Answer to the Comment of A. H. Frucht

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Frucht claims that the assertion of C. Koschnitzke, F. Kremer, L. Santo, P. Quick and A. Poglitsch [1] to have found a non-thermal influence of millimeter waves on the puffing of giant chromosomes is untenable due to erroneous application of statistical tests. This claim is based upon misunderstandings (1., 2.) and omissions (3.):

1. "Parametric tests cannot be used" writes Frucht. Parametric test *have not* been used in [1]. In Table I mean values and standard deviations are *reported* but the *conclusions* are only based upon the sign-test and the U-Test of Mann-Whitney which are nonparametric.
2. Frucht finds that, using the G-test the null hypothesis of no difference between experimental series I and IIIa cannot be rejected at the 0.05 significance level. This is in qualitative agreement with Table I in [1] in which values of 0.045 (± Test) and 0.042 (U-Test) were found as significance levels. It is not surprising that the use of a different test can lead to slightly different results. If our conclusion of finding a non-thermal mm-wave influence had been based only upon experimental series IIIa in which swept frequencies were used (64.1 GHz − 69.1 GHz), then it would be a weak claim. However in two further irradiation experiments with stabilized mm-wave frequencies (experimental series IIIb: 67.200 GHz ± 0.001 GHz, experimental series IIIc: 68.200 GHz ± 0.001 GHz) a strong irradiation effect was found. Frucht, too, acknowledges "they are significantly different from the others". We agree, because that is what we have reported. Then Frucht chooses to reexamine the results of IIIb and IIIc by omitting the negative values in experimental series I. This does not make any sense and represents a gross error of data selection. Conclusions have to be based upon all data and not upon a selection fitting a preconception. The nonoccurance of negative values in IIIb and IIIc is an *experimental* finding and has to be used in any statistical test. "If negative values are not observed, the primary dates, too, are biased (test IIIb, IIIc)" writes Frucht. We agree and hold that the mm-wave irradiation is the source of this bias (in the primary data).
3. Frucht mentions the microwave-induced temperature rise of 0.3 °C and concludes that "the conditions ... are not suited to prove athermal biological effects of high-frequency electromagnetic fields". He fails to notice that in [1] more than eightfold the microwave-induced temperature rise of 0.3 °C was simulated for a sham-exposed sample (experimental series II in Table I). No effect was observed on the puffing, thus proving that the chromosomes are not temperature-sensitive on this scale.

One might criticize that in [1] the irradiated experimental series (III) were tested against the sham-exposed series (I), instead of the sham-exposed series with additional heating (II). This gives probabilities (in percent) that the glands placed in the (sham)-irradiation chamber belong to the same distribution as the glands in the control chamber (according to the U-Test) of 27.4 (II against I), 1.9 (II against IIIa), 0.1 (II against IIIb), 0.1 (II against IIIc), which are in good agreement with Table I in [1].

Since the appearance of [1] the experiments were continued and all our results reported in [1] could be fully confirmed. (A publication is in progress.)

[1] C. Koschnitzke, F. Kremer, L. Santo, P. Quick, and A. Poglitsch, Z. Naturforsch. **38 c,** 883 − 886 (1983).

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