2019

Certificate of Analysis Report

Validating the Bio-Resonance Smart 5G Shield from AB Centrix, R&D

Note:

Most people agree that cell phones emit Electromagnetic Microwave Radiation (EMR). Whether EMR is exposing you to serious health risks from 5G cellphones emissions, including brain damage is still being hotly debated. The cellphone industry says there is no proof of danger. And yet, years of research suggests otherwise. Studies with mammals show that EMR transmitted from cell phones creates portals in the Blood-Brain Barrier big enough to allow large albumin molecules to pass through and begin to pool around the ganglia of brain cells. Not only does this accumulation of albumin impede intercellular communication in the brain, but researchers are concerned that the portals that will allow such large molecules to pass across the protective Blood-Brain Barrier would also allow a host of smaller, more brain-toxic substances into the brain as well.

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Equipment Validation & Certificate of Analysis Report

INTRODUCTION

This report is written to provide information on a product called the Smart 5G Shield; a product developed by AlphaBio Centrix, R&D. A test was conducted in August 2017, and validates that the EMR Defender **did neutralize harmful electromagnetic** toxins produced by a cellphone. The tests further indicated that the frequencies emitting from the "Smart Chip" demonstrated that it was providing the proper naturalizing frequencies.

The equipment used in the test is called the RAYOCOMP PS 100 and is manufactured in Germany. The company has been manufacturing bio-resonance equipment since 2017 for the Homeopath Industry, (the study of energetic science). Homeopathic Doctors and laboratories around the world rely on the equipment's accuracy for homeopathic treatments and energetic analysis.

The RAYOCOMP PS 100 can detect frequency imbalances in a 100 percent objective fashion. The equipment uses resonance and bio-feedback technology and can detect individual frequency patterns. The test results indicated that the Smart Chip inhabited specific frequency code (i.e. similar to the laser barcode scanning of items).

The equipment has successfully carried out millions of treatments. As well as testing for imbalance, disorders (physical as well as psychological) including destructive substances, such as chemicals, bacteria, fungi, viruses and parasites, which are often detected in humans. Far ahead of its time, this equipment has been specifically designed for the Homeopath Industry.

EXPOSURE TO EMF AND EMR

Cellular phones emit harmful electromagnetic frequency (EMF), or electromagnetic radiation (EMR). People who use cellphones every day without protection risk irreparable DNA breaks in brain cells. This slow exposure can tremendously impair membranes of the circulatory system, which could cause numerous health problems.

In North America alone it is estimated there are 262.2 million cellphones in use and that estimate keeps growing. And protection from the manufacturers is not being offered by them, or admission that they cause a health risk.

AlphaBio Centrix, R&D research team has developed a remarkable product called the Smart 5G Shield that will neutralize harmful EMF's and EMR's by providing precise frequencies that neutralize the electromagnetic frequencies to a natural state of oscillating frequencies. This field of frequency oscillations or bio resonance provides the energetic switch-boarding behind every cellular function.

(See comparison chart)

Comparison Chart

Comparison: Smart 5G Shield and another Cellphone Product

The test submitted uses the results from a German study that have identified (6) toxic Electro-magnetic radiation frequencies that emit from cellular telephones, they are as follows:

*22.50 Hz	40.00 Hz	77.50 Hz	78.50 Hz	89.50 Hz	***99.50 Hz**

* Most Critical Frequencies

Results from Evolution

Smart 5G Shield

Smart 5G Shield emits oscillating frequencies that immobilize and neutralize all (6) toxic frequencies

*22.50 Hz	40.00 Hz	77.50 Hz
78.50 Hz	**89.50 Hz**	***99.50 Hz** Most Important Frequency

* Most Critical Frequencies

Competitive CELLPHONE PRODUCT

The competition's cellphone chip produced (5) frequencies, but only produce two of the needed (6) frequencies that neutralize the harmful electromagnetic radiation frequencies

*22.50 Hz	37.00 Hz	39.00 Hz
78.50 Hz	***99.50 Hz** Most Important Frequency	Offer No Protection

* Most Critical Frequencies

AlphaBio Centrix, R&D conducted this test principle to identify toxic frequencies for the purpose of neutralizing their toxicity levels. The test also compared the effectiveness between the Smart 5G Shield protector and another cell phone chip.

Reported Information Regarding Danger from Cellphone Use

Sunday, 30 March 2018
CNN, and Fox News

Mobile Phone Dangers

Mobile cellphones could kill far more people than smoking or asbestos, a study by an award-winning cancer expert has concluded. He says people should avoid using them wherever possible and that governments and the mobile phone industry must take "immediate steps" to reduce exposure to their radiation.

The study, by Dr Vini Khurana, is the most devastating indictment yet published of the health risks. It draws on growing evidence – exclusively reported in the IoS in October – that using handsets for 10 years or more can double the risk of brain cancer. Cancers take at least a decade to develop, invalidating official safety assurances based on earlier studies which included few, if any, people who had used the phones for that long. Earlier this year, the French government warned against the use of mobile phones, especially by children. Germany also advises its people to minimize handset use, and the European Environment Agency has called for exposures to be reduced.

Professor Khurana – a top neurosurgeon, who has received 14 awards over the past 16 years, has published more than three dozen scientific papers – reviewed more than 100 studies on the effects of mobile phones. He has put the results on a brain surgery website, and a paper based on the research is currently being peer-reviewed for publication in a scientific journal.

He admits that mobiles can save lives in emergencies, but concludes that "there is a significant and increasing body of evidence for a link between mobile phone usage and certain brain tumors". He believes this will be "definitively proven" in the next decade. Noting that malignant brain tumors represent "a life-ending diagnosis", he adds: "We are currently experiencing a reactively unchecked and dangerous situation." He fears that "unless the industry and governments take immediate and decisive steps", the incidence of malignant brain tumors and associated death rate will be observed to rise globally within a decade from now, by which time it may be far too late to intervene medically. "It is anticipated that this danger has far broader public health ramifications than asbestos and smoking," says Professor Khurana, who told the IoS his assessment is partly based on the fact that three billion people now use the phones worldwide, three times as many as smoke. Smoking kills some five million worldwide each year, and exposure to asbestos is responsible for as many deaths in Britain as road accidents. Late last week, the Mobile Operators Association dismissed Khurana's study as "a selective discussion of scientific literature by one individual". It believes he "does not present a balanced analysis" of the published science, and "reaches opposite conclusions to the WHO and more than 30 other independent expert scientific reviews".

THE EQUIPMENT USED IN THE TEST RAYOCOMP PS 100

COMPANY AND PRODUCT PROFILE:

Biophysics Research Institute is a medical equipment business which has been involved for over 20 years in the development, manufacturing and sale of therapeutic and testing equipment in the ultra-fine bio-energy fields. In 1987 the company coined the term Bioresonance Therapy for therapy using the patient's own oscillations and/or those of substances. Today the Company speaks of Bioresonance Therapy to more accurately encompass the specialized highly differentiated electronic circuitry and extensive know-how developed over many years.

The specialist knowledge now available for the RAYOCOMP PS 100 device from basic and applied research is a vital component of this therapy. We are proud to have set certain standards in Bioresonance therapy. Thus, we can separate physiological and pathological oscillations one from another using a biological filter and use them simultaneously with different functions for different therapy options.

The range of options and, above all, effectiveness is further increased through band-pass technology which is what makes this method so unique and distinguishes it from all other techniques. Its special features include not only single frequency settings with certain pathogenic conditions but also the sweeping band-pass, phased raising and reduction of amplification, reciprocal amplification sweeps as well as analogue potential. You can obtain further information under RAYOCOMP PS 100 device. We began early on to support Bioresonance therapy with basic and applied research and to invest an above average proportion of the company's income in research.

The most important and particularly informative research work is soon to appear as a special volume. The workings and convenience of use of the RAYOCOMP PS 100 device have been refined since it first appeared on the market over 10 years ago. New findings from research and practice, i.e. the wealth of experience of users, have also been included in the overall therapy program and in applications software.

The company's main aim is to help doctors and non-medical practitioners to mitigate or cure disease without having to contend with harmful side effects and so to offer them an opportunity of identifying and successfully treating actual causes rather than symptoms. This project is supported not least by a series of books/technical publications on all aspects of RAYOCOMP PS 100 Bioresonance Therapy - both for the medical profession and for interested laypersons.

Meanwhile some 4,500 doctors from all specialties and non-medical practitioners around the world are working with RAYOCOMP PS 100 Bioresonance Therapy. **Our clients include general practitioners, ophthalmologists, chiropractors, surgeons, dermatologists, internal specialists, gynecologists, orthodontists, neurologists, orthopedics surgeons, and pediatricians, specialists in sports medicine, urologists, vets and dentists.**

The company places particular importance upon competent use of the technique. To this end a comprehensive well-structured training program with practical seminars delivered by experienced RAYOCOMP PS 100 therapists has been created which is continually extended and adapted to actual needs. Our seminar program is also DIN ISO 9002 and EN 46002 certified.

Over 38 colloquia featuring over 400 papers have been held for RAYOCOMP PS 100 users over the past 20 years. In addition, over the course of time, more than 1500 users have joined together in study groups and associations to ensure a continuous lively exchange of experience and information between users.

The company endeavor to offer RAYOCOMP PS 100 users top quality products and service, e.g. specialist advice, house journal, etc. A recent survey of our users confirmed this: Over 96% of respondents rated our service "very good" or "good"!

BIOPHYSICS RESEARCH INSTITUTE
Digital Biology Report

Note: The tests were performed using a RAYOCOMP PS 100 device that reacts to frequencies and can detect high levels of microwaves and environmental influences including harmful electro-smog.

The performance report on the CPD microchips was made by a representative of Biophysics Research Institute, using the Rayocomp PS 100 to test the following:

Biophysics Research Institute conducted the test especially for:

1) Testing 26 different energetic frequencies
2) Reaction to low and high-risk frequencies
3) Protections against harmful electromagnetic fields
4) Oscillating frequencies that cause blockage to the limbic core
5) Before and after reading with the CPD Phone Chip

The tests were conducted in three phases. The first phase included 2 hours of testing to determine the normal or baseline operating characteristics of the CPD Phone Chip. Phase 2 consisted of leaving the cellular phone in operation for 2 hours, or the approximate equivalence to 55 regular calls made, without the protection of the chip. Finally, Phase 3, an additional 2 hours with the CPD on the cellular phone to determine if indeed the comparisons were indicated by the Rayocomp PS 100.

The manufacturer claims that the Smart 5G Shield will help to reduce harmful electromagnetic fields, and protect the user from environmental influences such as electro-smog and pathological disturbances. The Smart 5G Shield is an add-on product that claims to reduce harmful frequencies and stimulate the body's own oscillation frequencies and as a result will help regulate the body's energetic system. The manufacturer is currently offering a one-year expiration date on the Smart 5G Shield.

Test Equipment:

The tests were performed using the RAYOCOMP PS 100 on the Smart 5G Shield. The equipment was set up to detect low and high frequencies that emit from any common mobile phone. Frequency output was taken from the microchips directly from the RAYOCOMP PS 100 which alleges to naturalize the variable load of frequencies set off by the cellular phone. The RAYOCOMP PS 100 measured the following:

- Natural oscillation frequencies
- Programmed frequencies during operating time
- Reduced EMR's
- Somatic frequencies
- Interference frequencies
- Activation on and off time
- Volume of electromagnetic fields
- Energetic load from the microchips
- Density of frequencies emitting from the microchips
- Internal energetic resonance from the body

A cellular phone without an electrical adaptor was used, allowing the measurement of frequencies to react without any electrical disturbance.

Test Procedure:

The Cellphone was tested without the microchips while on. The test indicated harmful microwaves were present. The cellphone phone was left on for 2 hours and was emitting low frequencies, which is a moderate load. At the end of the two hours data was collected. The Smart 5G Shield was then applied to the cellular phone per the manufacturer's instructions. The cellular phone was then in operation for an additional 2 hours and data was obtained.

RESULTS:

The charts below indicate the results of testing the Smart 5G Shield on a cell phone.

Testing Chart for Toxic Low Frequencies – German Studies (TABLE I)

Frequency Codes	Unprotected	Cellphone	Phone Chip	Protected Cellphone	In Use
	OFF	ON - In Use	OFF	ON IN USE	% Toxic Reduction
22.50	-28	-51 -153	+61	+34 -02	99.8%
40.00	-20	-31 -110	+49	+37 +03	100.3%
77.50	-03	-13 -28	+55	+43 -03	99.7%
78.50	-11	-22 -62	+60	+41 +03	100.3%
89.50	-10	-25 -70	+61	+41 -04	99.6%
99.50	-16	-52 -164	+71	+49 -04	99.6%
				Average Overall Change=	**99.893%**

REACTION FROM LOW FREQUENCIES UNPROCTECTED AND PROCTECTED RESULTS
Repeated data indicates that using Germany Frequencies on the Smart 5G Shield reduces harmful electromagnetic microwaves due from repeated usage of the cell phone by an average of **99.883%** after microchips were installed with continued protection to the cell phone user.

Testing Chart for Toxic High Frequencies – American Studies (TABLE II)

Frequency Codes	Unprotected	Cellphone	Phone Chip	Protected Cellphone	In Use
	OFF	ON - In Use	OFF	ON IN USE	% Toxic Reduction
0216	-08	-16 -59	+70	+34 -03	99.7%
0217	-12	-24 -72	+69	+31 +05	100.5%
0218	-29	-48 -171	+68	+32 -04	99.6%
0223	-25	-40 -144	+74	+30 +04	100.6%
0224	-45	-66 -178	+78	+40 -03	99.7%
0225	-48	-69 -176	+82	+53 -04	99.6%
				Average Overall Change=	**99.95%**

REACTION FROM HIGH FREQUENCIES UNPROCTECTED AND PROCTECTED RESULTS
Repeated data indicated that using American natural oscillating Frequencies detected high levels of toxic frequencies after 2 hours of testing with the Smart 5G Shield. The tests results show an average of 99.95% reduction of high frequencies.

Testing Chart for Immune System Energetic Response – (TABLE III)

Frequency Codes	Unprotected	Cellphone	Phone Chip	Protected Cellphone	In Use
	OFF	ON - In Use	OFF	ON IN USE	% Toxic Reduction
0498	-11	-26 -59	+71	+39 +11	99.7%
0509	-48	-81 -167	+81	+43 +13	99.6%
0528	-38	-118 -267	+91	+68 +31	100.5%
				Average Overall Change=	**99.933%**

REDUCTION OF HARMFUL FREQUENCIES CAUSING BLOCKAGE TO THE LIMBIC CORE

The specific frequencies programmed into the Smart 5G Shield were measured and results found an average 99.933% decrease in harmful frequencies. The test also indicated with continued use of the Smart 5G Shield the user can expect increased protection from environmental toxins.

DISCOMFORT FROM USE

No measurable discomfort was indicated. The decrease in harmful electromagnetic frequencies should improve the body's energetics and cope with external environmental influences.

CONCLUSIONS

Emissions from the cellular phone were measured and show a significant amount of low and high harmful EMR's. The Smart 5G Shield has shown to reduce these harmful EMR's including external environmental influences by 99.95% with the Smart 5G Shield is attached to the cellular phone, as shown on table I and II. The claimed effect of reduction of external influences on the immune system appears to be correct with test results on table III that show a 99.933% overall average reduction. Information of the brand name of the cellular phone and the manufacturer are withheld due to the test results.

SOME HEALTH EFFECTS LINKED WITH EMF'S

Depression	**Memory Loss**
Irritability	**Loss of Energy**
Inability to Concentrate	**Weakened Immune System**
Chronic Fatigue	**Headaches**

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

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Running Title:
Nerve Cell damage from GSM Mobile Phones

Key words:
Rats, cns, blood-brain barrier, neuronal damage, microwaves, mobile phones.

Acknowledgements
We thank BMA Susanne Strömblad and BMA Catarina Blennow at the Rausing Laboratory for excellent
technical assistance. The work was supported by a grant from The Swedish Council for Work Life Research.

Abbreviations
BBB Blood-brain barrier
GSM Global System for Mobile Communications
MRI Magnetic Resonance Imaging
RF Radiofrequency electromagnetic fields
TEM-cell Transverse Electromagnetic transmission line cell

Abstract

The possible risks of radio-frequent electromagnetic fields for the human body, is a growing concern for the society. We have earlier shown that weak pulsed microwaves give rise to a significant leakage of albumin through the blood-brain barrier (BBB). Now the author has investigated whether a pathological leakage over the BBB might be combined with damage to the neurons. Three groups of each 8 rats were exposed for 2 hours to GSM mobile phone electromagnetic fields of different strengths. We found, and present here for the first time, highly significant ($p<0.002$) evidence for neuronal damage in the cortex, the hippocampus and the basal ganglia in the brains of exposed rats.

Introduction

The largest human biological experiment ever! So has the voluntary exposure of the brain to microwaves from handheld mobile phones by one fourth of the world's population been called (Salford et al.2001). Within the near future microwaves will be emitted also by an abundance of other appliances in the cordless office and also in the home. The possible risks of radiofrequency electromagnetic fields (RF) for the human body, is a growing concern for the society. For a review see Hyland (Hyland 2000). Most researchers in the field have dwelled on the question whether RF may induce or promote cancer growth. Some have indicated increased risk (Hardell et al.2002; Repacholi et al.1997) while most studies including our own have shown no effects (Salford et al.1997a) or even a decreased risk (Adey et al.1999)

The possible risks of microwaves for the human body has attracted interest since the 1960-ies, e.g. before the advent of mobile phones, when radar and microwave ovens posed a possible health problem. Oscar and Hawkins early performed studies on effects of RF upon the BBB (Oscar and Hawkins1977). They demonstrated that at very low energy levels (< 10 W/m2); the fields in a restricted exposure window caused a significant leakage of 14C mannitol, insulin and also dextrin (same molecular weight as albumin) from the capillaries into the surrounding cerebella brain tissue. These findings, however, were not repeated in a study using 14C-sucrose (Gruenau 1982). In a recent in-vitro study it has been shown that EMF at 1.8 GHz increases the permeability to sucrose of the BBB (Schirmacher et al. 2000).

Shivers (Shivers et al.1987; Prato et al.1990) examined the effect of MRI upon the rat brain. They showed that the combined exposure to RF, pulsed and static magnetic fields gave rise to a significant pinocytotic transport of albumin from the capillaries into the brain. Inspired by this work, our group has since 1988 studied the effects of different intensities and modulations of 915 MHz RF in a rat model where the exposure takes place in a TEM-cell during various time periods. In series of more than 1600 animals, we have proven that subthermal energies from both pulse-modulated and continuous RF fields – including those from real GSM mobile phones - have the potency to significantly open the BBB for the animals´ own albumin (but not fibrinogen) to pass out into the brain and to accumulate in the neurons and glial cells surrounding the capillaries (Malmgren1998; Persson et al.1997; Persson and Salford 1996; Salford et al.1992, 1993, 1994, 1997b, 2001) (fig 1).

These results are duplicated recently in another laboratory (Töre et al. 2001). Similar results are found by others (Fritze et al.1997).

We and others (Oscar and Hawkins1977; Persson et al.1997) have pointed out that when such a relatively large molecule as albumin may pass the BBB, also many other smaller molecules, including toxic ones, may escape into the brain due to the exposure to RF. We have hitherto not concluded that such leakage is harmful for the brain. It is shown by Hassel, however, that autologous albumin injected into the brain tissue of rats, leads to damage to neurons at the injection site when the concentration of albumin in the injected solution is at least 25% of that in blood (Hassel et al.1994). In the present study, we have investigated whether leakage over the BBB might cause damage to the neurons.

Material and Methods

A Transverse Electromagnetic transmission line cell (TEM-cell) used for the RF exposure of rats was designed by dimensional scaling from previously constructed cells at the National Bureau of Standards (Crawford1974). TEM-cells are known to generate uniform electromagnetic fields for standard measurements. A genuine GSM mobile phone with a programmable power output is connected via a coaxial cable to the TEM-cell. No voice modulation was applied.

The cell is enclosed in a wooden box (15 x 15 x 15 cm) that supports the outer conductor and central plate. The outer conductor is made of brass-net and is attached to the inner walls of the box. The center plate, or septum, is constructed of aluminum. The TEM-cells are placed in a temperature-controlled room and the temperature in the TEM-cells kept constant by circulating room air through holes in the wooden box.

The SAR-distribution in the rat brain has been simulated with the FDTD-method (Martens et a. 1993) and found to vary less than 6 dB in the rat brain. The rats are placed in plastic trays (12 x 12 x 7 cm) to avoid contact with the central plate and outer conductor. The bottom of the tray is covered with absorbing paper to collect urine and feces. Thirty-two male and female Fischer 344 rats aged 12 – 26 weeks and weighing 282 ± 91 g were divided into 4 groups of each 8 rats. The peak output power from the GSM mobile telephone fed into two TEM-cells simultaneously for 2 hours were 10 mW, 100 mW and 1000 mW per cell, respectively. This exposed the rats to peak power densities of 0.24. 2.4 and 24 W/m2, respectively. This exposure resulted in average whole-body specific absorption rates (SAR) of 2 mW/kg, 20 mW/kg and 200 mW/kg, respectively.

For further details about exposure conditions and SAR calculations, see (Martens et al. 1993; Malmgren 1998). The fourth group of rats was simultaneously kept for 2 hours in non-activated TEM cells. The animals were awake during the exposure and could move and turn within the exposure chamber. The animals in each exposure group were allowed to survive for about 50 days after exposure. They were carefully observed daily for neurological or behavioral abnormalities during this period at the end of which they were anaesthetized and sacrificed by perfusion-fixation with 4% formaldehyde.

The brains were removed from the skull by non-traumatic technique (resection of bone structures at the skull base, followed by a midline incision from the foramen magnum to the nose) after an extended in situ post mortem fixation time of 30 minutes. Each brain was sectioned coronally in 1-2 mm thick slices, which all were embedded in paraffin and cut at 5 micrometer, stained for RNA/DNA with cresyl violet to show dark neurons. Applying albumin antibodies (Dakopatts), albumin is revealed as brownish spotty or more diffuse discolorations (Salford et al. 1994). The occurrence of "dark neurons" was judged semi-quantitatively by the neuropathologist as 0 (no or occasional dark neurons), 1 (moderate occurrence of dark neurons) or 2 (abundant occurrence). The microscopical analysis was performed blind to the test situation.

The Kruskal Wallis one-way analysis of variance by ranks was used for a simultaneous statistical test of the score distributions for the 4 exposure conditions. When the null hypothesis could be rejected, comparisons between controls and each of the exposure conditions was made with the Mann-Whitney non-parametric test for independent samples.

Results and Discussion

Controls and test animals alike showed the normal diffuse positive immuno-staining for albumin in hypothalamus, a kind of built-in method control. Control animals showed either no or an occasional and often questionable positively for albumin outside the hypothalamus (fig 1a). In one control animal a moderate number of dark neurons were observed while in all the other animals no such change was present. Exposed animals usually showed several albumin positive foci around the finer blood vessels in white and gray matter (fig 1b). Here the albumin had spread in the tissue in between the cell bodies, and surrounded neurons, which were either free of albumin or in some foci containing albumin. Also scattered neurons, not associated with albumin leakage between the neurons, were positive.

The cresyl violet staining revealed scattered and grouped dark neurons, which were often shrunken and dark staining, homogenized with loss of discernible internal cell structures. Some of these dark neurons were also albumin positive or showed cytoplasmic microvacuoles indicating an active pathological process. There were no hemorrhages and no discernible glial reaction, astrocytic or microglial, adjacent to changed neurons. Changed neurons were seen in all locations, but especially the cortex, hippocampus and basal ganglia, mixed in among normal neurons (fig 2). The percentage abnormal neurons are roughly appreciated to be maximally around 2%, but in some restricted areas dominated the picture.

The occurrence of dark neurons under the different exposure conditions is shown in figure, 3 which shows a significant positive relation between EMF dosage (SAR) and number of dark neurons. A combined non-parametric test for the 4 exposure situations simultaneously revealed that the distributions of scores differed significantly between the groups ($p<0.002$). We present here for the first-time evidence for neuronal damage caused by non-thermal microwave exposure. The cortex as well as the hippocampus and the basal ganglia in the brains of exposed rats contain damaged neurons. We realize that our study comprises few animals, but the combined results are highly significant and exhibit a clear dose-response relation.

The observed dark neurons are deemed not to be artifacts for the following reasons. The brains were perfusion fixed in situ and removed traumatically. The dark neurons were intermingled with normal appearing neurons (see fig 2a, b). Further, the presence of vacuoles in several of the dark neurons is a clear sign that damage occurred in the living animal. We cannot exclude that the neuronal change described may represent apoptotic cell death. The neuronal albumin uptake and other changes described would seem to indicate a serious neuronal damage, which may be mediated through organelle damage with release of not only hydrolytic lysosomal enzymes but also e.g. sequestered harmful material, such as heavy metals, stored away in cytoplasmatic organelles (lysosomes). The time between last exposure and sacrifice is of great importance for the detection of foci of leakage since extravasated albumin rapidly diffuses down to, and beyond, concentrations possible to demonstrate accurately immunobiologically.

However, the initial albumin leakage into the brain tissue (seen within hours in about 40% of exposed animals in our previous studies) may start a secondary BBB opening, leading to a vicious circle – as we demonstrate albumin leakage even 8 weeks after the exposure. The reason for our choice of 12 to 26 weeks old rats is that they are comparable to human mobile phone addicted teen-agers with respect to age. The situation of the growing brain might deserve special concern from the society since biological and maturational processes are particularly vulnerable.

The intense use of mobile phones by youngsters is a serious memento. A neuronal damage of the kind, here described, may not have immediately demonstrable consequences, even if repeated. It may, however, in the long run, result in reduced brain reserve capacity that might be unveiled by other later neuronal disease or even the wear and tear of ageing. We cannot exclude that after some decades of (often), daily use, a whole generation of users, may suffer negative effects maybe already in their middle age.

Correction

Figure 1 in the original manuscript was cited in "Materials and Methods" and illustrated albumin leakage that we had reported earlier. The figure showed examples of cross-sections of the brains of rats sacrificed immediately after exposure to microwaves. Because this could be misunderstood, in the interest of clarity and with the permission of the editor, we have replaced that figure. The new Figure 1 is now cited in "Results" and shows animals from the present study. Figure 1A illustrates the brain of a sham-exposed control animal, and Figure 1B illustrates an animal exposed to 2mW/kg for 2 hr.

Reference List

Adey W, Byus C, Cain C, Higgins R, Jones R, Kean C et al. 1999. Spontaneous and Nitrosourea induced Primary Tumors of the Central Nervous System in Fisher 344 rats exposed to 836 MHz Modulated Microwaves. Radiat Res 152:293-302. Crawford M. 1974. Generation of standard EM field using TEM transmission cells. IEEE Trans Elecromagn Compat EMC-16:189-195. Fritze K, Sommer C, Schmitz B, Mies G, Hossman K, Kiessling M et al. 1997. Effect of global system for mobile communication (GSM) microwave exposure on blood-brain barrier permeability in rat. Acta Neuropathol (Berlin) 94:465-470. Gruenau SP, Oscar KJ, Folker MT, Rapoport SI. 1982. Absence ofmicrowave effect on blood-brain-barrier permeability to [C-14]-labeled sucrose in the conscious rat. Experimental Neurology 75: 299-307. Hardell L, Hallquist A, Hansson Mild K, Carlberg M, Påhlson A, Lilja A. 2002. Cellular and Cordless telephones and the risk for brain tumors. European Journal of Cancer Prevention 11:377-386. Hassel B, Iversen E, Fonnum F. 1994. Neurotoxicity of Albumin in-vivo. Neuroscience Letters 167:29-32. Hyland G. 2000. Physics and Biology of Mobile Telephony. Lancet 356:1833-1836. Malmgren L. 1998. Radio frequency systems for NMR-imaging-Coil development and studies of non-thermal biological Effects. Series of Licentiate and Doctoral Theses, No. 6, Department of Applied Electronics, Lund University, Lund, Sweden. Martens L, Van Hese J, De Sutter D, De Wagter C, Malmgren L, Persson BRR, Salford LG. 1993. Electromagnetic field calculations used for exposure experiments on small animals in TEM-cells. Bioelectrochemistry and Bioenergetics 30:73-81 Oscar K, Hawkins T. 1977. Microwave alteration of the blood-brain barrier system of rats. Brain Res 126:281- 293. Persson B, Salford L. 1996. Permeability of the blood-brain barrier in rats induced by continuous wave and pulse-modulated 915 MHz electromagnetic radiation exposure in TEMcells. (Chiabrera A, Juutilainen J, eds). Brussel:EU DG XIII,66-72.

Persson B, Salford L, Brun A. 1997. Blood-brain barrier permeability in rats exposed to electromagnetic fields used in wireless communication. Wireless Networks 3:455-461. Prato F, Frappier J, Shivers R, Kavaliers M, Zabel P, Drost D et al. 1990. Magnetic resonance imaging increases the blood-brain barrier permeability to 153-gadolinium diethylenetriaminepentaacetic acid in rats. Brain Res 523:301- 304. Repacholi M, Basten A, Gebski V, Noonan D, Finnie J, Harris A. 1997. Lymphomas in Eμ-Pim1 Transgenic Mice Exposed to Pulsed 900 MHz Electromagnetic Fields. Radiat Res 147:631-640. Salford LG, Brun A, Eberhardt J, Malmgren L, Persson B. 1992. Electromagnetic fieldinduced permeability of the blood-brain barrier shown by immuno-histochemical methods. In: Interaction Mechanism of Low - Level Electromagnetic Fields in Living Systems (Nordén B, Ramel C, eds). Oxford: Oxford UniversityPress,251-258. Salford LG, Brun A, Eberhardt J, Persson B. 1993. Permeability of the blood-brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50, 200 Hz. Bioelectrochemistry and Bioenergetics 30:293-301. Salford LG, Brun A, Sturesson K, Eberhardt J, Persson B. 1994. Permeability of the Blood-Brain barrier Induced by 915 MHz Electromagnetic Radiation, Continuous Wave and Modulated at 8, 16, 50, and 200 Hz. Microscopy Research and Technique 27:535-542. Salford LG, Brun A, Persson B. 1997a. Brain tumor development in rats exposed to electromagnetic fields used in wireless communication. Wireless Networks 3:463-469. Salford LG, Persson B, Brun A. 1997b. Neurological Aspects on Wireless Communication. In: Non-Thermal effects of RF Electromagnetic Fields. Non-Thermal effects of RF Electromagnetic Fields (Bernhardt JH, Matthes R, Repacholi MH, eds). Munich, Germany:International Commission on Non-Ionizing Radiation Protection,131-143. Salford LG, Persson B, Malmgren L, Brun A. 2001. Téléphonie Mobile et Barrière Sang - Cerveau. In: Téléphonie Mobile - Effets Potentiels sur la Santé des Ondes Électromagnétiques de Haute Fréquence. (Pietteur Marco, ed.) Embourg, Belgium. 141-152. Schirmacher A, Winters S, Fischer S, Goeke J, Galla HJ, Kullnick U, et al. 2000. Electromagnetic fields (1.8 GHz) increase the permeability to sucrose of the blood-brain barrier in vitro. Bioelectromagnetics 21: 338-345. Shivers R, Kavaliers M, Teskey G, Prato F, Pelletier R. 1987. Magnetic resonance imaging temporarily alters blood-brain barrier in the rat. Neuroscience Letters 76:25-31. Töre F, Dulou P-E, Haro E, Veyret B, Aubineau P. 2001. Two-hour Exposure to 2 W/kg, 900 MHz GSM microwaves induces Plasma Protein Extravasation in Rat Brain. In: Proceedings from the 5th International Congress of the European Bioelectromagnetics Association, 6 September 2001 (Hietanen M, Jokela K, Juutilainen, J, eds). Finnish Institute of Occupational Health, Helsinki, 43-45.

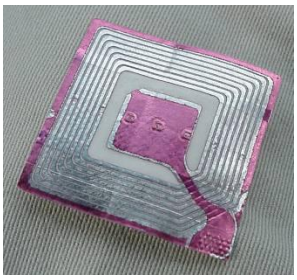
Figure Legends

Fig. 1. (a) Slightly enlarged cross section of central parts of the brain of an unexposed control rat, stained for albumin, which appears brownish in the central inferior parts of the brain, the hypothalamus, a normal feature.
(b) As (a) for an RF exposed rat, 2 mW/kg average whole body SAR, stained for albumin, which appears brownish in multiple small foci representing leakage from many vessels.
Fig. 2. (a) Row of nerve cells in a section of the pyramidal cell band of the hippocampus in a RF exposed rat. Among the normal big and pale blue nerve cells there are interspersed black and shrunken nerve cells, so called dark neurons. Microscopical picture stained with Cresyl violet, high magnification
(b) The cortex of an RF exposed rat, showing normal nerve cells pale blue, intermingled with abnormal, black and shrunken "dark neurons" at all depths of the cortex but least in the superficial upper layers. Microscopical picture stained with Cresyl violet, high magnification.
Fig 3. Distribution of scores for the occurrence of "dark neurons" as function of exposure condition. The dotted line connects mean values for each condition. A simultaneous nonparametric comparison of all 4 conditions revealed significant differences ($p<0,002$). The pvalues in the figure depict comparisons between each experimental condition and controls.

Similar Products

Radio Frequency (RF) Systems are the most widely used systems in the United States today and RF tags and labels are getting smaller all the time. The product shown below contains a miniature, disposable **electronic circuit** and **antenna,** similar to AlphaBio Centrix's technology. The product responds to a specific set of frequency emitted by a transmitter antenna (usually one pedestal of the entry/exit gate).

The response from the product is then picked up by an adjacent receiver antenna (the other pedestal). This processes the label response signal and will trigger an alarm when it matches specific criteria. The distance between the two gates, or pedestals, can be up to 80 inches wide. Operating frequencies for RF systems generally range from 2 to 10 MHz (millions of cycles per second); this has become standard in many countries.



The RF circuit inside looks like this

The **Electromagnetic (EM) system**, which is dominant in Europe, is used by many retail chain stores, supermarkets and libraries around the world. In this technology, a magnetic, iron-containing strip with an adhesive layer is attached to the merchandise. This strip is not removed at checkout -- it's simply deactivated by a scanner that uses a specific highly intense magnetic field. One of the advantages of the EM strip is that it can be reactivated and used at a low cost. What most people refer to as an electromagnetic tag is actually a metal wire or ribbon that has high **permeability**, making it easy for magnetic signals to flow through it. A magnetized piece of semi-hard magnetic material (basically, a weak magnet) is put up next to the active material to deactivate it. When you magnetize the semi-hard material, it saturates the tag and puts it in its inactive saturated state.

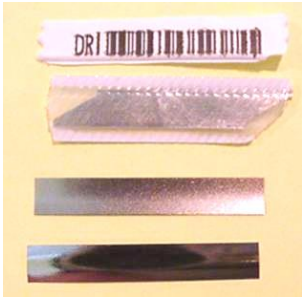
The EM system works by applying intensive low frequency magnetic fields generated by the transmitter antenna. When the strip passes through the gate, it will transmit a unique frequency pattern. This pattern is, in turn, being picked up by an adjacent receiver antenna. The small signal is processed and will trigger the alarm when the specific pattern is recognized. Because of the weak response of the strip, the low frequency (typically between 70 Hz and 1 kHz) and intensive field required by the EM system, EM antennas are larger than those used by most other EAS systems.

> The maximum distance between entry pedestals is 40 inches. Also, because of the low frequency here, the strips can be directly attached to metal surfaces. That's why EM systems are popular with hardware, book and record stores

Acousto-Magnetic System

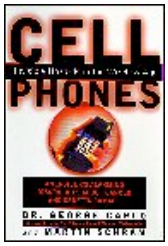
Another magnetic technology is the **acousto-magnetic system**, which has the ability to protect wide exits and allows for high-speed label application. It uses a transmitter to create a surveillance area where tags and labels are detected. The transmitter sends a radio frequency signal (of about 58 kHz) in pulses, which energize a tag in the surveillance zone. When the pulse ends, the tag responds, emitting a single frequency signal like a tuning fork. While the transmitter is off between pulses, the tag signal is detected by a receiver.

A microcomputer checks the tag signal detected by the receiver to ensure it is at the right frequency, is time-synchronized to the transmitter, and that it is at the proper level and the correct repetition rate. If all these criteria are met, the alarm occurs. In each case, an EAS tag or label is attached to an item. The tag is then **deactivated**, or taken from an active state where it will alarm an EAS system to an inactive state where it will not flag the alarm. The disposable tag is deactivated by swiping it over a pad or with a handheld scanner that "tells" the tag it's been authorized to leave the store. If the item has not been deactivated or detached by the clerk, when it is carried through the gates, an alarm will sound. The use of EAS systems does not completely eliminate shoplifting. However, experts say, theft can be reduced by 60 percent or more when a reliable system is used.



Magnet-based systems have a small wire or metal strip hidden in the tag

CELL PHONE BOOK



Invisible Hazards in the Wireless Age
By Dr. George Carlo & Martin Schram

Also subtitled, "An Insider's Alarming Discoveries about Cancer and Genetic Damage", this gripping narrative answers the question: are 500 million people worldwide exposed to harmful radiation every time they use a cellphone? A disturbing tale of government neglect, corporate manipulation, and commonsense caution for the concerned citizen. Must reading for anyone who thinks that the government or scientific community is truly looking after the public health. The book details the alarming signs about the dangers of cell phones as they emerged: interference with heart pacemakers, deep penetration of developing skulls of children by phone radiation, deterioration of the blood brain barrier, and most importantly (why haven't we heard more about this one in the news??) RF radiation from phones creates micronuclei in human blood cells… a type of genetic damage known to be a diagnostic marker for cancer! Very controversial. Includes recommendations for safer use of phones. 300 pages, hard cover, 2001.

LIST OF BOOKS

Note: we have tried to include as much literature as we could find relevant to our research. Consequently, this list is provided for information purpose only: the presence of a reference does not imply our automatic agreement with what is described in it.

Author: Michel SCHIFF

Title: "The Memory of Water" (Ed. Thorsons 1995, isbn: 0722535341)

Title: "Un cas de censure dans la science (La mémoire de l'eau)" (Ed. Albin Michel 1994, isbn: 2-226-07511-9)

Title: "Das Gedächtnis des Wassers" (Zweitausendeins 04/1997, isbn: 3-86150-220-8)

Author: Jean-Marie PELT

Title: "Les langages secrets de la nature" (Editor: Fayard 05/1996, ean13: 9782213596105 & 9782213961002)

Title: "La vie sociale des Plantes" "The Secret Life of Plants"

Author: Yves ROCARD

Title: "Les sourciers" (PUF - Que sais-je 08/1997, ean13: 9782130435396)

Title: "La science et les sourciers : baguettes, pendules, biomagnetisme" (Dunod 12/1995, ean13: 9782100029969)

Author: Bernard MARICHAL, HERVIEUX LAURENT

Title: "La pratique de l'immunothérapie à doses infinitésimales" (Ed. Roger Jollois)

Author: Rolland CONTE, Henri BERLIOCCHI, Yves LASME, Gabriel VERNOT

Title: "Théorie des hautes dilutions et aspects expérimentaux" (Ed. Polytechnica 1996, ean13: 9782840540458) "Theory of high dilutions and experimental aspects" (Ed. Polytechnica 1996, ean13: 9782840540465) 9782840540465)

Author: Pr Régis Dutheil & Brigitte Dutheil

Title: "La Médecine superlumineuse" (Ed. S A N D, 1992, ean13: 9782710705031)

Author: Roger SANTINI

Title: "Notre santé face aux champs électriques et magnétiques" (Sully 1995, ean13: 9782911074011)

Author: Théo Collborn, Diane Dumanovski, John Peterson Myers

Title: "L'homme en voie de disparition ?" (Préf. Al Gore, Ed. Terre Vivante 05/1997, ean13: 9782904082627)

Author: Cyril W. Smith, Simon Best

Title: "Electromagnetic Man (Health & Hazard in the electrical environment)" (Ed. Dent 1988,
isbn 0460046985)

Author: Bjorn E. W. Nordenstrom

Title: "Biologically Closed Electric Circuits" (Nordic Medical Publications 1983, isbn 9197043206)

Author: Fritz-Albert Popp, K.H. Li, Q. Gu
Title: "Recent Advances in Biophoton Research and Its Applications" (World Scientific Pub Co; May 1992; ISBN: 9810208553)

ADDITIONAL BOOKS ON MAGNETIC THERAPY

Biomagnetic Handbook: A Guide to Medical Magnets: The Energy of Tomorrow
William H. Philpott, M.D. and Sharon Taplin

The Pain Relief Breakthrough
Julian Whitaker, MD, and Brenda Adderley, MHA.

The Body Electric: Electromagnetism and The Foundation of Life
Robert O. Becker, M.D., and Gary Seldon

The Body Magnetic
Dr. Buryl Payne

Discovery of Magnetic Health: A Health Care Alternative
George J. Washnis and Richard Z. Hircak

Magnetic Therapy in Eastern Europe: Review of 30 Years of Research
J. Jerabek & William Pawluk, MD

Magnet Therapy: Balancing Your Body's Energy Flow for Self-Healing
Holger Hanneman

Magnet Therapy Theory and Practice
Dr. Neville S. Bengali

Magnetism and its Effect on the Living System
Albert Roy Davis and Walter C. Rawls, Jr.

Medical Magnets: Nature's Healing Energy
Barbara Gordon

The Invisible Force Traditional Magnetic Therapy
Fred Rinke C.M.T.A.

Principles of Magnetic Therapy
Dr Richard Broeringmeyer