Mar 2016: Letter to the Air Quality and Environmental Radiation Policy Section, Dept. of the Environment, Community & Local Government

My previous correspondence to you dated 29th June 2015 revealed the weaknesses within the ICNIRP guidelines on Electromagnetic/Radio Frequency/Wi-Fi (EMF) used by our Irish Government. Points made were that these guidelines are based on thermal and short-term effects only and also that they use the Specific Absorption Rate (SAR) as a means of measuring thermal effects. Reference was made to three world-renowned scientists (Dr. Dimitris Panagopoulos, of the University of Athens, Assoc. Prof. Olle Johansson of the Karolinska Institute, Stockholm, and Dr. George Carlo, of the Institute for Healthful Adaptation in Washington, USA) who produced a report concluding that the use of SAR as a method of measuring thermal outcomes is faulty, inadequate, misleading and ultimately destructive to all living things. *(Evaulation of Specific Absorption Rate as a Dosimetric Quantity for Electromagnetic Fields Bioeffects1. (2013): PubMed.gov, June 4; 8 (6)*

In official guidelines/reports across the board, non-thermal, continuous and pulsed effects of EMF have been completely ignored. In general, the reason given for this omission is that no adverse health effects stemming from these have been identified as yet. Another argument used is that no biophysical mechanism has been established that would explain how such effects could occur.

As stated in my previous letter, the belief that there are no adverse health effects from non-thermal EMF contradicts the findings in the BioInitiative report *(BioInitiative Report – Summary for the Public 2014),* which asserts that exposures to EMF:

can alter and damage genes, trigger epigenetic changes to gene expression and cause de novo mutations that prevent genetic recovery and healing mechanisms. These exposures may interfere with normal cardiac and brain function; alter circadian rhythms that regulate sleep, healing, and hormone balance; impair short-term memory, concentration, learning and behavior; provoke aberrant immune, allergic and inflammatory responses in tissues; alter brain metabolism; increase risks for reproductive failure (damage sperm and increase miscarriage risk); and cause cells to produce stress proteins.

A further twenty two thousand independent studies researching the non-thermal bioeffects of EMF concur with these findings, many concentrate on specific areas of work whilst others research the issue in a broad sense.

The absence of knowledge regarding a possible mechanism that could explain the causal process of such effects has been a stumbling block in the pursuit of truth. However, such an mechanism has now been established by Professor Emeritus, Martin Pall Ph.D., who verifys his findings in four research papers, all of which have been peer reviewed and replicated. Information about/access to these papers is attached for your perusal. Prof. Pall refers to the Canadian Safety Panel 6, which are the EMF guidelines used in Canada and are, like ICNIRPs, based only upon thermal and short-term effects.

Prof. Pall's research explains how exposure to non-thermal EMF opens voltage-gated-channels in cell membranes, allowing excess calcium to penetrate the cells. 'This increases nitric oxide and superoxide in the cells, leading to production of free radicals, oxidative stress, and DNA damage. Potential health effects include cancer, male and female infertility, neurodegenerative disease, neuropsychiatric conditions, and electromagnetic hypersensitivity. In addition, microwave radiation in conjunction with specific chemical

exposures may increase autism risk.' *(Joel Moskowitz, Ph.D., University of California – website Electromagnetic Radiation Safety:*
http://www.saferemr.com/2015/10/how-does-wireless-radiation-produce.html

These findings are extremely exciting and lend hope to the hundreds of Irish people who are already suffering from the functional impairment Electrohypersensitivity, along with the estimated 22 million across Europe. Given the potential public health crisis that may unfold over time should no action be taken, this paradigm shift needs to be taken seriously and responded to with urgency. Prof. Pall advocates the instigation of biologically-based EMF guidelines to replace the current obsolete ones.

As this will take some time, immediate action could be considered in the meantime e.g. Wi-Fi could be banned from schools and replaced with wired or fibre optic systems as is happening in many other countries, the Irish Governments Mobile Phone Radiation Warning Bill 2011 could be enacted, and consideration could be given to initiating a regulation that would see telecommunication companies obliged to install a device which reduces electrosmog in Wireless Local Networks (see excerpts attached – the argument supporting the patent application cements scientific findings on EMF + Health). This latter suggestion is pertinent given that the EU Directive 2014/53/EU will come into operation by 12 June 2017. Article 3 and 42 of this concerns radio equipment and the protection of health and safety of citizens. A further EU Directive 35/2013 is to come into effect in July 2016, seeking information from member states on direct biophysical effects and other indirect effects caused by electromagnetic fields. However, this only refers to occupational exposure and only addresses short-term effects.

I hope that the information contained in this letter has been helpful and that we will see some positive action soon for the sake of Electrohyprsensitives and the next generation.

(on behalf of IERVN)
The Irish Electromagnetic Radiation Victims Network, www.iervn.com

From: Electromagnetic Radiation Safety: (Joel Moskowitz Ph.D.)

http://www.saferemr.com/2015/10/how-does-wireless-radiation-produce.html

Wednesday, October 14, 2015

How does wireless radiation produce harmful health effects? A mechanism proposed by Dr. Martin Pall

A common argument used to deny the existence of biologic and health effects from exposure to low-intensity microwave radiation is that there is no possible biologic mechanism. Professor Emeritus Martin Pall, PhD, in an hour-long interview describes a biologic mechanism by which the microwave radiation emitted by cell phones, cordless phones, Wi-Fi, wireless baby monitors, smart meters, cell phone towers, and other wireless devices can harm us as well as other species.

Dr. Pall recently published four peer-reviewed papers that explain how exposure to low-intensity (i.e., non-thermal) pulsed electromagnetic fields opens **voltage-gated calcium channels** in cell membranes allowing excess calcium to penetrate the cells. This increases nitric oxide and superoxide in the cells, leading to production of free radicals, oxidative stress, and DNA damage. Potential health effects include cancer, male and female infertility, neurodegenerative disease, neuropsychiatric conditions, and electromagnetic hypersensitivity. In addition, microwave radiation in conjunction with specific chemical exposures may increase autism risk.

According to Dr. Pall, twenty-six studies have found that the effects of electromagnetic fields on voltage-gated calcium channels in cell membranes can be eliminated by administering calcium channel blockers.

Dr Pall advocates for the adoption of biologically-based radio frequency standards to replace the obsolete standards which only control for thermal effects that were adopted by the Federal Communications Commission in 1996.

Progressive Radio Network interview (Oct 8, 2015): http://bit.ly/pallinterview

References

The following are all open access papers:
Pall ML. Microwave frequency electromagnetic fields (EMFs) produce widespread neuropsychiatric effects including depression. J Chem Neuroanat. Aug 21, 2015. http://www.ncbi.nlm.nih.gov/pubmed/26300312

Pall ML. Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action. Rev Envir Health. 2015; 30(2):99-116. http://www.ncbi.nlm.nih.gov/pubmed/25879308

Pall ML. Electromagnetic field activation of voltage-gated calcium channels: role in therapeutic effects. Electromagn Biol Med. 2014; 33(4):251. http://www.ncbi.nlm.nih.gov/pubmed/24712750

Pall ML. Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects. J Cell Mol Med. 2013; J Cell Mol Med. 2013; 17(8):958-965. http://www.ncbi.nlm.nih.gov/pubmed/23802593

Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action.

Pall ML.

Abstract

This review considers a paradigm shift on microwave electromagnetic field (EMF) action from only thermal effects to action via voltage-gated calcium channel (VGCC) activation. Microwave/lower frequency EMFs were shown in two dozen studies to act via VGCC activation because all effects studied were blocked by calcium channel blockers. This mode of action was further supported by hundreds of studies showing microwave changes in calcium fluxes and intracellular calcium [Ca2+]i signaling. The biophysical properties of VGCCs/similar channels make them particularly sensitive to low intensity, non-thermal EMF exposures. Non-thermal studies have shown that in most cases pulsed fields are more active than are non-pulsed fields and that exposures within certain intensity windows have much large biological effects than do either lower or higher intensity exposures; these are both consistent with a VGCC role but inconsistent with only a heating/thermal role. Downstream effects of VGCC activation include calcium signaling, elevated nitric oxide (NO), NO signaling, peroxynitrite, free radical formation, and oxidative stress. Downstream effects explain repeatedly reported biological responses to non-thermal exposures: oxidative stress; single and double strand breaks in cellular DNA; cancer; male and female infertility; lowered melatonin/sleep disruption; cardiac changes including tachycardia, arrhythmia, and sudden cardiac death; diverse neuropsychiatric effects including depression; and therapeutic effects. Non-VGCC non-thermal mechanisms may occur, but none have been shown to have effects in mammals. Biologically relevant safety standards can be developed through studies of cell lines/cell cultures with high levels of different VGCCs, measuring their responses to different EMF exposures. The 2014 Canadian Report by a panel of experts only recognizes thermal effects regarding safety standards for non-ionizing radiation exposures. Its position is therefore contradicted by each of the observations above. The Report is assessed here in several ways including through Karl Popper's assessment of strength of evidence. Popper argues that the strongest type of evidence is evidence that falsifies a theory; second strongest is a test of "risky prediction"; the weakest confirms a prediction that the theory could be correct but in no way rules out alternative theories. All of the evidence supporting the

Report's conclusion that only thermal effects need be considered are of the weakest type, confirming prediction but not ruling out alternatives. In contrast, there are thousands of studies apparently falsifying their position. The Report argues that there are no biophysically viable mechanisms for non-thermal effects (shown to be false, see above). It claims that there are many "inconsistencies" in the literature causing them to throw out large numbers of studies; however, the one area where it apparently documents this claim, that of genotoxicity, shows no inconsistencies; rather it shows that various cell types, fields and end points produce different responses, as should be expected. The Report claims that cataract formation is produced by thermal effects but ignores studies falsifying this claim and also studies showing [Ca2+]i and VGCC roles. It is time for a paradigm shift away from only thermal effects toward VGCC activation and consequent downstream effects.

PMID: 25879308 [PubMed - indexed for MEDLINE]

WIPO Patentscope

Application No: WO2004075583 by Swisscom, 2004.

Invention: Reduction of electrosmog in Wireless Local Networks – Inventors: Moreno Blanca, Ferran and Bischoff, Jean-Claude

Abstract: A method and system for reduction of electrosmog in wireless local networks, one or more mobile network units (1) communicating with a base station (2) of a wireless local network (5). After a predefinable time interval without connecting signal, the base station (2) changes over from the normal transmitting−receiving mode into a sleep mode, in which sleep mode no beacon signals and/or other radio frequency signals are transmitted from the base station (2). If a mobile network unit (1) requires a network connection, it transmits an alert signal, and, upon receiving the alert signal of the mobile network unit (1), the base station transmits beacon signals to the mobile network unit (1) and changes over into the normal transmitting−receiving mode.

Reduction of Electrosmog in Wireless Local Networks
This invention relates to a method and system for reduction of electrosmog in wireless local area networks (WLAN), one or more mobile network units communicating with a base station by means of radio frequency signals in a wireless local area network, which base station amplifies the radio frequency signals of the mobile network unit and/or connects the wireless local area network to a wired fixed network by means of bridge functions. In particular, the invention relates to a method and system in which a WLAN comprises a plurality of access points with differing transmission cells.

The influence of electrosmog on the human body is a known problem. The health risk from mobile radio transmitters, handys and DECT telephones has been an explosive subject among the general public at least since the enormous breakthrough in mobile radio technology in the 1990s. To meet the concerns of science from the legislative side, the permissible limit values have thus been lowered several times, and technology has been increasingly focused on this problem. The risk of damage to health through electrosmog has also become better understood as a result of more recent and improved studies. When, for example, human blood cells are irradiated with electromagnetic fields, clear damage to hereditary material has been demonstrated and there have been indications of an increased cancer risk (Mashevich M., Folkman D., Kesar A., Barbul A., Korenstein R., Jerby E., Avivi L., Department of Human Genetics and Molecular Medicine, Tel-Aviv University, Tel-Aviv, Israel, "Exposure of human peripheral blood lymphocytes to electromagnetic fields associated with cellular phones leads to chromosomal instability," Bioelectromagnetics, 2003 Feb., 24(2): 82-90). In this study, for example, human peripheral lymphocytes were exposed to continuous electromagnetic fields of 830 MHz in order to examine whether this leads to losses or gains in chromosomes (aneuploidy). Bigger changes lead to instability of the genome (= the totality of all genes of a germinal cell) and thereby to cancer. The human peripheral blood lymphocytes (PBL) were irradiated at different average specific absorption rates (SAR) of 1.6 to 8.8 W/kg over a time period of 72 hours in an exposure system based on a parallel plate resonator in a temperature range of 34.5 to 37.5 °C. The average absorption rate (SAR) and its distribution

in the exposed tissue culture flask were determined by combining the measurement results with a numerical analysis based on a finite element simulation code. A linear increase in the chromosome No. 17 -- an aneuploidy (=numerical chromosome aberration) - was observed as a function of the SAR, demonstrating that this radiation has a genotoxic effect. The SAR-dependent aneuploidy was accompanied by an abnormal mode of replication of the chromosome 17 region engaged in segregation (repetitive DNA arrays associated with the centromere), suggesting that epigenetic alterations are involved in the SAR dependent genetic toxicity. Control experiments (i.e. without any radio frequency radiation) carried out in the temperature range of 34.5 to 38.5 °C showed that elevated temperature is not associated with either the genetic or epigenetic alterations observed following RF radiation, these alterations being the increased levels of aneuploidy and the modification in replication of the centromeric DNA arrays. These findings indicate that the genotoxic effect of electromagnetic radiation is elicited via a non-thermal pathway. Moreover aneuploidy is to be considered as a known phenomenon in the increase of cancer risk.

Thus it has been possible to show that mobile radio radiation can cause damage to genetic material, in particular in human white blood cells, whereby both the DNA itself is damaged and the number of chromosomes changed. This mutation can consequently lead to increased cancer risk. In particular, it could also be shown that this destruction is not dependent upon temperature increases, i.e. is non-thermal. Based on the scientific studies in the field, and owing to increasing pressure from the public, especially in the industrialized countries, epidemiological studies have been systematized by the World Health Organization (WHO) in the last few years, such as e.g. the currently running WHO Interphone Project, in order to be able to assess more precisely the health risks from electrosmog and work out corresponding guidelines.

Further information is found on the WIPO Patentscope site using the application number in the advanced search.