

Cherry

**Evidence that Electromagnetic Radiation is  
Genotoxic:**

**The implications for the epidemiology of cancer and  
cardiac, neurological and reproductive effects**

**Dr Neil Cherry**

**June 2000**

**For presentations in May to NZ Parliament  
and June 2000 in Italy, Austria, Ireland and at the  
European Parliament in Brussels.**

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### **Cell Phone Conclusions:**

Cell phones will highly probably increase many neurological diseases and brain tumours over the next 10 to 20 years

Cell sites will highly probably increase miscarriage, many cancers, many diseases, significant neurological and cardiac diseases and death. (+ animals (plants))

Thousands of cell sites being installed in communities, are significantly raising the exposure of millions of people to RF/MW at levels that are know to cause serious adverse health effects.

The problems are going to increase unless rapid, drastic and determined moves are made to reverse the trend and only install new sites in locations that produce extremely low mean residential exposures, somewhat less than

10 nW/cm<sup>2</sup> (0.01 $\mu$  W/cm<sup>2</sup>).

studies on the condition go back over 50 years and in the last few years some researchers have claimed that many of the mechanisms of sensitisation have now been unraveled. It seems strange, therefore, that the Department of Health appears to follow the few sceptics who still claim that the condition does not exist or deliberately conflate the two distinct conditions of EHS and EMF Neurosis. The NHS in the UK needs to be updated on the pathological aspects of electro-sensitivity, and be able to diagnose cases and help those who suffer from it. This would save sufferers from having to go abroad to receive an EHS diagnosis. It would also save NHS consultants and doctors from having to diagnose the condition under different terminology, since many in the NHS still seem to feel under threat from management if they diagnose someone as sensitised to EMFs.

## 5. Practical problems of increasing EMF pollution

It would also be a great help for the growing number of people being sensitised to EMFs if the AGNIR

could help the UK's Department of Health to resolve the many illogical situations in which sensitised people now find themselves. In fact the leading scientists in this area of public health and environmental pollution from EMFs have already begun to argue that enough about the EHS condition is sufficiently well established for the next stage. The urgent need, therefore, they now argue, is to determine how best to mitigate the condition for sufferers. EHS was recognized as an EI-Allergy by the Nordic Council of Ministers in the year 2000 and defined as a "disabling condition" by the WHO in 2005. Therefore, whether or not the sceptics at Essex and KCL continue to fail in their attempts to find some psychological rather than biological markers, the debate has moved on to this next stage, where employers, utilities, transport companies and local authorities are asking for advice on how best to protect those sensitised. Indeed, one aspect is how to implement the demands of the UN Convention on the Rights of Persons with Disabilities, which the UK signed in 2007, to help those people

with a functional impairment caused by this type of sensitisation.

## 6. Action is needed: EHS will continue until mitigation or a cure is found

The evidence of risks from sub-thermal EMFs is no longer disputed. Over 80% of studies on health effects from residence near mobile phone masts are said to show typical electro-sensitivity symptoms. Even the majority of underwriters are now apparently refusing to insure health risks from mobile phones. The need now is action to mitigate the harm being done. As leading scientists are now arguing, the AGNIR needs to advise the Department of Health of practical solutions to the distressing problems which sensitized people face in trying to survive in a country increasingly polluted by EMFs. Sufferers from electro-sensitivity are not going to go away, however much the sceptics in the "military-industrial" lobby-group may wish. There is nowhere to go.

## ES NEWS – ES RESEARCH

### Professor Belpomme: current state of ES research

#### Proven link between EMFs and cancer and Alzheimer's.

Next-up News on 10th September reported Alexandre Zalewski's interview in Metrofrance.com with Dominique Belpomme, professor of oncology at Paris Descartes University and president of ARTAC, the Association Research Therapeutic Anti-Cancer. Prof. Belpomme declared that "there is a proven link between EMFs, cancer and leukaemia", with an even higher risk of Alzheimer's.



**A major public health issue.** He says his twice-weekly consultations in Environmental Medicine see 10-20 new EMF patients per week, with a growing number of parents coming for their children who have headaches, impaired memory, concentration or language, problems with dyslexia. "It is a major public health issue. There is indeed neuro-degeneration." "These symptoms may be minor, like headaches, or much more serious as the beginning of Alzheimer's disease."

**Diagnosis of SICEM.** Based on treating 400 patients he has developed a diagnostic test using a pulsed Doppler ultrasound and cerebral blood tests. They serve to highlight an increase of some stress proteins, which reflect the

existence of a brain injury. "These are real sick. So I can certify that they suffer from a Syndrome of Intolerance to ElectroMagnetic Fields (SICEM)."

**Three protocols.** His treatment to reduce the symptoms is based on three elements. First, close the electro-brain barrier, using one or more antagonists of histamine receptors. Then stimulate the regeneration of astrocytes (brain cells) that were destroyed by EMFs. Finally, they initiate a study testing the effect of anti-oxidants. "We get interesting results, but this does not prevent a potential recurrence. Hence the need to complement this treatment of protective measures vis-à-vis the EMFs."

**Need for white areas.** This involves the creation of white areas, especially in public institutions and public transport. "It must be like for tobacco: prohibiting the WiFi in certain areas, such as libraries. It should also prohibit the installation of base stations near kindergartens and schools. There are urgent protective measures to take, but which are unfortunately not yet implemented."

**10-50% people ES by 2035-2060?** "We cannot remove the sick to please the public and political authorities of the country. In the name of the Hippocratic Oath I speak out publicly, because there is a major public health issue. Studies show that 10-50% of the population could become intolerant to EMFs in 25-50 years' time. One day we will pay the bill if we do not take precautionary measures and prevention is needed now."

## HEALTH [PDF La Une]

## The first radiation-free refuge is in the Drôme

## EMF: Prof. Belpomme "A major health problem"

By the Editor

Professor Dominique Belpomme is the president of ARTAC (preventive cancer research association). This research unit is one of the most advanced in Europe regarding people who are EHS (electro-hypersensitive).

"We have been working for the last year on the syndrome of intolerance to electromagnetic fields," he explains. "In Europe, the number of people affected is estimated to be between 1 and 10% of the population. It's a major health problem, a real threat to public health!" Fatigue, insomnia, depression, but other potential risks "of multiple sclerosis, and even Alzheimer's disease among young people" may be linked to the influence of these fields.

"We know now for certain that these people are genuinely ill." Diagnoses have been made possible thanks to tests developed by the association: encephalogram, biological tests, blood analysis.

"We are convinced that it is the amalgamation of different sources of EMFs - from relay antennas, high-voltage power lines, Wi-fi, etc - that causes this syndrome."



Prof. Dominique Belpomme

**"A slow grasp of the truth"**

It is still not clear why some people are seriously affected and others not. "We are working on a hypothesis involving magnetosomes, micro-electro magnets that we have in the brain."

"Grasping the truth is a slow process but it has started. More than 100 cities and towns have already decided to create zones where the radiation limit is 0.6 volts/metre. We are still wondering if the recent government consultations will produce concrete decisions, but things are beginning to move."

Until such time as appropriate planning policies are in place and the EHS syndrome is recognised "as a social or professional illness by Social Security" (a goal that will be pursued in the near future), Professor Belpomme recommends certain precautions:

No mobile phones for the under 12s or for pregnant women, no relay antennas close to schools, crèches, maternity clinics or hospitals, and above all the totality of radiation in public places from all sources should not exceed 1 volt /metre.

M.R.

Cancer rate exceeds birth rate

**Sue Webster**

**From:** "Dr Grahame Blackwell" <grahame@starweave.com>  
**To:** <Undisclosed-Recipient:>  
**Sent:** 12 April 2005 18:31  
**Subject:** Fw: Canada heading towards cancer crisis

For info

Grahame

----- Original Message -----

**From:** Dr Grahame Blackwell  
**Sent:** Tuesday, April 12, 2005 6:20 PM  
**Subject:** Re: Canada heading towards cancer crisis

Thanks for info, Robert.

There's none so blind as those that don't want to see.

Perhaps when the increase in healthcare costs outstrips the income from licencing of frequency use and taxation on mobile phone revenues, governments will begin to think it's worth doing something about it.

Grahame

----- Original Message -----

**From:** Robert Reidlinger  
**Sent:** Tuesday, April 12, 2005 6:03 PM  
**Subject:** Canada heading towards cancer crisis

What they fail to mention is that 100 percent of the population is being microwaved!!!!  
 Robert



**Canadian Cancer Society** **Société canadienne du cancer**

**Let's Make Cancer History**  
 1 888 939-3333 | [www.cancer.ca](http://www.cancer.ca)

Canada heading towards cancer crisis

12 April 2005

TORONTO -

### Canada heading towards cancer crisis

Canada's aging baby boomers and the country's growing population are propelling Canada into a cancer crisis, according to *Canadian Cancer Statistics 2005* released today by the Canadian Cancer Society.

"The number of new cancer cases in Canada is growing twice as fast as the population is growing," says Heather Logan, Director, Cancer Control Policy, Canadian Cancer Society. "Cancer is already straining our healthcare system and it's going to get worse as the number of new cancer cases increases as the baby boom generation ages."

From 2000 to 2004, the population grew about one per cent annually while the

## Cancer in EU at 'epidemic' levels



Cancer is at epidemic levels with a million people dying of the disease across the EU every year, according to British MEP John Bowis.

The UK Tory deputy was speaking after parliament's environment committee voted in favour of a resolution on combating cancer.

Bowis, EPP-ED spokesman on health, said, that "a million of our fellow citizens in the EU die each year from cancer."

"An average of only three per cent of health budgets are spent on cancer prevention. The links are clear. We have a major epidemic. We could save 330,000 lives a year."

"We need to get our act together and invest in cancer prevention."

One third of cancers are preventable, according to World Health Organisation figures.

The resolution calls on the commission to set up an institutionalised EU cancer task force composed of members from the commission, member states and parliament to meet on a regular basis.

Meanwhile, prevention and early diagnosis of cancer are key elements of a comprehensive strategy to fight cancer, said Greek MEP Antonios Trakatellis, told the committee on Tuesday.

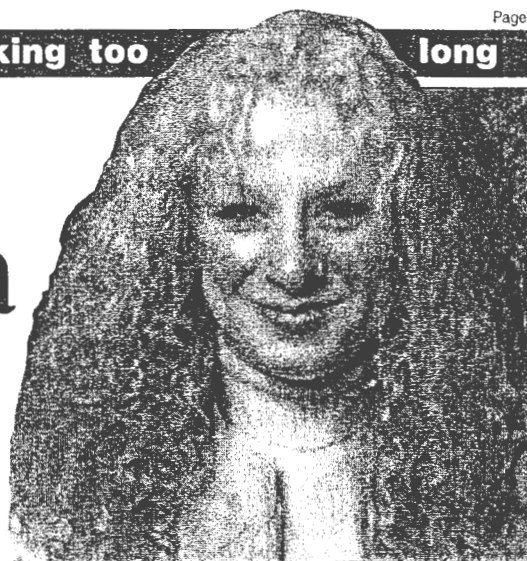
He said, "The Slovenian EU presidency pledged to make cancer a priority and we must continue on our fight to make sure that cancer does not remain the leading cause of death in Europe."

Sorry!  
Breakfast  
Toastie

Devastated parents warn of the dangers of talking too

long

# Our chatterbox daughter died of a brain tumour. We blame her mobile



Samantha Miller: 'Her phone never stopped ringing'

A TEENAGE girl who spent hours talking on her mobile phone each day has died from a brain tumour.

Samantha Miller, 17, spent hundreds of pounds a month on 'top-up' cards to pay for calls to her friends.

Her parents are convinced her constant mobile phone use triggered the tumour that killed her.

Less than a year after she bought the phone Samantha started complaining of headaches, ringing in the ears and a numb face.

Doctors diagnosed a malignant brain tumour and after a 15-month battle with the disease she died two weeks ago.

She will be buried next Wednesday, the day she should have celebrated her 18th birthday.

Her parents, Janet, 39, and Phil, 58, believe her phone is to blame.

The family, including Samantha's

## 'Heartbreaking to watch'

four brothers and sisters, have stopped using mobile phones.

'Samantha was glued to her phone day and night chatting to friends and her boyfriend,' her mother said.

'She was a real chatterbox - very lively, healthy and outgoing - and that phone never stopped ringing.'

'But she suddenly started getting headaches and went downhill very quickly. It was heartbreaking to watch.'

'We are convinced she died because she spent so much time on the phone.'

Samantha, who was studying hair-dressing and beauty therapy at a college in Street, near Glastonbury, Somerset, bought her handset nearly two years ago.

In January 2001 she was referred to Yeovil hospital where she was diagnosed with a highly malignant and advanced tumour.

The specialist asked Mrs Miller and her husband, a retired coach driver, if Samantha had a mobile phone.

However he was reluctant to blame it outright for her illness. In March

By Lech Mintowt-Czyz

last year surgeons at Frenchay Hospital, Bristol, operated to remove the tumour and this was followed by a course of radiotherapy.

But it returned in January and persisted despite a further course of chemotherapy.

Samantha spent her final weeks in a wheelchair and paralysed down her left side.

Her mother said: 'I have lost a beautiful daughter. It is too late for her but I want others, especially children, to be aware of the dangers.'

'Samantha was an extremely popular and bubbly girl. I could not believe how many friends she had. She was always on the phone to them.'

'The phone had an antenna and where she held it to her head was where the tumour appeared.'

'Holding a phone so close to your ear means all the radiation is going straight into the brain.'

'There needs to be more research - everyone has a mobile phone these days and I don't want anyone else to die as a result.'

After she was diagnosed, Samantha's two brothers Simon, 19 and Gary, 12, and sisters Jenny, 15, and Mariah, eight, stopped using mobile phones.

Research by Dr Alan Preece at Bristol University has supported the claims of those who believe mobile phone radiation is not safe.

A study of volunteers showed the emissions heat up the brain and alter reaction times.

In another study, Dr Preece used squid to argue that human brains can be altered by electrical impulses.

The squid changed colour when exposed to mobile phones, violently flashing through the spectrum. They also showed slower reaction times.

Simon Best, of mobile phone emission pressure group Powerwatch, said the Millers' story was becoming all too common.

'The amount of evidence that shows that mobile phone use is damaging is growing by the day,' he said.

'And as more and more people use their handsets for longer we expect cases like this to grow rapidly.'

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# Mobile Phones: It's Not Just About Brain Tumors!

Head of the INTERPHONE study, Elisabeth Cardis, and scientists in Israel link mobile phones to parotid gland tumors

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December 2008

[www.hygda.com](http://www.hygda.com)

It begins as a lump or mass on the side of the face in front of the ear, at or above the jawbone. If the growth is slow and the lump is painless it is likely to be benign (80% of cases). If the area is painful or numb (nerve paralysis) it may be malignant (20% of cases) and the prognosis is poor with average survival of 2-7 years and a 10-year survival of 14-26%. It affects between 1 to 3 people per 100,000 each year in the Western world. What I am referring to is a parotid gland tumor (PGT), also known as salivary gland tumor (SGT).

Parotid tumors have not received much attention until recently.



Roger Ebert



Lebron James



Adam Yauch



John McCain

**Roger Ebert**, 63, Pulitzer prize-winning movie critic in the Ebert & Roeper show, had his cancerous parotid gland tumor removed June 16, 2006.

**Lebron James**, 24, basketball MVP for the Cleveland Cavaliers, underwent surgery for a benign parotid tumor in June 2009.

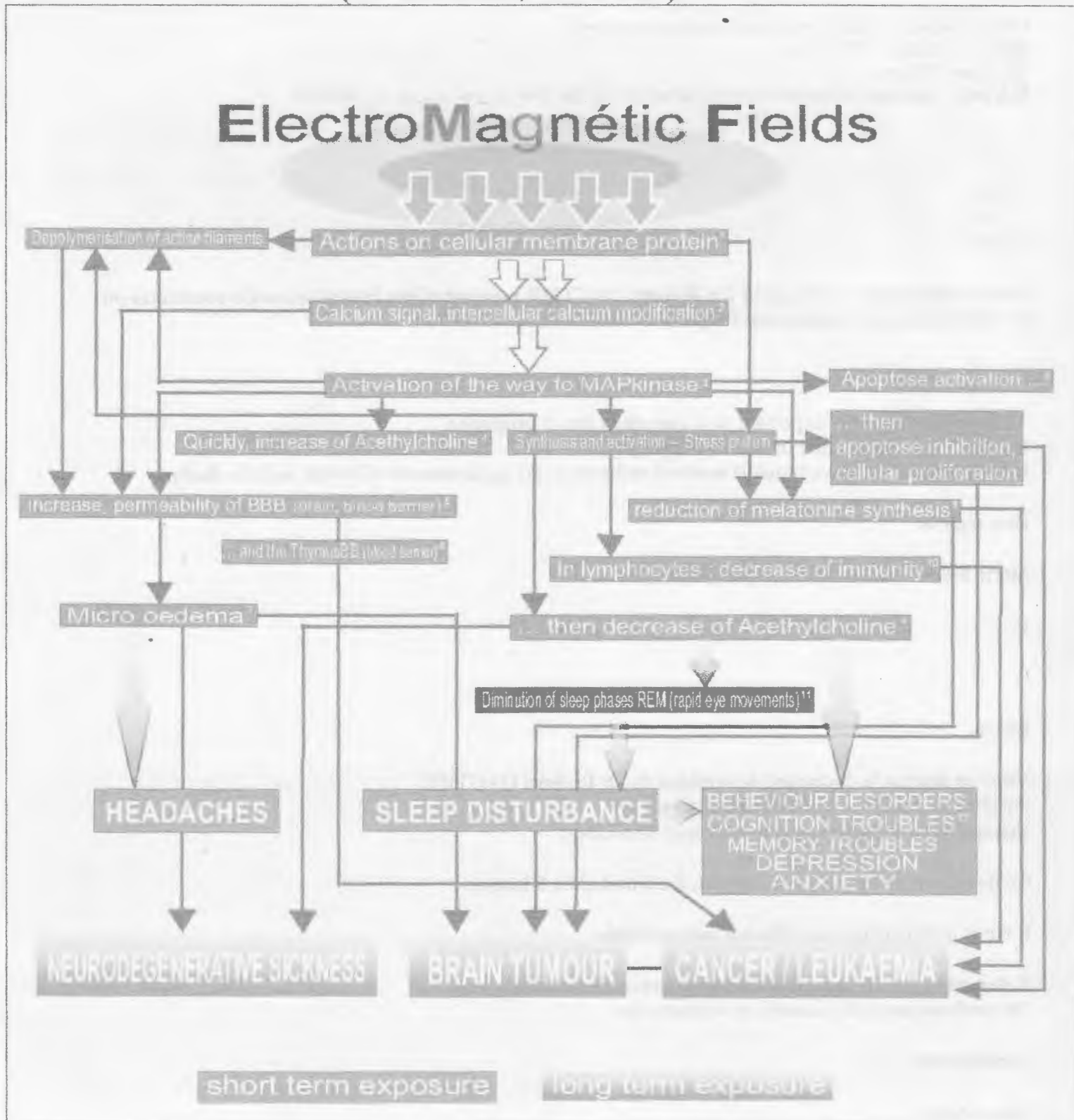
**Adam Yauch**, 44, of the Beastie Boys was diagnosed in July 2009 with a malignant parotid tumor and is scheduled for surgery. His band had to cancel engagements as a consequence. Click [here](#) to view his statement on YouTube.

**Senator John McCain** had part of his left parotid gland removed in 2000 although this was in conjunction with removal of lymph nodes as a precautionary step because of his bout with cancer. Recent photographs of John McCain (April 2008) show an enlarged mass on the left side of his face right where his parotid gland is located.



# Diagram of mechanisms linked to electromagnetic fields (EMF) exposure

(Dr Richard Gautier)



Publication references :

Scientific committee on the ElectroMagnetic Fields

csif-cem

[www.next-up.org](http://www.next-up.org)

(4)

Good  
references  
inc animals  
& plants

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# The Biological Effects of Weak Electromagnetic Fields

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Andrew Goldsworthy, 2007

What the power and telecoms companies would prefer us not to know

## Foreword

There have been many instances of harmful effects of electromagnetic fields from such seemingly innocuous devices as mobile phones, computers, power lines and domestic wiring. They include an increased risk of cancer, loss of fertility and unpleasant physiological symptoms. The power and mobile phone companies, hoping to avoid litigation, often assert that because the energy of the fields is too low to give significant heating, they cannot have any biological effect. However, the evidence that electromagnetic fields can have "non-thermal" biological effects is now overwhelming. In this article, I will explain how these effects arise. I have included key references that should enable the more inquisitive reader to delve deeper. If you do, you will often find contradictory assertions and that the reproducibility of several experiments is only mediocre. As we will see, this is almost certainly because of differences in the genetic and physiological condition of the biological material and its ability to defend itself against electromagnetic insults. Defence mechanisms have evolved by natural selection over countless millions of years of exposure to natural electromagnetic radiation, such as that from thunderstorms. They can often hide the underlying effects of man-made fields so we do not always see them in our experiments. We therefore have to concentrate on the experiments that give positive results if we are to discover the mechanisms. In this context, negative findings (frequently published in work financed by the telecoms and power companies) have no meaning.

## Abstract

1. Well-replicated studies have shown that weak electromagnetic fields remove calcium ions bound to the membranes of living cells, making them more likely to tear, develop temporary pores and leak.
2. DNAase (an enzyme that destroys DNA) leaking through the membranes of lysosomes (small bodies in living cells packed with digestive enzymes) explains the fragmentation of DNA seen in cells exposed to mobile phone signals. When this occurs in the germ line (the cells that give rise to eggs and sperm), it reduces fertility and predicts genetic damage in future generations.

The above family have moved 7 times, only to be clobbered over and again - finally by Wi-Fi and a new surveillance system - Celdar, operating in Wales, where they now live. Wi-Fi caused the husband to have a heart attack and the wife to fall unconscious in the street.

We must ask ourselves - why do our 'protective' agencies refuse to investigate the evidence which is pointed out to them so frequently? I think the answer is in the attached document. The consistent influence of the one person always evident in the background where there is obfuscation and refusal to listen to the victims, is **Michael Repacholi, instigator of the WHO and ICNIRP who proved in 1997 that pulse-modulated microwave emissions cause lymphoma in rodents - this symptom (cancer of the brain) is often associated with the use of mobile phones.** \*

Repacholi suggested to the then NRPB, that it was unnecessary to take into account the non-thermal aspect of microwaves when setting permitted levels - that is why these are ignored in the British permitted levels of 450 microwatts. **The Salzburg Resolution (9 countries, responsible, caring governments and 19 scientists allows only 0.1 permitted levels).**

When are the people in charge of this country going to listen? When is the media going to take up arms in our defence? We have seen the results of that in the excellent support given by the Telegraph Newspaper regarding the scandal of 'expenses' - let us please have the same support from other newspapers, radio and television. The only person who has been of constant support to victims in my village (Suffering insomnia, headache, nausea, dizziness, earache, tinnitus, headaches, nose-bleeds, raised blood-pressure, strokes and heart attacks - immediately on activation of an Orange mast near homes (Sept. 1st '01 - symptoms still ongoing!) is **Andrew Selous MP (SWBeds)** who is the first MP I have had who really listened to his constituents! The reason for the huge amount of symptoms is that the emissions attack individual cells, causing calcium efflux from such. The peer-reviewed proof is out there! Dr Neil Cherry; Prof Magda Havas (Trent University Toronto); Allan H. Frey; Prof. Andrew Goldsworthy - Imperial College London; Dr George Carlo - [DrCarlo@safewireless.org](mailto:DrCarlo@safewireless.org); **Barrie Trowers - expert in microwaves and human physiology tel: 01626 821014**; Henry Lai; Olle Johansson (Sweden); Yuri Gregoriev (Russian NRPB) etc. etc. - all

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02 August 2009 19:20:11

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Goldsworthy, Andrew ([a.goldsworthy@imperial.ac.uk](mailto:a.goldsworthy@imperial.ac.uk))



1 attachment

Some Fact...pdf (66.9 KB)



## Strong new evidence for increased lung cancer near powerlines supports Henshaw's theories

**DRAMATIC** new epidemiological evidence of cancer increases near to powerlines has been announced at this year's Bio-electromagnetics Society Meeting held in Munich in June.

Despite the increasingly frenzied statements coming from Dr John Swanson, an employed spokesman of National Grid, that high voltage powerlines are safe (he has been recently writing unsolicited letters to periodicals like *Farmers' Weekly*), Dr Alan Preece and colleagues at Bristol University announced some dramatic new evidence showing a significant cancer effect linked to high voltage powerlines.

Looking for epidemiological evidence to support (or not) Professor Denis Henshaw's corona ion and aerosol theories, he analysed the whole of the SW Cancer Registry database containing details of over 10,000 cancer cases, separating their addresses into their location with respect to 132 kV and above power lines. These were then normalised for population density.

He found a 29% increase in lung cancers, and about a 13% increase in most other cancers, up to about 1,000 metres downwind of the line, but upwind there was no effect. At right angles to the prevailing wind direction there was a smaller increase effect (about 15% and 8%) up to a few hundred metres. Skin cancers were highest very close to the line (within about  $\pm 30$  metres). For more details see the Bristol University website ([www.phys.bris.ac.uk](http://www.phys.bris.ac.uk)).

This is stunning epidemiological support for Henshaw's theories, which must now

be tested with the UK Childhood Cancer Study data. The UKCCS have not yet published their analysis of case and control distances to power lines and so this extra analysis must now be added before any paper is published. They have the full postcode of all the cases and controls and also the digital database mapping locations of the power lines, so it should be relatively easy to do.

### Hague adds to publicity

Preece's results are expected to be published by Christmas but were the subject of a Radio 4 programme *Costing the Earth* on September 21 that led to further media coverage. Both Prof Henshaw and Dr Preece were interviewed and both agreed that no further houses should be built near powerlines (or vice versa) until more research has been carried out. The programme featured a farmer living near a 400 kV line whose wife and daughter had died of cancer and he now suffered from it.

William Hague, MP, who has shown a continued interest in the debate, was also interviewed, having had a separate meeting with Professor Henshaw on 30 June at a farm owned by Derek Brass near Thimbleby, Yorkshire, arranged by Northallerton NFU, where Prof Henshaw installed equipment near the existing 400 kV line, which attracted much media interest.

THE UKCCS' report on distance to powerlines effects is due in mid-November. See next issue and website for response.

## Where are the UKCCS' electric field results?

THE UKCCCR continues to issue confusing and concerning statements about the results from the UKCCS EMF-related work. Its Secretary, Dr Peter Twentymen, wrote a puzzling letter to all supporters on 15th May.

Twentymen, in an earlier role as Editor of the *British Journal of Cancer*, rejected the pioneering Coghill, Steward and Philips paper on electric fields and childhood leukaemia that was eventually published in the *European Journal of Cancer Prevention* in 1996.

An interesting new paper by Paul Villeneuve et al, 'Leukaemia in Utility Workers' (see page 1) shows good support for our childhood results which found an association with increased incidence of electric, but not magnetic, fields. The new occupational study shows large increased odds ratios of adult leukaemia with electric fields. (Over 20 years exposure to 10 to 20 V/m gave an OR of 10.17 [95% CI 1.6-65.3]), compared with those in fields of less than 10 V/m, but non-significant elevations of risk were found between magnetic field exposure and leukaemia.)

In his recent letter, Twentymen stated that the UKCCS electromagnetic effects results were published in December 1999 (see last issue) and that hopefully this year further papers describing the effects of exposure to radon and gamma rays and also the influence of parental tobacco use in childhood cancer incidence would be published.

No mention of the electric field part of the UKCCS that was paid for, and inserted into Part 2 of the study, by the efforts of the Foundation for Children with Leukaemia, that was (and hopefully is still) due out in the Autumn.

No mention of the distances to high-voltage powerlines part of the study that was promised to be published this year after the incorrect headline clearing powerlines of a childhood cancer link led the UKCCS Press Release last December.

In February this year, Alasdair Philips asked Professor Nick Day (of Strangeways Laboratories, Oxford) to add a further spatial relationship analysis to their paper to test for any cancer incidence effects from the corona ion and aerosol effects measured for up to 1 km downwind of 132 kV and higher power lines.

Since then Dr Alan Preece, also at Bristol  
(continued on page 8)

## Non-thermal heat-shock response to microwaves

THIS was first reported last year and outlined at the Gothenburg conference on Mobile Phones and Health Effects that was chaired by Alasdair Philips.

Dr David de Pomerai and colleagues have now had the work published in *Nature* (25 May 2000; 405:417). They show that prolonged exposure to low intensity microwave fields, at levels below those many mobile phones users experience, induces heat-shock responses in the soil nematode *Caenorhabditis elegans*.

Heat shock proteins (HSPs) are induced in most organisms by adverse conditions (such as heat or toxicants) that cause damage to cellular proteins, acting as molecular chaperones to rescue damaged proteins and hold them in place.

The beauty of this experimental work is

that thousands of worms can be used for each experimental run, thus giving good statistical power to the results.

Their graph strikingly shows the traditional 'heat' HSP expression plotted on the same graph as the microwave HSP expression and it can be clearly seen that the effects are quite separate and that the cells are being stressed in some unknown way.

The calculated SAR to the cells is only 0.001 W/kg which is much less than published values for mobile phones (0.02 to 1.5 W/kg) and is a cause for concern.

One of the authors, Dr John Tattersall, based at the Chemical and Biological Countermeasures Unit at Porton Down Research Establishment, has also been finding other biological effects while doing DoH-funded work on MW exposure to rat brain slices.

# New Jobs for Ancient Chaperones



**Protective heat shock proteins present in every cell have long been known to counteract stress. Newly recognized roles in cancer and immunity make them potential therapeutic allies**

BY PRAMOD K. SRIVASTAVA

## KEY CONCEPTS

- Guardian proteins, found in all forms of life, keep a wide variety of cellular processes running smoothly.
- Through their diverse interactions, these proteins pick up telltale "fingerprints" of each cell's contents, which has allowed them to evolve a critical role in immune responses to cancer or pathogens.
- Therapies that take advantage of these proteins include inhibitors and enhancers of their various natural functions.

*The Editors*

In 1962 someone at the Genetics Institute in Pavia, Italy, turned up the temperature in an incubator holding fruit flies. When Ferruccio Ritossa, then a young geneticist, examined the cells of these "heat shocked" flies, he noticed that their chromosomes had puffed up at discrete locations. The puffy appearance was a known sign that genes were being activated in those regions to give rise to their encoded proteins, so those sites of activity became known as the heat shock loci.

The effect was reproducible but initially considered to be unique to the fruit fly. It took another 15 years before the proteins generated when these chromosome puffs appear were detected in mammals and other forms of life. In what is certainly among the most absorbing stories in contemporary biology, heat shock proteins (HSPs) have since been recognized as occupying a central role in *all* life—not just at the level of cells but of organisms and whole populations.

Indeed, these ubiquitous molecules are among the most ancient survival mechanisms to have been conserved throughout evolution. They have even been shown to facilitate evolution itself. Produced in response to stressful conditions,

including (but not limited to) heat, HSPs help individual cells to cope by keeping cellular processes working smoothly in the face of adversity. In the past decade scientists have realized that HSPs also play additional roles in higher organisms, such as humans. They are integral to our immune defenses against cancer and pathogens and might therefore prove valuable in developing a wide variety of new medicines and vaccines.

To understand how these versatile proteins can be harnessed therapeutically, it is helpful to look at the diverse ways they perform their core job, which is to act as "chaperones" for other proteins. Like the chaperoning of people, the work of HSPs has two objectives: to inhibit undesirable interactions and to promote desirable ones, so that a stable and productive bond forms between protein partners.

## Versatile Escorts

Proteins inside a cell often have just one or a very few correct "mates" with which they can interact effectively—for example, a receptor and its ligand, which behave like a lock and key, respectively. The ligand has little effect on other receptor types, and the receptor is typically activated only by its particular ligand or molecules very close to it in structure. In contrast, HSPs tend to associate with a wide range of "client" proteins, allowing the HSPs to perform a dizzying array of jobs. These can include helping newly formed amino acid chains to fold into their proper protein shapes, dismantling them after they have been damaged, escorting proteins to their intended mates and keeping them away from interlopers.

Specific examples can highlight just how critical these tasks are and can illustrate some of the

**Evidence that Electromagnetic Radiation is  
Genotoxic:**

**The implications for the epidemiology of cancer and  
cardiac, neurological and reproductive effects**

**Dr Neil Cherry**

**June 2000**

**For presentations in May to NZ Parliament  
and June 2000 in Italy, Austria, Ireland and at the  
European Parliament in Brussels.**

[Neil.Cherry@ecan.govt.nz](mailto:Neil.Cherry@ecan.govt.nz)

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**Canterbury, New Zealand**



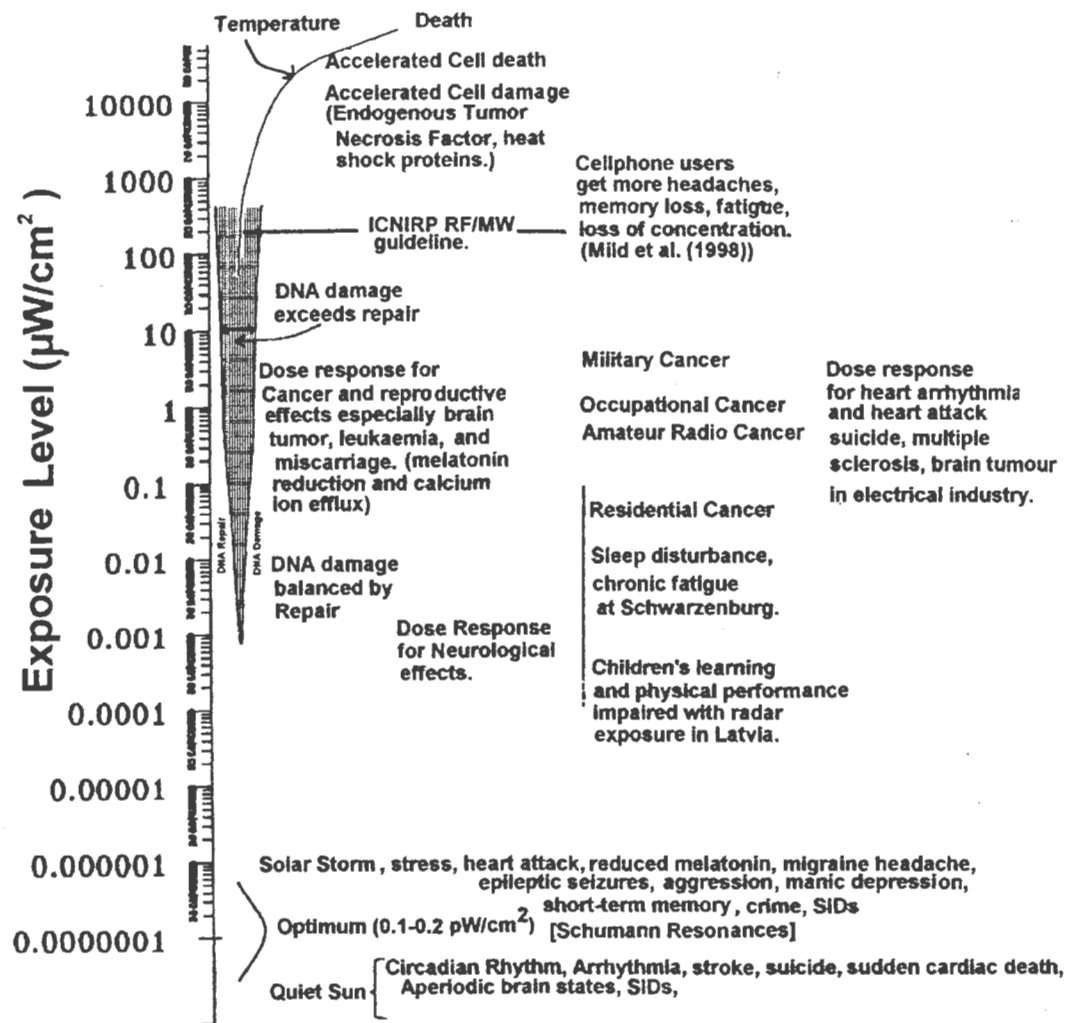


Figure 45: Summary of observed effects, and the mean levels of the exposure for human studies of exposure to electromagnetic radiation. All epidemiological studies occur below the ICNIRP and New Zealand Standard of allowable exposure.

These genotoxic biological mechanisms strongly support the large number of epidemiological studies that show significant increases of cancer, neurological, cardiac and reproductive health effects from ELF and RF/MW exposure in military, occupation, and residents studies. Altogether they show a causal relationship from EMR exposure and wide-spread adverse health effects. All of these adverse health effects are shown to be significantly increased in multiple epidemiological studies, including many with significant dose-response relationships. This data puts the situation in a very clear light. There are causal relationships between extremely low mean EMR exposures across the spectrum and a wide range of serious adverse health effects.



# Presentation for Consultant Oncologists – Birmingham 7<sup>th</sup> July 2003

B. Trower

*Genotoxicity ".....Many studies have shown that radiofrequency microwave radiation and extremely low frequency fields cause increased DNA strand breakage and chromosome aberrations..."*

Prof. N. Cherry, Lincoln University

Many papers today report either chromosomal/DNA or gene damage. In this presentation I have tried to follow the path to cancer from these damaged areas. It is possible that other factors may be necessary as well to induce cancer, such as environmental/industrial carcinogens: although these are absent in the laboratory experiments.

Microwave/radiofrequency radiation may also affect the "make up" and "balance" of cells by:

- Changing the blood-brain barrier.
- Producing heat-shock proteins.
- Changing cell potential – signal transduction – cell cycle timing – interference to the ATP double bond at the mitochondria DNA site.
- Reduce night time Melatonin (via small currents from calcite crystals in the pineal gland).
- Effect white blood cell function.
- Damage stem cells (which absorb radiation).
- Interfere with water bound layers around cells/tissue.

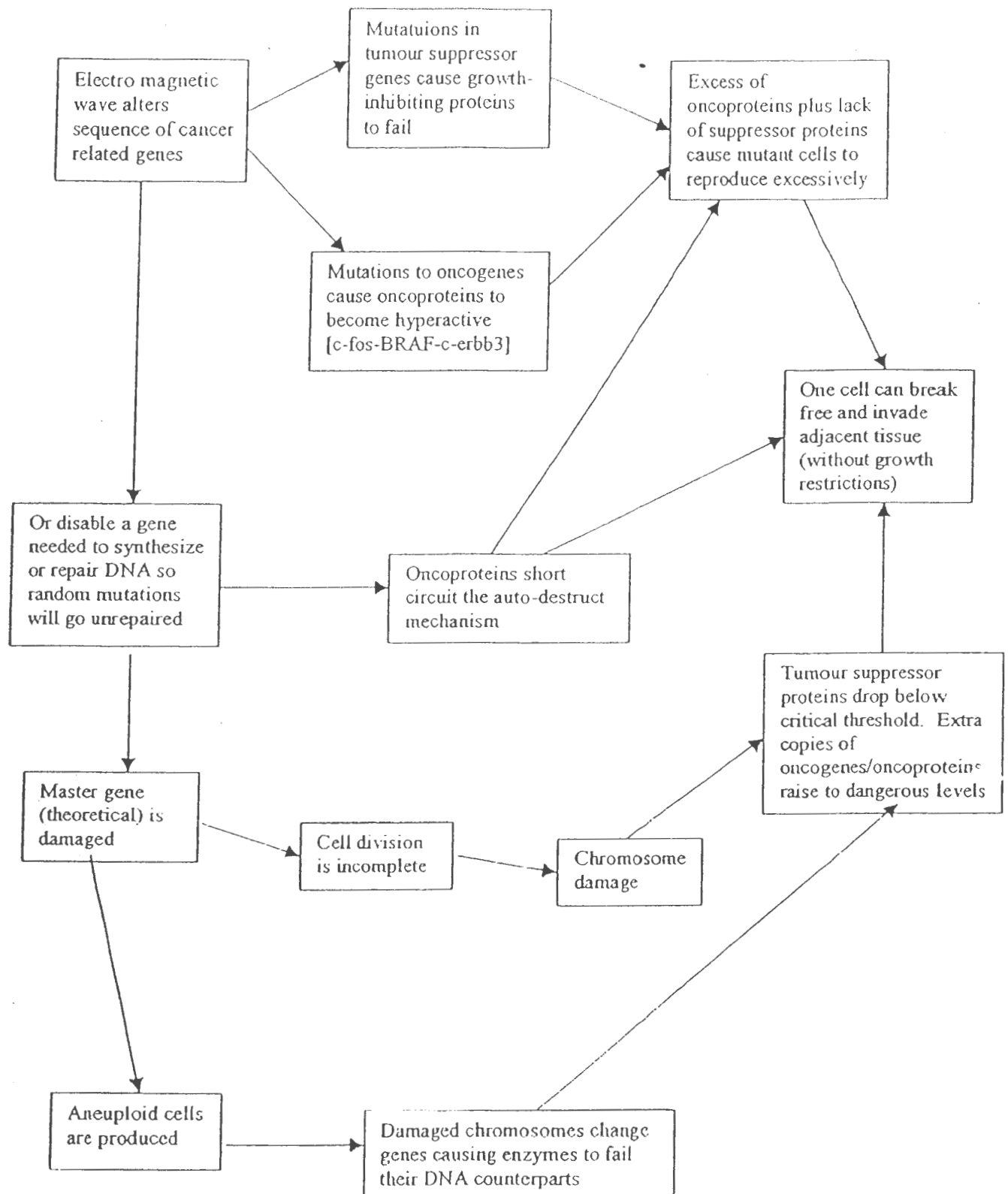
**All of the above are reported in papers**

Persons who sleep in a microwave field may have up to 1.8 thousand million waves passing through each cell each second

In my flow chart I have tried to show how from a damaged gene/chromosome/cell caused by electromagnetic interference, cancer may ensue.

I would also argue that the interference is continuous and accumulative, not from one single moment.

## Pathways for Damaged Genes to Induce Cancer



## Researched or Theoretical Cancers from Damaged Genes/DNA

### Problems

- Cells ignore "stop dividing" commands.
- Cells avoid the autodestruct mechanism and persuade nearby tissue and blood vessels to supply them.
- Problems with DNA.
- Telomers can seem to divide indefinitely.
- The ability is gained to invade nearby tissue (metastasize).

### Causes

- Damage to cell deletes or disrupts a tumour suppressor gene (RB,p53,APC).
- Mutations may increase oncogenes whose proteins stimulate cell to reproduce (BRAF,c-fos,c-erbB3).
- A mutation to just one allele is enough to activate an oncogene permanently; both alleles of a tumour suppressor gene may be affected.
- A mutation in the right gene can transform any cell.
- Approx 100 genes mutated to cause cancer (theory) [re- A Subway Map of Cancer W.Hahn – R. Weinberg].
- M.Al-Hajj – identified a rare subset of cells within cancer (breast), these cells could produce cancer in mice where the other cancer cells could not. Also identified for Leukaemia. Implications – small groups of cells = total metastasis.
- C-fos, c-erbB3 are less active in cancer cells than ordinary tissue.
- RB is hyperactive in colon cancer.
- Haploin sufficiency ~ some tumour suppressors are not mutated, just reduced enough to cause malignancy.

### Other Considerations

- Loss or Gain of part of chromosome.
- Changes in concentration of proteins that regulate the gene transcribing DNA - RNA – translated into protein.
- Cancer related mutations affect more than 100 oncogenes and approx. 15 tumour suppressor genes.
- A benign growth can be converted to invasive malignancy through genetic damage (C. Lengauer).
- Also, 90% of benign polyps had a missing piece of a chromosome (usually 5) -- the arm containing the APC tumour suppressor gene. Other researchers show similar in precancerous growths in breast/stomach/oesophagus.
- Normal cells stop dividing until DNA is repaired, genetically unstable cells do not (Breivik).

# Roots of Cancer

RECENT EVIDENCE CHALLENGES LONG-HELD THEORIES OF HOW CELLS TURN MALIGNANT—AND SUGGESTS NEW WAYS TO STOP TUMORS BEFORE THEY SPREAD

By W. Wayt Gibbs

## *What causes cancer?*

Tobacco smoke, most people would say. Probably too much alcohol, sunshine or grilled meat; infection with cervical papillomaviruses; asbestos. All have strong links to cancer, certainly. But they cannot be root causes. Much of the population is exposed to these carcinogens, yet only a tiny minority suffers dangerous tumors as a consequence.

A cause, by definition, leads invariably to its effect. The immediate cause of cancer must be some combination of insults and accidents that induces normal cells in a healthy human body to turn malignant, growing like weeds and sprouting in unnatural places.

At this level, the cause of cancer is not entirely a mystery. In fact, a decade ago many geneticists were confident that science was homing in on a final answer: cancer is the result of cumulative mutations that alter specific locations in a cell's DNA and thus change the particular proteins encoded by cancer-related genes at those spots. The mutations affect two kinds of cancer genes. The first are called tumor suppressors. They normally restrain cells' ability to divide, and mutations permanently disable the genes. The second variety, known as oncogenes, stimulate growth—in other words, cell division. Mutations lock oncogenes into an active state. Some researchers still take it as axiomatic that such growth-promoting changes to a small number of cancer genes are the initial event and root cause of every human cancer.

Others, however, including a few very prominent oncologists, are increasingly challenging that theory. No one questions that cancer is ultimately a disease of the DNA. But as biologists trace tumors to their roots, they have discovered many other abnormalities at work inside the nuclei of cells that, though not yet cancerous, are headed that way. Whole chromosomes, each containing 1,000 or more genes, are often lost or duplicated in their entirety. Pieces of chromosomes are frequently scrambled, truncated or fused together. Chemical additions to the DNA, or to the histone proteins around which it coils, somehow silence important genes, but in a reversible process quite different from mutation.

The accumulating evidence has spawned at least three hypotheses that compete with the standard dogma to explain what changes come first and which aberrations matter most in the decade-long transformation of a cell and its descendants from well-behaved tissue to invasive tumor. The challengers dispute the dominant view of the disease as the product of a defined genetic state. They argue that it is more useful to think of cancer as the consequence of a chaotic process, a combination of Murphy's Law and Darwin's Law: anything that can go wrong will, and in a competitive environment, the best adapted survive and prosper.

Despite that shared underlying principle, the new theories make different predictions about what kind of treatments will work best.

CAREFULLY CHOREOGRAPHED dance of chromosomes occurs during cell division. Missteps that mangle chromosomes or that send the wrong number to each daughter cell may be critical events early in the development of cancer, according to new theories.

# Scientists link eye cancer to mobile phones

MOBILE phones have been linked to human cancer in a scientific study for the first time. The research suggests there is a threefold increase in eye cancers among people who regularly use the devices.

The results will cause concern within the mobile telecoms industry. The radiation emitted from mobile phones has long been known temporarily to alter the workings of brain cells but there was previously no evidence of permanent damage to health.

If confirmed by subsequent research, the finding could lead to thousands of costly lawsuits by people with eye and possibly brain cancers.

More than 20m people in Brit-

**Jonathan Leake**  
Science Editor

ain have mobile phones. The research, published in the *Journal Epidemiology*, was carried out by a team from the University of Essen, in Germany. It investigated a form of eye cancer called uveal melanoma, in which tumours form in the layer that makes up the iris and base of the retina.

Dr Andreas Stang, who led the research, said he had examined 118 people with uveal melanoma and obtained details about their use of digital mobile phones. This was compared with a control group of 475 people without the disease.

To prevent bias, the researchers were not told if the person they were examining suffered from cancer or was healthy. When the results were analysed they found the cancer victims had a much higher rate of mobile phone use, though Stang cautions that his study needs confirmation.

The mechanism by which the radiation might cause cancer is uncertain but it is known that the watery contents of the eye assists the absorption of radiation.

Other research showed that cells called melanocytes found in the uveal layer started growing and dividing more rapidly when exposed to microwave radiation.

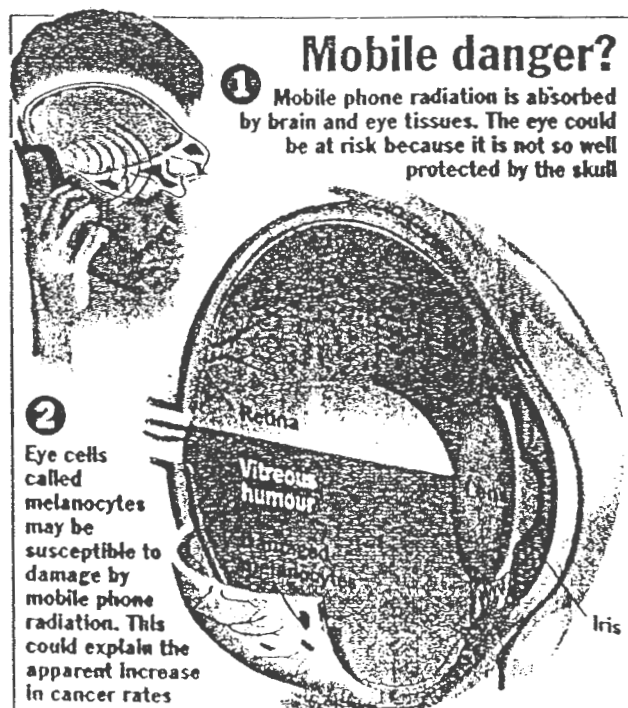
Since uveal melanoma starts within such cells, there is a ready-made mechanism by which mobile phone radiation might help to initiate cancer, especially in people with a genetic predisposition to the condition.

Last year the Stewart inquiry into mobile phone safety, appointed by the government, found no evidence to link the devices with brain tumours or any other disorder.

However, last month saw the launch of multi-billion-pound lawsuits against Verizon Horizon, an American mobile phone company 45% owned by Vodafone, the biggest British provider.

Customers claim they got brain tumours and other conditions from using the devices.

Vodafone said it welcomed new research but there was still no positive evidence that mobile phones harmed health.



*The future's bleak*  
Focus, Business, page 5

# Eyes

brain tumours, It also described the "growing movement of activists who believe we are witnessing the advent of a catastrophe: a brain-cancer epidemic that would be the largest public-health crisis in the history of the human race."



## "Will This Phone Kill You?"

Newsweek on 5th August had an article by Sharon Begley with the above title. The article gave examples of studies showing health dangers and those not doing so. It failed to reach a conclusion, but ended illogically by quoting Peter Sandman: "Uncertainty gives us a reason to stay unconcerned."

Mobile phone cancer link is indirect, not direct

Microwave News points out that the "tired argument" by Michael Shermer in October's Scientific American, claiming that "physics shows that cell phones cannot cause cancer", because microwaves do not have the quantum energy to break chemical bonds, is wrong if the link is indirect, not direct. The science suggests that microwaves inhibit repair mechanisms for DNA breaks, making an indirect cancer link probable.

Men's Magazine: "Exponent has defended nearly everything that is bad in American industry"

The May issue of Men's Health ran an article by Paul Scott called "Is Your Life on the Line?" To show the level of science in some arguments on cell phones, it quoted Linda Erdreich, a spokeswoman for Exponent, the consulting company used by the cellphone industry before the U.S. Senate. Exponent, it claimed, was the scientific equivalent of Mr. Burns from The

Simpsons: "In its 43-year history, Exponent has defended nearly everything that is bad in American industry: Buildings that fail. Amusement-park rides that exceed G-forces inflicted on astronauts. Soda machines in schools, rocket-fuel chemicals in groundwater, chromium in the workplace. Atrazine, asbestos, even the Exxon Valdez."

## Eye damage from mobiles

The Times of India on 23rd June reported that a new study at Charotar University of Science and Technology shows mobile phones affect eyes, leading to early cataracts and affecting the retina, cornea and other ocular systems. Professor Ved Vyas Dwivedi said, "The wavelength of wireless signals (which is about 2 to 2.5 cm) used for mobile phones and other wireless terminals matches with that received by the human eye. The dielectric constant (absorption capacity) of eye tissues is around 70 which is greater than unity (above 50). This means that the eye can absorb electromagnetic energy very quickly." SAR and temperature rise depend on the distance between eye and the mobile and the angle between the line of sight and shortest normal path.

"The problem is not that the eye absorbs the energy, but that the heat absorbed by the eye does not get transmitted or radiated out of the body." They recommend that mobiles should be kept as far as possible from the eye and not be used more than necessary, avoiding use in rural areas or a car.

Cancer from mobile – use a sledgehammer



On 24th May myjournalcourier.com had an article entitled "Local man blames cell phone use for cancer". Paul Hankins said "I'm living proof that mobiles give your cancer. For about five years the 74-year-old Jacksonville home-remodeler used his cell phone for work and just about everything. "I probably used it about five hours a day or maybe more." Last summer, after experiencing repeated headaches, he went to a doctor. "I told him my ear was sore. It felt like something was eating on me." A biopsy revealed it was a rare form of cancer. "I told them, 'Yeah, it's cell phone cancer.' It's outside of my brain. It's on the right side of my head behind my ear where I used the cell phone quite a bit." Hankins wonders how cell phone usage wouldn't cause cancer. "You get a very strong charge of electric current in your brain when using those phones," he said. "So it didn't surprise me that I had cancer." After getting the news Hankins said he took a sledgehammer to his cell phone. He urges everyone using cell phones to do the same, especially parents of children.



Avoid cordless phones!

In the Spectator on 7th August in "Your Problems Solved - Dear Mary", someone from London W11 asks how her husband, now working from home, can be discouraged from roaming through the house on a hands-free telephone. Mary advises "Incidentally, hands-free telephones are currently unfashionable on electromagnetic smog grounds. Citing health reasons, why not install a tethered line into his office instead?"

## Dublin meeting to debate health concerns over new masts

A GOVERNMENT-sponsored conference on March 6 at Dublin Castle in the Republic of Ireland will focus on the research into, health concerns raised by, and the international response to developments - including siting of masts - in the communications sector in Ireland and internationally.

The conference will look at communications technologies in the 300MHz to 300GHz range, including cellular phones, TV broadcasting systems, radar, satellites and MW communications.

Speakers will include:

- Dr Alistair McKinlay, head of the NRPB's Non-ionising Radiation Division and Chair of the EC's Expert Group on mobile phones, whose report on recommended research was published in early 1997;
- Dr Tony Swerdlow, Professor of Epidemiology at London School of Hygiene and Tropical Medicine, who has particularly studied the epidemiology of public exposure to EMFs;
- Dr Michael Repacholi, currently managing the WHO's International EMF Project, and previously heading the team at the Royal Adelaide Hospital in Australia whose research showing increased tumours in mice exposed to mobile phone frequencies published last year caused considerable concern and controversy (see Vol 8, no 1 & 2);
- Dr Lief Salford, Professor of Neurology at Lund University Hospital, who has studied the interaction of RF radiation with human and animal brain function, particularly effects on the blood-brain barrier;
- Dr Bernard Veyret, head of the Bioelectromagnetics group at the University of Bordeaux, who has extensively investigated the effects of MW radiation, including mobile phone frequencies (pulsed and GSM-modulated) on animals;
- Dr Thomas Tenforde, head of the Health Division at Batelle, Washington, a leading authority on possible mechanisms of interaction of EMFs with the body;
- Dr Russell Owen, Chief of the US FDA's Radiation Biology Branch, who is involved in recommending research

on wireless communications safety and undertaking a risk assessment of mobile phones;

● Mr John McAuley, manager of the Electromagnetic Compatibility Unit at the National Electronics Test Centre in Dublin, who, with his team, has undertaken most of the monitoring of public exposure to RF and MW in Ireland. He is a member of numerous European standards committees, including CENELEC.

Previous research papers by the speakers will be available and copies of their presentations, as well as a video, will be available for purchase as soon as possible after the event. Information on the conference is available on the website: <http://www.irigov.ie/tec>. For details of how to book, ring Mary Bruton on (00)+353 1 668233; fax: 6689135.

### Pager opens doors - literally

A NEW transmit/receive pager from Motorola can unlock garage doors, etc. In the USA they have introduced a pager that allows a customer to access a toll-free phone number to remotely lock and unlock power doors, and start a vehicle engine within seconds.

In addition, Motorola's CreataLink Control Module allows the user to disable a vehicle and engage the horn and flashing lights in the event of a theft. It also can display in-vehicle messages like local traffic and weather conditions, said Allan Spiro, marketing manager of Motorola's Florida-based FLEX Architecture Solutions Division which developed the pager.

Spiro said Motorola is currently in negotiations with car dealers, car alarm manufacturers and auto finance companies to market the device.

### An OFFER he couldn't refuse!

ALASDAIR Philips has been appointed to the OFFER (The Office of the Electricity Regulator) electricity users' committee for East Anglia. Good luck, Eastern Electricity! In fact, Eastern have been doing well, recently winning training and customer support awards from the industry news report *Utility Week*.

## Nocturnal EMFs reduce melatonin in women, linking breast cancer

THE first evidence that low-level EMFs can reduce the nocturnal release of melatonin in women was presented at a *Workshop on Electromagnetic Fields, Light-at-Night and Human Breast Cancer* in Washington, DC, last November.

The study by Dr Scott Davis, of the Fred Hutchinson Cancer Center in Seattle, WA, found the effect at nanotesla levels and showed a dose-response relationship. Together with other research, it supports the idea that EMFs can affect breast cancer in women by reducing melatonin levels.

As a result of the research presented, ten speakers including leading breast cancer and EMF researchers Drs David Blask, Charles Graham, Robert Liburdy, Wolfgang Lüscher and Nancy Evans, issued the following statement:

"According to an international panel, electromagnetic fields and environmental light may be considered potential risk factors for breast cancer, based on existing scientific evidence."

### Breast cancer down under

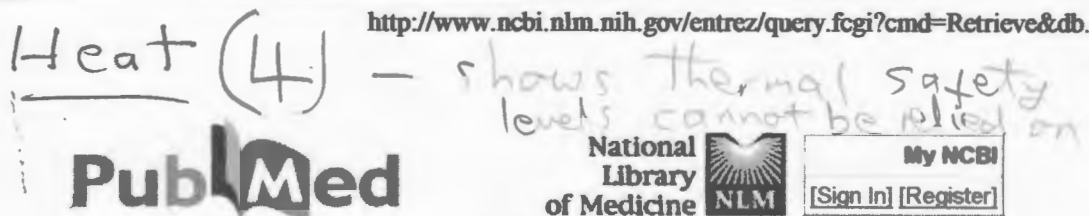
DON Maisch in Tasmania is involved in some new and independent epidemiological work on breast cancer. He has some preliminary results from 33 homes in Melbourne and has now obtained some data-loggers to extend the study to another 40 homes.

With the assistance of the Bioelectromagnetic Research and Information Network, New Zealand (BRAINNZ), who are presenting five papers at the Monash University Bioelectromagnetic Conference in Melbourne during February, they are hoping to get the findings published in a suitable journal.

### Underwired bras again!

FOLLOWING the suggestion by Anne Silk, in *Powerwatch Newsletter* No 3, July 1995, that bras with metal wire under the cups could resonate and increase microwave levels around the wearer's breasts, a recent issue of *Doctor* medical newspaper reported that underwiring has been found to encourage breast lumps, but it is not known why. Perhaps it is time to investigate the suggested reason - they increase the breasts' exposure to EMFs.



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1: Mutat Res. 2005 Jun 6;583(2):178-83.

Related Articles, Links

ELSEVIER  
FULL-TEXT ARTICLE

## Non-thermal DNA breakage by mobile-phone radiation (1800 MHz) in human fibroblasts and in transformed GFSH-R17 rat granulosa cells in vitro.

Diem E, Schwarz C, Adlkofer F, Jahn O, Rudiger H.

Division of Occupational Medicine, Medical University of Vienna, Waehringer Guertel 18-20, Vienna 1090, Austria.

Cultured human diploid fibroblasts and cultured rat granulosa cells were exposed to intermittent and continuous radiofrequency electromagnetic fields (RF-EMF) used in mobile phones, with different specific absorption rates (SAR) and different mobile-phone modulations. DNA strand breaks were determined by means of the alkaline and neutral comet assay. RF-EMF exposure (1800 MHz; SAR 1.2 or 2 W/kg; different modulations; during 4, 16 and 24h; intermittent 5 min on/10 min off or continuous wave) induced DNA single- and double-strand breaks. Effects occurred after 16 h exposure in both cell types and after different mobile-phone modulations. The intermittent exposure showed a stronger effect in the comet assay than continuous exposure. Therefore we conclude that the induced DNA damage cannot be based on thermal effects.



PMID: 15869902 [PubMed - in process]

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Jun 27 2005 04:57:20

# 10 out of 14 peer-reviewed studies on base stations found significant increases in symptoms and conform to WHO standards of scientific quality.

10 out of 14 peer-reviewed studies both found significant increases in the symptoms being analysed, and conformed to the specified WHO / ICNIRP standards of scientific quality, including their assessment criteria of consistency and replication. This review about studies on base stations will appear in a special issue of Pathophysiology. Included are only those studies that are about base station exposures and not those that used mobile phone radiation patterns but exposed in the far field. Therefore some studies that could in principle be included because they studied far field exposure are not among those considered in this review (presented by Dr Michael Kundi on Sept 23, 2008 at the London EMF International Conference).

1. **R. Santini**, B. Sarrigi, J.M. Danze, P. Le Ruz, M. Seigne, Enquête sur la santé de riverains de stations relais de téléphonie mobile : I/ Incidences de la distance et du sexe. *Pathol Biol (Paris)* 50 (2002) 368-373.
2. **R. Santini**, P. Santini, J.M. Danze, P. Le Ruz, M. Seigne, Enquête sur la santé de riverains de stations relais de téléphonie mobile : II/ Incidences de l'âge des sujets, de la durée de leur exposition et de leur position par rapport aux antennes et autres points. *Electromagnétiques. Pathol Biol (Paris)* 51 (2003) 412-415.
3. **M. Blottner**, B. Schlöhofer, J. Breckenkamp, B. Knecht, S. Schmiedel, U. Reis, P. Rothloff, J. Schütz, G. Berg-Buchhoff, **Querschnittstudie zur Erfassung und Bewertung möglicher gesundheitlicher Beeinträchtigungen durch die Felder von Mobilfunkbasisstationen**. *BfS* (2007).
4. **E.A. Navarro**, J. Begura, M. Portales, G. Gómez-Pereña de Mateo, The microwave syndrome: a preliminary study in Spain. *Electromagnetic Env Med* 22 (2003) 161-165.
5. **H-P. Hutter**, H. Moshammer, P. Waldner, M. Kundi, Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occup Environ Med* 63 (2006) 307-313.
6. **G. Abdel-Rassoul**, G. Abou El-Fateh, M. Abou Salem, A. Mohamed, F. Karahat, M. El-Bashoury, E. Salem, Neurobehavioral effects among inhabitants around mobile phone base stations. *Neurobiology* 25(2) (2006) 434-440.
7. **S. Heinrich**, A. Gessig, S. Schiltmeier, J. Hellbrück, **Elektromagnetische Felder: einen UMTS-Mobilfunkbasisstation und mögliche Auswirkungen auf die Befindlichkeit eine epidemiologische Felduntersuchung**. *Umwelt Med Forsch Praxis* 12 (2007) 171-180.
8. **S. Thomas**, A. Kohler, S. Heinrich, G. Prami, B. Nowak, R. von Kries, G. Radon, **Personal exposure to mobile phone frequencies and well-being in adults: a cross-sectional study based on dosimetry**. *Bioelectromagnetics* 29 (2008) 483-490.
9. **K. Radon**, H. Spiegel, N. Meyer, J. Klein, J. Brix, A. Wiedenhofer, H. Eder, G. Prami, A. Schulze, V. Ehrenstein, R. von Kries, D. Nowak, **Personal dosimetry of exposure to mobile telephone base stations? An epidemiologic feasibility study comparing the Mashek dosimeter prototype and the Antennessa SP-090 system**. *Bioelectromagnetics* 27 (2006) 77-81.
10. **H. Eger**, K.U. Heger, B. Lucas, R. Vogel, H. Wolf, **Einfluss der räumlichen Nähe von Mobilfunkstationen auf die Krebsinzidenz**. *Umwelt-Medizin-Gesellschaft* 37 (2004) 275-286.
11. **R. Wolf**, O. Wolf, **Increased incidence of cancer near a cellphone transmitter station**. *Int J Cancer Prev* 1 (2004) 129-138.
12. **A.P.M. Zwambag**, S.M.J.A. Koozekan, B.J.A.M. van Leersum, M.A. Ouwens, W.N. Mink, **Effects of Global Communication System Radio-Frequency Fields on Well-being and Cognitive Functions of Human Subjects with and without Subjective Complaints**. *FEL-03-C148*. The Hague, the Netherlands: TMO, 2003.
13. **S.J. Regel**, S. Heppner, M. Riedel, G. Grottel, J. Schürer, A. Hopp, V. Lott, M. Roth, J. Achermann, **GHS base station life exposure, well-being and cognitive performance**. *Human Health Perspect* 114 (2006) 1271-1275.
14. **S. Ertel**, D. Wallace, R. Engelwall, S. Zougkou, F. Russo, P. Salvadori, G. Moshammer, H. Radon, R. Debie, E. Fox, **Does short-term exposure to mobile phone base station signals increase symptoms in individuals who report sensitivity to electromagnetic fields? A double-blind randomised provocation study**. *Human Health Perspect* 115 (2007) 1402-1408.

**FEASABILITY STUDY: 1**  
**NO SIGNIFIANT SYMPTOMS: 3**  
**SIGNIFICANT SYMPTOMS: 10**

## **Cancers:**

Town and Country Planning Bill 21<sup>st</sup> May 2004 (Hansard Vol. 421 No. 91 - pages 1243-1263 inc.) – Re: Many (childhood) cancer clusters around transmitters.

Study of the health of people living in the vicinity of mobile phone base stations:

Santini – Santini – Danze – Ruz – Seigne

Pathol Biol 2002 50:369-73

National Institute of Sciences – France.

Conclusion – “...base stations not be sited closer than 300m to populations...”

March 2008 – “Breast Cancer Fund Study blames rise of breast cancer on radiation and environmental toxins. Michel Lee – Steering Committee:

<http://omega.twoday.net/stories/4802274/>

Environmental Epidemiological Study of cancer incidence in the Municipalities of Housmannstatten and Vasoldsberg (Austria). Dr G Oberfeld.

Conclusion – “... a significant cancer incidence with regard to timing and location in the area around the transmitter... includes breast cancers...”

([www.verwaltung.stiermark.at/cms/iel/21212/OE](http://www.verwaltung.stiermark.at/cms/iel/21212/OE))

Vatican Radio Officials Convicted:

<http://news.bbc.co.uk/1/hi/world/europe/4531247.stm>

Breast cancer cluster prompts nationwide study of all ABC studios

<http://omega.twoday.net/stories/4910624/>

Govt building tested in cancer cluster probe

<http://omega.twoday.net/stories/4914826/>

Hospital cancer study may be widened

<http://omega.twoday.net/stories/4967487/>

Another Australian building cancer cluster

<http://omega.twoday.net/stories/5118600/>

Britain: University radiation cancer probe begins

**Hazards news, 4 October 2008**

<http://www.hazards.org/workandhealth/index.htm#radiationcancerprobe>

**Brain Tumour cluster**

<http://www.thesun.co.uk/sol/homepage/news/article327532.ece>

Malaysia - Many cancer patients in Taman Subang says study (30<sup>th</sup> April 2008). Increase of 9% cancers around transmitters.

<http://medicine.com.my/?p=3356>

Osafia (Usfia) Israel – Many deaths from cancer around transmitters.

<http://omega.twoday.net/stories/382774/>

Journal of Australian College of Nutritional & Environmental Medicine Vol. 21 No. 1 Ap. 02 concludes:

“...breast, bladder, prostate, lung, colon and cutaneous melanoma cancers are all associated with each other (Ref. 11) refers to radiofrequency EMF...Estonia had a steep increase in the cancer mortality in 1991, the year that the “western” FM radio-frequencies were allowed and introduced all over the country”.

Professors Orjan Hallberg and Olle Johansson

Naila Study – Germany November 2004 – Over 10 years discovered a threefold increase in cancers over 5 years at a distance of up to 400 metres from base station.

Wolf and Wolf – April 2004 – discovered a four-fold increase within 350 metres and a tenfold increase among women (other research shows women suffer most) from a similar study during the same month – this time in Israel.

The ECOLOG study by **T-Mobil** – Conclusion: A cancer-promoting effect of high frequency electromagnetic fields...used by cellular telephone technology.

“The Influence of being physically near to a cellphone transmission mast on the incidence of cancer”. 17<sup>th</sup> April 2004 -

Ten year study: Conclusion – cancer cases are significantly higher in people living up to 400m from a transmitter than those without a transmitter.

Professors Eger – Hagen – Lucas – Vogel – Voit

In addition, the Bio-Initiative Report (review of over 2,000 studies) concluded: “... the existing public safety limits are inadequate to protect public health...”

[www.bioinitiative.org](http://www.bioinitiative.org)

Case-Control study on cancer and a NMT 450 mobile phone base station in Austria.  
Cancer cluster – Gerd Oberfeld 4<sup>th</sup> February 2008.

Japanese Interphone Results & Finnish Cellphone Experiment – 19<sup>th</sup> February 2008.  
[www.microwavenews.com](http://www.microwavenews.com)

The complete Interphone study (13 countries) found a large underestimation in the risk of cancer associated with electromagnetic radiation.

**NB: We are still waiting for the release of the complete findings of the Interphone Study – more than 2 years on!** [http://www.economist.com/science/displaystory.cfm?story\\_id=12295222](http://www.economist.com/science/displaystory.cfm?story_id=12295222)

Cancer in EU at “epidemic” levels – MEP John Bowis 26<sup>th</sup> February 2008.  
<http://www.eupolitix.com/latestnews/news-article/newsarticle/cancer-in-eu-at-epidemic-levels/>

The REFLEX Study (ground breaking in that it shows a genotoxic effect from electromagnetic radiation (i.e. cancer).

Joining the Dots – an overview of public health (from EMR). Cancer trends during the 21<sup>st</sup> Century. This report concludes – over 47 pages of studies – “... antennae should not be erected in residential areas or in the vicinity of schools/child care centres...”. Sarah Benson

**Although not strictly cancers, some recent research is nevertheless important (all relating to proximity to transmitters):**

Embryo blood disorder – (from non-thermal low electromagnetic fields. UHF EM field irradiation during pregnancy leads to increase in erythrocytes micronuclei incidence in rat offspring.

Departamento de Bioquimica, Rua Ramiro Barcelos 2600 anexo CEP 90035-003 Porto Alegre Brazil

Professors Amancio Romanelli Ferreira and Tanise Knakievicz  
(Phone +44 5551 331 65548)

Mechanism of a short-term ERK activation by electromagnetic fields at mobile phone frequency. (Damage to signalling pathways and cell processes)

Professors Friedman – Kraus – Houtman – Schiff – Seger  
Department of Biological Regulation – The Weizmann Institute of Science  
Rehovot 76100, Israel. (Manuscript BJ20061653)

Neurobehavioural effects among inhabitants around mobile phone base stations  
Showed neurobehavioural effects from low-level microwaves. The interesting fact here was that studies were done of people living *under* transmitters, compared to the control group without a transmitter on the roof.

Faculty of Medicine, Menoufiya University, Egypt (Phone +44 20482951291)  
Professors Abdel – Rassoul – El Fateh – Abou Salem – Farahat – El Batanouny and Salem.

Comparison of electromagnetic absorption – Characteristics in the head of adult and children for 1800 MHz mobile phones.

Basically they say that safety levels based on “phantom adults” does not allow for the multiplicity of variables concerning children and human physiology: *this is very relevant to WiFi.*

Professors Fernandez – Bulla – Pedra – Alvaro – Salles  
Depts of Electrical Engineering & Technological Education. Federal University of Rio Grande do Sul (UFRGS) Porto Alegre. RS 90035-190 Brazil.

## Suicides

REICHMANIS M, PERRY F S, MARINO A A and BECKER R O, 1979. Relation between Suicide and the Electromagnetic Field of Overhead Power Lines. **Physiology Chemistry & Physics**, **11**, 395-403.

PERRY – REICHMANIS – MARINO - BECKER

Environmental Power-frequency magnetic fields and suicide. 7<sup>th</sup> May 1980

Health Physics Vol. 41 P267-277

“... We found a significant correlation between suicide locations and...magnetic field strength. Significantly more suicides occurred at locations of high magnetic field strength.”

PERRY S, PEARL L and BINNS R, 1989. Power Frequency Magnetic Field: Depressive Illness and Myocardial Infarction. **Public health**, **103** 177-180

POOLE C KAVET R, FUNCH D P, DONELAN K, CHARRY J M and DREYER N A, 1993. Depressive Symptoms and Headaches in Relation to Proximity of Residence to an Alternating-Current Transmission Line Right-of -way. **American Journal of Epidemiology**, **137**, 318-330

SAVITZ D A, BOYLE C A, and HOLMGREEN P, 1994. Prevalence of Depression Among Electrical Workers. **American Journal of Industrial Medicine**, **25**, 165-177.

VERKASALO P K, KAPRIO J, VARJONEN J. ROMANOV K, HEIKKILA K and KOSKENVUO M., 1997. Magnetic Fields of Transmission Lines and Depression. **American Journal of Epidemiology**, **146** 1037-1045

BEALE I L, PEARCE N E, CONROY D M, HENNING M A and MURRELL K A, 1997. Psychological Effects of Chronic Exposure to 50 Hz Magnetic Fields in Humans Living Near Extra-High-Voltage Transmission Lines. **Bioelectromagnetics**, **18**, 584-594.

VAN WIJNGAARDEN E V, SAVITZ D A, KLECKNER R C, CAI J and LOOMIS D, 2000. Exposure to Electromagnetic Fields and Suicide Among Electric Utility Workers: A Nested Case-Control study. **WJM**, **173**, 94-100.

Considered biologically plausible via magnetic field exposure. Apparent low threshold ~ 0.1 uT. Predicted excess cases annually in the UK near high voltage power lines - Suicide 60 cases - Depression Up to 9,000 cases of mild depression.

Suicide and depression abstracts

[www.emfs.info/sci\\_depression\\_abstracts.asp](http://www.emfs.info/sci_depression_abstracts.asp) - 1st July 2008 - 16 papers.

Chronic exposure to ELF may induce depression “...and the incidence of depression-related suicide... [www.wave-guide.org](http://www.wave-guide.org) (record) 88240602

**NB Magnetic fields penetrate the body whatever the source – power lines, transmitters, etc.**

**Five Studies Showing Ill-Health Effects From Masts**  
**Document produced by Dr Grahame Blackwell 21 Feb 2005**

1. **Study of the health of people living in the vicinity of mobile phone base stations.**  
**Santini et al.**

**Pathol Biol (Paris) [Pathologie Biologie (Paris)] 2002; 50: 369 – 73**

Found significant health effects on people living within 300 metres of mobile phone base stations.

Conclusions include the recommendation:

“... it is advisable that mobile phone base stations not be sited closer than 300meters to populations”

2. **Netherlands Organization for Applied Scientific Research (TNO)**  
**Study for the Netherlands Ministries of Economic Affairs, Housing, Spatial Planning and the Environment, and Health, Welfare and Sport**

**“Effects of Global Communications System Radio-Frequency Fields On Well Being and Cognitive Function of Human Subjects With and Without Subjective Complaints”**

**(September 2003)**

Found significant effects on wellbeing, according to a number of internationally-recognised criteria (including headaches, muscle fatigue/pain, dizziness etc) from 3G mast emissions well below accepted ‘safety’ levels (less than 1/25,000<sup>th</sup> of ICNIRP guidelines). Those who had previously been noted as ‘electrosensitive’ under a scheme in that country were shown to have more pronounced ill-effects, though others were also shown to experience significant effects.

3. **THE MICROWAVE SYNDROME - FURTHER ASPECTS OF A SPANISH STUDY**

**Oberfeld Gerd<sup>1</sup>, Navarro A. Enrique<sup>3</sup>, Portoles Manuel<sup>2</sup>, Maestu Ceferino<sup>4</sup>, Gomez-Perretta Claudio<sup>2</sup>**

**1) Public Health Department Salzburg, Austria**

**2) University Hospital La Fe. Valencia, Spain**

**3) Department of Applied Physics, University Valencia, Spain**

**4) Foundation European Bioelectromagnetism (FEB) Madrid, Spain**

Presented at an International Conference in Kos (Greece), 2004

This study found significant ill-health effects in those living in the vicinity of two GSM mobile phone base stations. They observed that:

“The strongest five associations found are depressive tendency, fatigue, sleeping disorder, difficulty in concentration and cardiovascular problems.”

As their conclusion the research team wrote:

“Based on the data of this study the advice would be to strive for levels not higher than 0.02 V/m for the sum total, which is equal to a power density of 0.0001  $\mu\text{W}/\text{cm}^2$  or 1  $\mu\text{W}/\text{m}^2$ , which is the indoor exposure value for GSM base stations proposed on



empirical evidence by the Public Health Office of the Government of Salzburg in 2002.”

#### 4. INCREASED INCIDENCE OF CANCER NEAR A CELL-PHONE TRANSMITTER STATION.

Ronni Wolf MD<sup>1</sup>, Danny Wolf MD<sup>2</sup>

1. The Dermatology Unit, Kaplan Medical Center, Rehovot, and the Sackler Faculty of Medicine, Tel-Aviv University, Tel-Aviv, ISRAEL.
2. The Pediatric Outpatient Clinic, Hasharon Region, Kupat Holim, ISRAEL.

Published in:

International Journal of Cancer Prevention Volume 1, No. 2, April 2004

This study, based on medical records of people living within 350 metres of a long-established phone mast, showed a fourfold increased incidence of cancer generally compared with the general population of Israel, and a tenfold increase specifically among women, compared with the surrounding locality further from the mast.

#### 5. Naila Study, Germany (November 2004)

Report by researchers (five medical doctors)

Following the call by Wolfram König, President of the Bundesamt für Strahlenschutz (Federal Agency for radiation protection), to all doctors of medicine to collaborate actively in the assessment of the risk posed by cellular radiation, the aim of our study was to examine whether people living close to cellular transmitter antennas were exposed to a heightened risk of taking ill with malignant tumors.

The basis of the data used for the survey were PC files of the case histories of patients between the years 1994 and 2004. While adhering to data protection, the personal data of almost 1.000 patients were evaluated for this study, which was completed without any external financial support. It is intended to continue the project in the form of a register.

The result of the study shows that the proportion of newly developing cancer cases was significantly higher among those patients who had lived during the past ten years at a distance of up to 400 metres from the cellular transmitter site, which has been in operation since 1993, compared to those patients living further away, and that the patients fell ill on average 8 years earlier.

In the years 1999-2004, i.e. after five years' operation of the transmitting installation, the relative risk of getting cancer had trebled for the residents of the area in the proximity of the installation compared to the inhabitants of Naila outside the area.

**NOTE:** These are the only studies known of that specifically consider the effects of masts on people. All five of these studies show clear and significant ill-health effects. There are no known studies relating to health effects of masts that do not show such ill-health effects.