

## Studies of health effects of mobile phone masts

The studies below indicate increased risks of cancer amongst residents living near mobile phone masts and a range of symptoms associated with living near a phone mast (Click on the study for more details):

[Need help understanding the studies?...](#)

[Glossary..](#) **Studies on cancer in vicinity of a mobile phone base station**

[Eger H, Hagen K U, Lucas B, Vogel P, Voit H \(2004\), Einfluss der räumlichen Nähe von Mobilfunksendeanlagen auf die Krebsinzidenz, Umwelt-Medizin-Gesellschaft, 17. Jahrgang, Ausgabe 4/2004, S. 273-356](#)

**In the years 1999 until 2004, after five and more years of use of the phone mast, the risk of cancer for the people in**

the vicinity of the phone mast was three time the risk for the people living far away.

—

**Wolf R M.D., Wolf D M.D. (2004),  
Increase incidence of cancer near a  
cellphone transmitter station,  
International Journal of Cancer  
Prevention, vol. 1, nr. 2, April 2004.**

This epidemiological study examined people living within 350m of a long-established mast in the town of Netanya. They found a four fold increase in cancer compared with the general population of Israel and a ten fold increase in cancer in women

**compared with those outside the 350m zone in Netanya.□ □**

**Authors' comments:**

-

**"The measured level of RF radiation (power density) in the area was low; far below the current guidelines based on the thermal effects of RF exposure. We suggest, therefore, that the current guidelines be re-evaluated.**

-

**"The enormous short latency period; less than 2 years, indicates that if there is a real causal association between RF radiation emitted from the cell-phone base station and the cancer cases (which we strongly believe there is), then the RF radiation should have a very strong promoting effect on cancer at very low radiation!"**

-

**"Although the possibility remains that**

**this clustering of cancer cases in one year was a chance event, the unusual sex pattern of these cases, the 6 different cancer kinds, and the fact that only one patient smoked make this possibility very improbable and remote. It should be noted that 7 out of 8 cancer cases were women, like in the work of Maskarinec<sup>1</sup> who found 6 out of 7 leukemia cases in proximity to radio towers to occur in girls. Such unusual appearances of cancer cases due to one accused factor on two completely different occasions is alarming.**

-

**"We are aware of at least 2 areas in which a drastic increase in the incidence of cancer cases occurred near a cell-phone antenna, however, the setup was not suitable for a well design study of those cases. In one of them (which also got publication in the daily newspapers) there were 6 out of 7 cancer cases in women working in a store in close proximity to a cell-phone antenna.**

-

**"In conclusion, the results of this study showed that there was a significantly greater incidence of cancers of all kinds within the vicinity of a cell-phone transmitter station."**

## **Laboratory studies**

[Nittby H, Brun A, Eberhardt J,](#)

[Malmgren L, Persson BR,](#)

[Salford LG. 2009](#)

[Pathophysiology. 2009](#)

[Aug;16\(2-3\):103-12. Epub 2009](#)

[Apr 2: Increased blood-brain](#)

barrier permeability in  
mammalian brain 7 days after  
exposure to the radiation from a  
GSM-900 mobile phone.

Department of Neurosurgery,  
Lund University, The Rausing  
Laboratory and Lund University  
Hospital, S-22185, Lund,  
Sweden.

Findings in agreement with  
earlier studies seeing increased  
BBB permeability immediately



and 14 days after exposure.  
PMID: 19345073 [PubMed - in  
process]

**Leif G. Salford&#160; et al.  
(2003): Nerve Cell Damage in  
Mammalian Brain after  
Exposure to Microwaves  
from GSM Mobile Phones.**

Found highly significant ( $p < 0.002$ ) evidence for neuronal damage in the cortex, hippocampus, and basal

**ganglia in the brains of exposed rats.**

**Researchers chose 12-26-week-old rats because they are comparable in relative age with human teenagers and have growing brains.**

**Eberhardt JL, Persson BR, Brun AE, Salford LG, Malmgren LO. Department**

**of Medical Radiation**  
**Physics, Lund University**  
**Hospital, Lund, Sweden. B**  
**lood-brain barrier**  
**permeability and nerve cell**  
**damage in rat brain 14 and**  
**28 days after exposure to**  
**microwaves from GSM**  
**mobile phones.&#160;**

**Investigated the effects of  
global system for mobile  
communication (GSM)**

**microwave exposure on the permeability of the blood-brain barrier and signs of neuronal damage in rats using a real GSM programmable mobile phone in the 900 MHz band. Ninety-six non-anaesthetized rats were either exposed to microwaves or sham exposed in TEM-cells for 2 h at specific absorption rates of average**

**whole-body Specific Absorption Rates (SAR) of 0.12, 1.2, 12, or 120 mW/kg. The rats were sacrificed after a recovery time of either 14 or 28 d, following exposure and the extravazation of albumin, its uptake into neurons, and occurrence of damaged neurons was assessed.**

**Albumin extravazation and also its uptake into neurons was seen to be enhanced after 14 d (Kruskal Wallis test:  $p = 0.02$  and  $0.002$ , respectively), but not after a 28 d recovery period. The occurrence of dark neurons in the rat brains, on the other hand, was enhanced later, after 28 d ( $p = 0.02$ ). Furthermore, in the 28-d brain samples, neuronal albumin uptake was**

**significantly correlated to occurrence of damaged neurons (Spearman  $r = 0.41$ ;  $p < 0.01$ ).**

**Studies on symptoms in vicinity of a mobile phone base station**

Santini R, Seigne M,  
Bonhomme-Faivre L  
(2002), Investigations on  
the health of people living  
near mobile telephone  
relay stations: Incidence  
according to distance and  
sex, Pathol Biol (Paris),  
2002 Jul; 50(6):369-73



**In France 530 people took part. They listed up to 18 symptoms which decreased with distance from base station.**

**This study, published in the French journal PATHOLOGIE BIOLOGIE was the first published study looking at the non-specific health symptoms of**

**people living near cellular phone base stations. The report describes a number of effects including tiredness, headache, nausea, sleep disruption, depression, loss of memory, loss of appetite and libido decrease, and concludes that it is**

**advisable that mobile phone base stations are not sited closer than 300m to populations. □ Comparisons of complaints frequencies in relation with distance from base station and sex, show significant (p < 0.05) for those living 300 m or not exposed to base station, till 300 m for tiredness, 200 m for**

**headache, sleep disturbance, discomfort, etc. 100 m for irritability, depression, loss of memory, dizziness, libido decrease, etc. Women significantly more often than men ( $p < 0.05$ ) complained of headache, nausea, loss of appetite, sleep**

**disturbance,  
depression, discomfort  
and visual  
perturbations.**

**Santini Report Part II,  
2003.R. Santini, P.  
Santini, J. M. Danze, P.  
Le Ruz, M. Seigne,  
Symptoms**

experienced by people  
in vicinity of base  
stations: II /  
Incidences of age,  
duration of exposure,  
location of subjects in  
relation to the  
antennas and other  
electromagnetic  
factors **PATHOLOGIE**  
**BIOLOGIE (2003, 51:**  
412-415)

**This is the second part of the above study. Results show significant increase (p 5 years. Other electromagnetic factors (electrical transformers,**

**radio-television,  
transmitters,...) have  
effects on the  
frequency of some  
symptoms reported by  
the subjects.**

**It indicates that the  
age of the exposed  
subjects is a factor**



**which increases the sensitivity to some of the non specific health symptoms studied, and that being positioned facing the antennas is most harmful for some of the studied symptoms, particularly up to 100m away. The study concludes by**

**reiterating that that it would be advisable not to establish mobile telephony stations within 300m of populations.**

—

**Navarro E A, Segura J, Portoles M,**

**Comez-Perretta C**  
**(2003), The**  
**Microwave Syndrom:**  
**A Preliminary Study**  
**in Spain,**  
**Electromagnetic**  
**Biology and**  
**Medicine, Vol. 22,**  
**Issue 2, 2003**

**Study took place in Spain, Murcia. 101 subjects. Listed 18 symptoms which fell off with distance from the base station.**

**The present results demonstrate a significant correlation between several symptoms of what is**

**called microwave sickness and the microwave power density associated with the Base Station located on a hill at the edge of the town. Symptoms and signs include headache, fatigue, irritability, loss of appetite,**

**sleepiness,  
difficulties in  
concentration or  
memory, depression,  
and emotional  
instability.**

**Oberfeld G, Navarro  
A E, Portoles M,  
Maestu C, Gomez**

**Perretta C (2004),**  
**The microwave**  
**syndrome - further**  
**aspects of a Spanish**  
**study, 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. The strongest five associations found are depressive tendency, fatigue, sleeping disorder,**



**difficulty in concentration and cardiovascular problems. 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.

Hutter HP,  
Moshammer H,  
Wallner P, Kundi M.  
Subjective  
symptoms,  
sleeping problems,  
and cognitive

performance in  
subjects living near  
mobile phone base  
stations. Occup  
Environ Med. 2006  
May;63(5):307-13.  
Occup Environ  
Med. 2006  
May;63(5):298-9.

**In a cross-sectional study of randomly selected inhabitants living in urban and rural areas for more than one year near to 10 selected base**

**stations, 365  
subjects were  
investigated.  
Several cognitive  
tests were  
performed, and  
wellbeing and  
sleep quality were  
assessed. Field  
strength of**

**high-frequency  
electromagnetic  
fields (HF-EMF)  
was measured in  
the bedrooms of  
336 households.  
RESULTS: Total  
HF-EMF and  
exposure related to  
mobile**

**telecommunication  
were far below  
recommended  
levels (max. 4.1  
mW/m<sup>2</sup>). Distance  
from antennae was  
24-600 m in the  
rural area and  
20-250 m in the  
urban area.**



**Average power density was slightly higher in the rural area (0.05 mW/m<sup>2</sup>) than in the urban area (0.02 mW/m<sup>2</sup>). Despite the influence of confounding variables, including**

**fear of adverse effects from exposure to HF-EMF from the base station, there was a significant relation of some symptoms to measured power density; this was**

**highest for  
headaches.**

**Perceptual speed  
increased, while**

**accuracy**

**decreased**

**insignificantly with**

**increasing**

**exposure levels.**

**There was no**

**significant effect  
on sleep quality.  
CONCLUSION:  
Despite very low  
exposure to  
HF-EMF, effects on  
wellbeing and  
performance  
cannot be ruled  
out, as shown by**

**recently obtained  
experimental  
results; however,  
mechanisms of  
action at these low  
levels are unknown  
.**

**Abdel-Rassoul G,**  
**El-Fateh OA,**  
**Salem MA, Michael**  
**A, Farahat F,**  
**El-Batanouny M,**  
**Salem E.**  
**Neurobehavioral**  
**effects among**  
**inhabitants around**

**mobile phone**  
**base stations.**  
**Neurotoxicology.**  
**2007**  
**Mar;28(2):434-40.**  
**Epub 2006 Aug 1.**

**A cross-sectional**

**study was  
conducted on (85)  
inhabitants living  
nearby the first  
mobile phone  
station antenna in  
Menoufiya  
governorate,  
Egypt, 37 are**



**living in a building  
under the station  
antenna while 48  
opposite the  
station. A control  
group (80)  
participants were  
matched with the  
exposed for age,**

**sex, occupation  
and educational  
level. All  
participants  
completed a  
structured  
questionnaire  
containing:  
personal,**

**educational and  
medical histories;  
general and  
neurological  
examinations;  
neurobehavioral  
test battery  
(NBTB) in addition  
to Eysenck**

**personality  
questionnaire  
(EPQ). RESULTS:  
The prevalence of  
neuropsychiatric  
complaints as  
headache (23.5%),  
memory changes  
(28.2%), dizziness**

**(18.8%), tremors  
(9.4%), depressive  
symptoms (21.7%),  
and sleep  
disturbance  
(23.5%) were  
significantly  
higher among  
exposed**

**inhabitants than  
controls: (10%),  
(5%), (5%), (0%),  
(8.8%) and (10%),  
respectively  
( $P < 0.05$ ). The  
NBTB indicated  
that the exposed  
inhabitants**

**exhibited a significantly lower performance than controls in one of the tests of attention and short-term auditory memory [Paced Auditory**

**Serial Addition  
Test (PASAT)].  
Also, the  
inhabitants  
opposite the  
station exhibited a  
lower performance  
in the problem  
solving test (block**



**design) than those under the station. All inhabitants exhibited a better performance in the two tests of visuomotor speed (Digit symbol and Trailmaking B) and**

**one test of  
attention  
(Trailmaking A)  
than controls. The  
last available  
measures of RFR  
emitted from the  
first mobile phone  
base station**

**antennas in  
Menoufiya  
governorate were  
less than the  
allowable standard  
level.**

**CONCLUSIONS  
AND  
RECOMMENDATIO**

**NS: Inhabitants  
living nearby  
mobile phone base  
stations are at risk  
for developing  
neuropsychiatric  
problems and  
some changes in  
the performance of**

**neurobehavioral  
functions either by  
facilitation or  
inhibition. So,  
revision of  
standard  
guidelines for  
public exposure to  
RER from mobile**

**phone base  
station antennas  
and using of NBTB  
for regular  
assessment and  
early detection of  
biological effects  
among inhabitants  
around the**

**stations are  
recommended.**

**Thomas S,**  
**Kuhnlein A,**  
**Heinrich S, Praml**  
**G, Nowak D, von**  
**Kries R, Radon K**

**Epidemiological**  
**Study**  
**(cross-sectional**  
**study)** **Personal**  
**exposure to**  
**mobile phone**  
**frequencies and**  
**well-being in**  
**adults: a**



**cross-sectional**  
**study based on**  
**dosimetry.**  
**epidemiol.**  
**Bioelectromagnet**  
**ics 2008; 29 (6):**  
**463 - 470**

**Results/conclusion: Exposure levels were far below the ICNIRP reference level in a range from 0.13 % to 0.56 % of the ICNIRP reference level during**

**waking hours. The  
mostly reported  
chronic  
symptoms were  
sleeping  
disorders (58 %)  
and fatigue (21  
%), the mostly  
reported acute**

**symptom was  
fatigue in the  
evening (43 %).  
No statistically  
significant  
association  
between personal  
exposure to  
mobile phone**

**frequencies and chronic or acute symptoms was found.**

**Limitations (according to author): The sample size was relatively small.**

**The bedtime  
exposure levels  
has to be  
excluded from  
analyses because  
the valid  
measurements of  
the dosimeter can  
only be obtained**

**if the dosimeter is moved.**

**Exposure very low. Daily average 0.24 W/m<sup>2</sup>**

**Blettner et al.**  
**Mobile phone**

**base stations**

**and adverse**

**health effects:**

**Phase 1: A**

**population-based**

**cross-sectional**

**study in**

**Germany Occup**

**Environ**



# Med.2008

**Participants who  
are concerned  
about or attribute  
adverse health  
effects to mobile  
phone base**

**stations and those living in the vicinity of a mobile phone base station (500 m) reported slightly more health complaints than**

**others.**

**Conclusions: A substantial proportion of the German population is concerned about adverse health effects caused by**

**exposure from  
mobile phone  
base stations.  
The observed  
slightly higher  
prevalence of  
health  
complaints near  
base stations can**

**however not be  
fully explained by  
attributions or  
concerns.**

**Note: In phase 1  
a significant effect  
of distance from  
base station**

(<500m) on well  
being was found

**Bortkiewicz A,**  
**Zmyslony M,**  
**Szyjkowska A,**  
**Gadzicka E**  
**(2004),**

**Subjective**  
**symptoms**  
**reported by**  
**people living in**  
**the vicinity of**  
**cellular phone**  
**base stations,**  
**Med Pr. 2004; 55**

**(4):345-51**

**People living in  
the vicinity of  
base stations  
report various  
complaints**



**mostly of the  
circulatory  
system, but also  
of sleep  
disturbances,  
irritability,  
depression,  
blurred vision,**

**concentration  
difficulties,  
nausea, lack of  
appetite,  
headache and  
vertigo. The  
performed  
studies showed**

**the relationship  
between the  
incidence of  
individual  
symptoms, the  
level of  
exposure, and  
the distance**

**between a residential area and a base station. This association was observed in both groups of persons, those**

**who linked their complaints with the presence of the base station and those who did not notice such a relation.**

See also Studies  
relating to  
children's  
exposure to  
chronic low level  
electro-magnetic  
radiation

H. Chiang

a;#160; G. D.

Yao a;#160; Q.

S. Fang

b;#160; K. Q.  
Wang c;#160;  
D. Z. Lu d; Y. K.  
Zhou d. Health  
Effects of  
Environmental  
Electromagnetic  
Fields. Journal



**Electromagnetic**  
**Biology and**  
**Medicine,**  
**Volume 8, Issue**  
**1 1989, pages**  
**127 - 131**

Subjects included  
nursery school  
children, 3rd year  
secondary school  
children, college  
students and  
military personnel  
exposed to

pulsed  
microwave  
radiation and AM  
radio waves.  
Investigated the  
effects of  
exposure to  
environmental

electromagnetic  
fields (EMFs) in  
1170 subjects.

Neutrophil  
phagocytosis was  
enhanced in the  
low-intensity  
exposure groups,

but reduced significantly at relatively high intensities. Visual reaction time was prolonged and the scores of short-term

memory tests  
were lower in  
some  
high-intensity  
exposure groups.  
The data indicate  
that chronic  
exposure to

EMFs are associated with significant changes in some physiological parameters including the central nervous

and immune  
systems in man.  
Changes in white  
blood cells  
function,  
prolonged  
reaction time,  
lower short-term



memory scores  
were identified at  
power densities  
of 0-4 m W/cm<sup>2</sup>  
in school  
students (Chiang  
et al 1989).

Rööslı M,

Moser M,

Baldinini Y,

Meier M,

Braun-Fahrländ

er: Symptoms

of ill health  
ascribed to  
electromagneti  
c field  
exposure--a  
questionnaire  
survey. Ins  
titute of Social

**and Preventive**

**Medicine,**

**University of**

**Basel, Basel,**

**Switzerland.**

**Roeoesli@ispm**

**.unibe.ch**

**C.**

**Int J Hyg**

**Environ Health.**

**2004**

**Feb;207(2):141-**

**50.Links**

**From June**

**2001, health  
questionnaires  
were  
distributed to  
people who  
complained  
about  
symptoms of ill**

**health which they ascribed to exposure to electromagnetic fields (EMF). The objective of the survey was to gain a better**

**knowledge of  
the anxieties of  
complainants,  
to obtain hints  
of possible  
problems and  
of actions that  
should be taken**



**to solve the  
problems. The  
survey was not  
designed to  
establish a  
causal  
association  
between**

**exposure to  
EMF and  
symptoms of ill  
health. Within  
one year, 429  
questionnaires  
were returned  
of which 394**

persons  
reported  
symptoms.

**Waldmann-Se**

**Isam C., Jul**  
**2005,**  
**Documented**  
**Health Damage**  
**under the**  
**Influence of**  
**High**  
**Frequency**

# Electromagneti c Fields

**Evaluation of  
356 subjects in  
Oberfranken all**

**subject to  
long-term  
exposure to  
radiation found  
a range of  
reported  
symptoms**

**Germann, P**  
**(2004),**  
**Einfluss der**  
**Mobilfunkbela**  
**stung auf die**  
**Retikulozytenr**  
**eifung,**

vorläufige  
Bewertung  
anhand von  
1000  
Analysen. Juli  
2004.  
Significant



**effects of G S**  
**M phone mast**  
**on blood**  
**structure,**  
**Germany 2004.**

**Blood was  
drawn from  
1018 persons  
before a GSM  
mobile phone  
base station  
was installed**

**and again 6 to  
12 months  
after it was  
turned on.  
Significant  
changes in the  
blood have**

**been  
observed. The  
results of the  
reticulocyte  
studies show  
that significant  
effects appear**

**in humans as a  
direct cause of  
pulsed E M F,  
that can also  
be found in  
scientific  
literature in**

**vitro and in  
vivo (in fact  
biological  
effects to  
lymphocytes,  
granulocytes  
to bone growth**

and the bone marrow).

Radiofreque  
ncy (RF)

**sickness in**  
**the Lilienfeld**  
**Study: an**  
**effect of**  
**modulated**  
**microwaves?**  
**Johnson**



**Liakouris AG.**  
**Twin Streams**  
**Educational**  
**Center, Inc.,**  
**Carrboro,**  
**North**  
**Carolina,**

**USA.    Arch**

**Environ**

**Health. 1998**

**May-Jun;53(3)**

**:236-8.**

**The author  
reviewed U.S.  
literature,  
which  
revealed that  
research  
results are**

**sufficiently  
consistent to  
warrant  
further  
inquiry. A  
review of  
statistically**

**significant  
health effects  
noted in the  
Lilienfeld  
Study  
provided  
evidence that**

**the  
disregarded  
health  
conditions  
match the  
cluster  
attributed to**

**the  
radiofrequenc  
y sickness  
syndrome,  
thus  
establishing a  
possible**

**correlation  
between  
health effects  
and chronic  
exposure to  
low-intensity,  
modulated**



**microwave  
radiation. The  
author  
discusses  
these health  
effects  
relative to (a)**

**exposure  
parameters  
recorded at  
the U.S.  
Embassy in  
Moscow and  
(b) the Soviet**

**10-microwatt  
safety  
standard for  
the public.  
Given the  
evidence, new  
research-with**

**current  
knowledge  
and  
technology-is  
proposed.**

**Zwamborn A**

**P M, Vossen**

**S H J A, Van**

**Leersum B J**

**A M, Ouwens**

**M A, Makel W**

**N. (2003),**

**Effects of**  
**Global**  
**Communicati**  
**on System**  
**radiofrequen**  
**cy fields on**  
**Well-Being**

**and Cognitive**  
**Functions of**  
**human**  
**subjects with**  
**and without**  
**subjective**  
**complaints.**

**Netherlands**  
**Organisation**  
**for Applied**  
**Scientific**  
**Research**  
**(TNO)**  
**FEL-03-C148**



(2003).

In two  
groups  
(hypersensiti

**ve and  
non-hypersen  
sitive  
subjects)  
exposure to  
UMTS had a  
negative**

**influence on  
well-being in  
both groups.  
Cognitive  
function was  
consistently  
affected in**

**both groups  
exposed to  
GSM and  
UMTS.**

—

Regel SJ,

Negovetic S,

Röööslī M,

Berdiñas V,

Schuderer J,

Huss A, Lott

U, Kuster N,

**Achermann**

**P. Environ**

**Health**

**Perspect.**

**2006**

**Aug; 14(8):1**

**270-5**

**UMTS base  
station-like  
exposure,  
well-being,**

**and cognitive  
performance.  
The reported  
effects on  
brain  
functioning  
were**



**marginal and  
may have  
occurred by  
chance. Peak  
spatial  
absorption in  
brain tissue**

**was  
considerably  
smaller than  
during use of  
a mobile  
phone. No  
conclusions**

**can be drawn  
regarding  
short-term  
effects of cell  
phone  
exposure or  
the effects of**

**long-term  
base  
station-like  
exposure on  
human  
health.**

**Eltiti S,**

**Wallace D,**

**Ridgewell A,**

**Zougkou K,**

**Russo R,**

**Sepulveda F,**

**Mirshekar-Sy**

**ahkal D,**

**Rasor P,**

**Deeble R,**

**Fox E. Doe**  
**s short-term**  
**exposure to**  
**mobile**  
**phone base**  
**station**

**signals**

**increase**

**symptoms in**

**individuals**

**who report**

**sensitivity to**



**electromagn**  
**etic fields? A**  
**double-blind**  
**randomized**  
**provocation**  
**study. #160;**

**Envi**

**ron Health**

**Perspect.**

**2007**

**Nov; 115(11):**

**1603-8.**

# Short-term exposure to a typical

**GSM base  
station-like  
signal did  
not affect  
well-being or  
physiologica**

**I functions in  
sensitive or  
control  
individuals.  
Sensitive  
individuals**

**reported  
elevated  
levels of  
arousal  
when  
exposed to a**

**UMTS signal.  
Further  
analysis,  
however,  
indicated  
that this**

**difference  
was likely to  
be due to the  
effect of  
order of  
exposure**



**rather than  
the exposure  
itself. □**

**This study  
has been  
widely  
criticised.**

**GSM base**  
**stations:**  
**short-term**  
**effects on**

**well-being.&**

**#160;**

**Augner C,**

**Florian M,**

**Pauser G,**

**Oberfeld G,**

**Hacker GW.**  
**IGGMB,**  
**Research**  
**Institute for**  
**Frontier**  
**Questions of**

**Medicine**

**and**

**Biotechnolo**

**gy,**

**Landeskran**

**kenhaus**

**Salzburg,**  
**University**  
**Clinics of**  
**the**  
**Paracelsus**  
**Medical**

**Private**  
**University,**  
**Salzburg,**  
**Austria.**  
**Bioelectrom**  
**agnetics.**



**2009**

**Jan;30(1):73**

**-80**

PMID:

18803247

[PubMed - in  
process]

The  
purpose of

**this study  
was to  
examine the  
effects of  
short-term  
GSM (Global**

# System for Mobile Communications) cellular phone base station

# **RF-EMF (radiofrequency electromagnetic fields) exposure on**

**psychologic  
al symptoms  
(good mood,  
alertness,  
calmness)  
as measured**

**by a  
standardized  
well-being  
questionnaire.  
e.**

**Concluded  
that  
short-term  
exposure to  
GSM base  
station**



**signals may  
have an  
impact on  
well-being  
by reducing  
psychologic**

# al arousal.

