

Link between weak magnetic fields from power lines, phones and ill-health called into question

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Credit: Tony Boon/Wikipedia

Several past studies have suggested that the magnetic fields created by phones, high-voltage power lines and other electrical equipment are harmful for humans.

Research first carried out in the 1970's and again subsequently, found an association between people living near overhead [power lines](#) and an increased risk of [childhood leukaemia](#). Although some later studies have failed to find such a link, the International Agency for Research on Cancer has categorised low frequency magnetic fields as "possibly carcinogenic."

But a mechanism for this association has never been found and now the team from the Manchester Institute of Biotechnology has ruled out one of the prime candidates, in a paper published today in the *Journal of the Royal Society Interface*. The team studied the effects of weak magnetic fields (WMFs) on key human proteins, including those crucial for health, and found that they have no detectable impact.

With funding from the Electromagnetic Fields Biological Research Trust, the team looked at how WMFs affected a protein class called flavoproteins, which are key to processes vital for healthy human function, such as the nervous system, DNA repair and the biological clock.

If these proteins go wrong then there are serious knock-on effects for human health. But after subjecting them to WMFs in the lab it became clear that they have no detectable impact.

Dr Alex Jones, research fellow at the School of Chemistry at The University of Manchester, and co-lead author of the paper, said: "There is still some concern among the public about this potential link, which has been found in some studies into cases of childhood leukaemia, but without any clear mechanism for why.

"Flavoproteins transfer electrons from one place to another. Along the path the electrons take, very short lived chemical species known as radical pairs are often created. Biochemical reactions involving radical

pairs are considered the most plausible candidates for sensitivity to WMFs, but for them to be so the reaction conditions have to be right. This research suggests that the correct conditions for biochemical effects of WMFs are likely to be rare in human biology."

Professor Nigel Scrutton, co-lead author of the paper, from the Faculty of Life Sciences, said: "More work on other possible links will need to be done but this study definitely takes us nearer to the point where we can say that power-lines, mobile phones and other similar devices are likely to be safe for humans."

More information: Magnetic field effects as a result of the radical pair mechanism are unlikely in redox enzymes, *Journal of the Royal Society Interface*, 2014: [dx.doi.org/10.1098/rsif.2014.1155](https://doi.org/10.1098/rsif.2014.1155)

Provided by University of Manchester

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