

# Mobile Telecommunications and Health

## Summary of the ECOLOG study for T-Mobile, 2000

Mobile Telecommunications and Health.  
Appendix E, research database listing (in German)

In 2000, the same year the Stewart Report was commissioned by the UK Government, T-Mobil in Germany (the parent company of T-Mobile) commissioned a highly-rated independent research institute, the ECOLOG Institute in Hanover, to review all relevant available research to date with regard to the health risks from mobile telecommunications.

This review of over 220 peer-reviewed and published papers found strong indications for the **cancer-initiating** and **cancer-promoting** effects of high frequency electromagnetic fields used by mobile telephone technology. Experiments on cell cultures at power flux densities much lower than the guidelines, yielded strong indications for **genotoxic effects** of these fields, like single and double stranded DNA breaks and damage to chromosomes. The findings that high frequency electromagnetic fields influence **cell transformation, cell growth promotion** and **cell communication** also point on a **carcinogenic potential** of the fields used for mobile telephony. The study also found **teratogenic effects** (birth deformities) and loss of **fertility** in animal studies. Moreover, disruptions of other cellular processes, like the **synthesis of proteins** and the control of **cell functions by enzymes**, have been demonstrated. Numerous experiments on humans as well as on animals proved effects on the central nervous system, which reach from **neuro-chemical effects** to modifications of the brain potentials and impairments of certain brain functions. Loss of **memory and cognitive function**, for instance, have been demonstrated by animal experiments. From experiments with volunteers, who were exposed to the fields of mobile telephones, there is clear evidence for influences on certain cognitive functions. Possible risks for the brain also arise from an increased **permeability of the blood-brain barrier** to potentially harmful substances, observed in several experiments on animals exposed to mobile telephone fields.

The ECOLOG report also found indications for disruptions of the **endocrine and the immune system**. High frequency electromagnetic fields cause **stress reactions**, showing up in an increased production of stress hormones in experimental animals and they lead to a reduction of the concentration of the hormone **melatonin** in the blood of exposed animals and humans. Melatonin has a central control function for the hormone system and the diurnal biological rhythms and it is able to retard the development of certain tumours.

A common observation in many of the studies was the importance of pulse modulation. Pulse modulated fields seemed to have a stronger effect than continuous fields and that

in some cases, it was the pulse of a certain frequency which triggered the reaction, and absence of pulse, or pulse of a different frequency, led to less significant effects or no effect at all.

In sum, the ECOLOG report came to dramatically different conclusions than the Stewart Report and called for an immediate downward regulation of the power flux density that should be allowed by the guidelines, by a factor of 1,000.

### **Translator's Note**

In my translation from the German, I have consistently applied the following evidence categories as defined by ECOLOG-Institut in April 2003:

ECOLOG Evidence Categories:

- *evidence* (German: Nachweis): consistent results of identical studies are available
- *consistent indication* (German: konsistenter Hinweis): (strong) indication from different study designs considering the same (patho)physiological endpoint are available
- *strong indication* (German: deutlicher Hinweis): consistent results from comparable studies are available
- *indication*: similar results from comparable studies are available
- *weak indication*: single study results are available
- This report and its translation have been misrepresented at times. Here is a description of the circumstances from the original author:

Statement by Dr Hans-Peter Neitzke, ECOLOG-Institute  
*Andrea Klein*