



The Importance of Quality Control Measures in Scientific Studies

In a paper by Vijayalaxmia and Prihodab TJ¹, the authors looked at the influence of four quality control measures ideally associated with studies of exposure to radio-frequency (RF) energy. In this particular analysis, they assessed 225 published papers from the period 1990-2017, involving 110 animal studies and 115 studies of human cells exposed *in vitro* and *in vivo* to RF energy (involving 2,160 actual test results).

The four specific quality control measures (and why they are important) were:

1. 'Blind' collection/analysis of the data to eliminate any individual/observer 'bias';
2. Adequate description of 'dosimetry' for independent replication/confirmation;
3. Inclusion of 'positive controls' to confirm the outcomes; and
4. Inclusion of 'sham-exposed controls' to compare the data with those in RF exposure conditions.'

The results of the analysis are insightful and highlight the importance of the inclusion in the study design and the resulting publication of the above-mentioned quality control measures.

The authors found that in animal study publications, "blind" evaluation was mentioned in 60% of the studies, adequate dosimetry was described in 57%, positive controls were included in only 49% and sham-exposed controls were mentioned in 69% of the papers. In human study publications, 'blind' was mentioned in 61%, adequate dosimetry in 70%, positive controls in 67% and sham-exposed controls in 62%.

One of the conclusions of the study was when all four quality control measures were mentioned in the publication, the differences² between the exposed cells and controls or the effect size were smaller compared to those when one or more quality control measures were not mentioned in the investigation.

Other conclusions were:

- The number of published studies reporting *no significant difference* in genetic damage of cells exposed to RF energy, compared to that of control cells, increased with the higher number of quality control measures employed in investigations; and
- The number of published studies reporting *increased genetic damage* in cells exposed to RF energy decreased with the higher number of quality control measures.

The bottom line is that the inclusion of any, some or all quality measures saw fewer reported effects – or no effects at all - associated with exposure to RF energy, highlighting the importance of these measures in quality studies and publications in this area.

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¹ *Comprehensive Review of Quality of Publications and Meta-analysis of Genetic Damage in Mammalian Cells Exposed to Non-Ionizing Radiofrequency Fields*. Vijayalaxmia and Prihodab TJ. Radiation Research: January 2019, Vol. 191, No. 1, pp. 20-30. <https://doi.org/10.1667/RR15117.1>

² Standardized mean difference values