

May 2015



ECERI

European Cancer and Environment Research Institute

5th Paris Appeal Congress, 18th of May, 2015

Royal Academy of Medicine, Belgium

**IDIOPATHIC ENVIRONMENTAL INTOLERANCE: WHAT
ROLE FOR ELECTROMAGNETIC FIELDS AND
CHEMICALS?**



ABSTRACTS



**Royal
Academy
of Medicine
Belgium**



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**IDIOPATHIC ENVIRONMENTAL INTOLERANCE: WHAT ROLE FOR
ELECTROMAGNETIC FIELDS AND CHEMICALS?**

**A FOCUS ON ELECTROHYPERSENSITIVITY (EHS) AND
MULTIPLE CHEMICAL SENSITIVITY (MCS)**



Organisators



Founded February 2011 by European scientists and Members of the European Parliament (MEPs), **ECERI** is an international non-profit organization which currently coordinates fifteen research centres specialized in the field of oncology, genetics and epigenetics, which also works on environment-related diseases or disorders, gene-environment interactions and suspected environmental diseases.

ECERI's ultimate goal is to gain understanding of the biological mechanisms of genesis of cancer and other so-called environment-related diseases and disorders, in order to promote primary prevention methods that reduce morbidity and mortality.

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ISDE is an environmental independent, non-governmental non-profit organisation of medical doctors. Created on 25 November 1990, it has national and regional member organisations in over 25 countries.

The main purpose of **ISDE** is to help defend environment both locally and globally to prevent numerous illnesses, ensure the necessary conditions for health, and improve the quality of life to safeguard the health of our own generation and of future ones. **ISDE** was established as a tool for educating and updating physicians and the general public, and stimulating awareness and initiatives by public and private bodies, in particular governmental agencies.

Congress Organisation Committee:

Dominique Belpomme (France), Ernesto Burgio (Italy), Christine Campagnac (France), Vincent Castronovo (Belgium), Janos Frühling (Belgium), Jean Huss (Luxembourg), Philippe Irgaray (France), Paul Lannoye (Belgium), Peter Ohnsorge (Germany).

Responsible for logistic organisation: Sarra Selatnia (France) (sselatnia.artac@gmail.com)

PROGRAM OF THE CONGRESS

9:00 – 9:15 Opening and Welcome:
Dominique Belpomme, France, Janos Frühling, Belgium

9:15 –9:30 **Introductory conference: Lennart Hardell, Sweden**

9:30 – 9:50 **David Carpenter, USA**
History of the microwave syndrome

9:50 - 10:00 Discussion

10:00 – 10:20 **William Rea, USA**
History of Chemical Sensitivity

10:20 - 10:30 Discussion

10:30 – 10:50 **Ernesto Burgio, Italy**
Electromagnetic Field fetal effects

10:50 - 11:00 Discussion

11:00 – 11:15 Break

First session - Chairmen: David Carpenter, USA and Lennart Hardell, Sweden

11:15 - 11:35 **Igor Belyaev, Slovak Republic**
Electrohypersensitivity: input of mechanistic studies with low-intensity radiofrequency and extremely low frequency electromagnetic fields

11:35 - 11:45 Discussion

11:45 - 12:05 **André Vander Vorst, Belgium**
Electromagnetic fields effects on organisms

12:05 - 12:15 Discussion

12:15 - 12:35 **Michael Kundi, Austria**
Problems of objective assessment of idiopathic environmental intolerance related to electromagnetic fields

12:35 - 12:50 Discussion

12:50 – 13:00 **Magda Havas: *presentation of the International EMF Scientist Appeal***

13:00 – 14:00 Lunch break

Second session- Chairmen: **Cindy Sage**, USA and **Olle Johansson**, Sweden

14:00 – 14:20 **Magda Havas**, Canada

Heart Rate Variability (HRV) as a Diagnostic Tool in Electrohypersensitivity (EHS)

14:20 – 14:30 Discussion

14:30 - 14:50 **Olle Johansson**, Sweden

The functional impairment electrohypersensitivity - from theory to practice

14:50 - 15:00 Discussion

15:00 - 15:20 **Dominique Belpomme**, France

Electrohypersensitivity and multiple chemical sensitivity: two clinic-biological aspects of the same disorder?

15:20 - 15:30 Discussion

15:30 - 15:45 Break

Third session - Chairmen: **Michael Kundi**, Austria and **Joachim Mutter**, Germany

15:45 - 16:05 **Seyed Mohammad Javad Mortazavi**, Iran

Electromagnetic fields and dental mercury

16:05 - 16:15 Discussion

16:15 - 16:35 **Joachim Mutter**, Germany

Toxicity of heavy metals, especially mercury and interaction with HF-EMF

16:35 - 16:45 Discussion

16: 45 - 17: 05 **Peter Jennrich**, Germany

Heavy metals and chronic diseases: what therapeutic approaches?

17:05 - 17:15 Discussion

17:15 – 18:00 Roundtable Early warnings: what lessons for the future?

Moderators: **David Gee**, UK with the collaboration of **Michèle Rivasi**, France and **Jean Huss**, Luxembourg

Devra Davis, USA

A discussion of synergies between EMF and chemical exposures

Gérard Ledoigt, France

Synergistic health effects of chemical pollutants and electromagnetic fields

Approval of the Declaration on electrohypersensitivity and chemical sensitivity

Igor Belyaev, Head, Laboratory of Radiobiology, Cancer Research Institute, Slovak Academy of Science, Bratislava, Slovak Republic

Dominique Belpomme, Director ECERI, Brussels, Belgium, Professor in medical Oncology, Paris V University Hospital, France

Ernesto Burgio, Paediatrician, ISDE, Italy

David Carpenter, Director, Institute for Health and the Environment, University at Albany, Professor, Environmental Health Sciences, USA

Devra Lee Davis, PhD MPH, Founder and President of Environmental Health Trust, Wyoming, USA

David Gee, Institute of Environment, Health, and Societies, Brunel University, London, UK

Lennart Hardell, Epidemiologist, Professor at Örebro University Hospital in Örebro, Sweden

Magda Havas, Associate Prof of Environmental & Resource Studies at Trent University, Canada

Jean Huss, Honorary member of the Luxembourg Parliament and of the European Council Parliament, founder of the AKUT NGO, Luxembourg

Peter Jennrich, M.D, Würzburg, Germany

Olle Johansson, Neuroscientist, Professor in Experimental Dermatology, Department of Neuroscience, at the Karolinska Institute, Sweden

Michael Kundi, Professor, Medical University Vienna, Center for Public Health, Institute of Environmental Health, Austria

Gerard Ledoigt, Professor of Biology, Professor Emeritus, Blaise Pascal University, Clermont-Ferrand, France

Seyed Mohammad Javad Mortazavi, Professor of Medical Physics, President of the Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC) Shiraz University of Medical Sciences, Iran

Joachim Mutter, Environmental Health Center, Konstanz, Germany

William Rea, M.D., Thoracic and cardiovascular surgeon founder and director of the Environmental Health Center (EHC-D), Dallas, USA

Michèle Rivasi, Member of the European Parliament, France

Cindy Sage, MA, Co-Editor, BioInitiative Reports, USA

André Vander Vorst, Professor Emeritus Microwave Laboratory UCL, Belgium

Warm thanks to the partners of this congress

Fondation Pour une Terre Humaine, Switzerland

Léa Nature, France

OSATO Research Institute, Japan

Fondation Un Monde par Tous, France

With the support of associations

Akut, Luxembourg

Association for Therapeutical Research Against Cancer (ARTAC), France

European Academy for Environmental Medicine (EUROPAEM), Germany

GRAPPE (Thinking and Action Group for an Ecologic Policy), Belgium

PHIRE (Physician's Health Initiative for Radiation and Environment), UK

Opening of the congress and Welcome



Janos FRUHLING



Dominique BÉLPOMME

Opening talk

Ladies and Gentlemen

Dear Friends and Colleagues

Welcome to Brussels, the capital of the European Union Member States. I would like to thank the President of the Royal Academy of Medicine of Belgium and its Honorary Permanent Secretary, Professor Janos Frühling, who have honored us by providing this beautiful Albert II Hall for the fifth conference of the Paris Appeal.

I am particularly grateful to the Royal Academy of this country as it is quite open to the new public health problems that many people in the world are facing due to the degradation of our environment and it is very much ahead of its time in that field.

I would also like to thank David Carpenter and Cindy Sage who have agreed to be with us today and who, as we know, have coordinated the drafting of the two reports "Bioinitiative"¹. Both reports constitute an essential scientific basis for those willing to understand objectively, that is to say free from any socio-economic or political pressure, what the deleterious effects of electromagnetic fields on health really are.

The importance of works in this field, and more specifically in that of electrohypersensitivity, should be highlighted, and I would now like to thank more particularly Lennart Hardell, Michael Kundi, Olle Johansson and Igor Belayev for being with us today.

Likewise, we should emphasize the experience acquired over many years by William Rea, and the quality of works carried out by Claudia Miller in the field of multiple chemical sensitivity, Claudia Miller who unfortunately had to cancel her contribution to this conference due to last-minute health issues.

Thank you also to Ernesto Burgio, as the representative of the International Society of Doctors for the Environment, ISDE that in connection with the European Cancer and Environment Research Institute, ECERI, sponsored the fifth congress of the Paris Appeal. And finally thank you to André Van Der Vorst from Belgium, to Magda Havas from Canada, to Devra Lee Davis from USA, to Gérard Ledoigt from France, to Joachim Mutter and Peter Jennrich from Germany and to Mohammad Javad Mortazavi from Iran for their contributions and more particularly, to David Gee who, alongside the European MP Michèle Rivasi, has kindly agreed to host the roundtable that will close this congress at the end of the day.

As we know, it is to the American allergist Theron G Randolph that we owe the first clinical description, fifty years ago, of what is commonly called today the multiple chemical sensitivity syndrome². Since the workshop on multiple chemical sensitivities organized in 1992 in the United States at the request of the US Environmental Protection Agency³, commendable progress has been made in the definition and understanding of this syndrome, which led in 1999 to an international consensus meeting establishing the clinical criteria for the diagnosis⁴.

Multiple chemical sensitivity or MCS is indeed a chronic condition with reproducible symptoms in response to low levels of exposure to multiple chemicals. These symptoms become less intense or disappear when exposure to chemicals stops.

We have no reliable easy-to-use tests to diagnose these multiple chemical sensitivity and/or electrohypersensitivity syndromes clinically. To this we should add the first description of electrohypersensitivity in the years 2000 in France by René Santini⁵ and the numerous scientific studies that followed significantly burdened the understanding of pathophysiological mechanisms involved and complicated the definition of what physicochemical hypersensitivity actually is. Moreover, this may explain why clinical ecology, as originally suggested by Theron Randolph or

better, what is now called “environmental medicine”, refer often to diagnosis and treatment approaches not covered by science-based medicine: and why international organisms such as WHO have still not accepted officially to recognize and include these two syndromes within the framework of the Disease International Classification.

To clarify the discussions that will take place today, I suggest that we distinguish at the clinico-biological and nosological level, as shown on Table 1, what falls under intolerance and susceptibility, whether genetic and/or epigenetic, of hypersensitivity itself, the latter being considered as a separate entity. It is undoubtedly for these different reasons that an international consensus, taken up in parts by WHO⁶, has proposed to use the more general term, idiopathic environmental intolerance⁷, although, as David Gee told me, the term “idiopathic” is inconsistent with that of “environmental”. In an attempt to correct this antagonism, ECERI and ISDE decided to organize this international congress focusing on electrohypersensitivity and multiple chemical sensitivity so that WHO may size up the delay in not recognizing this pathology at a medical and scientific level. Indeed, both conditions, and more particularly, as shown in Figure 1, electrohypersensitivity, constitute a growing global problem, and it would be irresponsible not to take them into consideration in terms of public health and more particularly, in terms of their nosological insertion in the international classification of diseases, taking into account scientific advances over recent years.

For there is no doubt that the causal links resulting from epidemiological case-control studies only or from provocation trials can never provide the solution because in both cases, patients suffer from severe cognitive impairment. This explains why any study based on interviews or questionnaires can only be of little objective scientific value. And, from WHO’s perspective, this is probably where the problem comes from, a problem that can only be circumvented by the highlighting of biomarkers in both animals and humans.

This is the challenge we face in this congress, whose objectives are threefold: (1) to create an independent international working group intended to develop the nosological framework of idiopathic environmental intolerance, in order for it to shed its empty shell, deprived of clinical and biological meaning, and therefore integrate what electrohypersensitivity and multiple chemical sensitivity really are; (2) to draft for WHO an international declaration offering to put results of this working group at their disposal and inviting them to specify where they stand based on the new scientific data currently available; (3) and finally to relay to international authorities and media the international appeal coordinated by Elizabeth Kelley, entitled “Scientists Call for Protection from Non-Ionizing Electromagnetic Field Exposure”, an appeal which will be presented and discussed here by Magda Havas⁹.

To conclude, let me warmly thank Prof. Vincent Castronovo, Paul Lannoye, Jean Huss, Peter Ohnsorge, and more particularly Christine Campagnac, Fatou Diop, Sarra Selatnia and Philippe Irigaray from the Association for Research and Treatment Against Cancer (ARTAC) who coordinated the organization of this congress, as well as the different funders without which it could not have taken place.

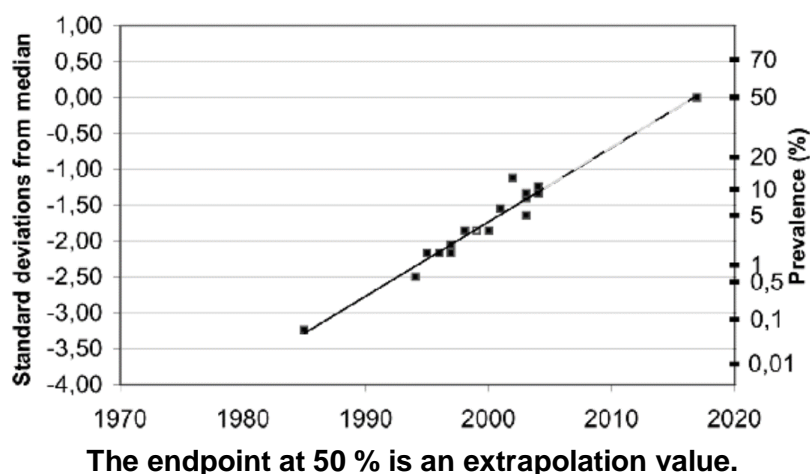
Thank you all.

Pr Dominique Belpomme

Table 1: EHS the tip of the iceberg?

Intolerance	Occurrence of multiple clinical and biological symptoms under the influence of EMF exposure. Normal tolerance threshold. But organic responses in the form of numerous pathological consequences?
Susceptibility	Increase in clinical and biological intolerance and sensitivity to EMFs caused by innate (genetic) and/or acquired (epigenetic) inherited factors
Hypersensitivity	Decrease in the tolerance threshold and extension of intolerance to the whole EMF frequency spectrum

Figure 1: The prevalence (%) of people around the world who consider themselves to be electrosensitive, plotted over time in a normal distribution graph⁸.



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Opening session



Lennart HARDELL



David CARPENTER



William REA



Ernesto BURGIO

INTRODUCTIVE CONFERENCE

Lennart Hardell



Epidemiologist,
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Some persons experience side effects from electrical and wireless equipment with symptoms like headache, nausea, dizziness, skin problems such as itching, pricking and heating, heart arrhythmias, concentration, memory and sleep problems, aches in muscles and joints and so on. The symptoms may depend on the frequency of the electromagnetic field (EMF), and also be very individual depending on sensibility and weakness. The intensity of the symptoms can vary from weak to strong within seconds and last from minutes to several days and make life very disabling. Already in 1970 a report from the Soviet Union described the Microwave syndrome as possible side effect from radar and radio radiation. Up to one fourth of the military personal working with such equipment with radiation emissions even under reference value could get symptoms like fatigue, dizziness, headache, problems with concentration and memory, and sleep disturbances. The suggested treatment was to change assignments and keep away from electromagnetic fields with rest, physical exercise and nutritional food. The symptoms were similar as described some 40 years later in Finnish persons with electromagnetic hypersensitivity (EHS). Other used names are Idiopathic Environmental Intolerance attributed to electromagnetic fields (IEI-EMF), and Electromagnetic Field Intolerance Syndrome (EMFIS). There are different opinions if the symptoms are caused by electromagnetic fields or if it is anxiety for the new technology that is the cause. Provocation studies on electromagnetic fields have demonstrated divergent results on persons with EHS. Some cannot discriminate between an active microwave signal and a placebo signal; some observed objective symptoms are changes in reactions of the pupil, heart rhythm, damage to erythrocytes, and disturbed glucose metabolism in the brain after exposure to electromagnetic fields. The reference value for radiofrequency electromagnetic fields from 1998 by ICNIRP protects from injuries caused by thermal effects exceeding one degree Celsius after short exposure observed in laboratories. Injuries and health effects caused by other biological mechanisms or from chronic exposure are not considered. The Austrian Medical Association has written a suggestion to a guideline for the diagnoses and treatment of EMF-related health problems and illnesses, but apart from that EHS is today not recognized as a specific diagnosis in the rest of the world. There are no diagnostic criteria and no treatment officially accepted. Instead persons with EHS are often offered cognitive therapy. In population based surveys the prevalence of EHS has ranged from 1.5 – 3.2 % in Sweden, 3.2 % in California, 5 % in Switzerland to 13.3 % in Taiwan.

Multiple chemical sensitivity (MCS) is part of IEI. The concept that MCS is a distinct entity that is caused by responses to chemicals originated in work in the 1950s. In the disease model MCS consists of an inability to adapt to chemicals and the development of responsiveness to extremely low concentrations after sensitization. The model postulates multiple symptoms that reflect involvement of multiple organ systems. Manifestation depends on: (1) the tissue or organ involved; (2) the chemical and pharmacologic nature of the toxin; (3) the individual susceptibility of the exposed person (genetic make-up, nutritional state, and total load at the time of exposure); (4) the length of time of the exposure; (5) amount and variety of other body stressors. Controlled exposures to establish the presence of MCS have been used. Patients are placed in environments judged to eliminate deleterious agents and then exposed to suspect chemicals. This organization offers a definition of MCS which is also referred to as ecologic illness that is poly-symptomatic, a multi-system chronic

disorder manifested by adverse reactions to environmental excitants. The excitants are present in air, water, drugs, and our habitats. Thus the patient with MCS can be discovered by removal from the suspected offending agents and by re-challenge, after an appropriate interval, under strictly controlled environmental conditions. Tests of the central nervous system, peripheral nervous system, nose and sinuses, pulmonary function, T-cell subsets, chemical antibodies and autoimmunity should be performed. If certain functions become abnormal or more abnormal after unintentional significant exposure, the diagnosis is confirmed. MCS is defined as an adverse reaction to ambient doses of toxic chemicals in our air, food, and water at levels which are generally accepted as subtoxic. Of the population 10-30 % have been reported to react to chemical substances with some type of sensitivity.

THE MICROWAVE SYNDROME OR ELECTRO-HYPERSENSITIVITY: HISTORICAL BACKGROUND

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Microwave generating equipment first became common during World War 2 with the development of radar. Soviet bloc countries reported that individuals exposed to microwaves frequently developed headaches, fatigue, loss of appetite, sleepiness, difficulty in concentration, poor memory, emotional instability, and labile cardiovascular function. For a variety of reasons these reports were discounted in Western countries, where the prevailing belief was that there could be no adverse health effects of electromagnetic fields (EMFs) that were not mediated by tissue heating. The reported Soviet effects were at lower intensities than those that cause heating. However there were several accidental exposures of radar operators in Western countries that resulted in persistent symptoms similar to those described above. The Soviets irradiated the US Embassy in Moscow with microwaves during the period 1953-1975, and while no convincing evidence of elevated cancer rates was reported, there were widespread reports of “microwave illness”. Officials passed these complaints off as being due to anxiety, not effects of the microwave exposure.

There is increasing evidence that the microwave syndrome or electro-hypersensitivity is a real disease that is caused by exposure to EMFs, especially those in the microwave range. The reported incidence of the syndrome is increasing along with increasing exposure to EMFs from electricity, WiFi, mobile phones and towers, smart meters and many other wireless devices. Why some individuals are more sensitive is unclear, but it appears that excessive exposure to EMFs, even for a brief period of time, can induce the syndrome.

THE HISTORY OF CHEMICAL SENSITIVITY

William J. Rea, M.D., F.A.C.S., F.A.A.E.M.



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The history of chemical sensitivity originates with Hippocrates who observed that some people could eat cheeses while others were made ill by eating them. He also observed that if an individual fasted for 3-4 days and then ate some foods, they would become sick. Since then, Gray's Anatomy and Guyton's Physiology had many physical and chemical observations about food and chemical sensitivity. Palling, Bland, and Corwin talked about the biochemistry of detoxification and nutrition. Selye described the general adaptation syndrome and Hare described the food factor in disease. Rowe emphasized this. Lee and Miller perfected the intradermal skin tests of intradermal, titration, and neutralization. Randolph and Dickey developed the Environmental Care Unit (ECU) while Rea provoked the technology of construction and avoidance. Rea developed preservative free antigens while Griffiths and Rea developed autogenous lymphocytic factor made from the patient's own blood. Simon and Hickey developed the 3D brain SPECT scan for the diagnosis of chemical sensitivity while scientists at the Environmental Health Center – Dallas (EHCD) developed provocation skin inhaled and oral challenge tests to diagnosis chemical sensitivity under environmentally controlled conditions. Heart rate variability and Ishikawa's pupillography showed the autonomic nervous system involvement. Laseter developed blood and tissue chemical analysis and Cude developed air analysis. The papers and technology have exploded since then.

CONCLUSIONS:

1. To trace the history of chemical sensitivity.
2. To describe the technology needed to diagnose chemical sensitivity.
3. To describe the treatment of chemical sensitivity.

ELECTROMAGNETIC FIELDS FETAL EFFECTS

Ernesto Burgio, M.D.



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The exposure of the foetus to electromagnetic fields (EMF), including both radiofrequency radiation (RF) related to new wireless technologies, and extremely low frequency fields (ELF-EMF), raises concerns for public health, because of the possible effects (neurodevelopmental disorders, cancer etc.) of long-term exposure to low intensity, environmental daily life levels on the directly exposed subjects and even on the future generations.

Many studies on RF and ELF-EMF confirm bio-effects and adverse health impacts in the foetus and young child due to exposure levels well below safety standards.

The early phases of development should receive more attention because of greater fragility and susceptibility of the developing embryo, foetus, and young child to environmental factors. Nevertheless the effects of EMF on foetus are insufficiently studied to date.

Since development means a high number of proliferating and differentiating stem cells and EMF can epigenetically influence DNA expression, the main concern regards *fetal programming*. The very essence of *fetal programming* is that every impact on fetal proliferating and differentiating cells can influence the (epi)genetic programming during the construction of tissues and organs and these changes could result in long-term consequences for their function during childhood and adulthood and even affect the following generations (*trans-generational* effects).

Despite of the difficulties in defining the connections linking EMF impacts on the developing brain and later troubles in behaviour and intelligence, there's a general *consensus* among neuropsychologists, neurotoxicologists, and pediatricians that such impacts and consequences may be of tremendous importance and there's already enough evidence in the research literature to support this idea.

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First session

Chairmen: **David Carpenter**, USA, **Lennart Hardell**, Sweden



David CARPENTER



Lennart HARDELL

ELECTROHYPERSENSITIVITY: INPUT OF MECHANISTIC STUDIES WITH LOW-INTENSITY RADIOFREQUENCY AND EXTREMELY LOW FREQUENCY ELECTROMAGNETIC FIELDS

Igor Belyaev^{1,2}



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Diverse biological responses to weak electromagnetic fields (EMF) of extremely low frequency (ELF) and non-thermal microwaves (MW) including adverse health effects related to electrohypersensitivity, have been studied by multiple research groups all over the world. In the dozen of studies no any effects were found (negative studies), while other reported the EMF effects (positive studies). The aim of this presentation is to provide an overview of the complex dependence of the ELF/MW effects on various physical and biological parameters. Besides dependencies on carrier frequency, modulation, genotype, physiological traits, presence of radical scavengers and antioxidants, reported by many research groups, the emerging data suggest dependencies of the MW effects on polarization, intermittence and coherence time of exposure, static magnetic field, electromagnetic stray fields, sex, age, individual traits, and cell density during exposure [1]. Our studies show that different frequency channels from GSM telephony differently affect cells from electrohypersensitive and healthy subjects [2-4]. Unfortunately, some reviews and panels in the field of bioelectromagnetics do not include analysis of various biological variables and physical parameters when comparing the data on the ELF/MW effects from different studies. As result, misleading conclusion is made that weak ELF/MW produce no “reproducible” effects. Our analysis suggests that different EMF signals (bandwidth, frequency, modulation, polarization) should be considered with care when studying EMF biological effects including electrohypersensitivity. The data also indicate that durations of exposure and post-exposure are important parameters for setting up the EMF effects. Taken into account the EMF response time kinetics, individual sensitivity, variation in physiology, and dependence on physical parameters it follows that more conditions of exposure should be validated in studies of electrohypersensitivity. Significant body of studies show that ELF/MW effects depend on concentration of divalent metals, ROS and antioxidants. These studies provide a mechanistic background for treatment of electrohypersensitivity based on chelating divalent metals, reducing ROS, and balancing vitamins.

Acknowledgements. This study was supported by the Slovak Research and Development Agency (APVV 0669-10); and the Vedecká grantová agentúra (VEGA) Grant Agency (2/0109/15) of the Slovak Republic.

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EFFECTS OF ELECTROMAGNETIC FIELDS ON LIVING ORGANISMS

André Vander Vorst



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We are interested here with very high frequency electromagnetic fields, at microwave frequencies, from 300 MHz to 300 GHz, with a wavelength of 1 m to 1 mm, respectively. This length is that of objects commonly used in the daily life, and of many components for the human body as well. Most wireless applications have been developed in this frequency range.

In 1982, the European Conference of Postal and Telecommunications Administrations (CEPT) formed the Group Special Mobile (GSM) to set up a pan-European mobile terrestrial system. Early 1994, there were about 1.3 million users worldwide. This exploded around 1998-2000: today, there are there are more than 3 billion devices worldwide. Other wireless devices were developed later.

One needs to distinguish between science and scientific expertise. When a scientist is interviewed for convincing the public opinion, he is used as an expert. A scientific statement issued in an area other than science, for instance in court, is transformed into expertise. The role of the expert has to be analysed.

Evaluating sanitary effects depends on the measuring tools that are used. The Specific Absorption Rate (SAR) measures only absorption, biological effect due to heating: it cannot measure field effects. Similarly, it cannot detect micro- or non-thermal effects. Soviet norms were one thousand times more stringent than Western norms: the possibility of non-thermal effects was accepted in the East and not in the West.

To investigate micro- and non-thermal effects, thermodynamics must be handled together with biology and electromagnetics. Several Soviet and Russian studies did this. In thermodynamics, temperature is a primary parameter: it can for instance be kept constant.

Hypersensitivity has been pointed out around year 2000 only. One estimates that about 5% of population is concerned. Measurement results on human beings are unfortunately lacking.

Financial considerations are strongly biasing the possibility of doing independent sanitary studies. In addition, the population does not dispose of the most advanced technology for an application as simple as GSM: for the same use, advanced technology could reduce the ambient field by a factor 5. More and more applications are added, instead of rationalising the devices.

PROBLEMS OF OBJECTIVE ASSESSMENT OF IDIOPATHIC ENVIRONMENTAL INTOLERANCE RELATED TO ELECTROMAGNETIC FIELDS

Michael Kundi



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The descriptor Idiopathic Environmental Intolerance (IEI) originated from a workshop convened 1996 in Berlin by the International Program on Chemical Safety (IPCS) of the World Health Organization (WHO). It was proposed to replace terms like Multiple Chemical Sensitivity because such terms were considered to suggest an unproven causal relationship. In 2004 a conference of the WHO EMF Project on Electromagnetic Hypersensitivity (EH) held in Prague suggested for the same reason to replace EH by “IEI with attribution to electromagnetic fields” (IEI-EMF).

There are some similarities but also significant differences between conditions summarized as IEI. A similarity is the reaction to environmental conditions by some persons that are tolerated by the majority. Concerning EH there is the problem that electric, magnetic and electromagnetic fields (EMF for short) in the range considered here cannot be perceived. Therefore, there must be a cognitive process in EH subjects of linking their symptoms to the presence of EMFs. This process of attribution is the origin of the skepticism of physicians and other scientists that EH could be causally linked to EMFs. EH persons have very different experiences concerning type, intensity, onset and duration of symptoms which seems to speak against a common causal factor. Also concerning the development of their conviction that EMFs are responsible EH persons differ considerably: in only a few cases a physician suggested the relationship, in the majority of cases, however, there are two experiences that are reported: in many a singular event occurred with a coincidence or close temporal succession of the appearance of a novel symptom and a change in the environment concerning sources of EMFs (e.g. starting to work with a CRT monitor, erection of a mobile phone base station or a high-voltage power line in the neighborhood), in other cases the attitude developed gradually and is often based on self-experimentations by checking more or less systematically whether the symptoms occur regularly in the presence of (specific) sources of EMFs. In this latter group the idea that EMFs might be responsible originated often in media reports or experiences of others.

There are a number of un-blinded and blinded provocation studies that revealed the following: 1) EH persons have higher levels of autonomous and CNS activity under the same conditions as controls; 2) under un-blinded conditions EH subjects experience higher annoyance and symptoms intensity than controls; 3) there is no indication that the symptoms are ‘objectively’ related to actual exposure.

In the scientific literature there is seldom an attempt to consider this evidence in context. It is rather interpreted as proof of no causal relationship to actual exposure. However, our own experience indicates that EH persons cannot be tested under the same conditions as others because the ‘nocebo’ effect of the experimental environment causes levels of arousal that interfere with the provocation procedure and might decrease the signal-to-noise ratio to indistinguishable levels.

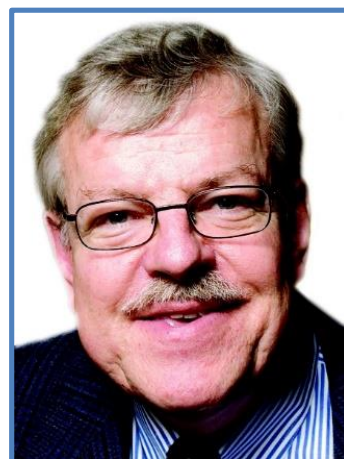
It is likely that a certain proportion of EH subjects wrongly attributing EMFs as a cause of their symptoms, but it is premature to conclude that this is the case in all EH individuals. We need to develop more suitable procedures to test the relationship between symptoms and exposure.

Second session

Chairmen: **Cindy Sage**, USA, **Olle Johansson**, Sweden



Cindy SAGE



Olle JOHANSSON

HEART RATE VARIABILITY (HRV) AS A DIAGNOSTIC TOOL IN ELECTROHYPERSENSITIVITY (EHS)

Magda Havas

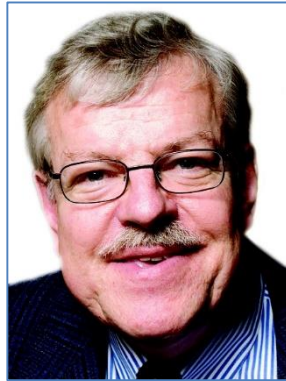


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One of the symptoms people who are electrohypersensitive (EHS) experience when they are exposed to electrosmog is a change in their heart rate either in the form of arrhythmia, tachycardia or bradycardia. This is easy to measure and can be used as a diagnostic. However, more information is provided when heart rate variability (HRV) is tested as this gives additional information about the sympathetic and parasympathetic regulation and about adrenal exhaustion. How to do this type of testing with some caveats about the reliability of HRV for diagnosing EHS is provided.

HEALTH EFFECTS OF ELECTROMAGNETIC FIELDS AND THE FUNCTIONAL IMPAIRMENT ELECTROHYPERSENSITIVITY – FROM THEORY TO PRACTICE

Olle Johansson



The Experimental Dermatology Unit, Department of Neuroscience,
The Karolinska Institute,
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In Sweden, electrohypersensitivity (EHS) is an officially fully recognized functional impairment (i.e., it is not regarded as a disease). Survey studies show that somewhere between 230,000– 290,000 Swedish men and women – out of a population of 9,000,000 - report a variety of symptoms when being in contact with electromagnetic field (EMF) sources. Swedish electrohypersensitive people have their own handicap organization, The Swedish Association for the Electrohypersensitive, which has its own website in both Swedish and English. This organization is included in the Swedish Disability Federation (Handikappförbundens Samarbets Organ; HSO).

One aim of our studies has been to investigate possible alterations, in the cellular and neuronal systems of these persons' skin. In summary, it is evident from our data that various alterations are present in the electrohypersensitive persons' skin that are not indicated in the skin of normal healthy volunteers.

The program at the **Fifth Paris Appeal Congress** will present riveting scientific and health policy presentations about the little known consequences of telecommunications technologies, computerization, electrification, and new utility technologies like smart meters, especially when it comes to their impact on persons with the functional impairment electrohypersensitivity.

ELECTROHYPERSENSITIVITY AND MULTIPLE CHEMICAL SENSITIVITY: TWO CLINIC-BIOLOGICAL ENTITIES OF THE SAME DISORDER?

Dominique Belpomme and Philippe Irigaray



Medical oncologist, Founder and President of the ECERI, Brussels - Belgium
President of the ISDE-France, Paris – France
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Much of the controversy over electro-hypersensitivity (EHS) and multiple chemical sensitivity (MCS) lies both in the absence of recognized diagnosis criteria and in the specific biological markers allowing the use of widely accepted tests for diagnosis. Since 2009, we prospectively investigated clinically and biologically 1200 consecutive EHS and/or MCS-self reported cases, in an attempt to establish objective diagnosis criteria and to elucidate the pathophysiological aspects of these two disorders. Inclusion criteria were: absence of diagnosed pathology; reproduced symptoms under the influence of electromagnetic fields (EMF) and/or chemicals, whatever their incriminated source; and regression or disappearance of symptoms in the case of EMF and/or chemical avoidance.

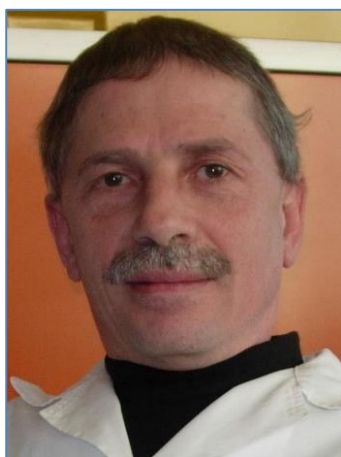
We report here our preliminary results, based on the analysis of 839 originally enrolled cases of which 810 met the inclusion criteria and 727 were evaluable. 521 were diagnosed with EHS, 52 with MCS and 154 with both EHS and MCS. Sex ratio (F/M) was 495/232, meaning that 2 out of 3 patients with EHS and/or MCS were female; mean age (years) was 47.9 ± 12.4 and median age was 47 (range 16-83), with no significant difference between the 3 groups in those characteristics. Concomitant multiple food intolerance was found in 28.5%, 41.9% and 70.4% of the cases in the 3 groups respectively. Since inflammation appears to be a key process resulting from the EMF and/or chemical effects on tissues, and histamine release is potentially a major trait of inflammation, we systematically measured histamine in the blood of patients. Importantly, 37%, 36.7% and 41.5% of the patients respectively in the 3 above individualized groups showed a significant increase in histaminemia (>10 nmol/l), meaning that a chronic inflammatory response can be detected in these patients. As the release of oxidants is part of the basic process of inflammation and they are a key contributor to damage and response, we also measured nitrotyrosin (NTT), a marker of both peroxynitrite (ONOO^-) production and opening of the blood brain barrier (BBB). NTT was increased in the blood (>0.90 $\mu\text{g/ml}$) in 29.7%, 26% and 28% of the cases in our 3 groups, respectively. Likewise protein S100B, another marker of BBB opening was found to be increased in the blood (>0.105 $\mu\text{g/L}$) in 14.7%, 19.7% and 10.7% of our cases, respectively. Circulating antibodies against O-myelin, Hsp 27 and/or Hsp 70 protein were also found to be increased in 43.1%, 25% and 52% of our cases respectively, indicating that the EHS and MCS disorders are associated with some autoimmune response. Since most patients reported chronic insomnia and fatigue, we also determined the 24h urine melatonin/creatinin ratio and found it was decreased (<0.8) in all investigated cases.

Finally, in order to gain further information about the underlying mechanisms of EHS and MCS, we serially measured the brain blood flow in the temporal lobes of each patient by using pulsed brain echodoppler. We found that both disorders were associated with an hypo-perfusion in the capsulothalamic area, suggesting that the inflammatory process may in fact involve the limbic system and the thalamus.

This ongoing study already strongly suggests that EHS and MCS can be objectively characterized and diagnosed with very simple tests. Both disorders appear to paint a common picture of inflammation-related hyper-histaminemia, oxidative stress, autoimmune response and BBB opening, and a deficit in melatonin excretion. EHS and MCS probably share a common pathological mechanism mainly involving the nervous central system.

Third session

Chairmen: **Michael Kundi**, Austria, **Magda Havas**, Canada



Michael KUNDI



Magda HAVAS

INCREASED MERCURY RELEASE FROM DENTAL AMALGAM RESTORATIONS AFTER EXPOSURE TO ELECTROMAGNETIC FIELDS AS A POTENTIAL HAZARD FOR HYPERSENSITIVE PEOPLE AND PREGNANT WOMEN

Ghazal Mortazavi^{1,2}, and SMJ Mortazavi^{2,3}



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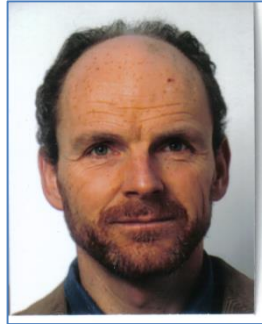
Over the past decades, the use of common sources of electromagnetic fields such as Wi-Fi routers and mobile phones has been increased enormously all over the world. There is ongoing concern that exposure to electromagnetic fields can lead to adverse health effects. It has recently been shown that even low doses of mercury may cause toxicity. Therefore, efforts are initiated to phase down or eliminate the use of mercury amalgam in dental restorations. Increased release of mercury from dental amalgam restorations after exposure to electromagnetic fields such as those generated by MRI and mobile phones has been reported by our team and other researchers. We have recently shown that some of the papers which reported no increased release of mercury after MRI, may have some methodological errors. Although it was previously believed that the amount of mercury released from dental amalgam cannot be hazardous, new findings indicate that mercury, even at low doses, may cause toxicity. Based on recent epidemiological findings, it can be claimed that the safety of mercury released from dental amalgam fillings is questionable. Therefore, as some individuals tend to be hypersensitive to the toxic effects of mercury, regulatory authorities should re-assess the safety of exposure to electromagnetic fields in individuals with amalgam restorations. On the other hand, we have reported that increased mercury release after exposure to electromagnetic fields may be risky for the pregnant women. It is worth mentioning that as a strong positive correlation between maternal and cord blood mercury levels has been found in some studies, our findings regarding the effect of exposure to electromagnetic fields on the release of mercury from dental amalgam fillings lead us to this conclusion that pregnant women with dental amalgam fillings should limit their exposure to electromagnetic fields to prevent toxic effects of mercury in their foetuses. Based on these findings, as infants and children are more vulnerable to mercury exposures, and as some individuals are routinely exposed to different sources of electromagnetic fields, we possibly need a paradigm shift in evaluating the health effects of amalgam fillings.

Keywords: Mercury release, Dental amalgam fillings, Electromagnetic fields, MRI, Hypersensitive people, Pregnancy.

Presenting Author: SMJ Mortazavi, Ph.D, Professor of Medical Physics Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC), The Head Medical Physics & Medical Engineering Department, The head Shiraz University of Medical Sciences, Shiraz, Iran.

ELECTROMAGNETIC FIELDS AND DENTAL METAL TOXICITY

Dr med. Joachim Mutter



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Artificial high frequency electromagnetic fields (HF-EMF) have emerged in the last years and almost everybody is exposed to rising levels. It was shown that metallic implants amplify HF-EMF 100- 700 fold nearby and exceed the safety levels. Because the safety-levels for HF-EMF did not protect from health damage, this is particularly true for people with metallic implants. If dental metals (crowns, fillings, bridges, titanium-implants) are implanted in the upper jaw, HF-EMF is enhanced in the cranial nerves and brain. Therefore, the presence of dental metals may increase the risk for HF-EMF- induced brain cancers several fold and should be acknowledged as confounding variable in future studies, exploring brain cancer risk in dependence of HF-EMF exposure.

Furthermore, preliminary own research has shown that patients with severe or fatal illness (like Amyotrophic Lateral Sklerosis, Alzheimer's, Parkinson's, Cancer, Multi-Systemic-Atrophy, Multiple Sklerosis, severe Elektrohypersensitivität, MCS, CFS and severe chronic pain (neuralgia, migraine) often have pieces of dental metals, mostly mercury-amalgam, in the jaw bone. Sometimes, the mercury-amalgam pieces are located in areas with otitis. Therefore, the patients suffers from toxicity of elemental and inorganic mercury which are released from amalgam, and from organic mercury compounds, which are produced by microorganism.

Dental amalgam consists of ca. 50 % metallic mercury. Studies on animals and humans have shown that mercury is continuously released from dental amalgam and absorbed by body tissues. Several conditions, like chewing, brushing, grinding, acidic- or hot beverages and electromagnetic fields (HF- and NF-EMF) increase the release of mercury vapor from amalgam fillings. Mercury is 3- 10-fold more toxic on neurons or protein folding than lead, arsenic or cadmium because it has an extremely high affinity due to "covalent bond" formation with thiol-groups, causing irreversible inhibition (binding-constant 10^{30-40}). This also explain the exceptionally long half-life of mercury in body tissues from several years to decades (brain) and the fact that mercury accumulates in such tissues over time of exposure. Autopsy studies have shown that people with dental amalgam have 2-12 fold more mercury in their body tissues. In-vitro- and animal studies have also shown that mercury vapor compared to other toxins, have the most damaging effect on mitochondria and neurons in multiple ways and is more toxic than methyl-mercury found in fish.

Mercury levels in the environment, and hence in animal- and human tissues, are rising. Genetic polymorphism (e.g. Phase-II-Detoxification) and exposure to other xenobiotics (the presence of lead enhance mercury toxicity at least 100 fold) results in increased mercury toxicity and accumulation in tissues, but decreased mercury excretion and thus, to low mercury levels in biomarkers. These mechanism was proposed in individuals with autism and Alzheimer disease.

It was also shown that mercury levels in blood or urine did not correlate with levels in body tissues. Most studies, which find no adverse health effects relay only on mercury levels in biomarkers, did not consider mercury peaces under crowns or in jaw bone, and therefore draw false conclusions.

HEAVY METALS AND CHRONIC DISEASES: WHAT THERAPEUTIC APPROACHES?

Peter Jennrich, General Practitioner



Clinical Metal Toxicologist (According to the Guidelines of the international Board of Clinical Metal Toxicology-IBCMT)

Director of the International Board of Clinical Metal Toxicology-IBCMT (NGO)
Medical Advisor of the German Association of Clinical Metal Toxicology-KMT (NGO)

Due to the rapidly increasing number of chronic diseases, we need new therapeutic approaches. These therapeutic approaches should allow a causal treatment of diseases. They should also be safe, effective and easy to handle. The use of chelating agents meets these requirements and thus represents an innovative therapeutic approach for the prevention and treatment of chronic diseases. Potentially toxic metals accumulate in the human body. They have severe pathological effects on the development of cardiovascular diseases, cancer, neurological disorders and many other ailments. Due to the ubiquitous distribution in everyday life avoiding toxic metal exposure is possible only in a very limited range. Therefore, other therapeutic approaches are needed to treat the accumulation of toxic metals in the body. Chelation therapy is the most important medical treatment for reducing the toxic effects of metals. Chelating agents are capable of binding to toxic metal ions to form complex structures which are easily excreted from the body. Chelation therapy complexes the metal and allows removal of toxic metal from the system rendering it immediately nontoxic and reducing the late effects of metal toxicity. Moreover the use of chelating agents as diagnostic tools allows a more realistic assessment of the body burden of metals than blood, urine or hair-mineral analyses. There are different chelating agents which can be used for the treatment of a chronic metal burden. One of the oldest chelating substances is EDTA (ethylenediamine tetraacetate). There was a long controversial discussion about the EDTA chelation therapy for some decades, but in 2003 the National Institutes of Health's National Heart, Lung, and Blood Institute (NHLBI) and National Center for Complementary and Alternative Medicine (NCCAM) cosponsored the Trial to Assess Chelation Therapy (TACT). The results were presented at the American Heart Association Scientific Sessions in November 2012. The Trial to Assess Chelation Therapy (TACT) was the first large-scale, multicenter study designed to determine the safety and efficacy of EDTA chelation therapy for individuals with coronary artery disease (CAD) and prior myocardial infarction (MI). Among stable patients with a history of MI, use of an intravenous chelation regimen with disodium EDTA, compared with placebo, modestly reduced the risk of adverse cardiovascular outcomes, many of which were revascularization procedures. These results provide evidence to guide further research but are not accepted to be sufficient to support the routine use of chelation therapy for treatment of patients who have had an MI.

One criticism is that the heavy metal burden of patients has not been tested. EDTA detoxifies lead as possible trigger of myocardial infarction. However mercury and arsenic are hardly detoxified by EDTA. Both metals can cause cardiovascular diseases which are linked with MI. DMPS (Sodium 2,3-dimercapto-1-propane sulfonate) and DMSA (meso-2,3-dimercaptosuccinic acid) are possible chelators for the treatment of mercury and arsenic. It can be assumed that patients which participated the TACT and had an arsenic and / or mercury load would have benefited from a combination of EDTA and DMPS or DMSA.

Nevertheless, the TACT is a milestone in the recognition of the therapeutic use of chelating substances beyond the treatment of acute metal poisoning.

Roundtable

Early warnings: what lessons for the future?

Moderators: **David Gee**, UK, with the collaboration of **Michèle Rivasi**, France, and
Jean Huss, Luxembourg



David GEE



Michèle RIVASI



Jean HUSS

A DISCUSSION OF SYNERGIES BETWEEN EMF AND CHEMICAL EXPOSURES

Devra Lee Davis



Professor of Epidemiology at the Graduate School of Public Health (2004-2010).
Founding Director of non-profit Environmental Health Trust in 2007 in Teton County, Wyoming
Visiting Scholar with the Goldman School of Public Policy and Management, University of California,
<http://ehtrust.org/>

VIDEOCONFERENCE

SYNERGISTIC HEALTH EFFECTS OF CHEMICAL POLLUTANTS AND ELECTROMAGNETIC FIELDS

G rard Ledoigt



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Humans and ecosystems are exposed to highly variable and unknown cocktail of chemicals and radiations. Although individual chemicals are typically present at low concentrations, they can interact with each other resulting in additive or potentially synergistic mixture effects. This was also observed with products obtained by radiation actions such as photolysis or electromagnetic fields treatments. The concomitant presence of various pesticides and their transformation products adds further complexity to chemical risk assessment.

Degradation of a parent molecule can produce several by-products which can trigger various toxic effects with different impacts on health and environment. For instance, photolysis sulcotrione cocktail have a greater cytotoxicity and genotoxicity than parent molecule and question about the impact of photochemical process on environment. Adjuvants were shown to modify the biological features of pesticides. Addition of other elements, metals or biological products, can differently enhance cell toxicity of pesticides or electromagnetic radiations suggesting a synergy in living beings.

Electromagnetic fields spreading, pesticide by-products and mixtures monitoring become greater for environmental contamination evaluations.

PARTICIPANTS' BIOGRAPHY

Pr Dominique BÉLPOMME

Dominique Belpomme is a medical doctor who conducted research for IARC (International Agency for Cancer Research) in 1968 at the Roswell Memorial Institute (Buffalo, New York). He is an emeritus full Professor in clinical oncology at the University Paris-Descartes and the President of the ARTAC (French Association for Research on Treatments Against Cancer). Dominique Belpomme has published many scientific papers in peer reviewed journal and has written several books for the medical society as well as for the general public. He is one of the worldwide recognized leaders working on the causal links between the environmental degradation and the origin of cancer and other diseases. A member of numerous European and American learned societies and the initiator of the Paris Appeal, he now heads the European Cancer and Environment Research Institute (ECERI) founded in 2011 in Brussels.



Dr Igor BELYAEV

Igor Belyaev received a diploma in physical engineering (Master of Science Degree) in Radiation Physics and Dosimetry from the Moscow Engineering Physics Institute (Moscow Technical University) in 1981; a Ph.D. in Radiobiology from the Institute of Biophysics, USSR Academy of Science, Pushchino, USSR, in 1986; a Doctor of Science degree (a post Ph.D. degree, the highest post-graduate academic degree in the Soviet Union, Russia) in Genetics from St. Petersburg State University, St. Petersburg, Russia, in 1994; was named an Associate Professor of Toxicological Genetics by the Stockholm University, Stockholm, Sweden, in 2004. From 1981 to 1994, he held the positions of Research Scientist, Head of the Laboratory, and Head Research Scientist at the Department of Biophysics, Radiation Physics and Ecology at the Moscow Engineering Physics Institute. From 1994 to 2006, he served as a visiting scientist, senior research scientist and group leader at Stockholm University in the Departments of Radiobiology, Molecular Genome Research, Genetic and Cellular Toxicology, Genetics, Toxicology and Microbiology. He is presently the Head Research Scientist and the Head of Radiobiological Laboratory at the Cancer Research Institute, Slovak Academy of Science. On-leave, 1994-2004, Moscow Engineering Physics, Institute, Igor Belyaev remains Research Professor on leave from the Institute of General Physics, Russian Academy of Science, Moscow, Russia.



Igor Belyaev is now or formerly a principal investigator for the research projects obtained from Russia, Sweden, USA, Slovakia, and a member of: The Working Group of the International EMF Project of the World Health Organization, the Working group for the evaluation of RF carcinogenicity of the International Agency on Research in Cancer (IARC); the Stakeholder Dialogue Group on EMF, Health systems and Products, Risk Assessment, Health and Consumers of the Directorate-General, of the European Commission; the Memorial Fund Committee of the Bioelectromagnetics Society, the Swedish National Committee for Radioscience, the Russian National Committee on Non-Ionizing Radiation Protection, and the European Association for Cancer Research. He serves as Associate Editor for the International Journal of Radiation Biology and on the Editorial Board of the Electromagnetic Biology and Medicine, Radiation Biology and Radioecology of the Russian Academy of Science. In 2011, he was awarded by the Bioelectromagnetics Society for the most influential paper in Bioelectromagnetics 2006-2010.

Dr Ernesto BURGIO

Graduated in Medicine and Surgery (1977) at the University of Pavia - Italy (Final score 110/110 cum laude); Specialized in Pediatrics (1980) at the University of Florence-Italy (Final score 30/30 cum laude); President of the Scientific Committee ISDE (International Society of Doctors for Environment) 2010-2015; President of the Scientific Committee ISDE Italy 2008-2015; President of the Scientific Office of ISDE; Member of the ECERI Scientific Board (European Cancer and Environment Research Institute) 2012-2015; Consultant at WHO Children Environmental Health (CEH) training projects Group 2010-2015; Member of the Scientific Committee of ARTAC France (Association pour la Recherche Therapeutique anti-Cancéreuse) 2010-2015; Member of the Committee on Environmental Carcinogenesis AIOM (Italian Association of Medical Oncology)

2008-2009; member of ENSSER (European Network of Scientists for Social and Environmental Responsibility) 2010-11; Member of EPH (Environment & Public Health) Panel - European Society for Research and Prevention on Environment and Health (European SREH) 2010-2012; Member of the Children Environmental Health Group of the SIP (Italian Society of Paediatricians) 2009-2012; Member of the Children Environmental Health Committee FIMP (Italian Federation of Medical Pediatricians) 2013-2015. In the last ten years he has been essentially working on epigenetics, environmental carcinogenesis and DOHaD-Developmental Origins of Health and Diseases.



Pr David O. CARPENTER



David O. Carpenter is a public health physician whose current position is Director of the Institute for Health and the Environment at the University at Albany. After receiving his MD degree from Harvard Medical School he chose a career of research and public health. He has held positions at the National Institute of Mental Health, the Armed Forces Radiobiology Research Institute, as the Director of the Wadsworth Center for Laboratories and Research of the New York State Department of Health, and as the Dean of the School of Public Health at the University at Albany. Dr. Carpenter's research initially was basic neurobiology, and more recently has been the study of human disease resulting from exposure to environmental contaminants.

He has focused on the relationship between exposures to a variety of chemicals and ionizing radiation on incidence of several human diseases, including diabetes, hypertension, heart disease and diseases of the nervous system. He has more than 380 peer reviewed publications and has edited five books.

When he arrived in Albany as the Director of the Wadsworth Laboratories of the New York State Department of Health, he was given the responsibility of administering a program to determine whether there were adverse human health effects of electromagnetic fields (EMFs), initiated because of concern of hazards from high voltage powerlines. A 5 million dollar research program was begun, and when finished in 1987 the program concluded that while there were effects of EMFs on many organ systems, a particular concern was an increased incidence of leukemia in children living in home with elevated magnetic fields. After that time Dr. Carpenter became for the spokesperson for New York State on issues related to EMFs. He has continued to evaluate research in this area, and has edited two books and written several review articles on the subject. He testified before the President's Cancer Panel in 2009 on human health effects of both power line and radiofrequency EMFs from a variety of sources, particularly from mobile phones. He is the Co-Editor of the Bioinitiative Report (www.bioinitiative.org), published first in 2007 and revised in 2012. This is a comprehensive review of the effects of EMFs.

Pr Devra Lee DAVIS



Devra Davis founded non-profit Environmental Health Trust in 2007 in Teton County, Wyoming to provide basic research and education about environmental health hazards and promote constructive policies locally, nationally and internationally. Dr. Davis lectures at University of California, San Francisco and Berkeley, Dartmouth, Georgetown, Harvard, London School of Hygiene and Tropical Medicine and major universities in India, Finland, and elsewhere. She was Founding Director, Center for Environmental Oncology, University of Pittsburgh Cancer Institute, and Professor of Epidemiology at the Graduate School of Public Health (2004-2010). She spent 2013-2014 as a Visiting Scholar with the Goldman School of Public Policy and Management at the University of California, Berkeley and has served as a Distinguished Visiting Professor at the London School of Hygiene and Tropical Medicine and Visiting Professor at Mt. Sinai School of Medicine, Oberlin College and Carnegie Mellon University.

An award-winning scientist and writer, Davis' work has appeared in more than a dozen languages. She was designated a National Book Award Finalist for *When Smoke Ran Like Water* (2002, Basic Books). Her most recent book, *Disconnect*, selected by TIME magazine as a top pick in 2010, received the Silver Medal from Nautilus Books for courageous investigation for the paperback edition in 2013, was identified by Project Censored as "the news that didn't make the news," and is the subject of multi-media international policy-making attention—including a special edition recently released in India.

The Secret History of the War on Cancer was a top pick by Newsweek that influenced national cancer policy by the Cancer Association of South Africa, and is being used at major schools of public health, including Harvard, Emory, and Tulane University. Dr. Davis also was the founding director of the Board on Environmental Studies and Toxicology of the U.S. National Research Council, National Academy of Sciences and the only woman to serve as Scholar in Residence, 1983-1993. Among the NAS reports she directed were those advising that tobacco smoke be removed from airplanes and the environments of young children.

Her career has spanned academia, public policy, and public service. President Clinton appointed the Honorable Dr. Davis to the newly established Chemical Safety and Hazard Investigation Board, (1994-99) an independent executive branch agency that investigates, prevents, and mitigates chemical accidents. As the former Senior Advisor to the Assistant Secretary for Health in the Department of Health and Human Services, she has counseled leading officials in the United States, United Nations, European Environment Agency, Pan American Health Organization, World Health Organization, and World Bank and served as a member of the Board of Scientific Counselors of the U.S. National Toxicology Program, 1983-86 and various advisory committees to the U.S. Centers for Disease Control and Prevention. She also served as a U.S. delegate to the International Conference on Women in Beijing in 1996, the Johannesburg Conference on Sustainable Development in 1997, and other major international conferences.

Pr Janos FRUHLING

Born in Budapest, is a Belgian Professor of Medicine. A specialist in nuclear medicine, former director of the Jules Bordet Institute in Brussels and former President of the French speaking Medical Board of Brabant, he is the Honorary Permanent Secretary of the Royal Academy of medicine of Belgium and the former secretary of the Federation of European Academies of Medicine. He is currently the Vice-President of the Scientific Board of the ECERI, the European Cancer and Environment Research Institute in Brussels.



David GEE



David was educated in politics and economics at York University (1965-68) and has worked for over 40 years at the science/policy interface of occupational, public, and environmental risk assessment & reduction, with UK Trade Unions; with the UK Environmental Group, Friends of the Earth, where he was Director; and, from December 1995 to May 2013, with the European Environment Agency, an EU environmental information providing body in Copenhagen, where he was Senior Adviser, Science, Policy, Emerging Issues. He has published reports and peer reviewed articles and lectured on Scientific Uncertainty; the Precautionary Principle; Environmental Health; Environmental Taxes and Ecological Tax Reform; Clean production; Eco-efficiency; Endocrine disrupting chemicals; Electro-magnetic fields; Evaluating evidence; and anticipatory research.

He is initiator, co-editor and contributor to the widely cited and used EEA reports, “Late Lessons from Early Warnings: the Precautionary Principle 1898-2000” (2001), and “Late Lessons from Early Warnings: Science, Precaution, Innovation” (EEA, 2013).

He is now a Visiting Fellow at the new Institute of Environment, Health, and Societies, at Brunel University, London.

Pr Lennart HARDELL

Lennart Hardell, MD, PhD, has a long career as a clinical and medical research doctor, currently at the Department of Oncology, University Hospital, Örebro, Sweden. He has also served as a professor at the Örebro University. He is specialised in oncology with a focused interest in environmental risk factors for cancer that he has studied in epidemiological investigations. He was a Research fellow at School of Public Health, University of California, Berkeley, USA in 1985. Over the years he has received several scientific awards for his research.

In the late 1970's and early 1980's he was the first to show an increased risk for cancer in persons exposed to phenoxy herbicides and contaminating dioxins. His research group has also made studies on persistent organic pollutants and cancer risks, such as PCB and the risk for malignant lymphoma. In recent years much research has focused on use of mobile phones and cordless phones and the risk of brain tumours. His research has contributed to the cancer classification of different agents such as TCDD, PCB, the herbicide glyphosate, and radiofrequency fields. He has published more than 350 peer-reviewed scientific articles.



Dr Magda HAVAS



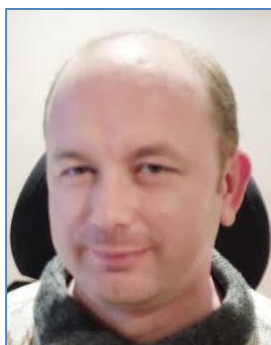
Dr Magda Havas received her B.Sc. and Ph.D. from the University of Toronto and did Post Doctoral Research at Cornell University before going at Trent University in 1989. Her current research falls into two categories: (1) harmful effects of electrosmog and ways to identify biomarkers among those who are electrohypersensitivity and thus help doctors with their diagnoses; and (2) beneficial effects of frequency therapy using PEMF and light. Dr. Havas has published more than 130 articles and has given more than 300 invited lectures around the world but mostly in Europe and North America. She provides expert testimony related to power lines and radio frequency radiation and advises NGO working on electrosmog around the world.

Jean HUSS

A teacher by training, a former Member of the Luxemburg parliament and a member of the Parliament Assembly of the European Council, authored a report which was adopted in 2009 by this very same assembly. Founder of the NGO called AKUT, he is also a member of the presidium of the European Academy of Environmental Medicine and a member of the ARTAC Board.



Philippe IRIGARAY



Doctor of Science in Biochemistry, awarded for his thesis entitled "Effect of benzo[a]pyrene on lipolysis in vitro and in vivo" by the Institut National Polytechnique de Lorraine, Philippe Irigaray is one of the forerunners of the causal links between environmental pollution and obesity.

Through his knowledge in physiology, metabolic syndrome and cancer, he joined ARTAC as scientific research director. Since then he has co-authored numerous scientific papers with Professor Dominique Belpomme in peer-review journals and was recently selected by the GRePEC (Groupe de Recherches et de Prévention sur l'environnement – cancer), a Quebec government issued group through which he supports research on environmental causes of cancer, as an expert in the field of environmental health, and thus constitutes with 4 other

eminent scientists, an international review of research projects. He is presently a member of the ECERI scientific committee as well as a member of the ECERI executive administrative board.

Dr Peter JENNRICH

General Practitioner, Clinical Metal Toxicologist According to the Guidelines of the International Board of Clinical Metal Toxicology - IBCMT

Director of the International Board of Clinical Metal Toxicology – IBCMT (NGO)

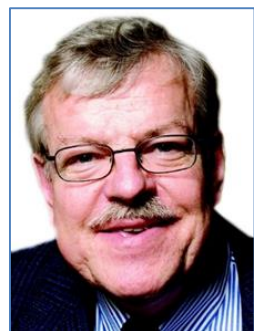
Medical Advisor of the German Association of Clinical Metal Toxicology – KMT (NGO)

Certified in Emergency Medicine, as General Practitioner, in Naturopathic Medicine, Chelation Therapy. Certified as Candidate IBCMT, Certified as Clinical Metal Toxicologist



Books: "Schwermetalle – Ursache für Zivilisationskrankheiten" Edition CO`MED 2007. "Das hat mit geholfen!" - Schwermetallentgiftung als Basistherapie chronischer Krankheiten. AURUM / Kamphausen Verlagsgruppe 2012. "ENTGIFTEN – Leicht gemacht" AURUM / Kamphausen Verlagsgruppe 2013

Pr Olle JOHANSSON

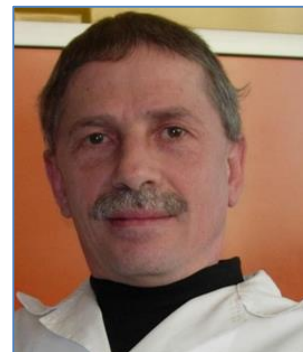


Olle Johansson, associate professor, head of the Experimental Dermatology Unit, Department of Neuroscience, at the Karolinska Institute (famous for its Nobel Prize in Physiology or Medicine) in Stockholm, Sweden, is a world-leading authority in the field of EMF radiation and health effects. He has also been a guest professor as well as adjunct professor in basic and clinical neuroscience at the Royal Institute of Technology, Stockholm. He has published more than 600 original articles, reviews, book chapters and conference reports within the field of basic and applied neuroscience, dermatoscience, and in the area of health effects of electromagnetic fields and the functional impairment electrohypersensitivity.

His studies have been widely recognized in the public media, including newspapers, magazines, journals, radio and TV, as well as on the Internet, both nationally as well as internationally, and he has been invited to give very many public lectures around the world, some of which are to be found in a YouTube format.

Pr Michael KUNDI

Michael Kundi studied medicine, psychology and mathematics at the University of Vienna. Doctoral degree 1979, habilitation at the Medical Faculty in Epidemiology and Occupational Health in 1989. 1991 to 1996 head of the department for epidemiology and methodology at the Institute of Environmental Health, since 1996 head of the department for Occupational- and Social Health, and since 2004 head of the Institute of Environmental Health at the Medical University of Vienna. Epidemiological, toxicological, and psychophysiological research of environmental and occupational factors and other public health issues. More than 380 publications in peer-reviewed scientific journals. Main research in the last years: effects of air pollution, indoor exposures, and electromagnetic fields.



Consulting editor of the International Archives of Allergy and Immunology and member of the editorial board of several other journals. Member of several standards committees, member of the national vaccination committee and the EMF working group of the Highest Health Council of the Ministry of Health. Since 2010 he is coordinator of the doctoral program for public health at the Medical University Vienna.

Pr Gérard LEDOIGT

Education: Paris 11 University, Orsay Faculty of Sciences: Licence in Chemistry-Physiology (1966). Certificate of Genetics (1967). Master Degree in Microbiology (1968). Doctorat d'Etat in Natural Sciences (1976). UCSD, USA: Post-graduate fellow (NSF grant. 1978-1979).

Teaching: 1966-1983: Assistant Professor of Cell Biology, University of Paris 11 Medical School. 1983-2013: Professor of Biology, University Blaise Pascal, Clermont-Ferrand.

2013 to present: Professor Emeritus, University Blaise Pascal, Clermont-Ferrand.

Direction: 1986-1990: Dean of the Faculty of Sciences (Clermont-Ferrand University).

1995-1999: Chairman of the Biology Department (Clermont-Ferrand University).

2000-2007: Founding Director the Research Team "ERTAC" (Tumors and Cell Self-Control).

1994-1996: President of the French Society of Plant Physiology (SFPV / SFBV)

Experience: Publications (105); Patents (2); Scientific meetings and Conferences (100). Member of PhD (77), and HDR (11) admissions committees.

Related activities: Elected member of National Committee on Universities (1999-2011)

Member of the scientific committee of the Health and Radio-frequencies Foundation (2007-2010) and ANSES, GT Radiofréquences & Santé (2011-2016).



Pr SMJ MORTAZAVI



SMJ Mortazavi currently holds the position of director of the Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC). He also serves as Professor of Medical Physics in the School of Medicine of Shiraz University of Medical Sciences (SUMS). Mortazavi has authored more than 110 papers in peer reviewed journals in the areas such as non-ionizing radiation, radiation protection, dosimetry, natural radiation, radiation hormesis, radioadaptive response and the possible role of radioadaptive response in radiation protection. He has also published papers on radiation protection in manned space missions.

Professor SMJ Mortazavi's reports on the health effects of exposure to high levels of natural radiation in high background radiation areas of Ramsar have been widely cited (one is cited more than 120 times in the Web of Science).

He has also published papers on the future role of radioadaptation in the long-term stay of humans in space. Mortazavi et al. in 2003 presented this novel concept that after in vitro Ground-based tests and screening of the candidates for selection of the individuals with the highest magnitude of adaptive

response, prior radiation exposure to continuous isotropic galactic cosmic radiation (GCR) during any mission might induce an adaptive response in astronauts to better protect them against high levels of radiation in an unpredictable solar particle event (SPE). (This paper is cited 20 times in the Web of Science).

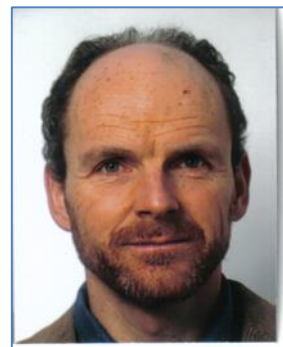
Dr Joachim MUTTER

1984-1987 training course and certificate electronic technician. After suffering from severe and deadly disease, he searched for the main causes of health and illness. High school education with Baccalaureate 1989. After working three years as Electronic technician, he absolved the Medical University School Freiburg with medical degree in 1999.

From 2000-2001 he works as physician at an internal ward. From April 2001 until July 2008, he was physician and medical researcher at the University Medical Center Freiburg (Germany), Department of Hygiene and Environmental Medicine (Chairman: Prof. Dr. Franz Daschner) and Clinic for Complementary and Integrative Medicine ("Uni-Zentrum Naturheilkunde Freiburg"). He becomes a Specialist for Hygiene and Environmental Medicine. Since 2009 private medical clinic in Konstanz/ Germany.

Scientific research and publications of environmental factors, heavy metals and electromagnetic fields in the pathogenesis of neurodegenerative diseases, e.g. Alzheimer's. With a new curative approach developed at the University Medical Center Freiburg, he treats patients which suffers to almost all known diseases including cancer, amyotrophic lateral sclerosis, Alzheimer's, Parkinson's, Autism, Autoimmunity, MCS, EHS, CFS. He also coaches healthy people and top athletes (e.g. winner of olympic gold, and silver). He is senior lecturer in a Master of Arts course for "mitochondrial medicine" at the Europe University Frankfurt (Oder). He gives lectures and medical seminars in many countries, including Finland, United Kingdom, Italy, Switzerland and become famous in Germany through interviews newspapers, radio and television. He educate physicians in "causal medicine".

He is author of four bestseller books and many scientific articles, which are published in international accepted scientific journals. A list of publications, lectures and television interviews are available at: <http://www.detoxklinik.de/aerzte>



Dr William REA



William J. Rea, M.D., F.A.C.S., F.A.A.E.M., is a thoracic, cardiovascular and general surgeon with an added interest in the environmental aspects of health and disease. Founder of the Environmental Health Center - Dallas (EHC-D), Dr. Rea is currently director of this highly specialized Dallas-based medical facility. Dr. Rea was awarded the Jonathan Forman Gold Medal Award in 1987 and the Herbert J. Rinkle Award in 1993 and the 1998 Service Award, all by the American Academy of Environmental Medicine, and was named Outstanding Alumnus by Otterbein College in 1991.

Other awards include the Mountain Valley Water Hall of Fame in 1987, the Special Achievement Award by Otterbein College in 91, the Distinguished Pioneers in Alternative Medicine Award by the Foundation for the Advancement of Innovative Medicine Education Fund in 1994, the Gold Star

Award by the International Biographical Center in 1997, Five Hundred Leaders of Influence Award in 1997, Who's Who in the South and Southwest in 1997, The Twentieth Century Award for Achievement in 1997 and the Dor W. Brown, Jr., M.D. Lectureship Award by the Pan American Allergy Society. Author of five medical textbooks, Chemical Sensitivity, V. 1-4, Reversibility of Chronic Degenerative Disease and Hypersensitivity, V. 1: Regulating Mechanisms of Chemical Sensitivity, and the pictorial book, Optimum Environments for Optimum Health and Creativity as well as co-authoring Your Home, Your Health and Well-Being. Dr Rea has published more than 150 research papers related to the topic of thoracic and cardiovascular surgery as well as that of environmental medicine.

Dr Rea currently serves on the board and is president of the American Environmental Health Foundation and previously served on the board of the American Academy of Environmental Medicine. He previously held the position of chief of surgery at Brookhaven Medical Center and chief of

cardiovascular surgery at Dallas Veteran's Hospital, and he is a past president of the American Academy of Environmental Medicine and the Pan American Allergy Society. He has also served on the Science Advisory Board for the US Environmental Protection Agency, on the Research Committee for the American Academy of Otolaryngic Allergy and on the Committee on Aspects of Cardiovascular, Endocrine and Autoimmune Diseases of the American College of Allergists, Committee on Immunotoxicology for the Office of Technology Assessment and on the panel on Chemical Sensitivity of the National Academy of Sciences. He was previously adjunct professor with the University of Oklahoma Health Science Center College of Public Health. Dr Rea is a fellow of the American College of Surgeons, the American Academy of Environmental Medicine, the American College of Allergists, the American College of Preventive Medicine and the American College of Nutrition.

Born in Jefferson, Ohio, Dr Rea graduated from Otterbein College in Westerville, Ohio, and Ohio State University College of Medicine in Columbus, Ohio. He then completed a rotating internship at Parkland Memorial Hospital in Dallas, Texas. He held a general surgery residency from 1963-67 and a cardiovascular surgery fellowship and residency from 1967-69 with The University of Texas Southwestern Medical School system, which includes Parkland Memorial Hospital, Baylor Medical Center, Veteran's Hospital and Children's Medical Center.

From 1984-85, Dr Rea held the position of adjunct professor of environmental sciences and mathematics at the University of Texas, while from 1972-82 he acted as clinical associate professor of thoracic surgery at The University of Texas Southwestern Medical School. Dr Rea held the First World Professorial Chair of Environmental Medicine at the University of Surrey, Guildford, England from 1988 – 1998. He also served as adjunct professor of psychology and guest lecturer at North Texas State University.

Dr Rea has treated over 30,000 patients with chemical sensitivity and chronic degenerative disease. He has helped create numerous environmental units throughout the world including Mexico, Brazil, Japan, China, Australia, England, Spain, Italy, and Germany. The principles of environmental medicine are used and taught in these centers. He has trained hundreds of physicians on the facts and principles of environmental medicine.

Michèle RIVASI



Member of the European Parliament - Group of the Greens/European Free Alliance, Vice-Chairman of the Group of the Greens/European Free Alliance of the European Parliament– Chief of the French speaking delegation of the Greens/European Free Alliance Group.

Vice Chair of the Delegation to the ACP-EU (Joint Parliamentary Assembly) – Vice chair of the Social and Environmental Committee, Permanent Member of ENVI (Environment, public health and food safety Committee), Deputy Member of ITRE (Industry, research and energy Committee) and PETI (Petition Committee).

Aggregation (postgraduate, competition-based teaching qualification) in biology. CAPES (postgraduate qualification in secondary-school teaching). DEA (postgraduate diploma).

President of the Center of Research and Independent Information on ElectroMagnetic Radiation (CRIIREM)

Fundator of the Independent Committee for Research and Information on Radioactivity (CRIIRAD) following the nuclear accident of Chernobyl.

Director of Greenpeace France (2003-2004)

Elective mandates: Member of the National Assembly 1997-200, Member of the Drôme Departmental Council 2008, Member of the Municipal Council, and deputy mayor of Valence since 2008.

Bibliography:

"Ce nucléaire qu'on nous cache" RIVASI M. and CRIE H. Albin Michel, 1998

"Survivre au Téléphone Mobile et aux Réseaux Sans Fil", RIVASI M., LAYET M., GOUHIER C. Le courrier du Livre, 2009.

Cindy SAGE

Cindy Sage is the co-owner of Sage Associates in Santa Barbara, CA. Sage Associates is an internationally known environmental sciences consulting firm. The company specializes in translating complex technical and scientific information for the public and decision-makers. Her specialty area of practice is the science and public health effects of electromagnetic fields and radiofrequency radiation (non-ionizing radiation). She is the co-editor and principal author of the BioInitiative Reports (2007 and 2012) and a founder of the international BioInitiative Working Group.



Ms. Sage has published many scientific studies on electromagnetic fields and radiofrequency radiation, including science, public health, public policy, and environmental consequences of exposures to EMF and RFR. She was the co-facilitator of the Collaborative for Health and the Environment EMF Group from 2006-2011 and is a full member of the Bioelectromagnetics Society. She has presented the BioInitiative Report at the Royal Society of London meetings (2007, 2009) and co-authored the 2010 Seletun (Norway) Scientific Consensus Statement on Wireless RFR Risks.

Ms. Sage has provided expert testimony and scientific briefings to the European Environmental Agency (Denmark), the European Commission (Brussels), UK Health Protection Agency, UK Children with Leukemia registered charity, and various international health agencies, US Department of Justice, FCC, FDA, public utilities commissions, LEED, state legislative committees, and numerous state and municipal agencies and commissions. In 2002, she consulted with the California Department of Education on new EMF Title 5 School Siting Policies, and briefed the California Energy Commission Indoor Environmental Quality (IEQ) committee on EMF/RFR recommended exposure levels.

Pr André VANDER VORST



André Vander Vorst, born in Brussels, Belgium, 1935, received the degrees of El. Eng. and Mech. Eng. 1958 and Ph.D. 1965, Université catholique de Louvain (UCL), Belgium, and M.Sc. in Electrical Engineering 1965, M.I.T., USA. He has been with UCL as assistant, assistant professor, associate professor, professor, and professor emeritus 2001. As a postdoc, he spent 1964-65 at M.I.T. and 1965-66 at Stanford University, USA, in radio astronomy. In 1966, he founded the Microwave Laboratory at UCL, which he headed until 2001. He spent his entire scientific career in the field of Microwaves.

Head of EE Department, Dean of Engineering, Vice-President of Academic Council, President of Open School in Economic and Social Politics, all at UCL, he has been teaching in four Belgian universities.

Active in IEEE Region 8 1967-2001 and in the IEEE Microwave Theory and Techniques Society 1985-2006, he has been active in the European Microwave Conferences since the first one in London, UK, 1969.

Associate member of the Belgian Royal Academy, member of Academia Europaea and The Electromagnetics Academy, Honorary Member of the Belgian National Committee of URSI, he has been a founder member of a number of associations, including the European Microwave Association, EuMA, as Secretary General since 1998, and of the company MiC6, Belgium.

He has authored or co-authored seven books, a number of book chapters, and more than three hundred papers published in peer-reviewed journals and conferences, with his last book, RF/Microwave Interaction with Biological Tissues, A. Vander Vorst, A. Rosen, Y. Kotsuka, published in 2006.

He is a fellow of IEEE, obtained SITEL Prize 1986, Meritorious Service Award IEEE-MTT-S 1994, IEEE Third Millennium Medal 2000, the Microwave Career Award 2004 from IEEE-MTT-S: "For a Career of Leadership, Meritorious Achievement, Creativity and Outstanding Contributions in the Field of Microwave Theory and Techniques", and other awards.

He has been a member of the Conseil Supérieur de Santé, Belgium, and of the Gezondheidsraad, The Netherlands.

APPENDICES

PARIS APPEAL

International declaration on diseases due to chemical pollution



Scientists and researchers at the international colloquium in May the 7th 2004 at UNESCO in Paris on "cancer environment and society" organised by French cancer research organisation ARTAC gave their support to the Paris Appeal.

This "Paris Appeal" is to call national decision-makers, European Authorities, international organisations, and specifically the United Nations Organisation to:

- * ban all products which are recognised as dangerous for human beings by the scientific authorities
- * apply the precautionary principle to chemicals which constitute a danger for health
- * adopt programs with requirements and deadlines to achieve the elimination/regulation of the polluting substances emissions
- * strengthen the EU 2001 REACH.

This Paris appeal has been already signed by numerous international scientists, Nobel Prize winners, around 1.000 European NGO's, about 200.000 citizens. It is also signed by 2 million European doctors represented by the Standing Committee of European Doctors.

I. PREAMBLE

Recalling that, according to the *Constitution of the World Health Organization (WHO)* of 7 April 1948, Health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity",

Recalling the commitment to the universal principles of human rights, asserted in the *Universal Declaration of Human Rights* of 10 December 1948, and in the two International United Nations Covenants on Economic, Social and Cultural Rights, and specifically Article 12.1, which sets out the right for every human being to the highest attainable standard of physical and mental health,

Recalling the *Stockholm Declaration* of the United Nations Conference on the Human Environment adopted 16 June 1972, stating that "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being", and that the right to life itself is acknowledged as a fundamental human right,

Recalling the *Declaration of the Hague* on the environment signed by representatives of 24 countries on March 11, 1989, reasserting that remedies to be sought involve not only the fundamental duty to preserve the ecosystem, but also the right to live in dignity in a viable global environment, and the consequent duty of the community of nations vis-à-vis present and future generations to do whatever needs to be done to preserve the quality of the atmosphere,

Recalling that the United Nations *Convention on the Rights of the Child* signed on November 20, 1989, sets out in Article 6 that States Parties shall "recognize that every child has the inherent right to life" and shall "ensure to the maximum extent possible the survival and development of the child" and in Article 24 that States Parties "recognize the right of the child to the enjoyment of the highest attainable standard of health (...)" and "shall take appropriate measures (...) to combat disease (...) taking into consideration the dangers and risks of environmental pollution",

Recalling the *European Charter on Environment and Health* adopted 8 December 1989, according to which every individual is entitled to an environment conducive to the highest attainable level of health and well-being,

Recalling *Resolution 45/94*, passed on 14 December 1990, by the *General Assembly of the United Nations*, on the need to ensure a healthy environment for the well-being of individuals declaring that everyone has the right to an adequate standard of living for his or her own health and well-being,

Recalling the *Convention on Biological Diversity* of 5 June 1992, stating in its Preamble that "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat",

Recalling that the *Rio Declaration on Environment and Development* of 13 June 1992, proclaims in Principle 1 that “Human beings are at the centre of concerns for sustainable development (...) and are entitled to a healthy and productive life in harmony with nature”, and in Principle 15 that “in order to protect the environment, the **precautionary approach** shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”,

Recalling that, under Article 2 of Annex V of the *Ospar Convention for the Protection of the Marine Environment of the North-East Atlantic*, signed on 22 September 1992, Contracting Parties shall fulfil their obligation and take “the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health...” with a view to eliminating the discharge, emission or loss of hazardous substances found in the marine environment by the year 2020,

Recalling that the consolidated version, dated October 2, 1997, of the *Treaty establishing the European Community* specifies in Article 174, regarding the environment, that Community policy on the environment shall contribute to pursuit of the following purposes: preserving, protecting and improving the quality of the environment, protecting human health, prudent and rational utilization of natural resources and promoting measures at international level to deal with regional or worldwide environmental problems. In § 2, the same article makes it clear that Community policy on the environment shall be based on the **precautionary principle**, and Preventive Action Principle, on the Correction Principle, aiming at correcting, first and foremost, the sources of environmental degradation, as well as on the Polluter-pays Principle.

Recalling that the *Cartagena Protocol on Biosafety* with regard to the Convention on Biological Diversity of 29 January 2000, reasserts in its Preamble and Article 1 **the precautionary approach** contained in Principle 15 of the Rio Declaration on Environment and Development, (...) taking into account risks to human health (...),

Recalling that the *Stockholm Convention on Persistent Organic Pollutants (POPs)* of 22 May 2001, recognizes that “Persistent Organic Pollutants possess toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species” and specifies, in Article 1, its objective, which is to “protect human health and the environment from Persistent Organic Pollutants”,

Recalling that the *Johannesburg Declaration on Sustainable Development* of 4 September 2002, denounces the continuing loss of biodiversity, desertification, the adverse effects of climate change, more frequent and devastating natural disasters, and air, water and marine pollution (...),

II. SCIENTIFIC CONSIDERATIONS

§1. **Whereas** the sanitary situation is deteriorating worldwide, and considering that this deterioration, though different in nature, affects developing as well as industrialized countries,

§2. **Whereas** chronic diseases registered by WHO, especially cancers, are increasing alarmingly; whereas the global incidence of cancers is on the rise worldwide; whereas since 1950, the incidence of cancers among the populations of highly industrialized nations has increased steadily; whereas anyone, young or old, can be affected by cancer; whereas chemical pollution, the magnitude of which remains to be assessed, could largely contribute to the onset of cancer,

§3. **Whereas** exposure to some substances or chemicals cause a rise in the incidence of some congenital anomalies,

§4. **Whereas** infertility, and particularly male infertility - whether it be consecutive or not to congenital malformations or due to a decline in sperm quality and/or sperm counts – is on the rise, especially in highly industrialized areas; whereas, in some European countries, up to 15% of couples are now infertile, chemical pollution being one of the causes of infertility,

§5. **Aware of** the fact that human beings are now exposed to a widespread chemical/toxic pollution caused by multiple substances or chemicals; that this pollution affects human health; that these effects are often due to a poorly regulated marketing of chemicals, but also to inadequately controlled management and monitoring of production, consumer use and disposal of these chemicals,

§6. **Conscious of** the fact that these substances or chemicals are more and more numerous : Polyaromatic hydrocarbons (PAHs), organo-halogenated derivatives such as dioxins and polychlorinated biphenyls (PCBs), asbestos, toxic metals including those qualified as hazardous heavy metals such as lead, mercury and cadmium, pesticides, food additives and others ; that some of these products resist degradation and are persistent in the environment; that many of these products contaminate the air, water, soil and food web; that man is constantly exposed to persistent toxic substances or products, including Persistent Organic Pollutants (POPs) ; that, among these substances or products, some bioaccumulate in living organisms, including the human body,

§7. **Whereas** most of these substances or products are currently being marketed without prior and sufficient toxicological testing and risk assessment for human health,

§8. **Whereas** these numerous chemical substances or products cause a widespread dispersed contamination throughout the environment; whereas they interact with one another thus causing additional and/or synergic toxic effects in the environment and/or living organisms; whereas it is therefore extremely difficult to produce evidence, at the epidemiological level, of a direct link between exposure to one and/or the other of these chemical substances or products, and the development of these diseases,

§9. **Whereas**, regarding toxicology, a number of these substances or chemicals are hormone-disrupting chemicals (*endocrine disrupters*), that can be *carcinogenic, mutagenic or toxic for reproduction* (CMRs) for human beings, and therefore susceptible to induce cancers, congenital malformations and/or infertility; whereas some of these substances or products can be, among other effects, *allergenic* resulting in chronic respiratory diseases, such as asthma; whereas some are *neurotoxic* chemicals, leading to degenerative diseases of the central nervous system in adult population and to intellectual impairment in children; whereas some are *immunotoxic*, leading to immunodeficiency, particularly in children, causing infections, especially viral infections; whereas pesticides are deliberately spread in large amounts in the environment, while a great number are toxic chemical pollutants for animals and/or human beings and for the environment,

§10. **Whereas** children are the most vulnerable and exposed to contamination by these pollutants; whereas a great number of these substances or toxic products are transported across the placenta and can pass through to the foetus; whereas they accumulate in human adipose tissue and are then found in breast-feeding mothers' milk; therefore acknowledging that pollutants have already entered the child's system as from his/her birth; whereas, in addition, children can ingest and/or inhale these substances or products and/or inhale the air polluted by the same substances, especially in our homes,

§11. **Whereas** these polluting substances or products can induce diseases in children population, such as those listed in §9; whereas one out of seven children in Europe suffers from asthma, whereas asthma is made worse by city and home pollution; whereas incidence in pediatric cancers has been on the rise for the last 20 years in some industrialized countries; and whereas these considerations all lead to the fact that **Children are now in serious danger**,

§12. **Whereas** the human being is a mammal consubstantial with the surrounding flora and fauna, any irreversible destruction or pollution of which endangers his own life; whereas man is responsible for the disappearance of several thousand species each year,

§13. **Whereas** the 28 July 1999 *Wingspread Statement*, signed by 22 U.S. scientific experts and NGO's, establishes a causal link between extinct wildlife and domestic animals and contamination of the environment by some of these chemicals; whereas man is exposed to the same products as these domestic or wild animal species; whereas these products caused diseases in these animal species (congenital malformations, infertility) leading thus to their extinction and considering that these diseases parallel those now found in human beings,

§14. **Whereas** chemical pollution in all its forms has become one of the main causes of current human scourges such as cancers, infertility, congenital diseases, etc; whereas contemporary medicine is unable to halt them and, despite great advances in medical research, could well never be able to eradicate them,

§15. **Whereas**, moreover, pollution triggered by the atmospheric release of greenhouse gases leads unquestionably to a worsening of global warming and serious climatic disruption; whereas, according to the less pessimistic scientific forecasts, by 2100, the average temperature could well have risen by 3°, which will contribute to the development and proliferation of viruses, bacteria, parasites and vectors of these infectious agents; and considering that consequently, the spreading of their ecological niche from the southern to the northern hemisphere would be likely to cause the dispersion of the diseases they induce and the recurrence of infectious and/or parasitic diseases, which had been partially halted in the last century, or even the appearance of new diseases, in northern hemisphere nations.

III. DECLARATION

Based on these considerations, We, Scientists, Medical Doctors, Jurists, Ethicists and Citizens, convinced of the urgency and seriousness of the present situation, solemnly declare that:

Article 1

The development of numerous current diseases is a result of the deterioration of the environment.

Article 2

Chemical pollution represents a serious threat to children and to Man's survival.

Article 3

As our own health that of our children and future generations, is under threat, *the Human race itself is in serious danger.*

We call upon national decision-makers, European Authorities, international organizations, and specifically the United Nations Organization (UNO), to take the following measures:

Measure # 1: Banning all products that are *certainly* or *probably* carcinogenic, mutagenic or reprotoxic (CMRs) for human beings, as specified by competent international scientific authorities and organizations, and therefore applying to these products the principle of substitution; exceptionally, whenever implementation of this principle is not feasible and the use of the product concerned is considered unavoidable, limiting its use to a minimum with particularly stringent measures of fixed quotas,

Measure # 2: Applying the precautionary principle to all chemicals that, regardless of toxicity characteristics specified in Measure # 1 (refer to §9 and §13), and because they are persistent, bioaccumulative, toxic (PBT) or very persistent and very bioaccumulative (vPvB), constitute an allegedly serious and/or irreversible danger for human and/or animal health, and more generally the environment, without waiting for the definite proof of an epidemiological link, so as to anticipate and avoid serious and/or irreversible sanitary or ecological damage,

Measure # 3: Promoting the adoption of toxicological standards or international thresholds to protect people, based on the assessment of risks for the most vulnerable, i.e. mostly children and the embryo.

Measure # 4: With respect to the precautionary principle, adopting programs with scheduled deadlines and targets in precise figures so as to achieve elimination or strictly regulated reduction in polluting substances emissions and in the utilization of marketed chemicals, such as pesticides, modeling the reduction in use implemented in Sweden, Denmark or Norway,

Measure # 5: Due to the serious threats to mankind, calling upon States to require from every public or private entity to take responsibility for the consequences of their actions or their inefficiency to react; whenever this is not the State's responsibility, it should be dealt with by an international jurisdiction;

Measure # 6: As for global warming and climate change, this responsibility requires nations to implement forceful measures to cut greenhouse gases emissions without waiting for prior effective implementation of the Kyoto Protocol.

Measure # 7: As regards Europe, reinforcing the REACH program (Registration, Evaluation and Authorisation of CHemicals) that aims at regulating the marketing of chemicals so as to ensure substitution of the most dangerous for man with less dangerous substitutes; as regards the world, adopting international regulations to control the marketing of chemicals following the REACH program in a reinforced version.

SCIENTISTS SIGNATORIES

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Belgium: Action Environnement Beauchevin; Aide et Coopération au Développement d'Arequ au Pérou; Association Belge de Lutte contre la Mucoviscidose; Association d'ErE; Association Francophone Belge de l'Ostéogénèse Imparfaite; Association pour la Protection de la Nature et de l'Environnement; ATTAC – Huy; Cercles des Naturalistes de Belgique; Comité pour le Développement durable des Collines par ses Habitants; Entente nationale pour la protection de la nature; Fédération namuraise d'apiculture; Fondation Hicter; GAWI; Greenpeace Belgique; Inter-Environnement Wallonie; La voix des femmes; L'Alimentation Vive; Les Amis de la Terre Belgique; L'hébergement asbl; Ligue des Droits de l'Enfant; Nature et Progrès Belgique; Perfume Foundation; Pesticide Action Network Belgique; Stop Poison Santé; Super Day;

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Spain: Científicos por el medio ambiente; Ecologistas en Accion;

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Ireland: Irish Doctors' Environmental Association;

Italia: Movimento dei Consumatori;

Norway: Bellona Foundation;

The Netherlands: De nederlandse vrouwen raad; Organisation de femmes catholiques; Women in Europe for a Common Future;

Republic of Macedonia: Association of Doctors for the Environment MADE;

Czech republic: Health Care Without Harm Europe;

Sweden: International Chemical Secretariat;

Switzerland: Comité International de la Croix Rouge; Fondation Mediantis; Fondation pour une terre humaine;

Ukraine: Mama-86-Kharkov.

Health and Environment Alliance (HEAL) and its members:

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European Public Health Alliance (EPHA), which represent more than 100 ONGs :

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Other countries :

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Halte Incin' ; Haute-Saône nature environnement ; H-50 ; Horizon vert ; Humeur Bio ;

Imagin'ere ; Indre Nature ; Info Vivrao ; Inter Bio Bretagne ; Intelligence Verte ; IRH Environnement ;

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Khorum ;

La Carline ; La Gazette des Jardins ; La Méditerranée en grand, l'Europe ensemble ; La Roche Claire ; La Ruche de l'Ecologie ; L'Atelier du Hêtre ; La vie claire "Voltaire" ; La vie saine ; L'air du Perche ; Laissez nous vivre ; Lapining ; La Sauvegarde de l'environnement ; Le Carillon de Combreaux ; Le Forum de la Santé ; Le pas de pégage ; Le POULP ; Le Réseau santé ; Le Sourire du Cotentin ; Les Amis de la nature de Colombes ; Les Amis de la Terre (France, Isère, Midi-Pyrénées, Paris, Rhône, Toulouse, Landes) ; Les Amis du monde diplomatique ; Les Amis du vent ; Les Bretons de Région Parisienne ; Les Droits des Non-Fumeurs ; Lestrem Nature ; Les Trois Prés ; Les Webs de Gévaudan ; L'étang nouveau ; Librimedia ; Ligue de Protection des Oiseaux ; Ligue ROC ; Lions Club Orléans ; Loire Vivante Lutte Contre l'Obscurantisme ;

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S.A.G.E.P ; Santé - Liberté – Entraide ; Santé Solidarité ; Sauvegarde de la Nature et de l'Environnement ; Sauvegarde des Coteaux du Lyonnais - Sainte Consoce ; Schilick Ecologie ; Sem Bio ; Sèvre Environnement ; Shintaido Paris ; Société vaudoise pour la protection des animaux ; SOS Environnement Haute Durance Briançon ; SOS Grand Bleu ; Spiral pro dev durable ; Stop Poisons Santé ; Sucy Nature Environnement ; Syndicat C.F.T.C. de la Police Nationale ; Syndicat de traitement des déchets ; Syndicat des Apiculteurs Professionnel ; Syndicat Professionnel des Apiculteurs Autonomes du Gard ; Synergie Solidaire ; Synopsis ;

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Statement in Paris Senate on March 23 2009: Electromagnetic fields on our health

Darwinian evolution occurred in the presence of natural electromagnetic fields. Magnetoreception is one of the biological mechanisms used by migrating birds and bees for navigation. No scientist can currently be positively certain that the coverage of our European territories by multiple artificial electromagnetic fields does not have, and will not have, any major impact on the behaviour and conservation of fauna.

The effects of electromagnetic fields on our health have been established through clinical observation of a great number of toxicological and biological investigations, and through some epidemiological studies. There is, to this day in Europe, a growing number of “electrohypersensitive” patients, who have developed intolerance to electromagnetic fields.

Although the biological mechanisms of electrosensitivity remain unknown, it is legally acknowledged as a handicap in Sweden.

We, physicians, acting in accordance with the Hippocratic Oath, we, researchers, acting in the name of scientific truth, we all, doctors and researchers from the different States of the European Union, hereby state in full independence of judgement, that a growing number of patients are to be found who have become intolerant to electromagnetic fields, and that this intolerance is causing them serious prejudice in terms of health, professional and family life; that the possibility of their developing a neurodegenerative disease, or even some form of cancer, cannot be ruled out, and that this prejudice therefore ought to be acknowledged and compensated for by the social security systems of the different member States of the European community.

We hereby warn governments, that in view of our present knowledge, it is not to be ruled out that after a sufficient period of exposure, this intolerance might also affect children and therefore cause a major public health problem in years to come in all the countries making an unrestricted use of electromagnetic field based technologies.

Although our scientific knowledge remains incomplete, and some issues have actually given rise to controversy, the international scientific community unanimously acknowledges a potentially serious hazard on public health, urgently requiring the application of the precautionary principle. Going along with certain lobbies and jeopardizing health in the name of short term economical and financial interests can only cause harm to all our fellow citizens.

Pr Franz Adlkofer, European Reflex Program Coordinator, Verum Foundation, Munich (Germany)

Pr Dominique Belpomme, Université Paris-Descartes, Département d'oncologie médicale, Hôpital Européen Georges Pompidou, Paris (France)

Pr Lennart Hardell, MD PhD, Department of oncology, University Hospital, Orebro (Sweden)

Pr Olle Johansson, Department of neuroscience, Karolinska Institute, Royal Institute of Technology, Stockholm (Sweden)

Electromagnetic fields and public health

Electromagnetic hypersensitivity

Backgrounder
December 2005



As societies industrialize and the technological revolution continues, there has been an unprecedented increase in the number and diversity of electromagnetic field (EMF) sources. These sources include video display units (VDUs) associated with computers, mobile phones and their base stations. While these devices have made our life richer, safer and easier, they have been accompanied by concerns about possible health risks due to their EMF emissions.

For some time a number of individuals have reported a variety of health problems that they relate to exposure to EMF. While some individuals report mild symptoms and react by avoiding the fields as best they can, others are so severely affected that they cease work and change their entire lifestyle. This reputed sensitivity to EMF has been generally termed “electromagnetic hypersensitivity” or EHS.

This fact sheet describes what is known about the condition and provides information for helping people with such symptoms. Information provided is based on a WHO Workshop on Electrical Hypersensitivity (Prague, Czech Republic, 2004), an international conference on EMF and non-specific health symptoms (COST244bis, 1998), a European Commission report (Bergqvist and Vogel, 1997) and recent reviews of the literature.

What is EHS?

EHS is characterized by a variety of non-specific symptoms, which afflicted individuals attribute to exposure to EMF. The symptoms most commonly experienced include dermatological symptoms (redness, tingling, and burning sensations) as well as neurasthenic and vegetative symptoms (fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitation, and digestive disturbances). The collection of symptoms is not part of any recognized syndrome.

EHS resembles multiple chemical sensitivities (MCS), another disorder associated with low-level environmental exposures to chemicals. Both EHS and MCS are characterized by a range of non-specific symptoms that lack apparent toxicological or physiological basis or independent verification. A more general term for sensitivity to environmental factors is Idiopathic Environmental Intolerance (IEI), which originated from a workshop convened by the International Program on Chemical Safety (IPCS) of the WHO in 1996 in Berlin. IEI is a descriptor without any implication of chemical etiology, immunological sensitivity or EMF susceptibility. IEI incorporates a number of disorders sharing similar non-specific medically unexplained symptoms that adversely affect people. However since the term EHS is in common usage it will continue to be used here.

Prevalence

There is a very wide range of estimates of the prevalence of EHS in the general population. A survey of occupational medical centres estimated the prevalence of EHS to be a few individuals per million in the population. However, a survey of self-help groups yielded much higher estimates. Approximately 10% of reported cases of EHS were considered severe.

There is also considerable geographical variability in prevalence of EHS and in the reported symptoms. The reported incidence of EHS has been higher in Sweden, Germany, and Denmark, than in the United Kingdom, Austria, and France. VDU-related symptoms were more prevalent in Scandinavian countries,

and they were more commonly related to skin disorders than elsewhere in Europe. Symptoms similar to those reported by EHS individuals are common in the general population.

Studies on EHS individuals

A number of studies have been conducted where EHS individuals were exposed to EMF similar to those that they attributed to the cause of their symptoms. The aim was to elicit symptoms under controlled laboratory conditions.

The majority of studies indicate that EHS individuals cannot detect EMF exposure any more accurately than non-EHS individuals. Well controlled and conducted double-blind studies have shown that symptoms were not correlated with EMF exposure.

It has been suggested that symptoms experienced by some EHS individuals might arise from environmental factors unrelated to EMF. Examples may include “flicker” from fluorescent lights, glare and other visual problems with VDUs, and poor ergonomic design of computer workstations. Other factors that may play a role include poor indoor air quality or stress in the workplace or living environment.

There are also some indications that these symptoms may be due to pre-existing psychiatric conditions as well as stress reactions as a result of worrying about EMF health effects, rather than the EMF exposure itself.

Conclusions

EHS is characterized by a variety of non-specific symptoms that differ from individual to individual. The symptoms are certainly real and can vary widely in their severity. Whatever its cause, EHS can be a disabling problem for the affected individual. EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure. Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem.

Physicians: Treatment of affected individuals should focus on the health symptoms and the clinical picture, and not on the person's perceived need for reducing or eliminating EMF in the workplace or home. This requires:

- a medical evaluation to identify and treat any specific conditions that may be responsible for the symptoms,
- a psychological evaluation to identify alternative psychiatric/psychological conditions that may be responsible for the symptoms,
- an assessment of the workplace and home for factors that might contribute to the presented symptoms. These could include indoor air pollution, excessive noise, poor lighting (flickering light) or ergonomic factors. A reduction of stress and other improvements in the work situation might be appropriate.

For EHS individuals with long lasting symptoms and severe handicaps, therapy should be directed principally at reducing symptoms and functional handicaps. This should be done in close co-operation with a qualified medical specialist (to address the medical and psychological aspects of the symptoms) and a hygienist (to identify and, if necessary, control factors in the environment that are known to have adverse health effects of relevance to the patient).

Treatment should aim to establish an effective physician-patient relationship, help develop strategies for coping with the situation and encourage patients to return to work and lead a normal social life.

EHS individuals: Apart from treatment by professionals, self help groups can be a valuable resource for the EHS individual.

Governments: Governments should provide appropriately targeted and balanced information about potential health hazards of EMF to EHS individuals, health-care professionals and employers. The information should include a clear statement that no scientific basis currently exists for a connection between EHS and exposure to EMF.

Researchers: Some studies suggest that certain physiological responses of EHS individuals tend to be outside the normal range. In particular, hyper reactivity in the central nervous system and imbalance in the autonomic nervous system need to be followed up in clinical investigations and the results for the individuals taken as input for possible treatment.

What WHO is doing

WHO, through its International EMF Project, is identifying research needs and co-ordinating a world-wide program of EMF studies to allow a better understanding of any health risk associated with EMF exposure. Particular emphasis is placed on possible health consequences of low-level EMF. Information about the EMF Project and EMF effects is provided in a series of fact sheets in several languages www.who.int/emf/.

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International Appeal: Scientists Call for Protection from Non-Ionizing Electromagnetic Field Exposure. Inquiries can be made through Elizabeth Kelley, M.A., Appeal coordinator at IKelley45@msn.com

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