

## One Page Summary of Andrew Goldsworthy 'The Biological Effects of Weak Electromagnetic Fields'

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

--**Andrew Goldsworthy**, 2007

[http://www.hese-project.org/hese-uk/en/papers/goldsworthy\\_bio\\_weak\\_em\\_07.pdf](http://www.hese-project.org/hese-uk/en/papers/goldsworthy_bio_weak_em_07.pdf)

- **Weak electromagnetic fields release calcium from cell membranes**
- **The loss of calcium makes cell membranes leak**
- **How calcium loss makes holes in membranes**
- **Membrane leakage damages DNA**
- **DNA damage may cause cancer**
- **DNA damage reduces fertility**
- **There may also be permanent genetic damage**

The power and mobile phone companies have seized upon this characteristic

variability to discredit work on the non-thermal effects of electromagnetic fields as

being due to the experimental error. Nothing could be further from the truth. Many of these experiments are highly reproducible, especially the fundamental and all important ones on the effects of the radiation on the release of calcium from cell membranes. Secondary effects further down the line may be less reproducible since they are more likely to be mitigated by the intervention of cellular defence mechanisms. Therefore, we cannot expect rigidly reproducible results in all circumstances any more than we can expect everyone to experience exactly the same side effects from taking a medicinal drug. However, that does not mean that they can be safely ignored!

### Conclusion

In the latter part of this article, I have explained how weak electromagnetic fields can interact with cell membranes to weaken them and make them more permeable. ...There is undeniable experimental proof that weak electromagnetic fields can remove bound calcium ions from cell membranes. There is also no doubt that bound calcium ions are essential for the stability of these membranes. Consequently, their loss will increase temporary pore formation under the mechanical stresses from pressure differences within the cell and abrasion by its moving contents. **This very simple conclusion can account for virtually all of the known biological effects of electromagnetic fields, including changes in metabolism, the promotion of cancer, genetic damage, loss of fertility, deleterious**

**effects on brain function and the unpleasant symptoms experienced by electrosensitive individuals.**

### **Electrosensitivity and hypocalcemia – a possible cure**

However, it seems possible that at least some cases electrosensitivity could be due to low levels of ionised calcium in the blood exacerbating the electromagnetic effects. If so, it may be possible to relieve some or all of the symptoms by conventional treatment for hypocalcemia.