

Comments on the European Research REFLEX Project (2000-2004)

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This EU-funded project, undertaken by twelve partner institutions from seven European countries, published its Final Report in November 2004.

The twelve partners between them conducted a large number of experiments on human, rat and mouse cells of various types. Roughly half of those experiments used RF (RadioFrequency) EMFs, as emitted by mobile phones and masts; the other half used ELF (Extremely Low Frequency) EMFs as emitted from power lines and similar sources. Both types of emission were shown to have a number of significant effects on the behaviour of cells - potentially seriously harmful effects.

Experiments with RF EMFs used 900 MHz and 1800 MHz, as used in GSM mobile phone systems, at levels within the internationally-accepted ICNIRP 'safety' guidelines. Most significantly, damage to DNA - both single-strand and double-strand breaks - were found by at least three project partners to result from these RF emissions. As cited in the Report:

"DNA double strand breaks may affect the integrity of the genome leading to cell death, uncontrolled cell growth or cancer (Van Gent et al. 2001)."

Participant 3 specifically recorded that:

"RF-EMF generated DNA strand breaks in granulosa cells of rats and DNA strand breaks and chromosomal aberrations in human fibroblasts." "Our results imply a genotoxic action of RF-EMFs below proposed radiation safety levels."

In the Summary on 'Genotoxic Effects' the Report states:

"Based on the methodology used and the data obtained in the REFLEX study, the findings on genotoxicity caused by RF-EMF are hard facts."

The REFLEX team record, very responsibly, that all of these many experiments were conducted 'in vitro' (on groups of living cells in Petri dishes) and so their results cannot be taken as definite proof of effects in living organisms from RF EMFs below guideline levels. However, they go on to say:

"They move such an assumption nearer into the range of the possible." and:

"Since all these observations were made in in vitro studies, the results obtained neither preclude nor confirm a health risk due to EMF exposure, but they speak in favour of such a possibility."

That last phrase says, in effect: ***It is more likely than not, on the basis of these findings, that such health risks exist.***

[It's worth noting here that this responsible attitude contrasts sharply with the ambitious claims often made of, for example, the DSTL Porton Down study on TETRA radiation - also conducted 'in vitro' - that it 'proves' that such radiation isn't harmful to living organisms. The bias should, if anything, lean the other way: lack of an effect on isolated cells 'in vitro' shouldn't be taken to mean that a far more complex living organism wouldn't be affected; whereas clear evidence of effects on living cells 'in vitro' is a definite warning sign as to likely consequences for living organisms.]

The REFLEX research team went on to say:

"Furthermore, there exists no justification anymore to claim, that we are not aware of any pathophysiological mechanisms which could be the basis for the development of functional disturbances and any kind of chronic diseases in animal and man."

In other words:

The claim, so often peddled out by official sources, that there are no known mechanisms by which radiofrequency electromagnetic radiation could cause illness, is no longer tenable.

The following text lists some of the "Conclusions based on the findings obtained in RF EMF research" listed in the REFLEX Report:

"RF-EMF produced genotoxic effects in fibroblasts, HL-60 cells, granulosa cells of rats and neural progenitor cells derived from mouse embryonic stem cells (Participants 2, 3 and 4). Cells responded to RF-EMF exposure between SAR levels of 0.3 and 2 W/kg with a significant increase in single and double strand DNA breaks and in micronuclei frequency (Participants 2 and 3). Chromosomal aberrations in fibroblasts were also observed after RF-EMF exposure (Participant 3). In HL-60 cells an increase in the intracellular generation of free radicals accompanying RF-EMF exposure could clearly be demonstrated (Participant 2)."

...

"There is some indication that RF-EMF may affect the growth arrest and DNA damage inducible gene GADD45 and the neuronal differentiation by inhibition of Nurr1 in neural progenitor cells (Participant 4)."

...

"There is some indication that RF-EMF may have some influence on the bcl-2 mediated anti-apoptotic pathway in neural progenitor cells (Participant 4) and on the the p38MAPK/hsp27 stress response pathway in endothelial cells of human origin (Participant 6) which may in turn exert an inhibitory effect on apoptosis."

[Note: 'apoptosis' is 'programmed cell death' - the body's own defence mechanism that kills off cells that are malformed or running out of control, a natural protection against possibly cancerous cells. Inhibition of this process is thus bad news.]

"The results of the whole genome cDNA micro-array and proteomic analyses indicated that [RF] EMF may activate several groups of genes that play a role in cell division, cell proliferation and cell differentiation (Participants 2, 6 and 12)." External activation of such crucial groups of genes needs no further comment.

Finally, under "Policy-Related Benefits", the REFLEX Report has this to say:

"The policy related benefits of the REFLEX project consist in the fact that new knowledge has been generated independent of whether one likes it or not. ... the overall objective of REFLEX was to find out whether or not the fundamental biological processes at the cellular and molecular level support such an assumption [public fear of health effects]. For this purpose, possible effects of EMFs on cellular events controlling key functions, including those involved in carcinogenesis and in the pathogenesis of neurodegenerative disorders, were studied through focussed research.

*Failure to observe the occurrence of such key critical events in living cells after EMF exposure would have suggested that further research efforts in this field could be suspended and financial resources be reallocated to the investigation of more important issues. **But as clearly demonstrated, the results of the REFLEX project show the way into the opposite direction.**" (Emphasis from the Author).*