

LETTERS TO THE EDITOR

Ultrasound Bioeffects Investigations: Controls

Sir:

We write to call to the attention of readers of this Journal that the report by Anderson and Barrett (1981) contains some deficiencies in experimental design which, when considered in detail, mitigate severely against accepting the conclusions of the authors. The principal problem is that the authors did not report the results of adequately paired controls. Thus, the authors state that the control mice received treatment identical to the ultrasound irradiated mice, yet only one control group of 10 mice is reported in their Table 1. How could this one group have received treatment identical to the nine remaining groups listed in the table? Different sham control groups should have been paired to the three different ultrasound durations involved, viz. 5, 3.3, and 1.6 min., as well as the two different periods between treatment and assay. Until the authors report on precisely paired controls, their data cannot be accepted as a believable effect of ultrasound exposure. Similar remarks can be made of an earlier report (Anderson and Barrett, 1979).

It should be noted that many laboratory animals, and mice in particular, respond to novel environments with large increases in plasma corticosterone levels (Liburdy, 1979 & 1980; Riley, 1981). That these stress related responses can have profound effects upon the immune system (see Riley, 1981 for a recent review) only further points out the need for precise pairing of sham and treated groups. Thus, a slightly different handling procedure between sham and treated groups may show up as differences due to stress and not to any particular agent or treatment. In this respect, we would also argue for the need for an additional experimental group, namely, "home cage" or "minimum handling" controls. By comparing sham, treated and minimum handling control groups, one can usually determine whether stress related phenomena are involved.

Yours etc.,

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References.

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Liburdy, R.P. (1979). Radiofrequency radiation alters the immune system: Modulation of T- and B- lymphocyte levels and cell-mediated immunocompetence by hyperthermic radiation. Rad. Res. 77:34-46.  
Liburdy, R.P. (1980). Radiofrequency radiation alters the immune system. II. Modulation of in vivo lymphocyte circulation. Rad. Res. 83:66-73.  
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Authors Reply.

Sir:

It is surprising that Cain and Dunn should criticize our (Anderson and Barrett, 1981) use of a sham treated control group of mice for comparison with separate experimental groups by citing a report (Liburdy, 1979) in which the same experimental construct was employed. Liburdy compared (Table 1) a single group of untreated mice with four experimental groups: one group received radiofrequency radiation (RFR) on a single occasion, and the second group received RFR twice daily on ten successive days for a total of 20 treatments. The third and fourth groups were exposed once and twenty times to a hot air environment to increase their rectal temperatures to the same degree as RFR. These mice were later evaluated for several variables and compared to the untreated controls.