

# ICEMS Position Paper on the Cerebral Tumor Court Case

The Italian Supreme Court, namely "Corte di Cassazione" (3<sup>rd</sup> level of judgment), confirmed on the 12<sup>th</sup> October 2012 the previous decision of the Court of Appeals of Brescia that ruled the Insurance Body for Work (INAIL) must compensate Mr. Marcolini, a worker who had a tumor in the head due to long-term use of a mobile phone.

This decision is supported by a consistent amount of evidence on the link between mobile phone microwave exposure and head tumor onset, especially by the epidemiological evidence found by Olle Johansson (2002), Lennart Hardell (2002-2012), the INTERPHONE study (2010), and a study by Anders Albohm and Maria Feychting et al. (2006), relative to benign tumor of the acoustic nerve.

All of these studies and more represented the scientific basis for the IARC classification (2B) of radiofrequency as a possible carcinogen in May 2011.

The epidemiological evidence is also supported by important scientific findings regarding the biological mechanisms of EMF action on living organisms:

- 1) microwave-induced blood-brain barrier permeability, with consequent passage of albumin into the brain, was discovered by Leif Salford, professor of Neurosurgery at the University of Lund (Sweden) and collaborators (*Micros Res Tech* 1994, 27(6)), published also by *Environmental Health Perspectives*, a magazine of the NIH;
- 2) altered working of the calcium-potassium cell pump – a fundamental mechanism of living cells – due to extremely low frequencies was observed first by S. M. Bawin and W. Ross Adey (*PNAS* 1976, 73(6)) and then, with reference to amplitude modulated radiofrequencies, by C.F. Blackman et al. from the US EPA (*radio SC* 1979, 14(68));
- 3) D.B. Leyle and colleagues found diminished functionality of the immune system in people exposed to microwaves (*Bioelectromagnetics*, 1983, 4);
- 4) microwave-induced DNA single- and double-strand breaks were discovered by Henry Lai and N.P. Singh of the University of Washington in Seattle (*Bioelectromagnetics*, 1995, 16; *J Radiation Biol* 1996 69(4));
- 5) altered micronucleation during cell reproduction was found by Ian Udroui, Lusianna Ieradi and Livio Giuliani (*Eu J Cancer*, 2008; *Eu J Cancer Library*, 2010, Vol. 5);

- 6) Fiorenzo Marinelli from Institute of Molecular Genetics of National Council of Research (Bologna) and colleagues found mechanisms by which electromagnetic fields influence the life cycle of cells by inducing abnormal apoptotic and survival signals (*J Cell Phys*, 2004, 198);
- 7) magnetic field-induction of ion currents in the cell, able to alter the chemical links, was discovered by Mikhail Zhadin and Viktor Novikov of the Institute of Cell Biophysics in Poushkin (Russia) (*Biofizika*, 1994, 39(1); *Bioelectromagnetics*, 1998, 19(1)) and it was also independently investigated by Emilio Del Giudice, Frank Barnes, Giuliano Mengoli, Mikhail Zhadin, Livio Giuliani and others (*Bioelectromagnetics*, 2002, 23(7); 2005, 26(4); 2006, 27(1). *EBM*, 2006, 25(4), *BioMagnetic Res. and Tech.*, 2008, 6(1)), and confirmed by Alexander Pazur in Germany (*BioMagnetic Res. and Tech.*, 2004, 2(8)) and by Diego Alberto et al. at the Politecnico in Turin (*EBM*, 2008, 27(3)) e (4));
- 8) the effectiveness of the ion currents induced in cells by magnetic fields during the differentiation of stem cells was investigated by Antonella Lisi and the research group from ISPESL, CNR and Sapienza University of Rome (*Bioelectromagnetics*, 2004, 25(2); *J Cell Physiol.*, 2005, 204(2); *EBM*, 2006, 25(4); 2008, 27(2) and (3); *Cardiov. Res.*, 2009, 82(3)), and by Silvia Di Loreto et al. (*J Cell Phys.*, 2009, 219(2));
- 9) the effectiveness of ion currents induced in cells by magnetic fields in treating tumors has been shown independently by Viktor Novikov and collaborators (*Biofizika*, 1998, 43(5); *Bioelectromagnetics*, 2009, 30(5)), by Igor Belyaev and collaborators at the Center for Cancer Research in Bratislava (*Bioelectromagnetics*, 2005, 26(5)) and by Boris Pasha and colleagues at the University of Alabama (*British Med J*, 2011, Aug. and Dec.);
- 10) the correlation between mechanisms due to extremely-low-frequency magnetic fields and mechanisms due to pulsed microwaves from mobile phones was found. It is well known that the effect of mobile phones on health is correlated with the effect of low-frequency magnetic fields, as highlighted in the *Lancet* (2000) by Gerard Hyland of the University of Warwick;
- 11) Christos Georgiou of the University of Patras (*Eu J Oncology*, Libr. Vol. V, 2010) focused on electromagnetic induction of oxidative stress in cells;
- 12) Jiry Pokorny and colleagues from the Czech Academy of Sciences in Prague (*Eu Physics J*, 2001, 40) focused on the non-thermal coupling of microwaves and cancer tissues, discovered earlier by E.H. Frick and S. Morse in 1926 (*J Cancer Res*, 1926, 10);

- 13) effects on pregnancy and on offspring due to microwave exposure were observed, *inter alios*, by Nesrin Seyhan and colleagues from the University of Gazi in Ankara (EBM, 2006, 25(4));
- 14) C. F. Blackman and colleagues from the US EPA also focused on the antagonistic effect of 50 Hz frequency on the action of melatonin and tamoxifen in therapies;
- 15) Morando Soffritti and colleagues from Istituto Ramazzini in Bologna detected a syncarcinogenic effect of extremely low frequencies combined with gamma rays (Eu J Oncology Library 2010, Vol. 5), ionizing radiations widely used in diagnostics and therapeutics mainly for women.

Importantly, the ruling of the Supreme Court in Brescia underlined the discrepancies between the low evidence of risk found by industry-funded studies and the higher evidence of risk found by independent studies, such as the ones by the Swedish group directed by epidemiologist Lennart Hardell, spotlighting a significant issue of modern science: conflict of interest and the problem of industry funding of research that is suspected of “bias,” manipulating scientific results for marketing purposes.

It is also important to underline that before the decision of Brescia, which was ruled under the Civil Code as it was a work lawsuit, there were two other positive judgments in Italy under the Penal Code:

1) the case of the radio-TV stations of Maddalena Hill, in Brescia, where the Court of Brescia – the same one that adopted the recent civil ruling – condemned the owners of radio-TV stations on the hill for “dangerous launching”.<sup>1</sup>

2) the case of Radio Vaticana in Rome, where the Italian Supreme Court was required to ascertain the penal relevance of emissions rising over the *attention value*<sup>2</sup> established in Italy: 6 V/m for the electric field due to RF/MWs, as stated in decree

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<sup>1</sup> The “dangerous launching” is a violation of the Penal Code referring to the launching into the environment of physical objects that can be dangerous. A ruling of the Supreme Court in the trial of Radio Vaticana stated that this violation could be applied to EMFs because of the equivalence between energy and matter.

<sup>2</sup> The Italian Framework Law 2001/36 on EMF protection provides three ceiling limits:  
i) an exposure limit that should never be passed, either for acute or for long-term exposures;  
ii) an *attention value* for places where people stay for more than four hours;  
iii) a *quality limit* that is aimed at providing for a progressive mitigation of people’s exposures, with reference to more sensitive subjects. The progressive mitigation implies the *prudent avoidance* principle in projecting new installations, as a corollary of the precautionary principle, stated in law 2001/36, Art. 1. The Italian President of Council’s Decrees dated 8/7/2003 stated the respective limits as: 20 V/m (1 W/m<sup>2</sup>) as *exposure limit*, 6 V/m (0,1 W/m<sup>2</sup>) as *attention value*; while the *quality limit* is the same as the *attention value*, thus, in fact, denying its aim.

1998/381, art. 4, according to the position document of the Ministerial Committee (decree 6/2/1997) including Pietro Comba, Martino Grandolfo and one of the present authors.

The Supreme Court stated that radiofrequency emissions above 6 V/m represent a crime of "dangerous launching" punishable by Article 674 of the Italian Penal Code. Since Article 2043 of the Italian Civil Code states that damages caused by a delictual action have to be compensated, the Brescia Court's decision in favour of Mr. Marcolini was a logical consequence. Article 2043 of the Civil Code is, in fact, inherited from the Roman Right, specifically from the Lex Aquilia introduced by the Tribune Aquilio Gallo in 287 B.C. which stated that even damages caused by negligence ("culpa laevisissima") had to be compensated. The Roman Right provides a specific law on damages so that judges need only establish whether or not a damage occurred (the so-called "an", that is the Latin word meaning "whether") and, then, determine the "quantum" (the Latin word meaning "how much") of the compensation.

In the Brescia Case of Mr. Marcolini, the "an" was a consequence of the Supreme Court statement about "dangerous launching" previously pronounced in the case of Radio Vaticana, given that the overexposures were ascertained by the Italian Environmental Agency. On that occasion, the Italian Supreme Court stated that the violation of the Penal Code occurs every time exposure limits are exceeded. In the recent judgment regarding the work lawsuit in Brescia, the Supreme Court emphasized (at the beginning of the rationale of the sentence): *"the use of cell phones or radio-telephones for many hours (5/6 every day), and the left ipsilateral use...have been fully witnessed. Based on this point, which quantifies the exposure level, the consultant of the Court must begin ..."*.

Two previous "an" were already established in the cases of Maddalena Hill and Radio Vaticana; so the Brescia judges of the Civil Court had only to fix the "quantum", the amount of compensation. However, the "quantum" had to be correlated to the extent of the damage. That was the task of the Consultant of the Court, Dr. Giuseppe Grasso, neurosurgeon at the Brescia Hospital. In this regard, he showed the clear relationship between heavy ipsilateral exposures to mobile phone EMFs, as in the case discussed in the lawsuit, and the development of neurinomas of the acoustic nerve, well known in epidemiological studies, especially those by Lennart Hardell.

Dr. Grasso underscored that the neuroma of the trigeminal nerve, discussed in the lawsuit, presented the same histopathology of the acoustic neuroma, already being

correlated to EMFs in epidemiology – both are schwannoma - and that the two tumors stem from the same cerebellar site from which the two nerves originate. Given that, it is possible to extend all considerations about acoustic nerve neuroma to the trigeminal nerve neuroma. The “an” - i.e., the causal nexus between heavy ipsilateral long-term use of mobile phones and the neuroma of the plaintiff - was reinforced, and the extent of the damage was recognized as being as wide as it is in the case of acoustic nerve neuroma.

Given the Italian Court cases, it is possible to conclude that protecting public health from radiofrequency exposure could be improved by adopting a framework of restrictions in several steps:

- 1) establishing a framework for restricting people’s exposures to radiation from cell phones, which are able to induce exposures of hundreds of V/m, especially in the connection phase, and extending the actual limits for whole-body exposures to partial exposures, as well. Partial exposures would be considered to be all the exposures where, given the relative position of the electromagnetic source and of the target, the whole body is not concerned (e.g., people’s exposures due to portable devices, including mobile phones and cordless phones);
- 2) establishing a framework for restricting people’s exposures that includes **attention values** (i.e., ceiling values for non-occasional exposures), at least of the order of 1/100 of the **reference levels** reported in Guidelines (e.g., in EU Recc. 1999/519/CE), as already provided by the law in Italy and in Switzerland (6 V/m for RF/Mws, bills respectively in 1998 and in 1999) and in China (14 V/m for RF, bill in 2003);
- 3) **punishing those who exceed** attention values (as in the cases of Maddalena Hill in Brescia and of Radio-Vaticana in Rome; although nobody paid due to the “prescription of offenses”);
- 4) providing legal **compensation of damages** (this is easier today in Italy because of the three previous judgments: two under Penal Law and, the most recent, under Civil Law).

**Given the amount of scientific evidence regarding the biological and health effects of radiofrequency radiation, it is possible to conclude that new biologically-based safety standards need to be adopted for protecting the health of mobile phone users.**

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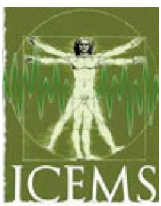
Livio Giuliani, ICEMS Scientific Secretariat and Spokesman

Morando Soffritti, ICEMS Steering Committee Chairman

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