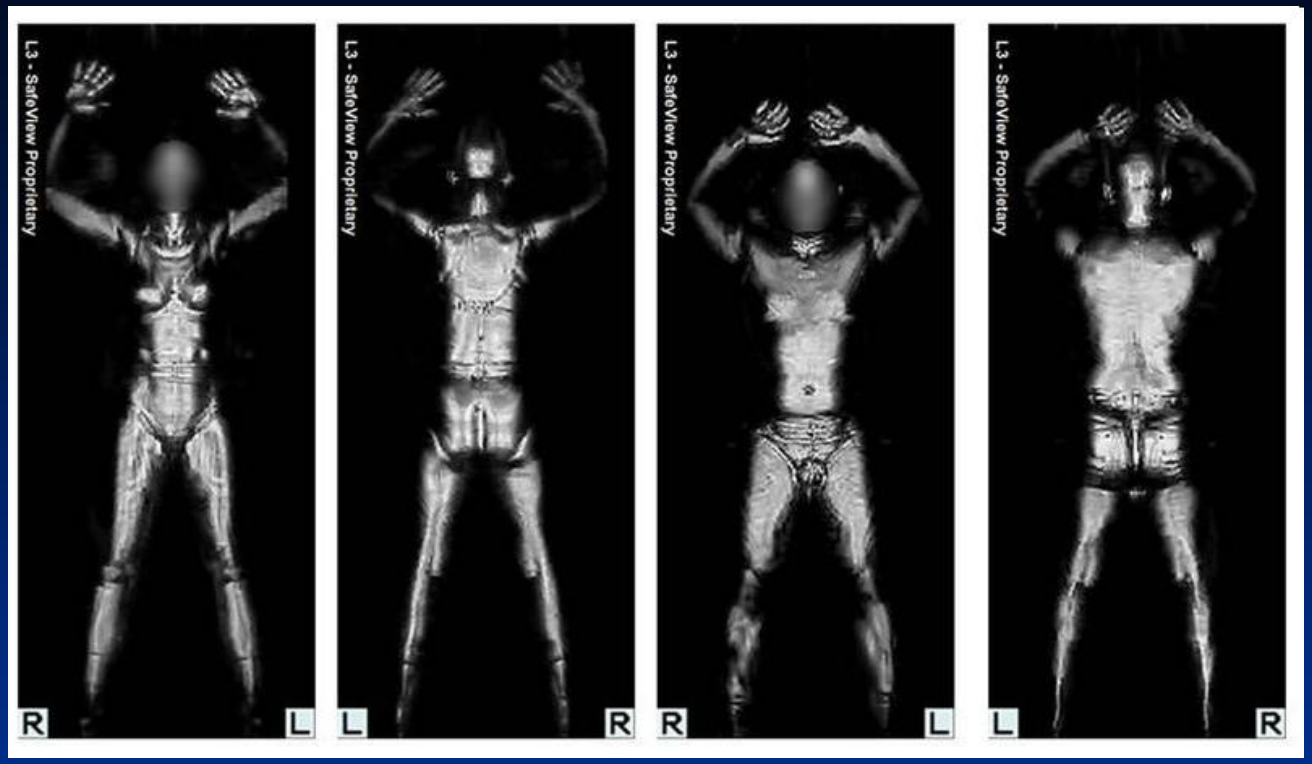
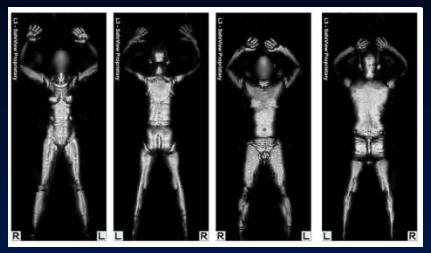


Image Source: http://en.wikipedia.org/wiki/File:Mmw_large.jpg

- Airport Technology Backscatter Soft X-rays (20 KeV or less)
- Uses Waves at Trillions of cycles per second (very short wave lengths), exposure tends to concentrate 100 x more in skin
- Argued to be safe because it doesn't penetrate deeply into body, but has been found to affect DNA by resonance

Full Body Scanners may Increase Skin Cancer



- Relative Risk of Cancer increases 3% per 10mSv or 1000 mrem
- Cross-country flight = 4 mrem, Chest X-ray = 10 mrem
- TSA claims whole body backscatter = 0.002 mrem ?!
- Hard X-rays (50-150 KeV) go through all body tissues
- Soft X-rays mostly absorbed in skin, effective exposure per unit of mass tissue is therefore 100 x hard X-rays
- Skin has quickly dividing cells, soft tissue 2x absorption
- Actual increased absorption exposure calc. @ 10 mrem
- 750 Mil passenger x 3%/1000mrem x 10 mrem = 225,000 additional skin cancers annually possible

TeraHertz Scanners affect DNA

- High Frequency Radiation in range between Microwaves and Infrared (Heat) Radiation
- “Alexandrov and his team (Los Alamos Labs) have created a model to investigate how THz fields interact with double-stranded DNA and what they've found is remarkable. They say that although the forces generated are tiny, resonant effects allow THz waves to unzip double-stranded DNA, creating bubbles in the double strand that could significantly interfere with processes such as gene expression and DNA replication. That's a jaw dropping conclusion.”
- Source: http://www.technologyreview.com/blog/arxiv/24331/

Radio and TV Towers






- Distance from Towers decreases exposure
- All blanket area with various frequencies
- Must be Differentiated from Cell Towers
- Locating local antennas: www.antennasearch.com

Neil Cherry's 2002 Study of Cancer associated with San Francisco Tower

Cancer and RF Broadcasting

Cherry (2002)

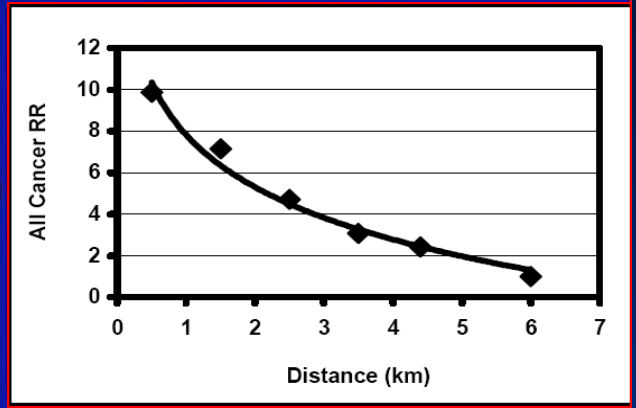
SUTRO TOWER

Antennas: 400-570m

FM: 54.7kW

TV: 616kW

UHF: 18.3MW



Risk Ratio for all childhood cancers (1937-1988)

- is elevated, falls off with distance from antenna
- RR>5 at 3km, where power density is 1μW/cm²
  (~1000 times lower than safety standard)

Exposure Limit at 1.8 GHz is 1000 μW/cm²

Table 4: The Near Sutro Tower (<1km) Childhood Cancer rates compared with the remote >5km rates. (* Fisher Exact p-value for n<5).

Cancer Type	Cases	RR	95%CI	p-value
Brain Cancer	3	15.5	3.14-76.8	0.004*
Leukaemia	2	5.2	1.05-25.6	0.08*
Lymphoma	2	15.5	2.19-110	0.02*
Leukaemia/Lymphoma	4	7.8	2.34-25.7	0.0045*
All Cancer	7	9.9	3.84-25.4	<0.0000001

www.neilcherry.com/documents/90_r3_EMR_Sutro_Paper_09-02.pdf

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Vatican Radio ordered to pay damages

Print

Published: Feb. 25, 2011 at 4:41 PM

VATICAN CITY, Feb. 25 (UPI) -- An Italian court has ruled Vatican Radio must pay damages to a small town near Rome for electromagnetic pollution created by its transmitters.

Italy's Supreme Court upheld an order for damages in a case that began in 2001 when so-called electrosmog levels produced by Vatican Radio transmitters near the town of Cesano were found to exceed levels allowed by law, Italian news agency ANSA reported Friday.

The station quickly reduced the strength of its signals, but the case went to court amid news reports of a regional health authority study that found children in the Cesano area were six times more likely to develop leukemia than their peers elsewhere.

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Related Stories

- Bell-ringing priest cleared of charges
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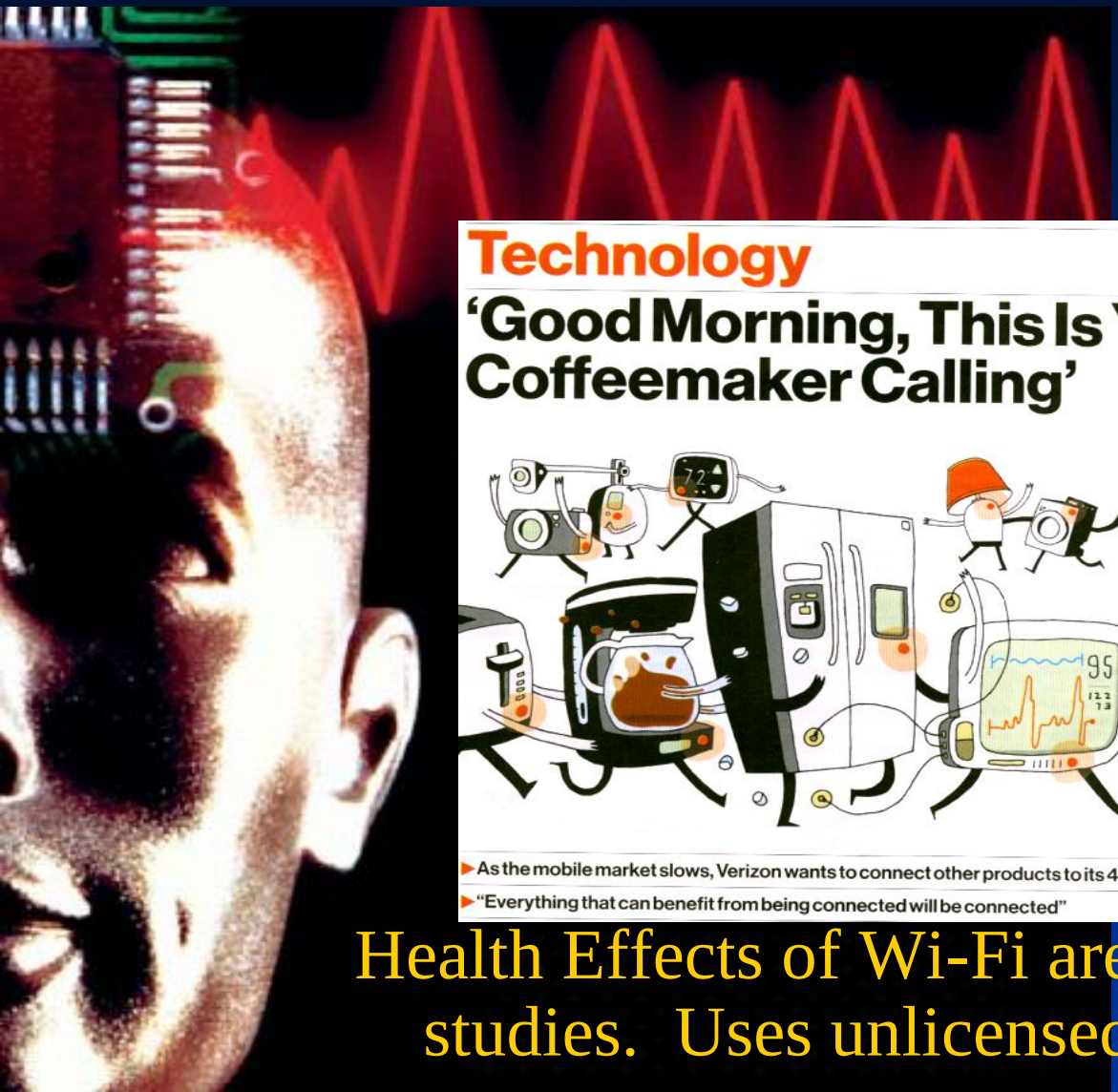
Wi-Fi in Homes and Schools



Primarily Non-thermal Effects so the Existing Thermal-based Exposure Standards are too high and not really protecting us.

All Wi-Fi Devices such as iPad, iPods, Wi-Fi, iTV and other enabled devices have not been tested in any large scale studies.

Industry is seeking to make your Home fully Wi-Fi enabled.



IEEE 802.11 Standard

Technology

'Good Morning, This Is Your Coffeemaker Calling'

▶ As the mobile market slows, Verizon wants to connect other products to its 4G network

▶ "Everything that can benefit from being connected will be connected"

Bloomberg Businessweek

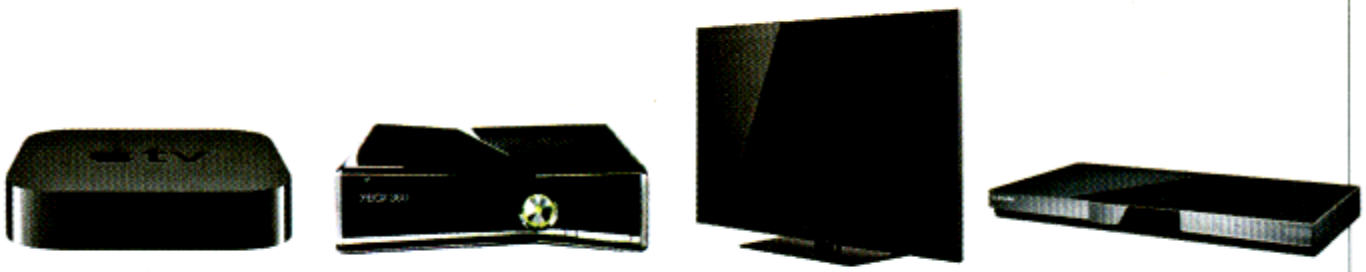
September 20 – September 26

Health Effects of Wi-Fi are not considered in any studies. Uses unlicensed band at 2.45 GHz.

New Devices now coming Online and into our Schools

Cutting the Cord

New devices are bringing movies and TV shows directly into the living room, without a cable subscription



Apple TV	Xbox 360	Sony Bravia TV	Samsung Blu-ray disc
Web-to-TV interface box	Game consoles	Internet-ready TV	Internet-connected DVD player











More Educators are becoming aware of the health and negative behavioural effects of WiFi Microwave radiation

Many Schools are Dismantling WiFi



THE TIMES
THE SUNDAY TIMES

Archive Article | Please enjoy this article from The Times & The Sunday Times arc

From The Times

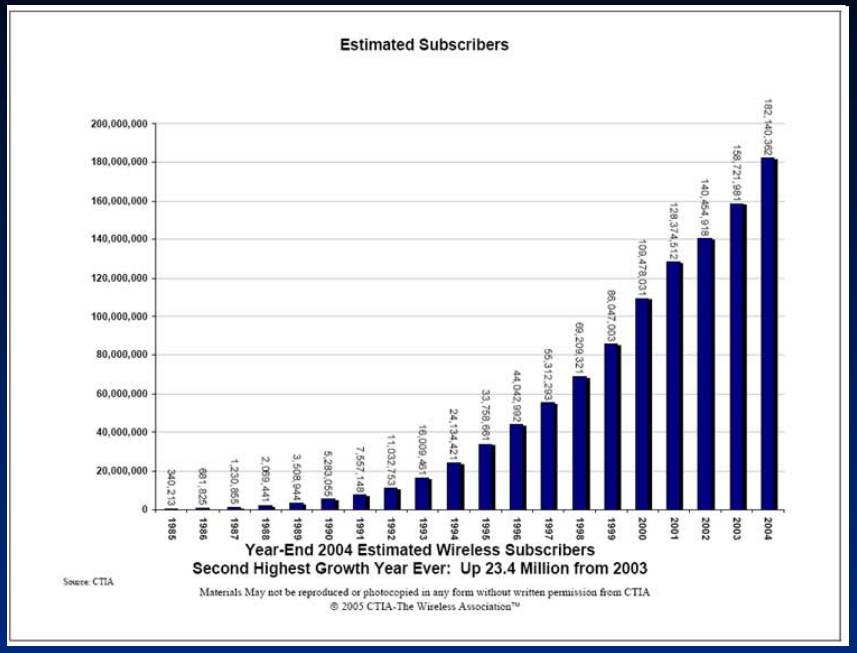
November 20, 2006

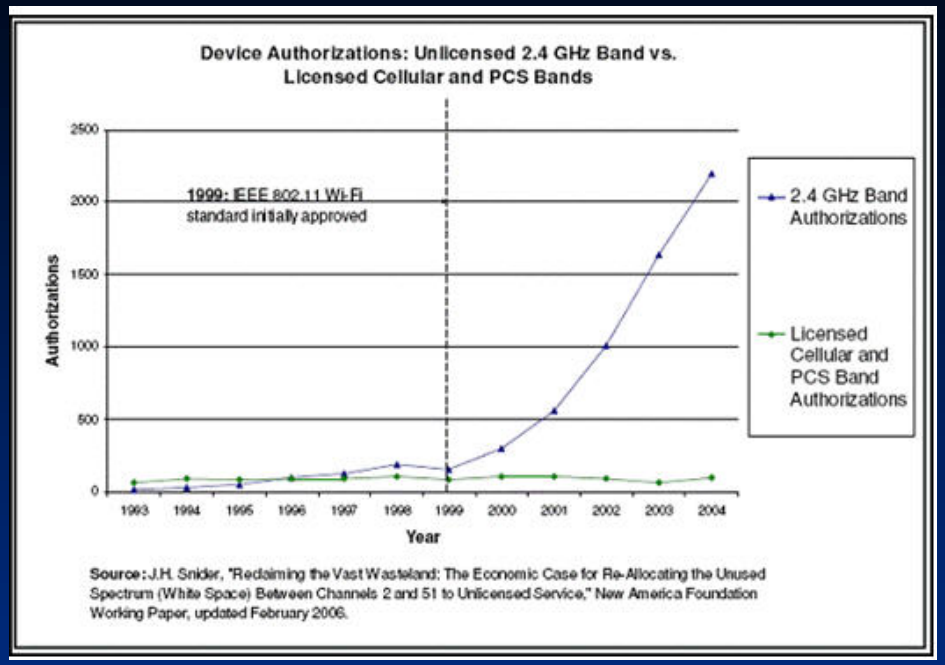
Health fears lead schools to dismantle wireless networks

Radiation levels blamed for illnesses
Teacher became too sick to work

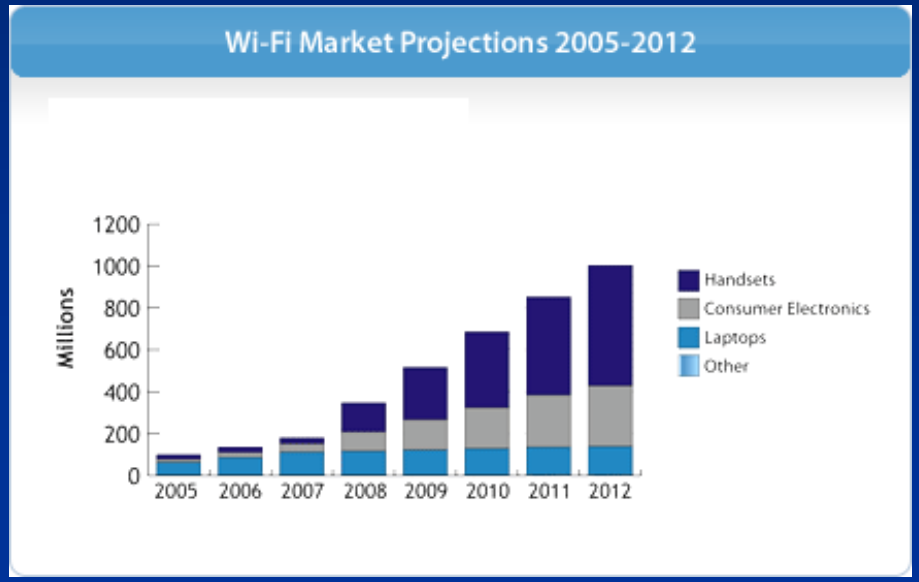
- Already beginning in 2006 in UK

Exponential Growth in Wireless Subscribers

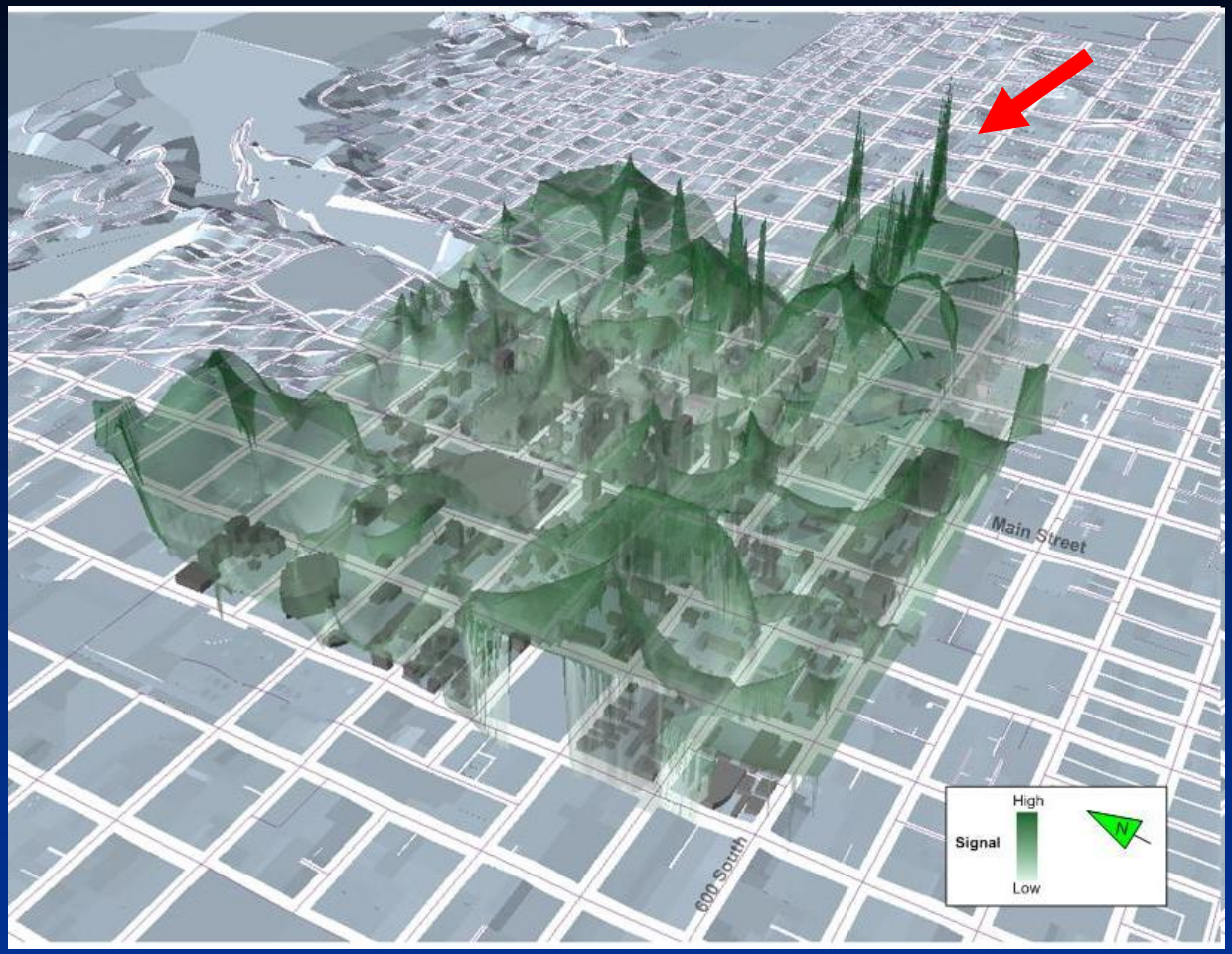




- Courtesy CTIA – The Wireless Association



Radiation Levels Varies in Cities



- WiFi Cloud enveloping Salt Lake City, UT from ~1700 access points
- Note the High Levels at certain Hot Spots (arrow)
- Source: http://www.geosimulation.org/pictures/downtown-with-legend.jpg

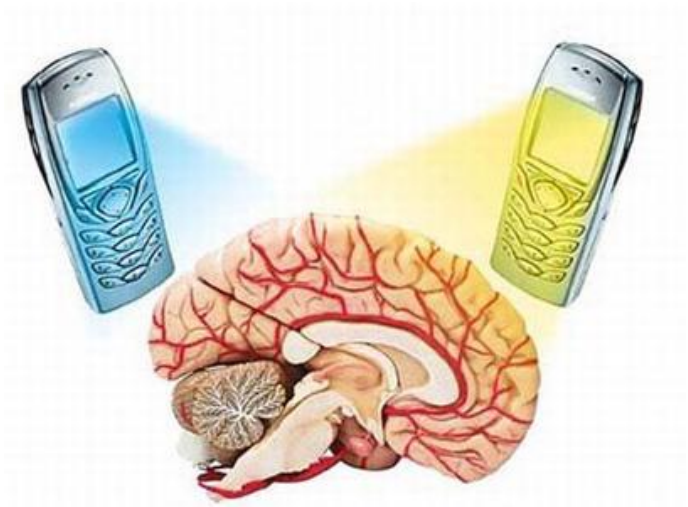
Recent News about Microwaves

- Paris Library System – 40% staff sickened, removed Wi-Fi
- National Library of France – removed Wi-Fi on health grounds, respecting the Precautionary Principle
- Teachers Union (UK) – 38,000 Teachers want no Wi-Fi in schools
- Lakehead University (Canada) – No Wi-Fi



Trends in Cell Phone Use in U.S. (1984–2007)

Figure 6



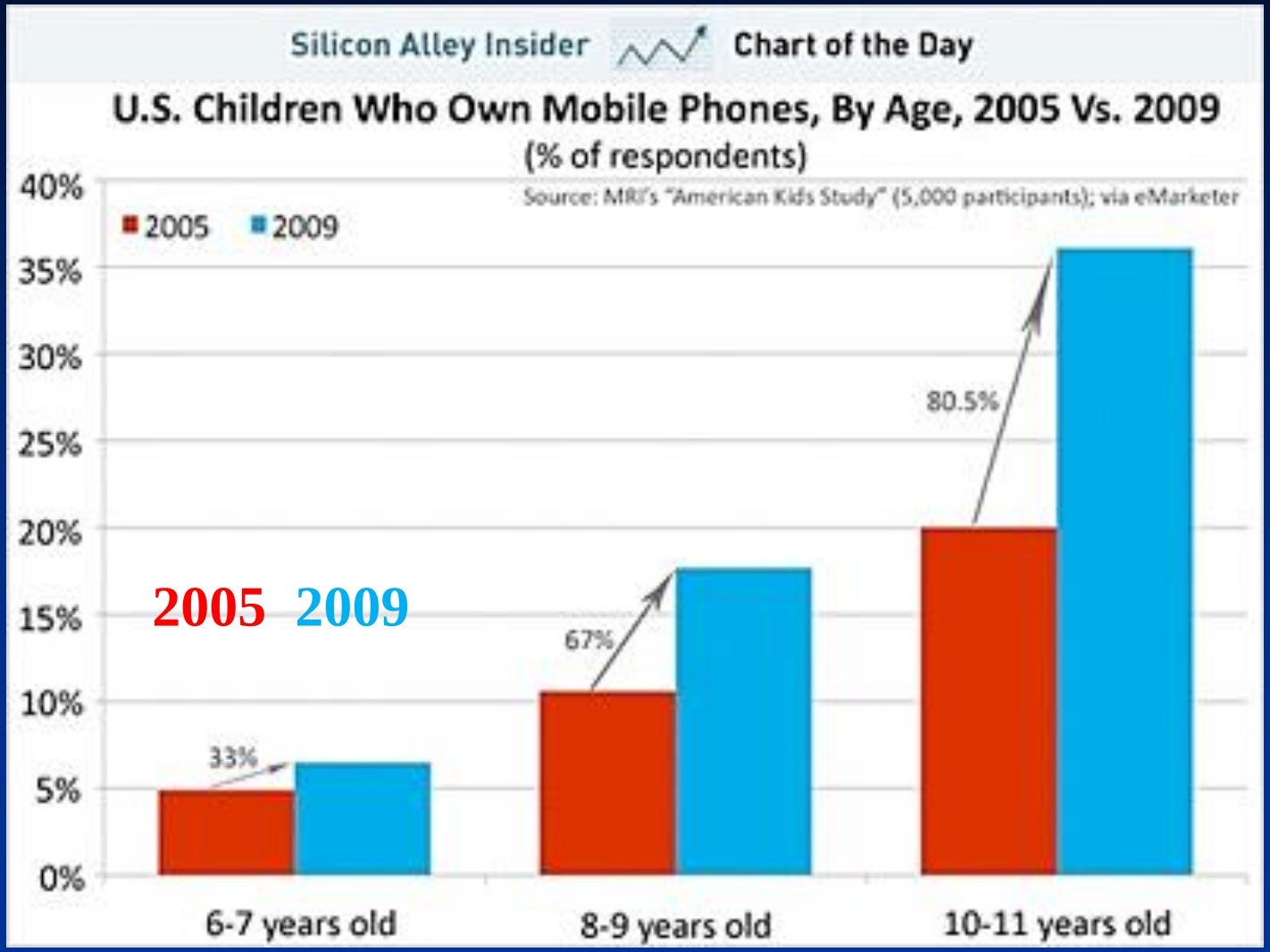
Year	Number of Subscribers (in millions)
'84	0.1
'85	0.3
'86	0.7
'87	1.2
'88	2.1
'89	3.5
'90	5.3
'91	7.6
'92	11.0
'93	16.0
'94	24.1
'95	33.6
'96	43.4
'97	51.2
'98	69.2
'99	86.0
'00	100.5
'01	128.4
'02	140.8
'03	158.7
'04	182.1
'05	207.9
'06	233.0
'07	255.4

NUMBER OF SUBSCRIBERS (IN MILLIONS)

YEAR

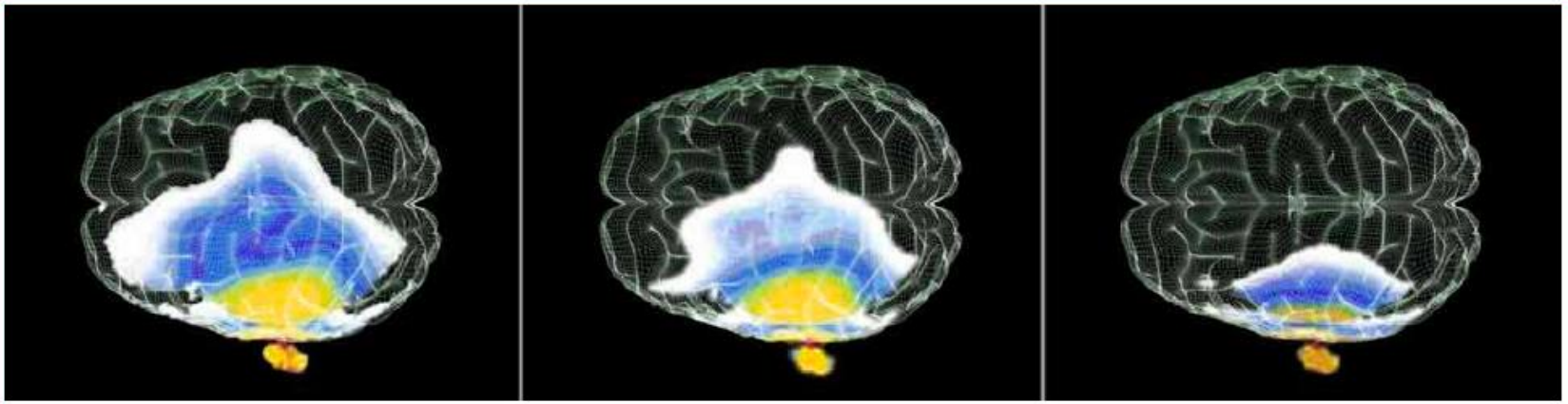
Source: Cellular Telecommunications and Internet Association [Internet]. [cited 2009 Jan 9] Available from: http://www.ctia.org.

Cell Companies are Actively Targeting Children with Vulnerable Brains



Too Many Children with Vulnerable Brains own Cell Phones in the US

- In US, 50% of all 8-year olds have Cell Phones
- By age 12, 75% of kids use Cell Phones
- Other countries have banned sale until Age 16
- 5 year old child absorbs 2.5 X radiation of adult



5 year old child | 10 year old child | adult

Electromagnetic fields from cell phones are estimated to penetrate the brain, especially in children. Model estimate of the absorption of electromagnetic radiation from a cell phone based on age (Frequency GSM 900 Mhz).

DECT Cordless Telephones: A Microwave Transmitter in the Home

NONSTOP PULSED 2.4 GHZ RADIATION INSIDE US HOMES
2nd International Workshop on Biological Effects of Electromagnetic Fields 7-11 Oct 2002

NONSTOP PULSED 2.4 GHZ RADIATION INSIDE US HOMES

THOMAS HAUMANN[1] AND PETER SIERCK[2]

[1]Umweltanalytik und Baubiologie,
Meisenburgstrasse 25, D-45133 Essen, Germany

[2]Environmental Testing & Technology, Inc.,
1106 Second Street, Encinitas CA 92024, USA

Figure 3: Pulsed signal of 2.4 GHz DFHSS technology – ZERO SPAN (GIGASET cordless phone base station)

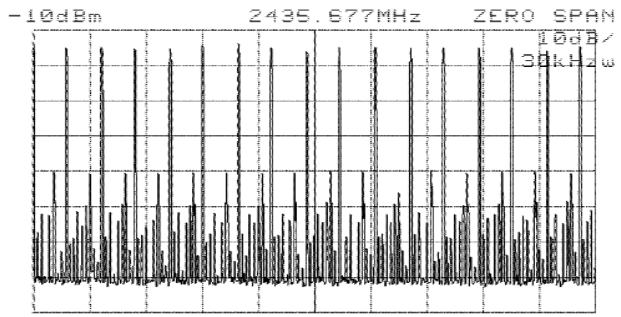
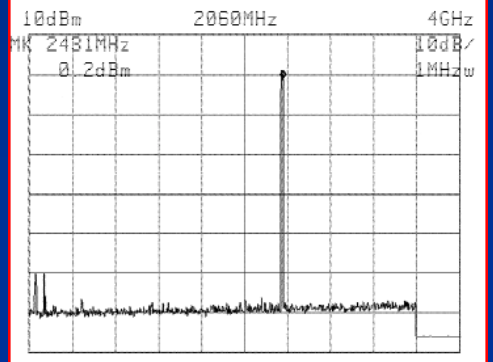


Figure 2: Spectrum analysis (with 2.4 GHz)



DECT oder Gigaset Cordless Phones transmit even when not in use. Have Non-thermal Effects on our Body and Blood

	US GIGASET (2.4 GHz)*
Distance	DFHSS (Digital Frequency Hopping Spread Spectrum) digital pulsed 100 Hz frequency range 2450 MHz
30 centimeter - 12.5“	673,000 µW/m^2
50 centimeter – 19.8”	280,000 µW/m^2
1 meter - 39.4”	72,000 µW/m^2
2 meter - 78.8“	23,000 µW/m^2

What exactly are Smart Meters

SmartMeter™ Electric System



Traditional Residential Electric Meter



SmartMeter™ Residential Electric Meter

SmartMeter™ Gas System



Traditional Residential Gas Meter



SmartMeter™ Residential Gas Meter



- Access Point (above)
- 2-way communication at Microwave frequencies
- Remote changes possible
- Gas Meter is One-way RF to meter only
- Health Effects have not been studied before roll-out

What is Cumulative Effect of Meters ?



This could be especially problematic for apartment and city dwellers with high meter density

Smart Meters and MESH Network



- SmartMeters in California use 900 MHz microwave radiation with all house in an area interconnected in Mesh Network
- Add another cloud of Electrosmog on top of Wi-Fi, UMTS, GSM, DECT etc

Data from Smart Meter (3 minutes shown) recorded 2 feet from meter

AllCH4 in uW/m^2	
Minimum:	0.0 uW/m^2
Maximum:	14999.0 uW/m^2
Average:	2707.1 uW/m^2
Standard Derivati	5337.8 uW/m^2
95. percentile:	14848.3 uW/m^2
Edges per hour:	384.1 /h
Absolute thresho	8044.9 uW/m^2

- 384 pulses / hr = 9216 pulses /day @ 15,000 µW/m^2 peak, Avg =2.707



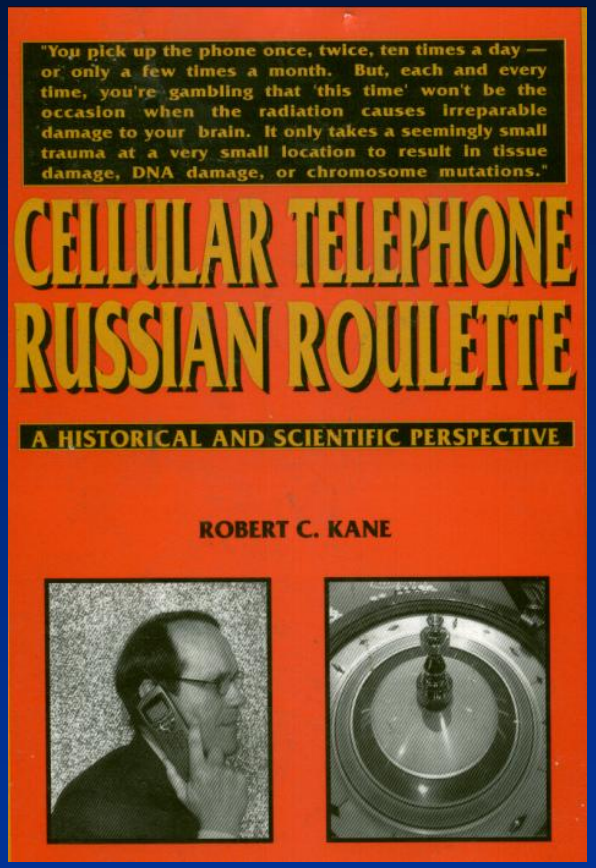
What some Customers have reported after Smart Meter Installations

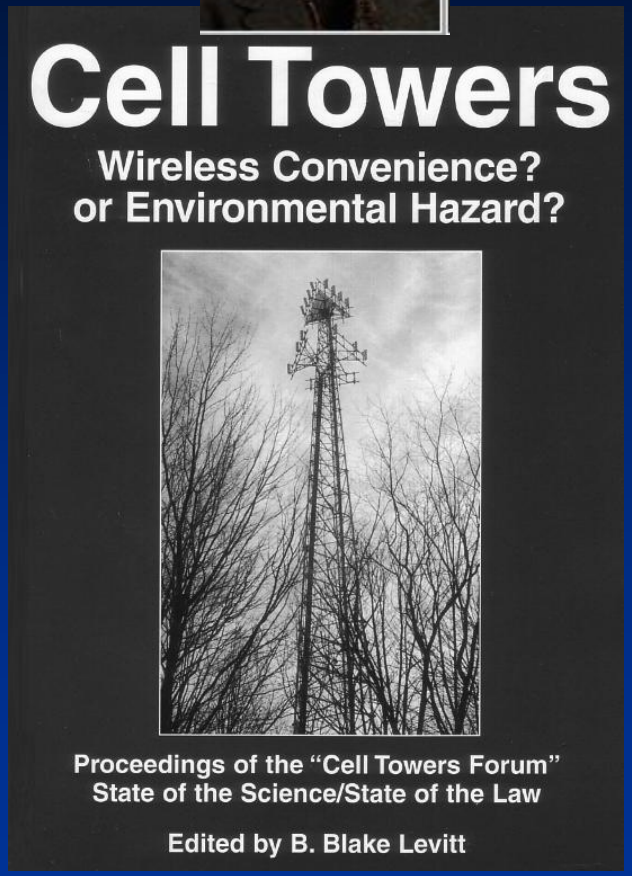
- Headaches
- Sleep problems
- Ringing in the ears or searing ear pain
- Nausea
- Dizziness
- Agitation
- Other non-specific symptoms
- These are often EMF Hypersensitive People

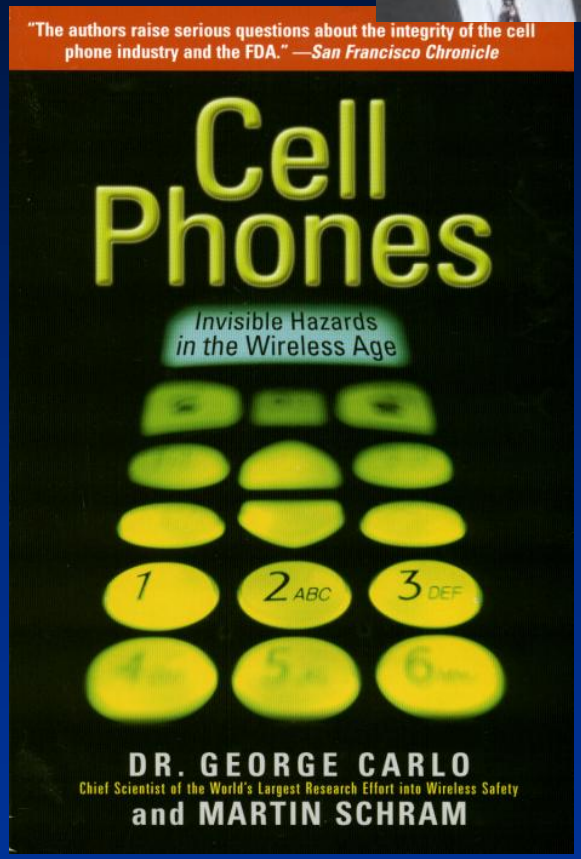
Cell Phone Hazards – 2001 Books











Little has happened to awaken public awareness

2010 Int J Occup Environ Health 16:263-267

Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations

VINI G. KHURANA, LENNART HARDELL, JORIS EVERAERT, ALICJA BORTKIEWICZ, MICHAEL CARLBERG, MIKKO AHONEN

- Suggest that current guidelines are inadequate in protecting the health of human populations
- 8 out 10 studies reported adverse neurobehavioral symptoms or cancer at <500 m from base stations
- Cancer studies needed > 5 years exposure for significant results to become apparent

Symptoms associated with Proximity to Cell Phone Base Stations

Source: 2002 Neil Cherry

Symptoms	Distances of subjects from cell phone base stations (m)											
	< 10 m		10 to 50 m		50 to 100 m		100 to 200 m		200 to 300 m		> 300 m …	
	2	3	2	3	2	3	2	3	2	3	2	3
Fatigue	76 *	72 *	63.5 *	50.9 *	60.6	56.6 *	64.2	41.1	66.6 *	43.7	40.7	27.2
Irritability	32.8	23.2 *	41.7 *	25.7 *	47.2 *	44.1 *	25.8	4.1	25	9	18	3.3
Headache	51 *	47.8 *	40 *	26.1 *	40.6 *	36.7 *	60.7 *	31.2 *	19.3	0	15.6	1.8
Nausea	14.5 *	6.9	8.4	3	5.7	3.8	2.4	4.6	0	2.3	2.1	1.1
Loss of appetite	20.4 *	8.3	8	5.5	5	5	6.9	0	4.2	0	3.3	3.3
Sleep Disturbance	41.3 *	57.1 *	41.4 *	57.5 *	46.9 *	58.5 *	45.8 *	50*	33.3	35.5	13.8	21.1
Depression	16.9	26.8 *	21.6	19.7 *	11.6	24 *	16.2	3.1	13.6	2.5	10.3	3.7
Discomfort	28 *	45.4 *	25.2 *	18.9	30.6 *	12.8	15.7 *	0	9.7	5.1	2.4	8.1
Difficulties in concentration	39.3	28.8 *	37.5	16.6	34.2	26.4 *	25	12.5	43.3	5.5	26.7	7.1
Loss of Memory	27.8	25.4 *	29.4	26.6 *	37.1 *	29 *	25	15.6	17.2	11.1	17.9	5.8
Cutaneous problems	18.1 *	17.1 *	6.6	10.8	11.1 *	11.1	13.9 *	7.5	8.7	0	1.2	4.6
Visual Perturbations	14.5	24.3 *	23	13.5	22	7.1	2.5	4.9	15	2.8	13.6	4.1
Hearing Difficulties	33.3 *	17.4	17.7 *	12	8.3	15.5	7.7	7.7	11.6	9.5	5.6	8.7
Vertigo	10	12.5 *	17.3 *	7.5*	9.6	9.6*	12.2	2.7	7.7	5.2	6.2	0
Moving Difficulties	5.6	7.7*	8.2	1.7	3	3	0	0	2	0	2.9	1
Cardiovascular Problems	10.1 *	13 *	15.3 *	9.6	12.3 *	7.4	8.7	0	8.5	6.5	1	3

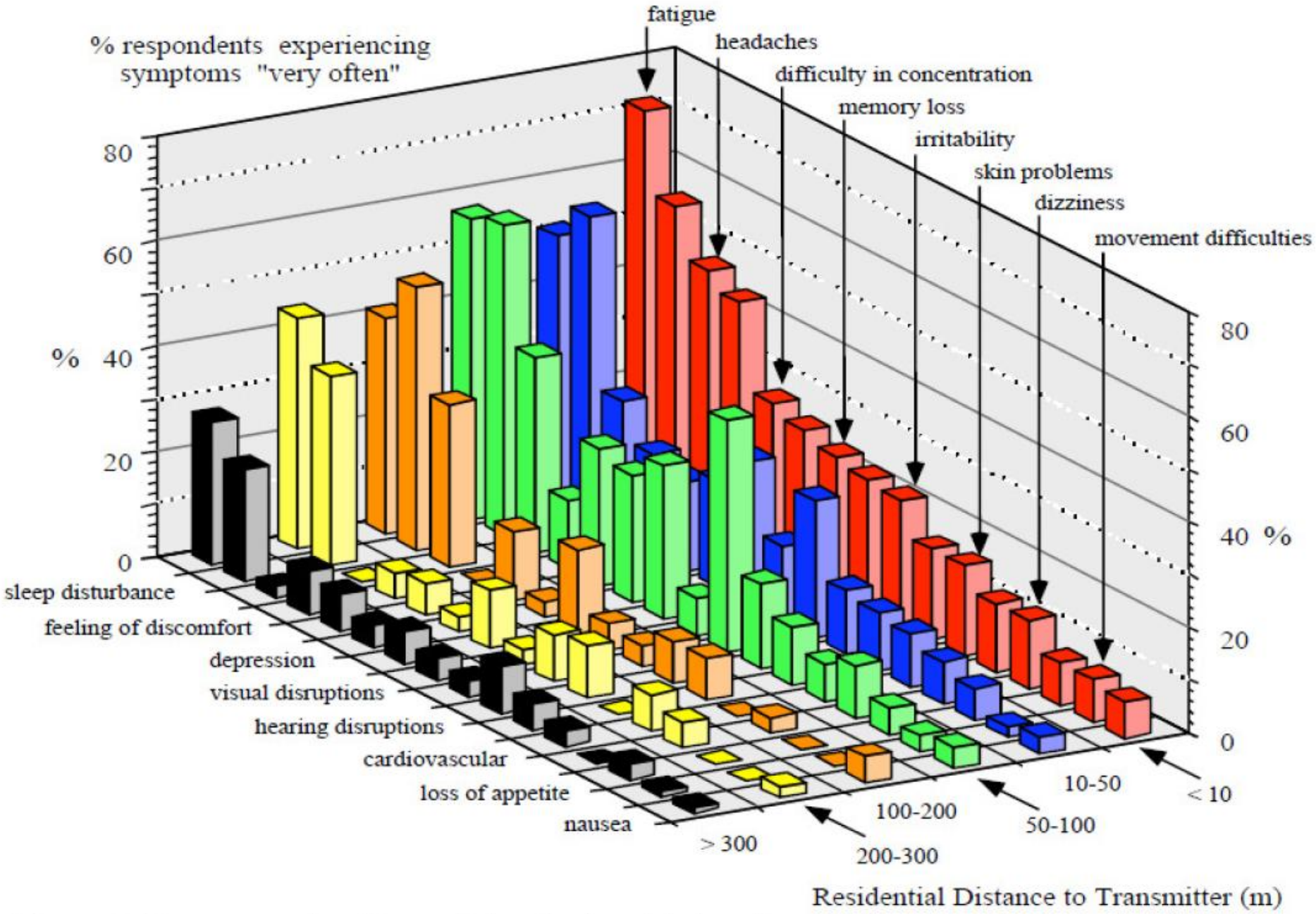


Figure 9. Response of residents living in the vicinity of a cellular phone base station in France.

Radiated Power Effects & Exposure Limits

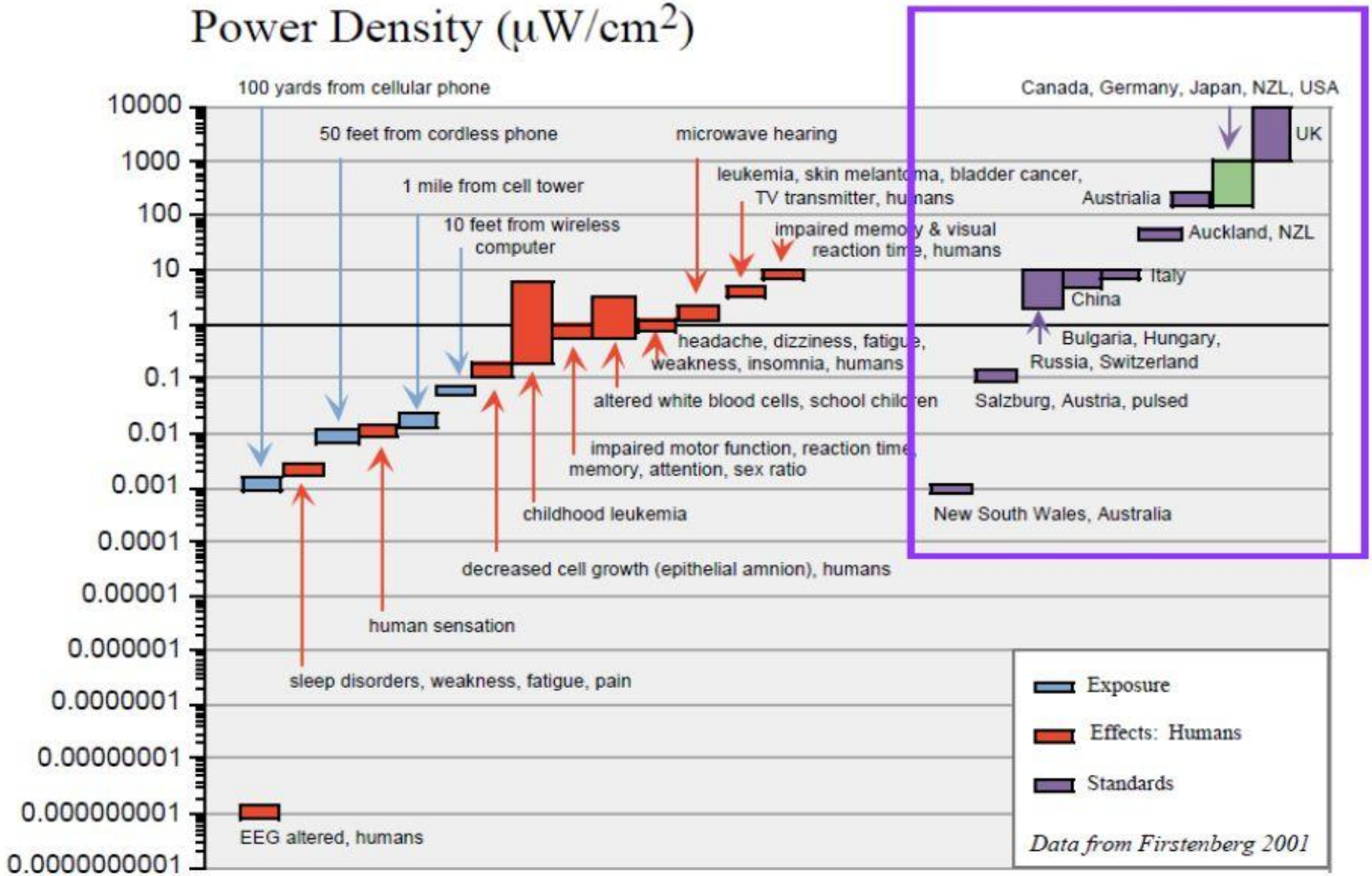


Figure 3: Guidelines, exposures and effects of radio frequency radiation at various power densities. Data from Firstenberg 2001.

Radiation Limits of Different Countries @1.8 GHz

Table 2 - International Radiation Density Limits for GSM1800

Power Density (W/m^2)	International Exposure limits adopted by various countries
10	FCC (USA) OET-65, Public Exposure Guidelines at 1800 MHz
9.2	**ICNIRP and EU recommandation 1998 – Adopted in India**
3	Canada (Safety Code 6, 1997)
2	Australia
1.2	Belgium (ex Wallonia)
0.5	New Zealand
0.24	Exposure limit in CSSR, Belgium, Luxembourg
0.1	Exposure limit in Poland, China, Italy , Paris
0.095	Exposure limit in Italy in areas with duration > 4hours
0.095	Exposure limit in Switzerland
0.09	ECOLOG 1998 (Germany) *Precaution recommendation only*
0.025	Exposure limit in Italy in sensitive areas
0.02	**Exposure limit in Russia (since 1970), Bulgaria, Hungary**
0.001	"Precautionary limit" in Austria, Salzburg City only
0.0009	*BUND 1997 (Germany) Precaution recommendation only*
0.00001	**New South Wales, Australia**

Prudent Avoidance Levels

- Allowed Power Density at 1.9 GHz
  = 1000 $\mu W/cm^2$ (USA)

- New Zealand Environment Court ruled in MacIntyre vs BellSouth to set a level of $2\mu W/cm^2$ as precautionary approach

A level 500 TIMES LESS than US !

Microwave Intensity Scale (900 MHz)

Log Scale (each step is 10X)

13 • FCC 900 MHz limit 6,000,000 µW/m² (10 Trillion x Natural)

(Based only on Thermal Exposure Criteria)

12

11 • 300 yards from a Cell Tower Base = 20,000 µW/m² Max Exposure in China, Russia, Italy

• Smart Meters @ 2 ft = 15,000 µW/m² (measured)

10

~~~~Non-Thermal Effects here~~~~

9

8 • 3 feet from Meter through Wall = 150 µW/m² (measured)

7 • Salzburg Austria Safe Recommendations 10 µW outside

6 1 µW indoors

5

4 2010 Average Background Level 0.005 - 0.01 µW/m²

3

2 • 1980 levels = 5 x Natural

1 • Natural Background 0.000,001 µW/m²

1000 – 20,000 Times increase In 30 Years
~~~~

2003-2009: Epidemiological Studies on Mobile Base Station Health Effects (all non-US)

TABLE 1 Summary of Epidemiological Studies of Mobile Phone Base Station Health Effects

Publication (Year; Country)	Clinical Assessment	Study Design	Base Station Details	Participants	EMF Measured	Key Findings	Strengths	Limitations
Navarro[2] (2003: Spain)	Neuro-behavioral	Survey-questionnaire	GSM-DCS 1800 MHz	101	Yes	More symptoms with closer proximity to base station (< 150 m)	Detailed questionnaire, EMF measured, distances studied[a]	Low participation, self-estimated distances, subjects aware[b]
Santini[3] (2003: France)	Neuro-behavioral	Survey-questionnaire	n/s	530	No	More symptoms with closer proximity to base station (< 300 m)	Detailed questionnaire, distances & other EMF exposures assessed	As above, plus no EMF measurements, no base station details
Eger[7] (2004: Germany)	Cancer incidence	Retrospective case review	GSM 935 MHz	967	No	3 x risk of cancer after 5 yrs of exposure (< 400 m); early age of cancer diagnosis	Maximum beam intensity calculated, reliable cancer data collection	Other environmental risk factors not assessed; analysis not adjusted for age and sex.
Wolf & Wolf[8] (2004: Israel)	Cancer incidence	Retrospective case review	TDMA 850 MHz	1844	Yes	> 4 x risk of cancer after 3–7 yrs exposure (< 350 m); early age of cancer diagnosis	Reliable cancer & demographic data, no other major environmental pollutant identified	Not all environmental risk factors assessed; possible selection bias; no age, sex adjustment.
Gadzicka[4] (2006: Poland)	Neuro-behavioral	Survey-questionnaire	n/s	500	No	More headache with proximity < 150 m; nocebo unlikely[c]	Detailed questionnaire, distances & EMF studied, nocebo studied	Subjects aware, no base station details
Hutter[5] (2006: Austria)	Neuro-behavioral	Cross-sectional	900 MHz	336	Yes	Headaches & impaired concentration at higher power density; nocebo unlikely	Detailed questionnaire and testing, EMF measured, distances studied; nocebo effect studied	Subjects aware, low participation rate
Meyer[9] (2006: Germany)	Cancer incidence	Retrospective case review	n/s	177,428	No	No increased cancer incidence in municipalities with or without base stations	Wide population assessed (Bavaria)	Observation period only 2 years, vague definitions of exposure, exposure onset unknown, distance to base station unknown
Abdel-Rassoul[6] (2007: Egypt)	Neuro-behavioral	Cross-sectional	n/s	165	Yes	More symptoms & lower cognitive performance if living under or < 10 m from base station	Detailed questionnaire and testing, EMF measured, distances studied, subjects unaware	Exact base station details n/s, low number of participants
Bleitner[10] (2009: Germany)	Neuro-behavioral	Cross-sectional	n/s	30,047	No	More health complaints closer to base station (< 500 m)	Wide population assessed, detailed survey, nocebo effect assessed	EMF measurements not carried out (see phase II in Berg-Beckhoff et al., 2009; below)
Berg-Beckhoff[11] (2009: Germany)	Neuro-behavioral	Cross-sectional	GSM 900 MHz GSM 1800 MHz UMTS 1920–1980 MHz	1326	Yes	Health effects probably caused by stress and not by RF-EMF	Measured EMF emissions, standardized questionnaires	Low participation, no detailed list of symptoms published, single "spot" measurement in one place in dwelling, no occupational exposure assessed, time lag from assessment of symptoms and EMF measurement

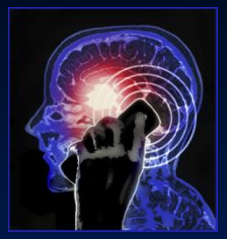
There are Serious Scientific Cocerns about Non-Thermal Microwave Exposure in Animals and Humans



Exposure Hazards

Power Density
Levels
Versus
Specific Absorption
Rate (SAR)

Cell Phone versus Cell Tower Radiation Standards



Amount Absorbed by Body



Amount Radiated into Space

Cell Phone	Cell Tower / Smart Meter
SAR defines safety limit = 1.6 W/kg	Power Density safety limit Freq. dependent ~1000μW/cm^2
Near field	Far field
Localized	Whole-body – absorption not known
Acute (when used)	Chronic
Voluntary	Involuntary
Can use earpiece	Cannot reduce RF
Can use speakerphone	Cannot reduce the RF
Body Burden variable = ~ ½ hr /day average	Body Burden constant = 24-hour every day

SAR Values are Misleading

- Different body parts have different absorption of RF radiation
- SAR standard is based on estimates and body averaging
- Some organs may be much more at risk – Thyroid, joints, reproductive organs

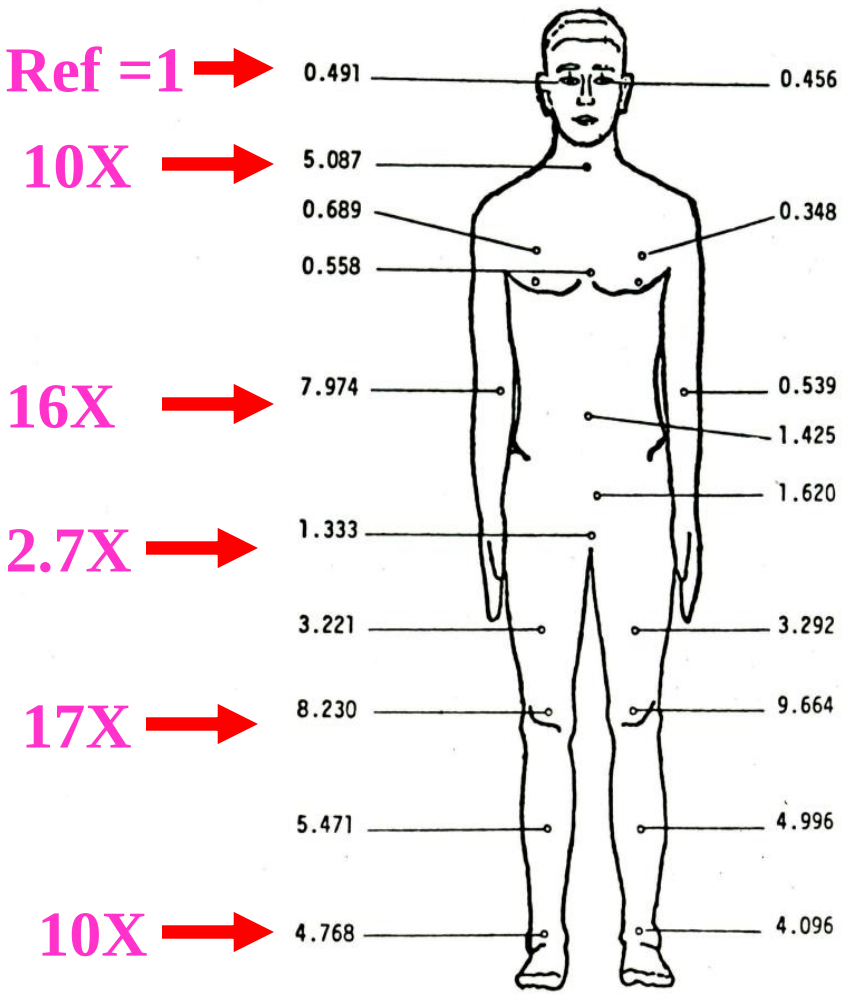


Figure 10
Hotspots—variations in specific absorption rate measure in watts per kilogram. Incident power is 10mW/cm^2 giving an average, whole-body SAR of 1.88 W/kg. Reprinted with permission from *IEEE Proceedings* 68(1980): 27. (© 1980 IEEE)

Source: IEEE 68(1):24-32 P.O. Gandhi

State of the knowledge for electromagnetic absorbed dose in man and animals

FCC Standards too High

- Based on Standard Anthromorphic Man





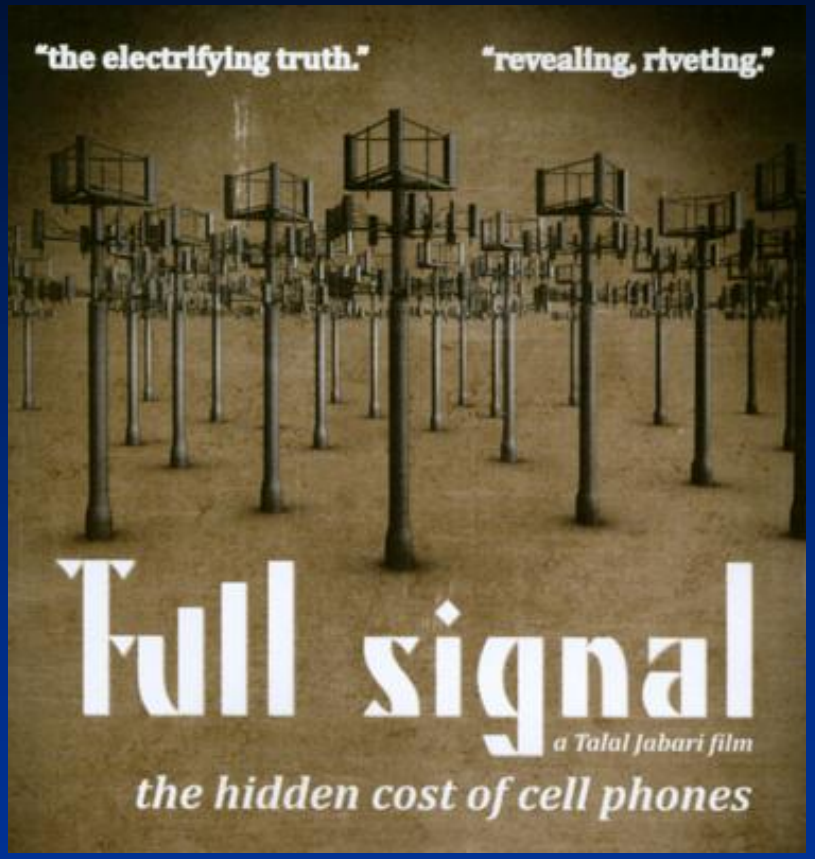


- Exposure standard based on a 200 pound (91 kg) man with a thick skull using phone for 6 minute exposure
- US has done no research on Microwave Effects since 1990s

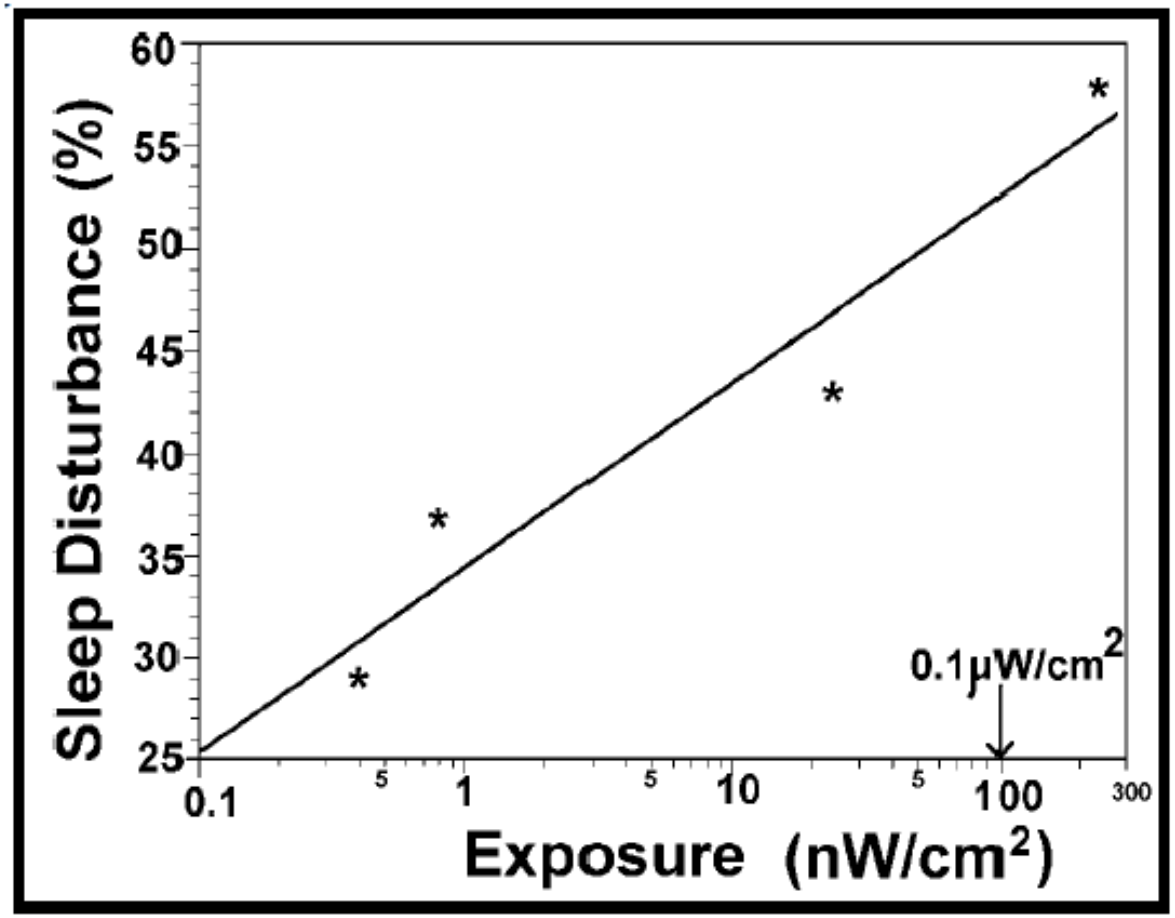
2010 Film on Cell Phone Problems

- Outlines the World's largest Biological Experiment with Microwaves Today
- Perspectives offered by Scientists, Activists, Lawyers, Lawmakers

- www.fullsignalmovie.com



Sleep is affected at very low levels of Microwave Radiation (nW/cm2)



US Exposure Standard is1000 μW/cm^2

Dose-response relationship for Sleep Disturbance with exposure in nW/cm^2

Microwave Sub-thermal Effects on Cells

Examples of sub-thermal effects of microwaves on cells (Belyaev, 2005)[443]		
Objects	***Effects***	***Reference***
Preloaded synaptosomes	Changes in calcium efflux	Lin-Liu and Adey, 1982
ReuberH35 hepatoma cells	Ornithine decarboxylase (ODC)	Byuset al. , 1988
rat brain cells	DNA damage as measured with comets	Lai H, Singh, 1997
AMA human epithelial cells	cell proliferation	Velizarovet al., 1999
Human lymphocytes	53BP1 DNA-breaks co-localizing foci	Belyaev et al., 2005
Lymphocytes, *E. coli* cells	Chromatin conformation	Belyaev et al., 2000
rat astrocytes and porcine brain capillary endothelial cells	permeability of an in vitro model of the blood-brain barrier (BBB)	Schirmacheret al., 2000
human mast cell line, HMC-1	expression of the proto-oncogene c-kit, etc.	Harvey et al, 2000
Human endothelial cell line	activation of the hsp27/p38MAPK stress pathway	Leszczynski et al., 2002
Human peripheral blood cultures	micronucleus frequency (only phase-modulated)	d'Ambrosio et al., 2002

Studies showing genetic effects, classified by results and sponsorship (Belyaev, 2005)					
Effect			***No Effect***		
Independent	*Industry-sponsored*		*Independent*	*Industry-sponsored studies*	
d'Ambrosio (02); Harvey & French (00); Gadhia (03); Maes (96a,b); Mashevich (03); Pacini (02); Sykes (01)	Goswami (99); Ivaschuk (97); Phillips (98); Tice (02)		McNamee (02a,b, 03)	Antonopoulos (97); Bischt (02); Fritz (97); Gos (00); Li (01);	Maes (01); Malyapa (97); Morrisey (99); Takahaski (02); Vijayalaximi (01a,b, 03); Zeni (03)

- Effect on brain cells, lymphocytes, mast and liver cells
- Largest number are recent studies (within last decade)

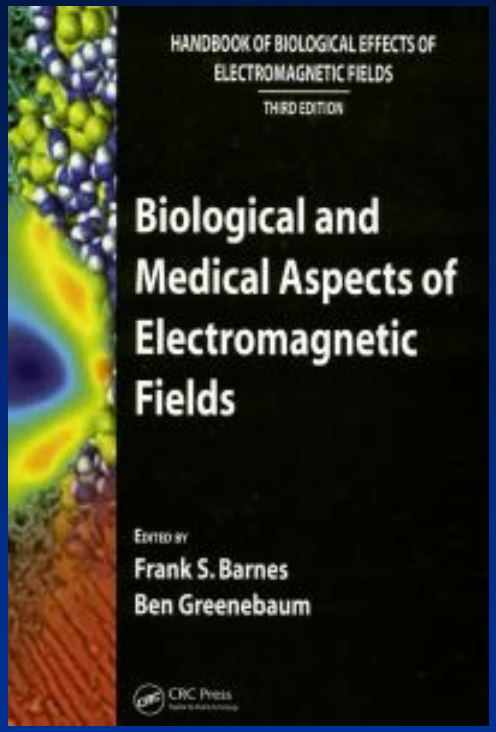


Prof. Arthur Pilla, PhD

Professor of Biomedical Engineering, Columbia Univ

From a Current Biophysics Textbook

"The biophysical lore prevailing until the late 1980s and lingering to this day is that, unless the amplitude and frequencies of an applied electric field were sufficient to produce tissue heating, there could be no effect. However, this position had to be changed as the evidence for weak (non-thermal) EMF bioeffects became overwhelming."



Source: 2007 Textbook: Biological and Medical Aspects of Electromagnetic Fields. F. Barnes and B. Greenebaum eds. P. 377



Michael Bevington
Electrosensitivity UK

www.es-uk.info

- Excellent Overview of the Non-thermal Issues
- New book in 2010 outlining Hypersensitivity Syndrome with extensive scientific references
- Has given excellent historical overview of the key scientific issues – 173 references

Attitudes to the health dangers of non-thermal EMFs

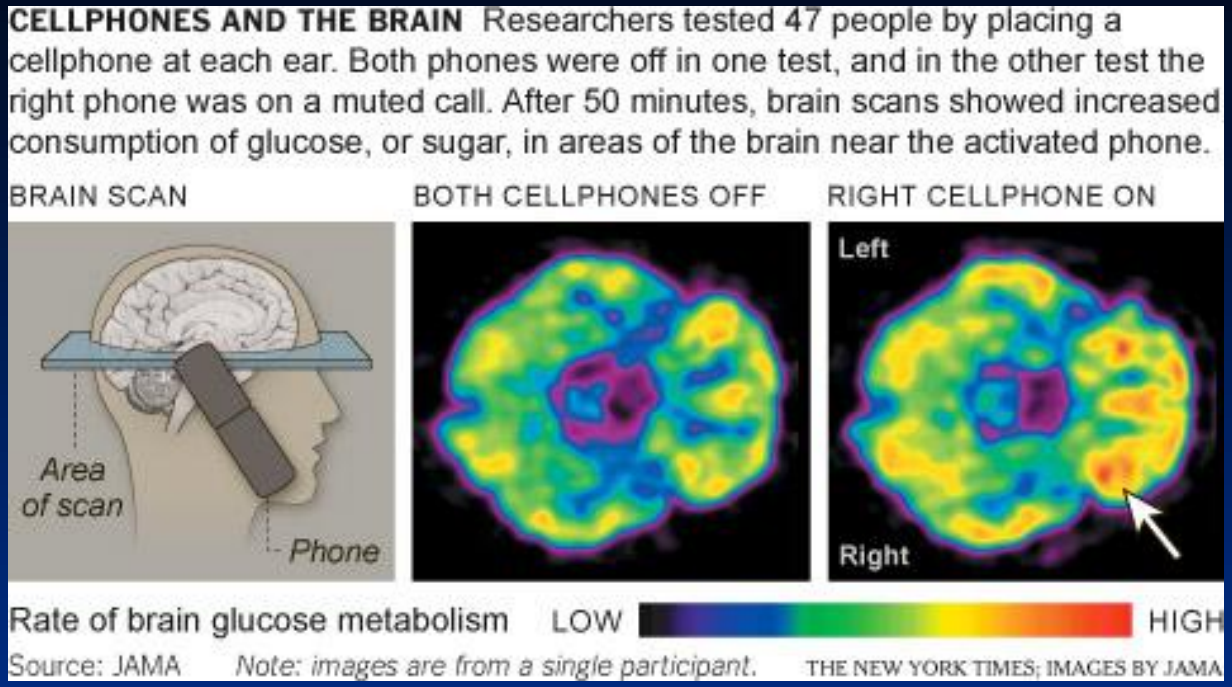
A review of the polarisation in attitudes towards research into the health dangers of non-thermal electromagnetic fields (EMFs).

100s of Studies explain Biological Effects

8. SUB-THERMAL AND DIRECT OR INDIRECT BIOLOGICAL MECHANISMS [126] *page 12*

acetylcholine [127] [128]
ACTH [129] [130] [131]
amyloids [132] [133]
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auditory [138] [139] [140] [141] [142] [143] [144]
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nitric oxide [354] [355]
piezoelectricity [356] [357] [358] [359] [360]
photons [361] [362] [363] [364] [365] [366] [367] [368] [369] [370]
proteins [371] [372] [373] [374] [375] [376] [377] [378]
radical pair mechanism [379] [380] [381] [382] [383]
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teratogenic [413] [414] [415] [416]
thrombosis [417] [418] [419] [420]
thyroid gland [421] [422] [423]
transthyretin [424] [425]
X-ray-induced mutations [426] [427] [428]

2011: Brain is sensitive to Non-thermal EMFs!



- PET Scan study by Dr. Volkow – NIH and Brookhaven Nat'l Lab
- Metabolic effect was highest near the antenna, nearest max radiation
- The effects on neuronal activity could be due to changes in neurotransmitter release, cell membrane permeability, cell excitability, or calcium efflux.
- The long term implications are still being discussed (JAMA 2-23-11)

Areas of Brain is sensitive to Non-thermal EMFs in Volkow Study

- **The orbital-frontal cortex**
- Decision making, plays a role in modulation of antisocial behavior
- Also plays a role in obsessive-compulsive disorder

- **The temporal pole**
- Associated with smell, taste, facial recognition, visual discrimination
- Plays a role in emotional control regulated by the limbic system

- **The superior-temporal gyrus**
- Plays role in hearing and with social cognition

- These regions of the brain play critical roles in behavior, judgment, impulse control and sensation, all “excited” by cellphone radiation.

Rebuttal to Interphone Study

- Endorsed by 43 scientists from 14 countries
- Rebuts the flawed conclusions of the biased Interphone Study



Cellphones and Brain Tumors

15 Reasons for Concern

Science, Spin and the Truth Behind Interphone

August 25, 2009

Available at: www.powerwatch.org.uk/science/reasons_us.pdf



Leonard Hardell's Swedish Research Group

Meta-analysis of long-term mobile phone use and the association with brain tumours

INTERNATIONAL JOURNAL OF ONCOLOGY 32: 1097-1103, 2008

- Hardell et al (2008) – Study of Cell Phones and Cordless Phones showed a 10 year Latency Period, on same side where phone was used:
- Malignant Brain Tumors (e.g.Glioma)
  - Odds Ratio = 2.7 95% CI = 1.3 – 6.0 (Cell Phone)
  - Odds Ratio = 2.1 95% CI = 0.97 – 4.6 (Cordless Phones)
  - Odds Ratio = 5.5 Children & Teens < 20 years for first use of phones
- See also: L. Hardell, et al., "Case-control study on the use of cellular and cordless phones and the risk for malignant brain tumours," *International Journal of Radiation Biology* 78, no. 10 (2002): 931-936. (earlier study)

Long-term use of cellular phones and brain tumours: increased risk associated with use for > or =10 years.

Hardell L, Carlberg M, Söderqvist F, Mild KH, Morgan LL.

www.ncbi.nlm.nih.gov/pubmed/17409179

Bioinitiative Report 2007

- Effects on Gene and Protein Expression (Transcriptomic and Proteomic Research)
- Genotoxic Effects – RFR and ELF DNA Damage
- Stress Response (Stress Proteins)
- Effects on Immune Function
- Effects on Neurology and Behavior
- Brain Tumors, Acoustic Neuromas, and childhood cancers like leukemia

- Source: www.bioinitiative.org





Cindy Sage – Co-Editor Bioinitiatives Working Group

- *Adult risks are about double (about a 200% increased risk) at 10 years and longer cell phone use. Children who begin using cell phones in their teen years have more than a five-fold (500%) increased risk of glioma by the time they are in their 20's.*

Source: www.bioinitiative.org



Cindy Sage – Co-Editor Bioinitiatives Working Group

- *"Increased brain tumor risk has been associated with cell phone use in nearly all studies at 10 years and longer, particularly when the phone is used mainly on one side of the head or ipsilateral use. The same is true for cell phone use and acoustic neuroma. Cordless phone use has been reported in some studies to be associated with increased risk of both types of tumor as well.*

Source: www.bioinitiative.org

Special Issue Pathophysiology



- Volume 16, Issues 2-3, (August 2009) Electromagnetic Fields (EMF) Special Issue
- Edited by Martin Blank (Columbia University)

- Has recent Overview of Biological and Health Effects of EMF

Epidemiological evidence for an association between use of wireless phones and tumor diseases

Lennart Hardell [a,*], Michael Carlberg [a], Kjell Hansson Mild [b]

Available online at www.sciencedirect.com

ScienceDirect

& BIOMEDICINE PHARMACOTHERAPY

Biomedicine & Pharmacotherapy 61 (2007) 640–658

www.elsevier.com/locate/biopha

Dossier : Cancer : Influence of environment

Lifestyle-related factors and environmental agents causing cancer: An overview

P. Irigaray [a,*], J.A. Newby [b], R. Clapp [c], L. Hardell [d,e], V. Howard [f], L. Montagnier [g], S. Epstein [h], D. Belpomme [a,i]

- Good review article from 2007
- Cites the VLF and ELF connection with cancer
- Increased leukemia risk in children with high exposure
- Pulsed EMF leads to DNA breakage
- Long-term cordless and cellular phones increases risk for brain cancer including neuroma and glioma



REFLEX Study completed 2004

- **R**isk **E**valuation of Potential Environmental Hazards **F**rom **L**ow Energy **E**lectromagnetic Field (EMF) E**X**posure using Sensitive in vitro Methods
- Led by Prof Adlkofer, Verum Foundation, Germany
- 12 research groups from 7 countries in Europe
- Duration Feb 2000 to May 2004 – 52 months
- Total Project cost Euros 3,150,000 ($ 4 Million)
- No EMF Research in US since mid-1990s !!!

REFLEX Study 2004 Findings

- RF-EMF exposure produced genotoxic effects in fibroblasts, granulosa cells and HL60 cells.
- Significant increase in single and double strand DNA breaks and in micronuclei frequency.
- Chromosomal aberrations in fibroblasts observed
- Proteomic analyses showed changes in numerous proteins, including heat shock protein hsp27, a marker for cellular stress responses.

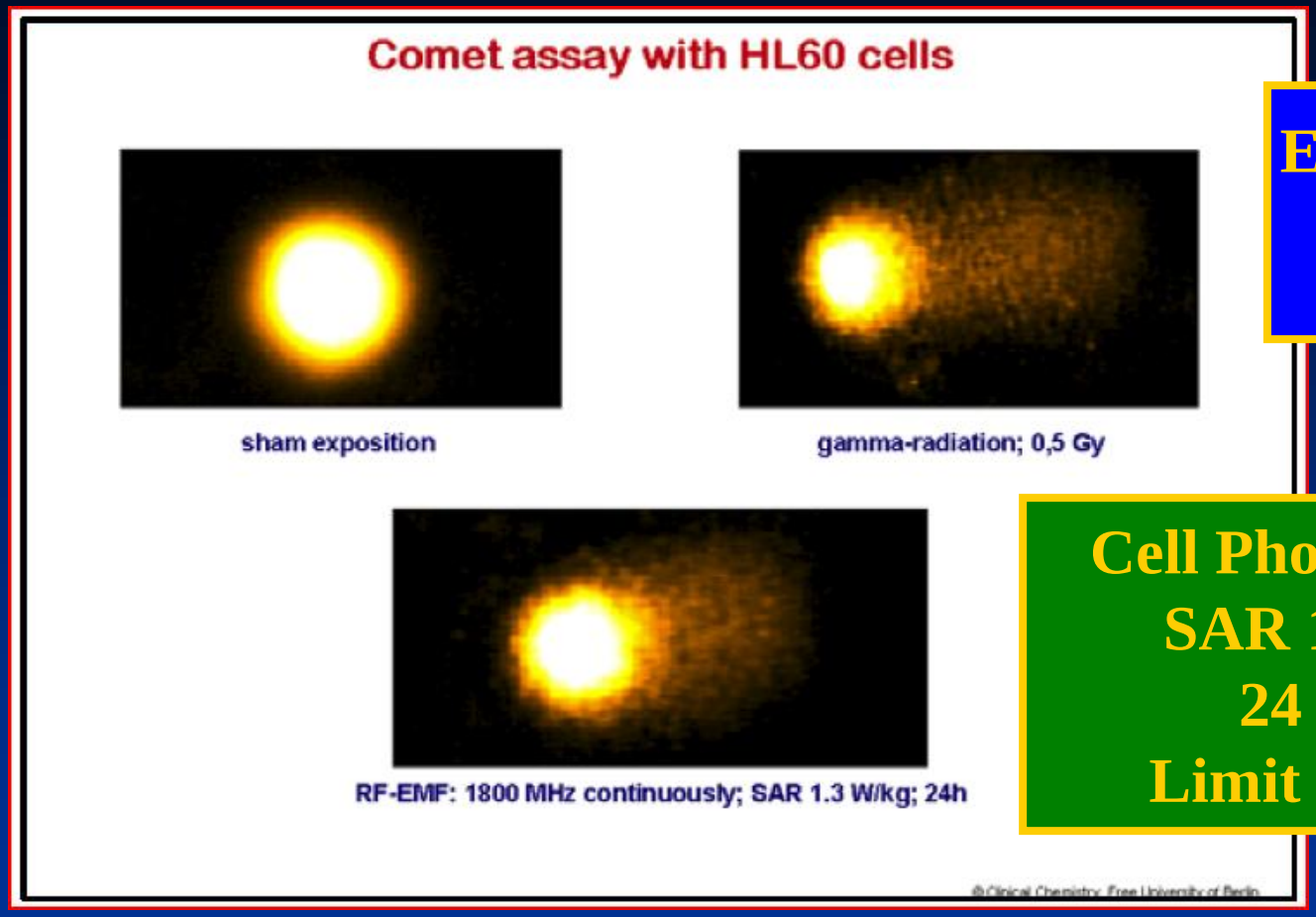
Prof Franz Adlkofer
Verum Foundation



- DNA strand breaks occur at only 1/40th of Guideline Limits
- Presented solid evidence of DNA strand breaks in conjunction with the formation of micronuclei does not allow any further doubting of the genotoxic effect of UMTS (Cell Phone) signals
- Precautionary Principle should be invoked in Europe

- Reference: Adlkofer, F. (2006) Risk Evaluation of Potential Environmental Hazards from Low Energy Electromagnetic Field Exposure using sensitive In Vitro Methods. BIOELECTROMAGNETICS CURRENT CONCEPTS. NATO Security through Science Series, 2006, 2006:331-354. Also known as REFLEX study report.

REFLEX Study 2004 Findings



Equivalent to 1600 Chest X-rays

Cell Phone 1.8 GHz
SAR 1.3 W/kg
24 hours
Limit = 2 W/kg

- DNA Breakage was found with Cell Phone Exposure similar to Gamma Ray (or X-Ray) Exposure

Adult Leukemia associated with RFR

Table 6: A summary of epidemiological studies involving adult leukaemia mortality or incidence, ranked by probable RF/MW exposure category.

Study	Reference	Exposure Category	Leukaemia Type	Risk Ratio	95% Confidence Interval
Polish Military (Mortality)	Szmigielski (1996)	High	ALL	5.75	1.22-18.16
			CML	13.90	6.72-22.12
			CLL	3.68	1.45-5.18
			AML	8.62	3.54-13.67
			All Leuk.	6.31	3.12-14.32
Korean War Radar Exposure	Robinette et al. (1980) (Mortality)	High AT/ET	Leuk/Lymp	2.22	1.02-4.81
Radio and TV Repairmen	Milham (1985)	Moderate	Acute Leuk.	3.44	
			Leuk.	1.76	
Amateur Radio (Mortality)	Milham (1988)	Moderate	AML	1.79	1.03-2.85
UK Sutton Coldfield <=2km	Dolk et al. (1997a)	Moderate	Leuk	1.83	1.22-2.74
North Sydney TV/FM towers (Mortality)	Hocking et al.(1996)	Low	All Leuk.	1.17	0.96-1.43
			ALL+CLL	1.39	1.00-1.92
			AML+CML	1.01	0.82-1.24
			Other Leuk	1.57	1.01-2.46
UK TV/FM (Incidence)	Dolk et al. (1997b)	Low	Adult Leuk.	1.03	1.00-1.07

Note: ALL : Acute Lymphatic Leukemia; CLL: Chronic Lymphatic Leukaemia; AML Acute Myeloid Leukaemia; CML: Chronic Myeloid Leukaemia; and All Leuk.: All Adult Leukaemia.

Source: www.neilcherry.com/documents/90_r2_EMR_Living_Near_Broadcast_Towers_Health.pdf

Adverse Effects on Fertility from Cell Phones in Humans (2009)

Fertil Steril. 2009 Oct;92(4):1318-25. Epub 2008 Sep 20.

Effects of radiofrequency electromagnetic waves (RF-EMW) from cellular phones on human ejaculated semen: an in vitro pilot study.

Agarwal A, Desai NR, Makker K, Varghese A, Mouradi R, Sabanegh E, Sharma R.

Center for Reproductive Medicine, Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, Ohio 44195, USA. Agarwaa@ccf.org

Abstract

OBJECTIVE: To evaluate effects of cellular phone radiofrequency electromagnetic waves (RF-EMW) during talk mode on unprocessed (neat) ejaculated human semen.

CONCLUSION(S): Radiofrequency electromagnetic waves emitted from cell phones may lead to oxidative stress in human semen. We speculate that keeping the cell phone in a trouser pocket in talk mode may negatively affect spermatozoa and impair male fertility.

2009: Carcinogenesis of EMFs with Emphasis on Male Reproductive System

Reprod Biol Endocrinol. 2009 Oct 22;7:114.

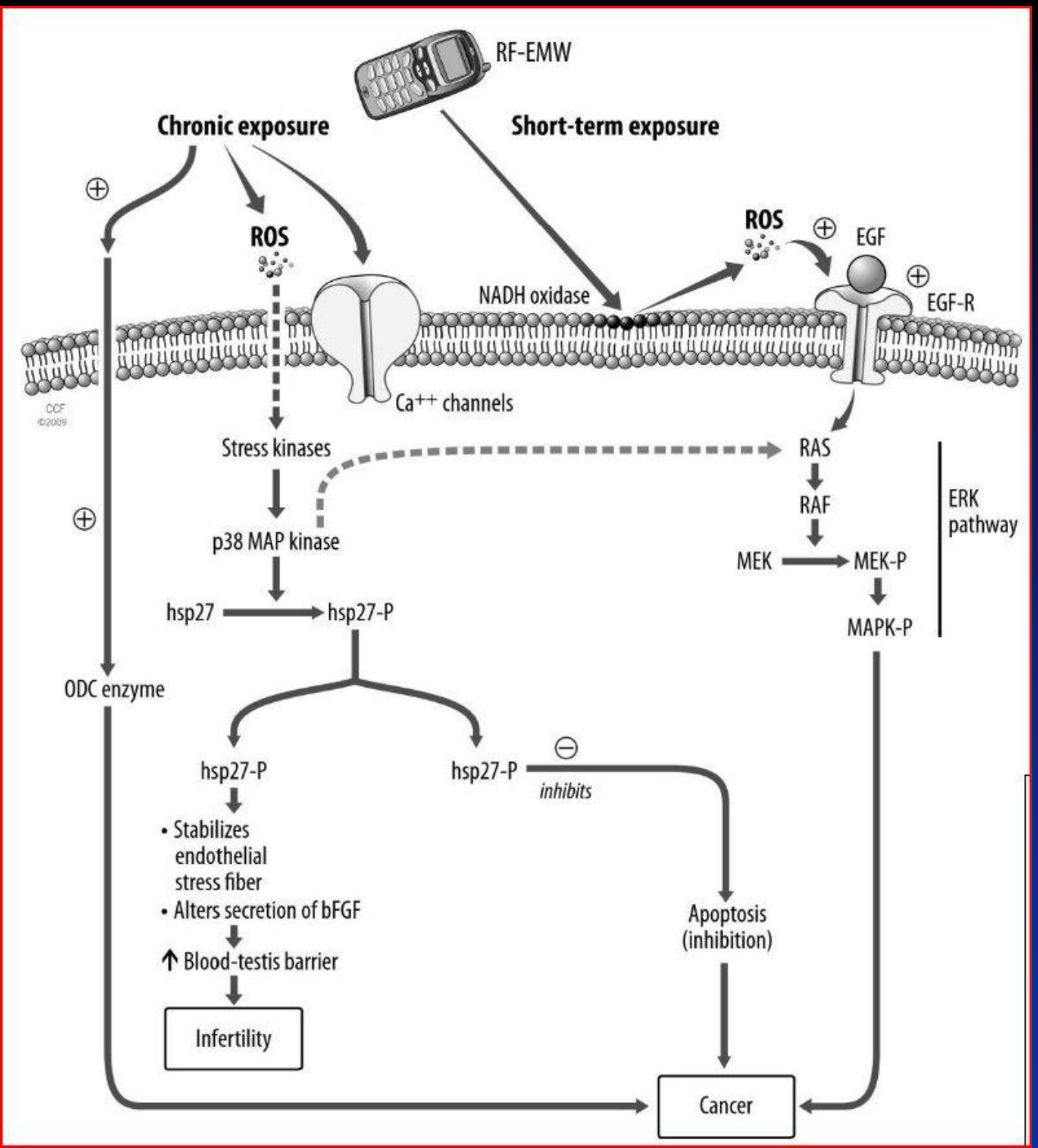
Pathophysiology of cell phone radiation: oxidative stress and carcinogenesis with focus on male reproductive system.

Desai NR, Kesari KK, Agarwal A.

Center for Reproductive Medicine, Glickman Urological and Kidney Institute and Obstetrics and Gynecology and Women's Health Institute, Cleveland Clinic, Cleveland, Ohio, USA. nisargdesai@hotmail.com

Abstract

Hazardous health effects stemming from exposure to radiofrequency electromagnetic waves (RF-EMW) emitted from cell phones have been reported in the literature. However, the cellular target of RF-EMW is still controversial. This review identifies the plasma membrane as a target of RF-EMW. In addition, the effects of RF-EMW on plasma membrane structures (i.e. NADH oxidase, phosphatidylserine, ornithine decarboxylase) and voltage-gated calcium channels are discussed. We explore the disturbance in reactive oxygen species (ROS) metabolism caused by RF-EMW and delineate NADH oxidase mediated ROS formation as playing a central role in oxidative stress (OS) due to cell phone radiation (with a focus on the male reproductive system). This review also addresses: 1) the controversial effects of RF-EMW on mammalian cells and sperm DNA as well as its effect on apoptosis, 2) epidemiological, in vivo animal and in vitro studies on the effect of RF-EMW on male reproductive system, and 3) finally, exposure assessment and dosimetry by computational biomodeling.



Current Mechanisms for Cell Phone EMF Effects

-Reactive Oxygen Species
- Ornithine Decarboxylase
- Heat Shock Protein 27 .
- Ca++ channel modulation
- EGF / ERK Pathway modul.
-

Source: Desai NR et al. Pathophysiology of Cell Phone Radiation: Oxidative Stress and Carcinogenesis Reprod Biol Endocrinol 7:114 Oct 22, 2009

Proposed Model of Studying Cell Phone Radiation using new Technologies

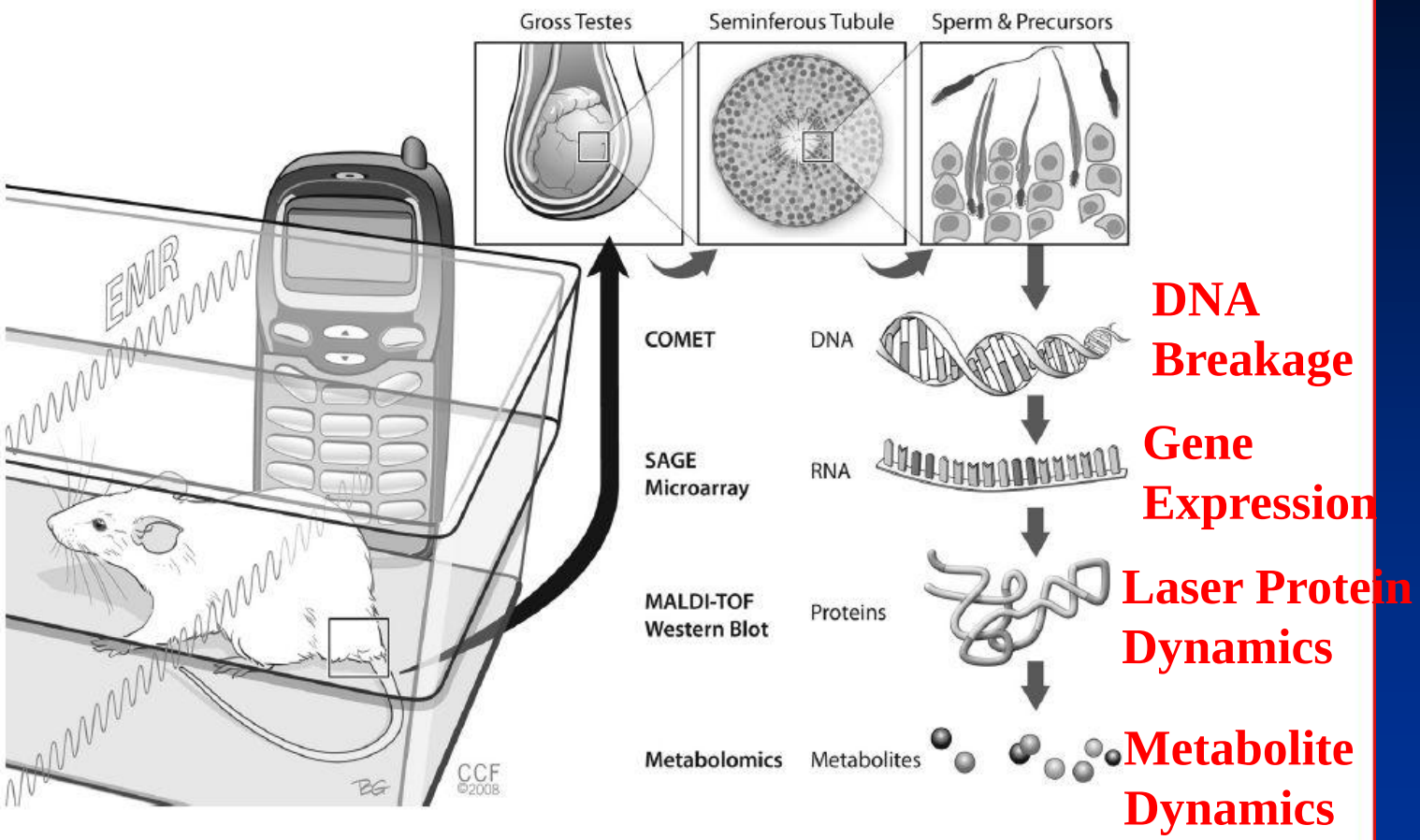


Figure 2. A proposed model to study the effect of cell phone radiation using the high-throughput technologies. These techniques combined with modern bioinformatics could be helpful to find minute variations caused by RF-EMF in protein or gene expression changes that might be of insufficient magnitude to alter cell physiology or give any phenotypic alteration. MALDI-TOF = matrix-assisted laser desorption/ionization time of flight; SAGE = serial analysis of gene expression.

2003 Lund University, Sweden Low Level Cell Phone Microwave Irradiation of Rat Brains

Environmental Health
PERSPECTIVES
Journal of the National Institute of Environmental Health Sciences

Nerve Cell Damage in Mammalian Brain after Exposure to Microwaves from GSM Mobile Phones

Leif G. Salford, Arne E. Brun, Jacob L. Eberhardt, Lars Malmgren, Bertil R.R. Persson

doi:10.1289/ehp.6039 (available at http://dx.doi.org/)
Online 29 January 2003

Microwave Irradiation affecting Blood Brain Barrier already known in 1980

Justesen, D.R.: Microwave Irradiation and the Blood-Brain Barrier. Proc. IEEE 68(1):60-67, 1980.

Low Level Microwave Exposure Brain Changes at 0.125% Safe Levels



Normal Rat Brain Changed Brain after Exposure

Low Level Exposure of SAR = 2 mW/kg Whole Body for 2 hours only
(In USA, Accepted Safe Levels are 1600 mW/kg)

Rats sacrificed after 50 days without further irradiation

Used 12-26 week old rats comparable to cell phone addicted teenagers

Changes in Blood Brain Barrier

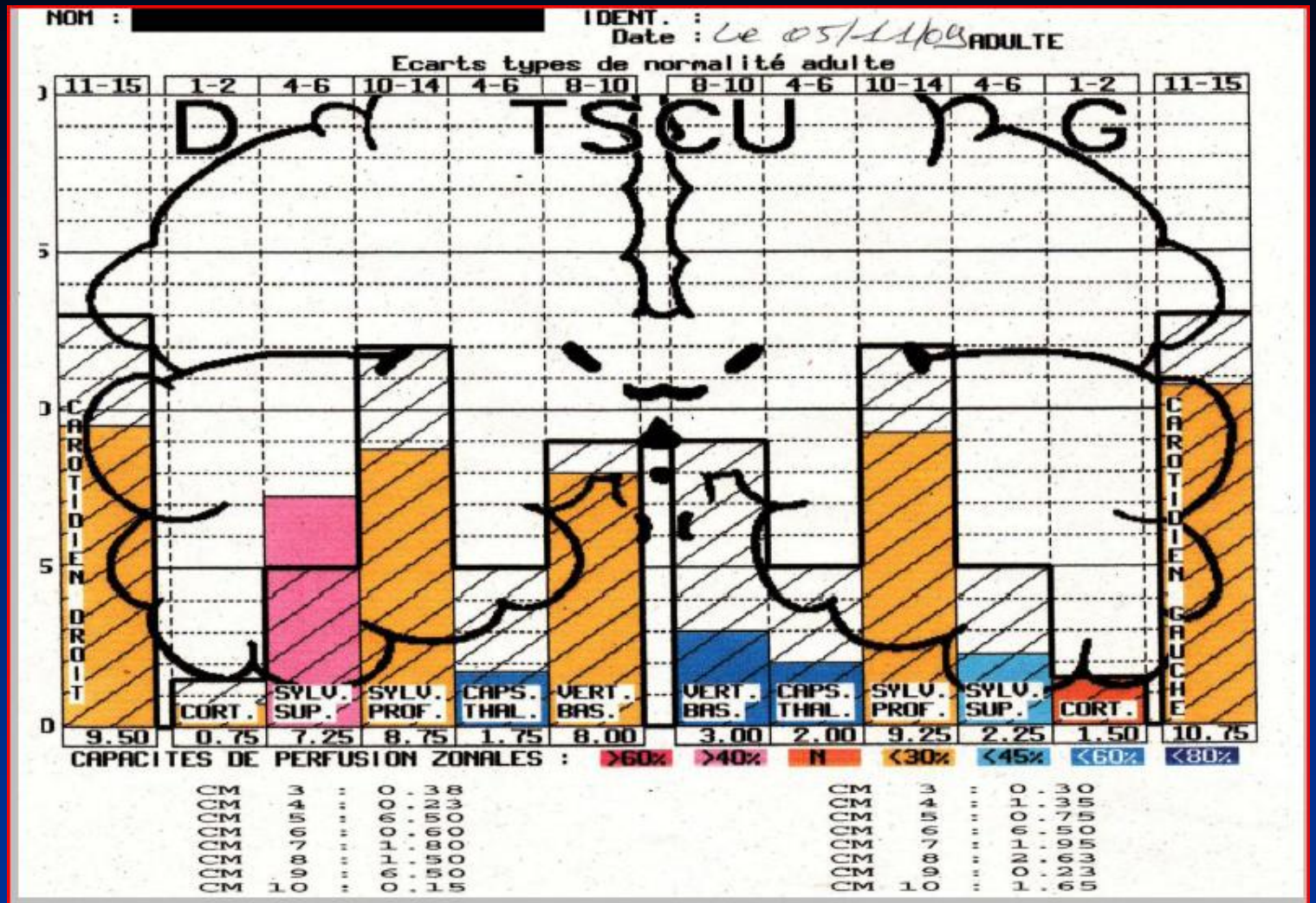
Low levels microwave cause albumen leakage into the brain, perhaps also other drugs, toxins etc.

"SAR values lower than 1 mW/kg give rise to a more pronounced albumin leakage than higher SAR values. . . . The situation that the weakest fields, according to our findings, are the biologically most effective, poses a major problem."

Dr. Leif Salford, Lund University, Sweden

(FCC Safety levels is 1600 mW/kg)

Effect of Electrosmog on Brain Perfusion

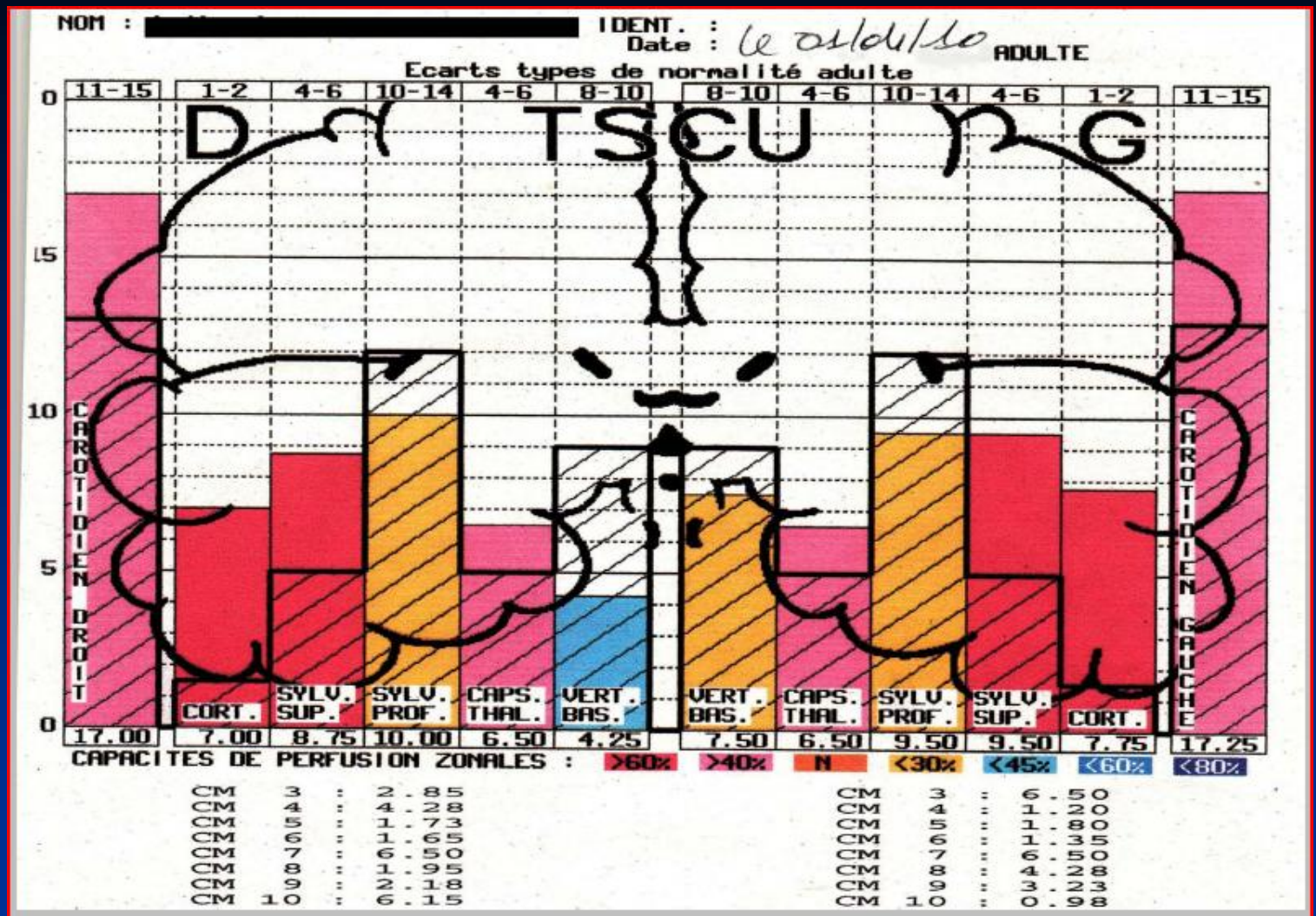


Nov 5 2009

CENTRE D'EXPLORATION DE LA FONCTION CÉRÉBRALE PARIS

Diagram 1 represents the encephaloscan of Philippe EHS before his arrival in the Forêt de Saoû. It is clear that after living for several years in an average town and being exposed to its artificial electromagnetic microwave pollution, he is in a weakened state. In this first diagram the circulation levels in several areas of both hemispheres are seen to be seriously affected.

Effect of Electrosmog on Brain Perfusion

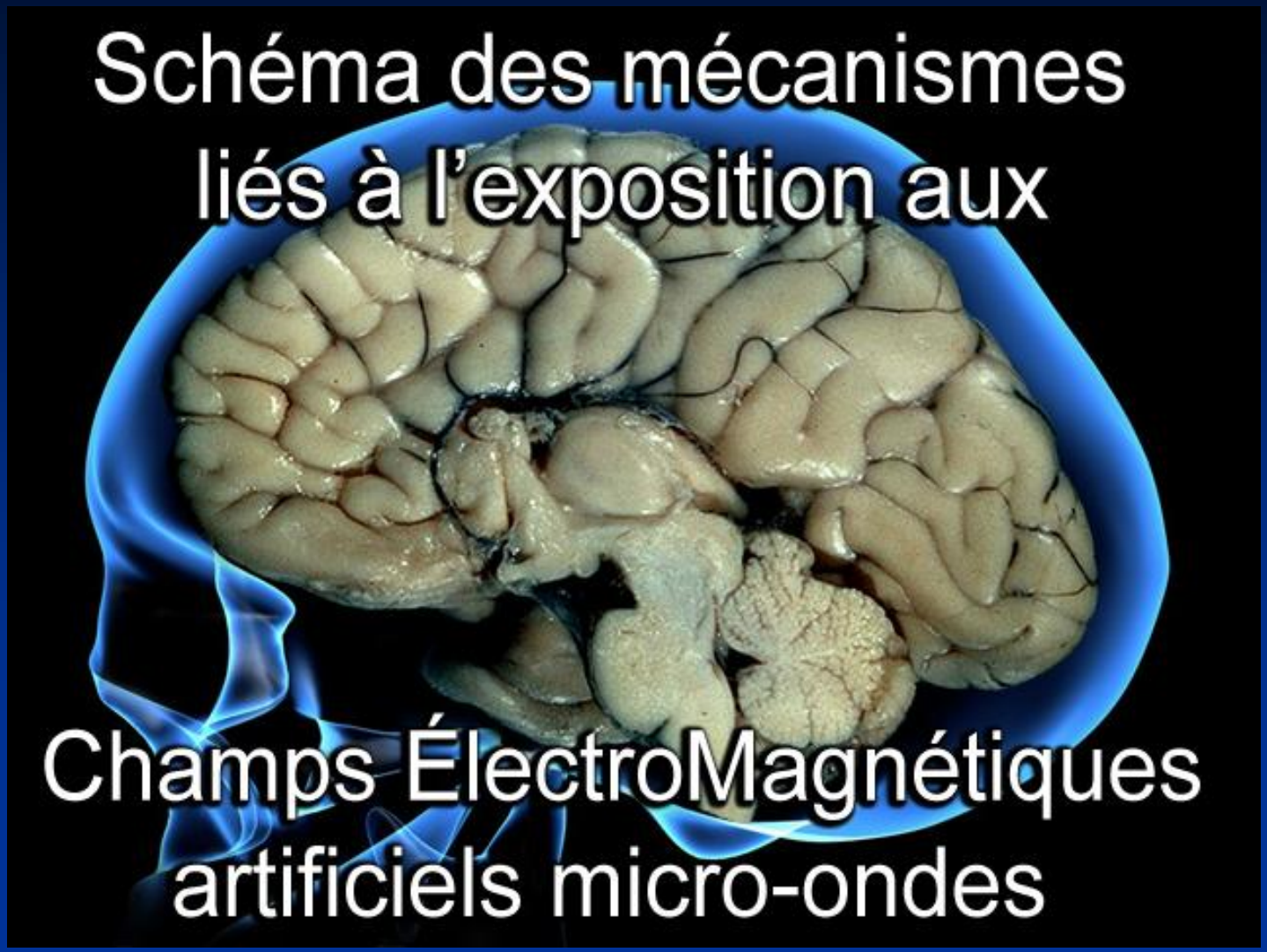


Feb 1 2010

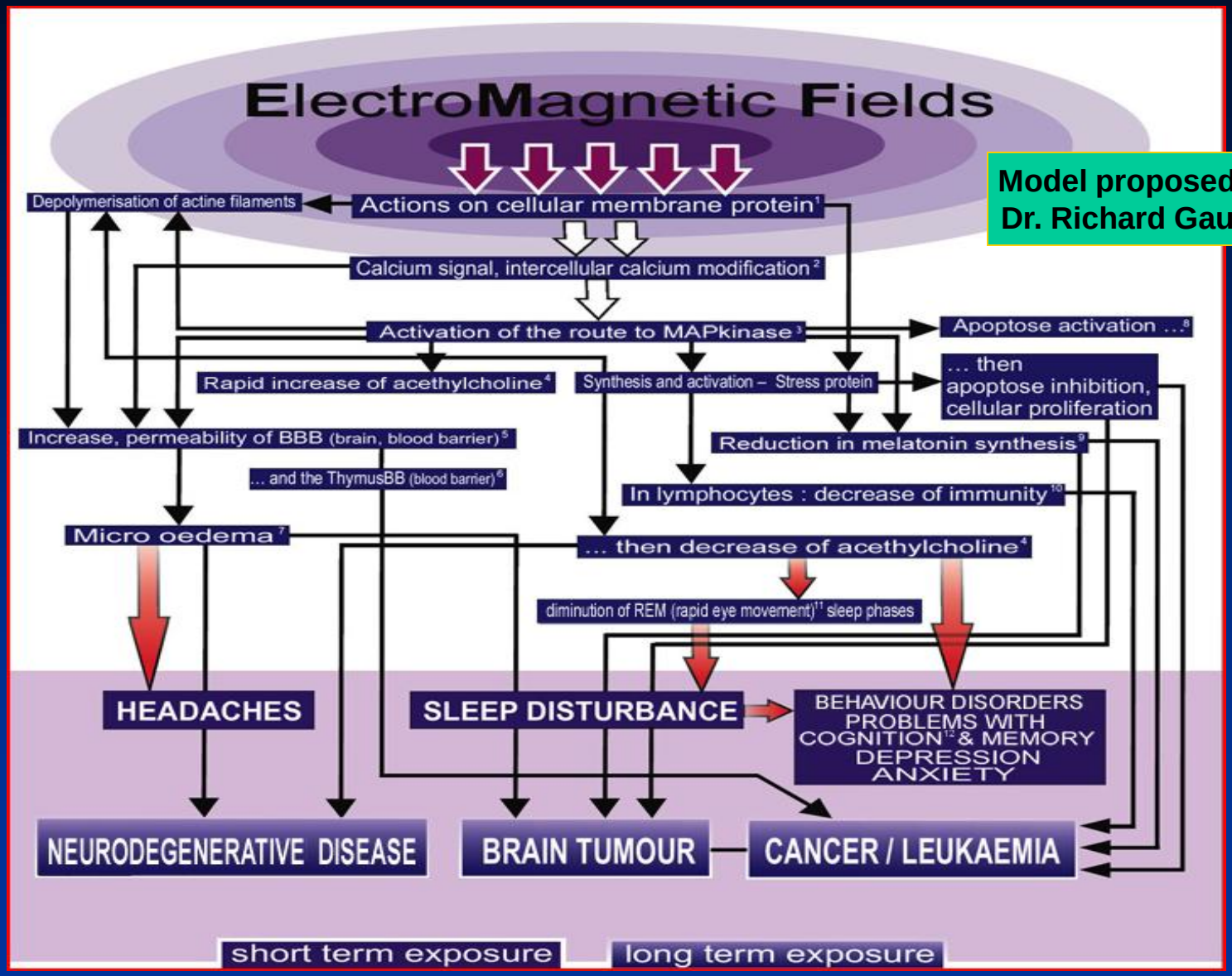
CENTRE D'EXPLORATION DE LA FONCTION CÉRÉBRALE PARIS

Diagram 2 represents the encephaloscan of Philippe EHS after living 3 months in the Forêt de Saoû (an area with very low artificial EM radiation). A spectacular improvement can be seen in the circulation in the 2 hemispheres of the brain. Visible physical consequence: Philippe was no longer in a weakened state.

Dr. Richard Gautier, France
2010 Model of EMF Causation of Disease



Health Impacts of Low Intensity EMFs



Model proposed in 2010 by Dr. Richard Gautier, France

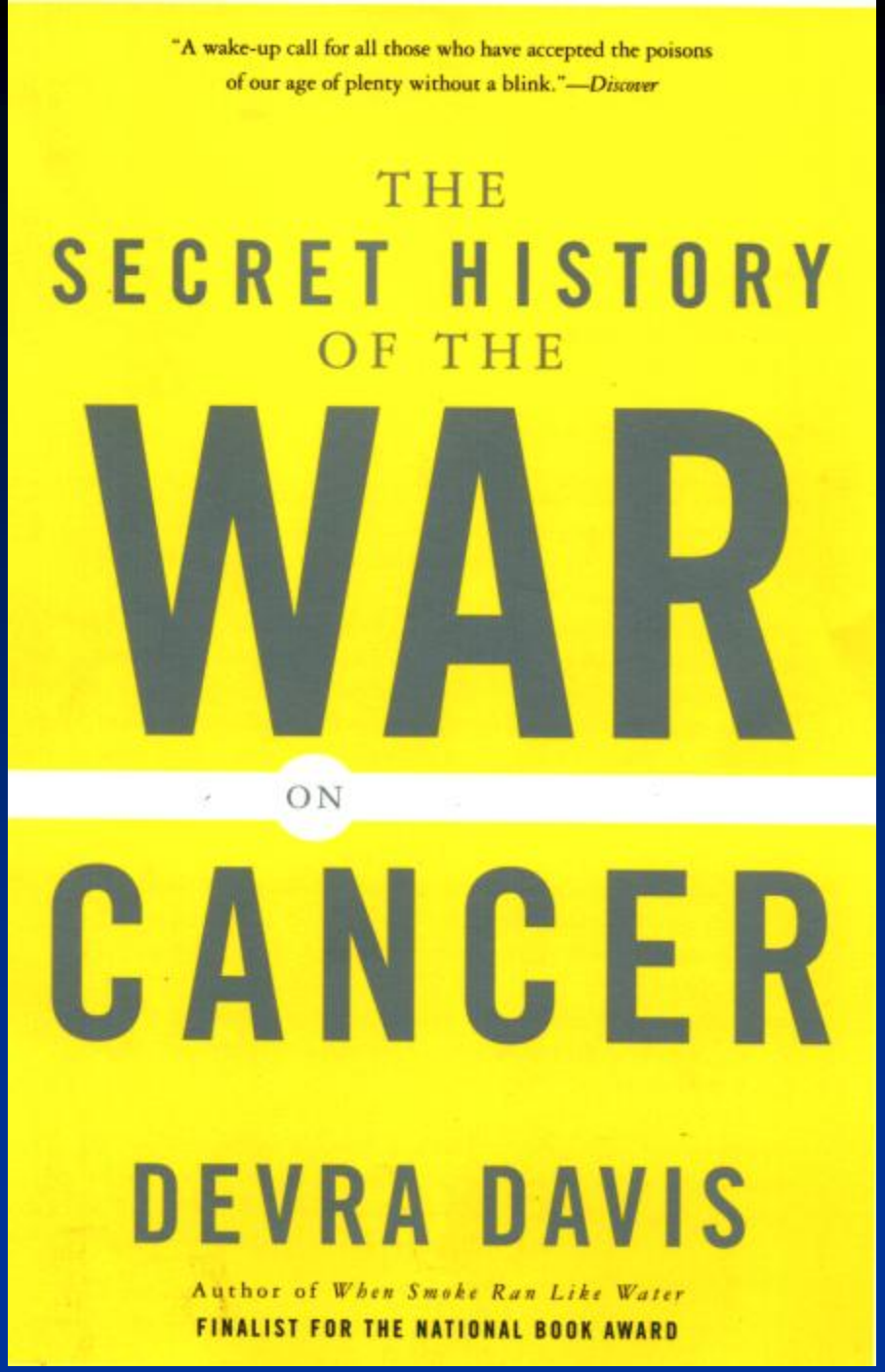
Effect of Pulsed Microwaves

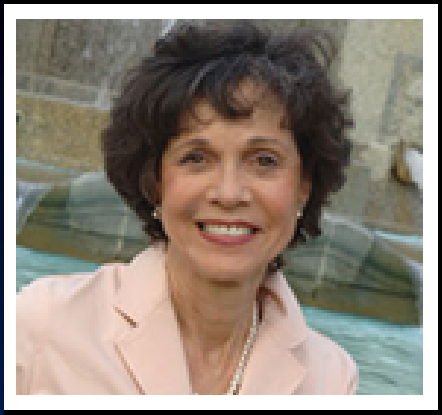
- Breech the protective Blood Brain Barrier
- Affect the Opiate-Dopamine Neurotransmitters
- Affect Testosterone Hormone levels
- Can Decrease Sperm Production in Men
- Affect the natural Craniosacral Rhythm of Brain
- Can affect Heart Rate and Heart Rate Variability
- EEG changes – also in sleep, reduction of learning, memory problems
- Lowers Hormones : Melatonin – pineal hormone – affects sleep & Testosterone in male rats



Devra Davis

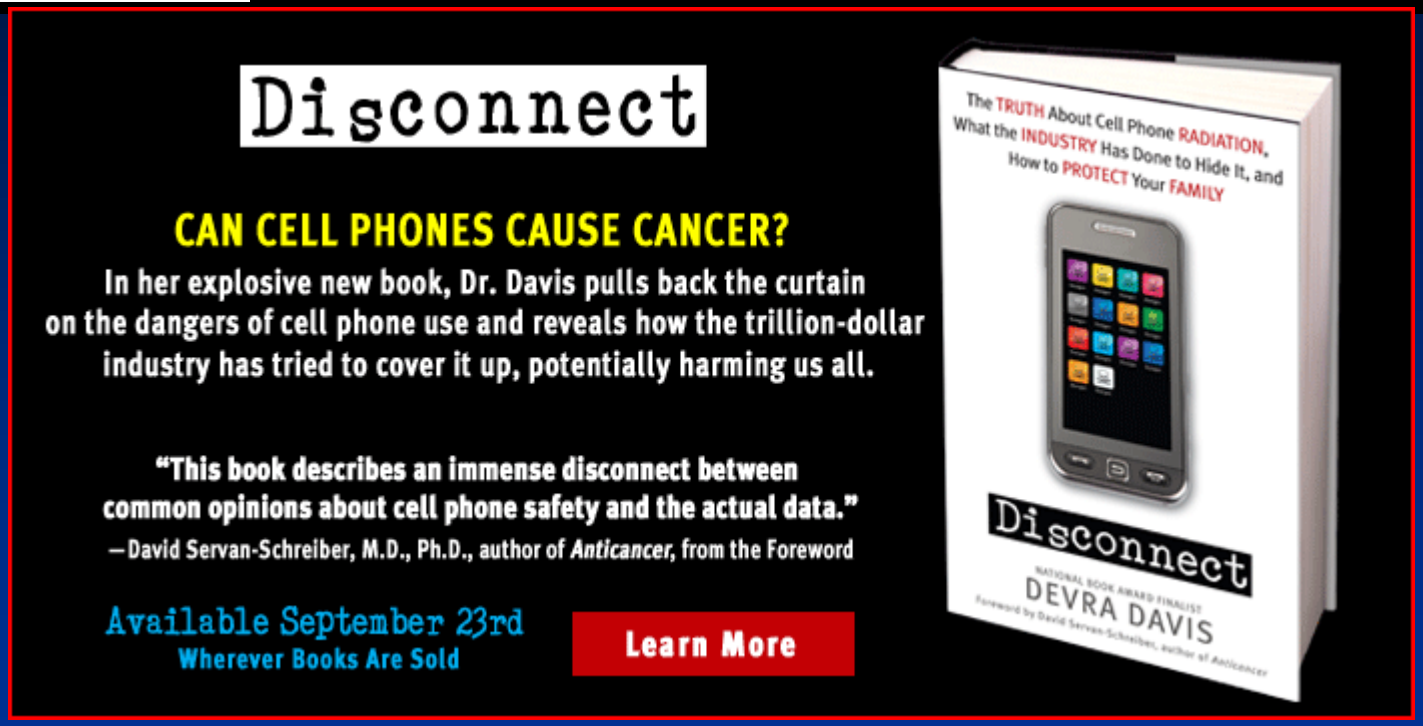
- Prof University of Pittsburg
- 2007 Book exposes EMF dangers
- Was instrumental in convening 2009 Senate Hearings on Cell Phone Dangers





Environmental Health Trust

Dr. Devra Lee Davis



- Dr Davis was instrumental in having US Senate Hearings on Cell Phone Dangers in 2009
- Website: www.environmentalhealthtrust.org

Latest International Research Symposium held in Norway in 2009



- Talks and Videos available at http://www.emf2009.no/

March 23, 2009 Paris Declaration Electromagnetic Fields on our Health



- **Electrosensibilité : Appel des scientifiques du 23-03-2009**
- http://www.dailymotion.com/swf/video/x8s5y6

2008–2009 ANNUAL REPORT PRESIDENT'S CANCER PANEL

- "In the face of uncertainty about RF energy and cell phone-related cancer risks, some researchers, several countries (Germany, France, Austria, United Kingdom, Russia), and the European Environment Agency have taken a precautionary stance regarding cell phone use, particularly by children."

Source: http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf

2008–2009 ANNUAL REPORT |PRESIDENT'S CANCER PANEL

- "Limited evidence suggests that risk of a brain tumor (specifically, glioma) on the same side of the head where the user typically holds the phone may be increased among long-term cell phone users."
- "A subset analysis of the eight studies considered most rigorous methodologically showed that long-term cell phone users had a 10–30 percent increased risk of tumors compared with people who seldom or never used a cell phone."

Source: http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf

Groups that are Providing Independent Scientific Assessments

- The Radiation Research Trust: www.radiationresearch.org
- Powerwatch: www.powerwatch.org.uk
- EMR Policy Institute: www.emrpolicy.org
- The Peoples Initiative Foundation: www.ThePeoplesInitiative.org
- www.electromagnetichealth.org
- http://emfsafetynetwork.org/?p=609

3 - 5% of general population in Europe are now Electrosensitive



Electrosensitive People

Seems to be a growing number, estimated at 3% of German population

"Some people become ill at power densities of less than 10 nanowatts/cm^2. . . Small children are very sensitive to these emitters, down to field densities of 1 nanowatt/cm^2."

Dr. Lebrecht von Klitzing, Medical University of Luebeck, Germany

(FCC 1.8 GHz Safety Levels = 1000$\mu W/cm^2$ which is a 100 times higher than 10 nW /cm^2)

Common Adverse Health Effects Reported

1. Headaches
   (Dopamine-opiate neutransmitters, changed blood brain barrier)

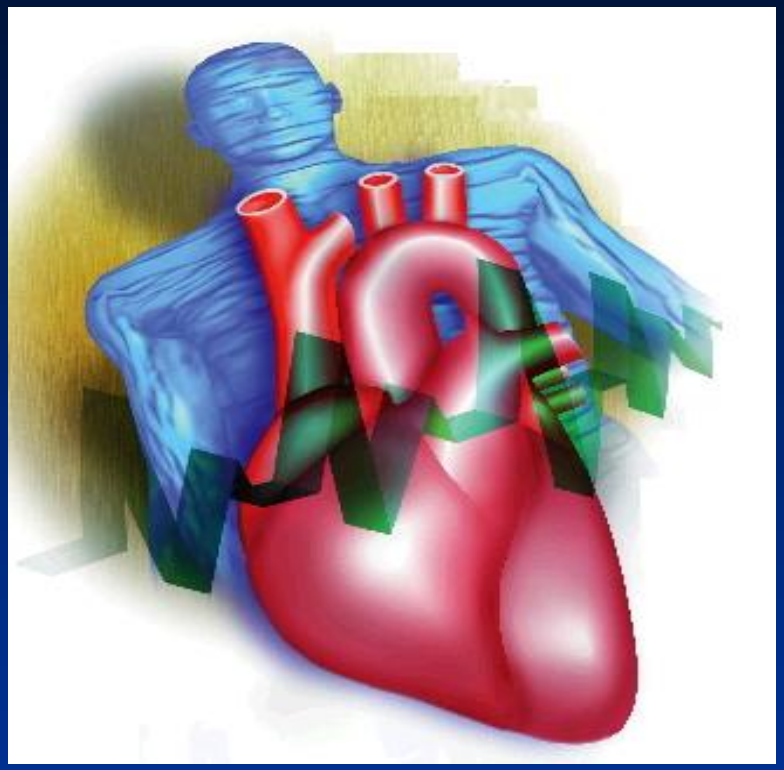
2. Sleep Disruption
   (Melatonin hormone disruption, Rapid Eye Movement sleep disturbed)

3. Short-term Memory Impairment
   (Radiation affects hippocampus region: Memory & Emotions)

4. Increased Seizure Frequency in Epileptics
   (ELF Modulation effects possible, animal studies, Sidorenko, 1999)

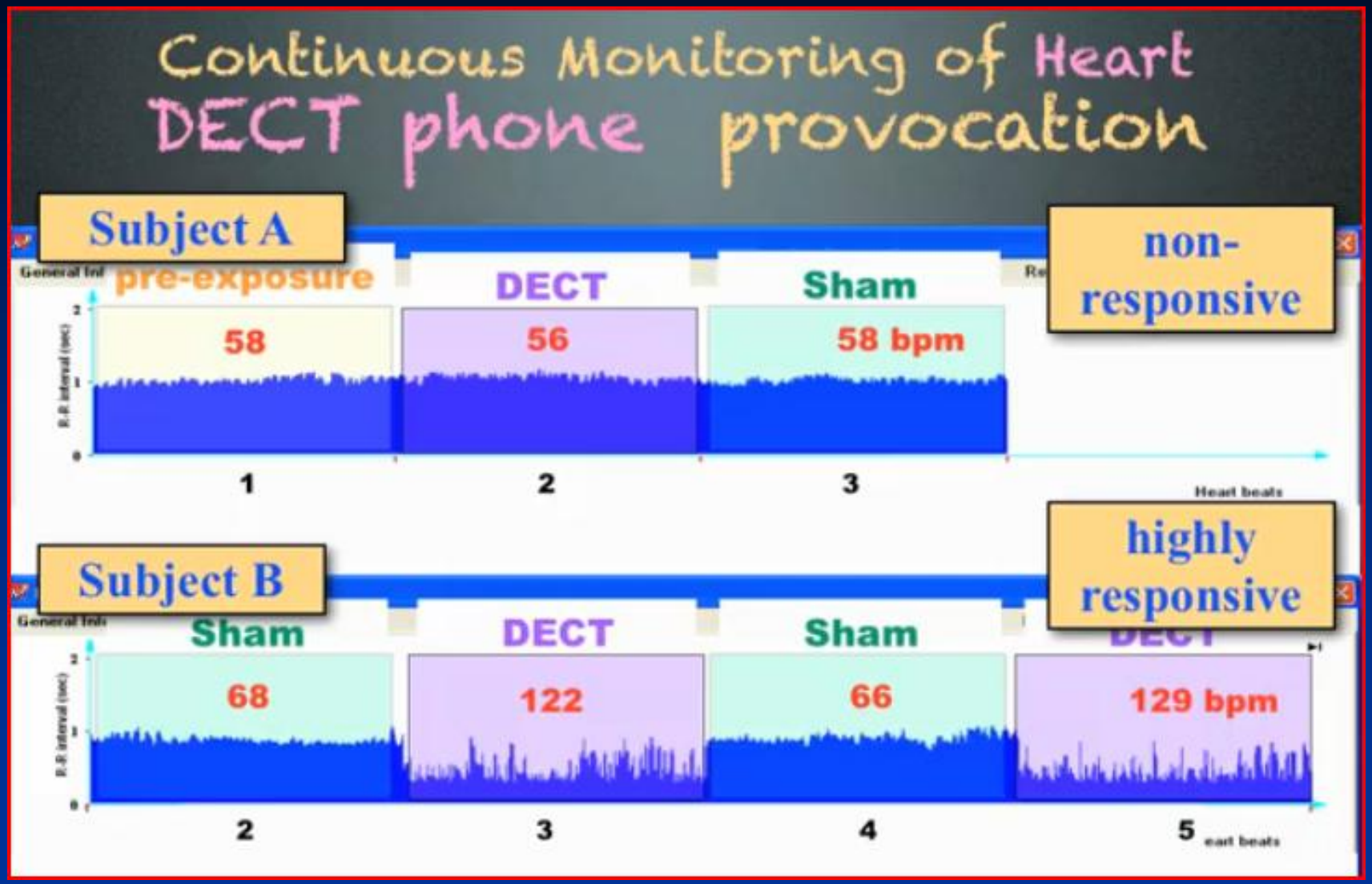
5. Increased Incidence Rare Brain Tumors
   (Neuroepitheliomas, Acoustic Neuromas, Muscat, JAMA, Dec 2000)
   (Dr. G. Carlos: Cell Phones: Invisible Hazards in the Wireless Age, 2001)

Effect of Electromagnetic Pulsed Radiation on Heart Rate Variability



Electrically Hypersensitive People are especially affected

Selected People show Heart Rate Abnormalities to Cordless DECT Phones

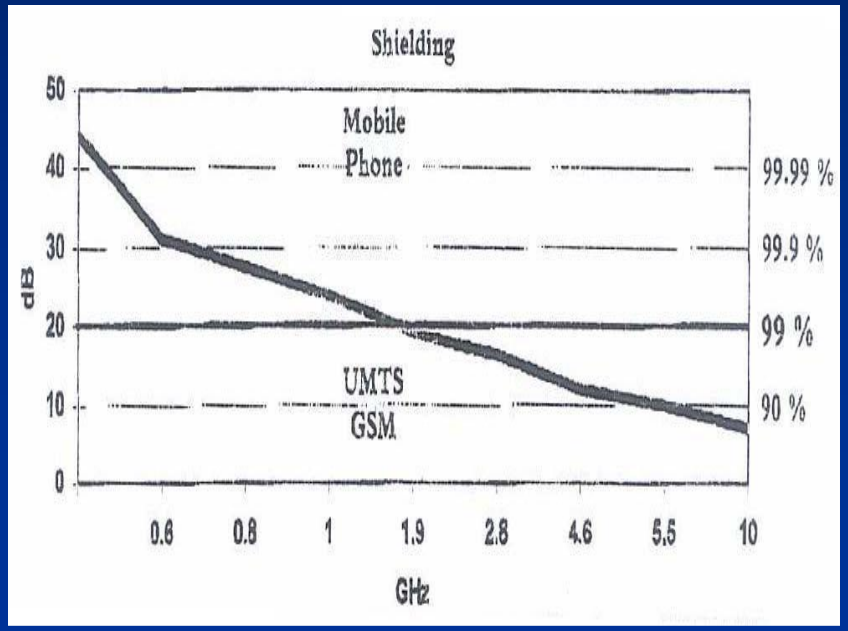


Research of Dr. Magda Havas – Heart Rate Variability Effects

Swiss Electromagnetic Bed Shielding

- Canopies with conductive materials that stop RF radiation while you sleep
- Price range $800 -1200 depending on bed size
- Reflects Microwaves but is not to be grounded





Adverse Biological Effect of Regular Magnetic Fields can be altered by Random Noise Fields

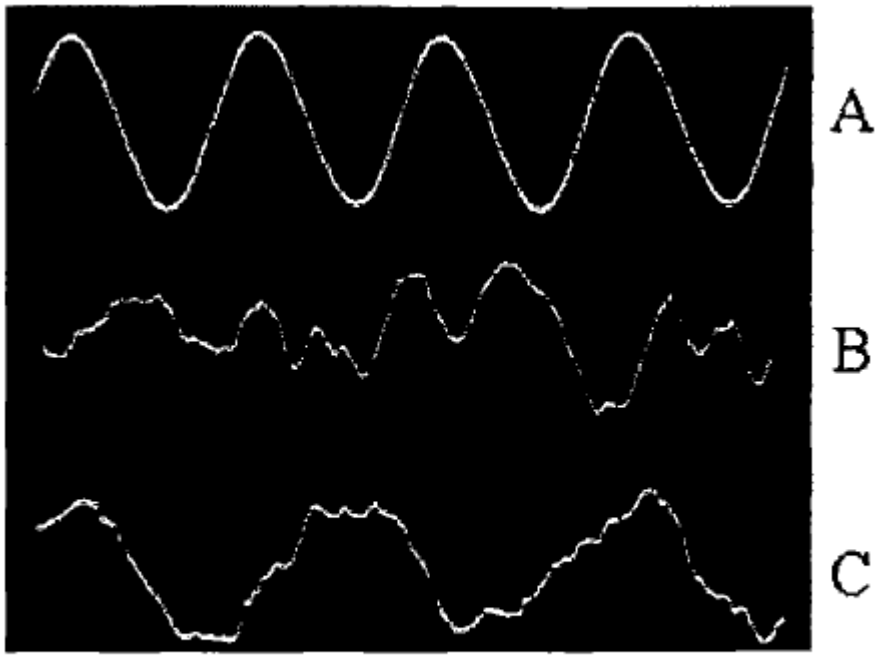


Fig. 1. The waveforms of MF and noise. The intensity of MF to noise MF is equal. **A:** Waveform of sinusoidal MF. **B:** Waveform of noise MF. **C:** Combined waveform of ELF MF and noise MF.

Data from Q.Zeng et al. Bioelectromagnetics 2006

- Adverse Biological Effect is by Disturbing Gap Junction Intercellular Communication by 50 Hz Fields
- Incoherent / Noise Fields tend to cancel these effects

2004: Rats forget Learned Tasks after Microwave Exposure (H. Lai research)

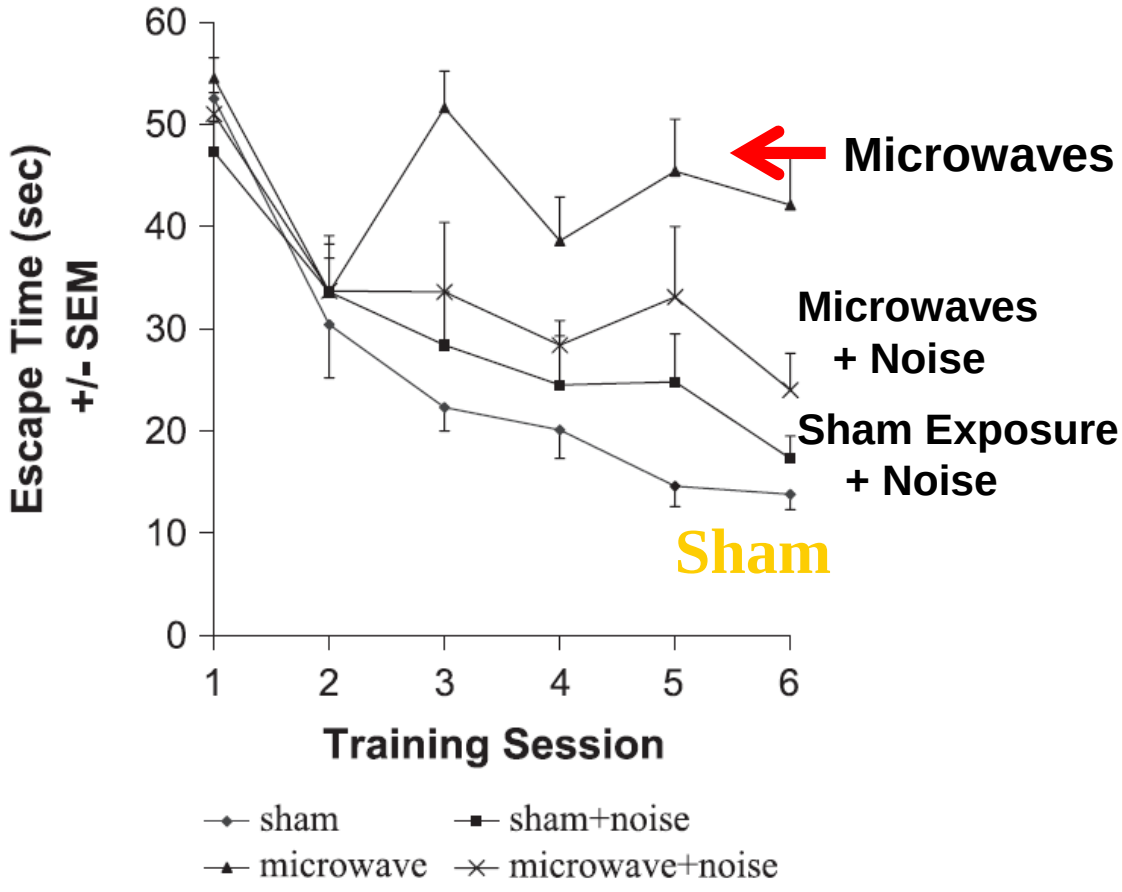
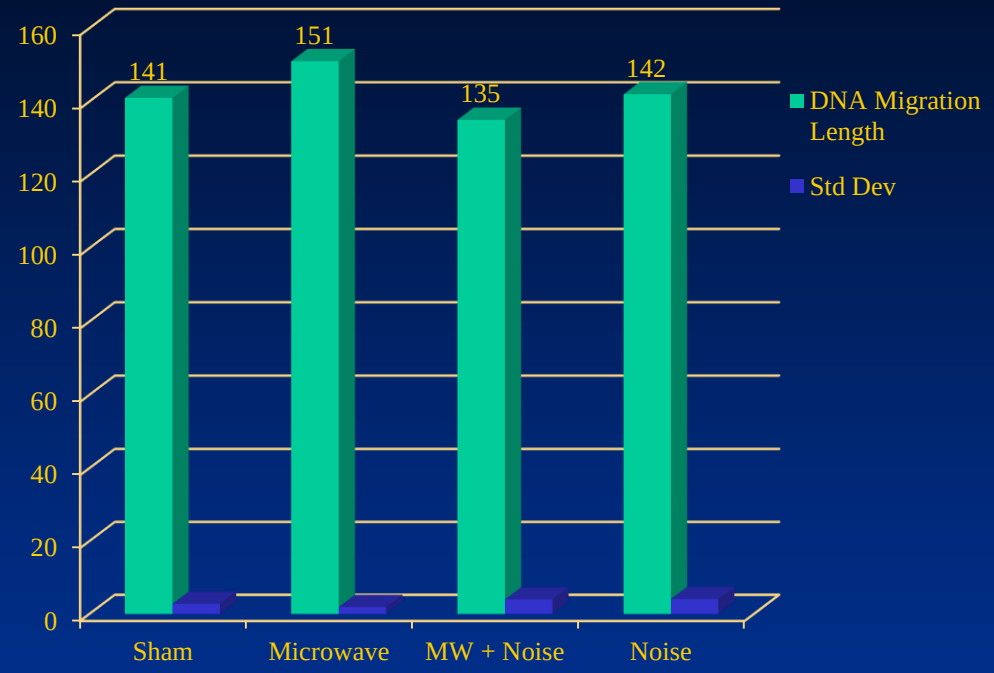


Fig. 1. Average 'escape time' (i.e. time to reach the platform after release into the water) during the six training sessions of microwave, sham, 'sham+noise' and 'microwave+noise'-exposed rats. n=8 in each group.

- Escape time from water decreased when noise added to microwave exposure
- Exposure was 1 hour before training session using continuous 2.45 GHz microwave signal with power density of 2 mW/cm^2 similar to cell phone (1.2 W/kg SAR)

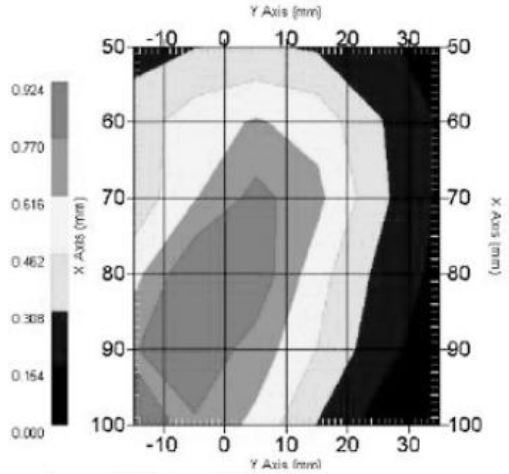
DNA Breakage from Regular Microwave Fields can be abolished by Random / Noise Fields



Data from Lai & Singh Electromagnetic Biol Med 24: 23-29, 2005

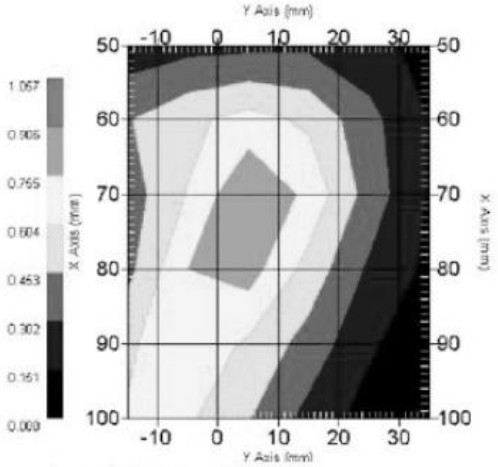
- Double strand DNA breaks from Microwave Radiation at 2.45 GHz is abolished if incoherent noise fields are added
- The non-thermal effects operate at cell membrane level

Polymer Chips have been developed that alter SAR Measurements from Cell Phone



1 gram SAR value: 0.875 W/kg
10 gram SAR value: 0.540 W/kg
Area Scan Peak SAR: 0.922 W/kg
Zoom Scan Peak SAR: 1.451 W/kg

NO MRET polymer material



1 gram SAR value: 0.635 W/kg
10 gram SAR value: 0.391 W/kg
Area Scan Peak SAR: 0.907 W/kg
Zoom Scan Peak SAR: 1.030 W/kg

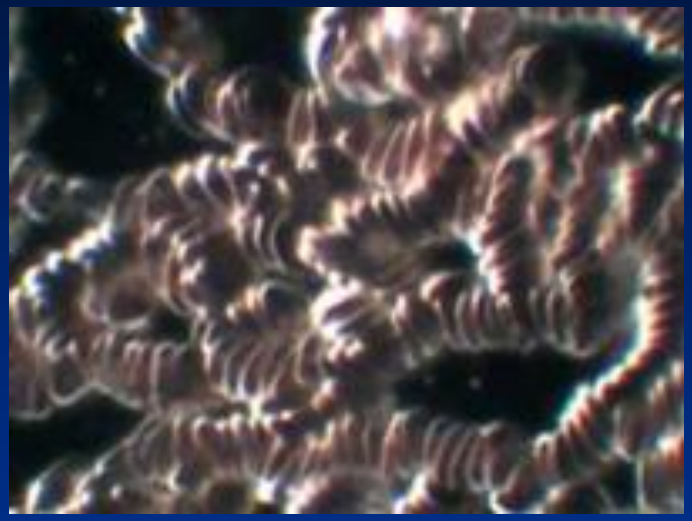
Applied MRET polymer material

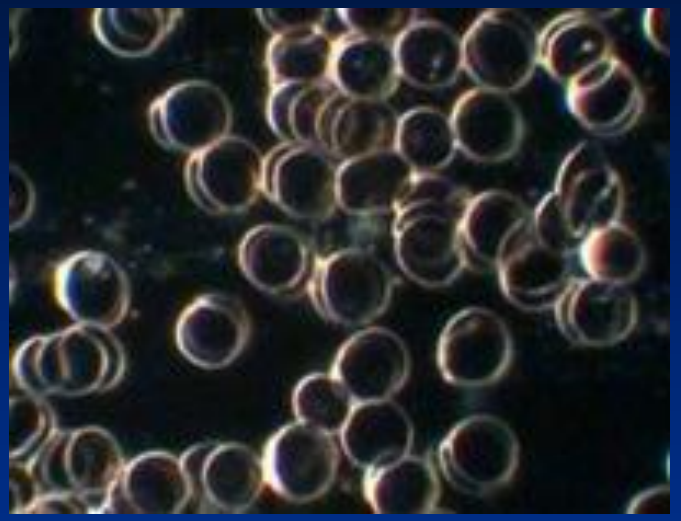
Figure 8. *Phone Model: LG VX6000; Frequency: 1900.00 MHz; Max. Transmitted Power: 0.256 W; Phantom data: APREL-SAM Left Ear; Probe Sensitivity: 1.20 1.20 1.20 μV/ (V/m)².*

Journal of Microwave Power & Electromagnetic Energy Vol. 42, No. 1, 2008

See also: Smirnov I V., Polymer Material Providing Compatibility between Technologically Originated EMR and Biological Systems. *Explore Magazine*. 2006; (15)4: 26-32.

Chips using different Technologies can alter Effects on Blood from Cell Phone Emissions





Rouleaux Formation in Dark Field Microscopy after brief cell phone use (Left), does not occur after application of Cell Phone Chip (Right).

Preliminary Studies need Replication in Larger Trials.

Protective Cell Phone Steps to take (1)

- Limit use of mobile phone (less than 2 minutes is desirable)
- Prohibit children to use mobile phone due to greater RFR absorption – up to 2.5 times
- Use in speaker phone mode or with air tube or wired headset – decreases direct brain exposure
- Avoid keeping mobile phone in your pocket or belt – affects fertility
- Wait until connection is made before bringing near body (greater than 1 inch from skin is best)

Protective Cell Phone Steps to take (2)

- Don’t use your mobile phone in metal structures like airplanes, elevators, buses – greater reflection
- Use shortest time if few ‘bars’ due to greater radiation from phone
- Purchase phone with low Specific Absorption Rate (SAR rating)
- Consider EMF protection device
- Consider antioxidant nutritional supplements

Summary Points

- Electromagnetic Radiation is a Potential Health Hazard – makes Detoxification more difficult
- Exposure to RFR and ELF EMF environment should be assessed in all cancer patients
- Prevention is the Key – Minimize Exposure
- Cell Phone and Cordless Phone Microwave Exposure has a > 10 year latency leading to cancer
- Improving Mitochondrial Energy Production is Vital and may be key to Tomorrows Laser Therapies and Informational Medicine

Thank you for listening

