# Letters

## Canadian Saccharin Study

Several points in the article "Saccharin: A chemical in search of an identity" by Barbara J. Culliton (News and Comment, 10 June, p. 1179) were in error or unclear with regard to the Canadian study in which rats were fed ortho-toluenesulfonamide (OTS) and saccharin. We offer the following corrections and comments in the hope that errors will not be perpetuated.

*Incidence of tumors.* Fifty male and fifty female Sprague-Dawley rats constituted the original group size. Table I indicates the incidence of benign and malignant tumors observed during the study for the control and saccharin-treated animals only. Diagnoses of the tumors were a consensus of seven eminent pathologists who were not associated with the design or conduct of this study.

*Bladder parasites.* No parasites or ova of the parasite *Trichosomoides crassicauda* were detected during the course of or upon termination of the study. Samples of urine were passed through a Millipore filter and stained according to the Papanicolaou method. In addition to examining these preparations, we scrutinized serial sections of the bladder for parasites and their ova during our examination for tumors.

*Urinary calculi and urinary tract stones.* Microcalculi are produced in the kidneys of older rats (*1*) and excreted in the urine. Microcalculi (40 to 70 microns) were detected as an incidental finding in all groups during the examinations of the Millipore filters. They were found with a similar frequency in the urine of the male rats that were receiving either control diets or diets containing saccharin. The incidence of microcalculi in the rats' urine was not related to treatment.

Bladder stones visible to the naked eye were observed in two $F_0$ males and in two $F_1$ males from four different treatment groups. One animal from each generation had a benign bladder tumor. Visible inspection revealed kidney stones in three $F_0$ males from the same treatment group and one had a benign bladder tumor. In addition three $F_0$ females from three different treatment groups had kidney stones visible to the naked eye but no bladder tumors.

*Impurities.* Two lots of sodium saccharin, manufactured by the Sherwin-Williams Company (Maumee procedure), were used in this study: lot number G S-1233 and lot number S-1022. Neither lot of saccharin contained detectable amounts of OTS. Lot number G S-1233 was used during the first 25 weeks that the $F_0$ rats were being tested and the first week the $F_1$ rats were being tested. Lot number S-1022 was used during the remainder of the study. Both batches contained 8 to 12 different impurities. Lot number G S-1233 contained 10 parts per million total water and organic soluble impurities and lot number S-1022 contained 40 parts per million total impurities (*2*).

*Mutagenicity testing.* Samples of the saccharin as fed to the rats from both lot numbers G S-1233 and S-1022 were tested for mutagenic activity using the Ames *Salmonella* assay, and the results were negative. However, when the impurities from 1 kilogram of these two lots of sodium saccharin were extracted and the impurities were tested for mutagenicity, only the impurities soluble in organic solvents from lot number S-1022 were found to be mutagenic in the Ames assay (*3*).

One confounding factor was that the impurities soluble in organic solvents from the lot of saccharin used in the previous one-generation rat study by Munro *et al.* (*4*), lot number 191010, manufactured by the Daiwa Chemical Company Ltd. in Japan (Remsen-Fahlberg procedure), gave a positive result in the Ames assay but was negative for the cancer bioassay in rats. Consequently, the relationship, if any, between the incidence of bladder tumors in rats fed saccharin and the positive mutagenic results is unknown at this time.

Table 1. Incidence of bladder tumors among rats fed sodium saccharin (5 percent) and control rats fed a normal diet.

| Treatment | Tumors (No.) | | | |
|---|---|---|---|---|
| | $F_0$ generation | | $F_1$ generation | |
| | Benign | Malignant | Benign | Malignant |
| | *Males* | | | |
| None (controls) | 1 | 0 | 0 | 0 |
| Sodium saccharin | 4 | 3 | 4 | 8 |
| | *Females* | | | |
| None (controls) | 0 | 0 | 0 | 0 |
| Sodium saccharin | 0 | 0 | 0 | 2 |

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**References**

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2. B. Stavric, in *Proceedings, Toxicology Forum on Saccharin* (Center for Continuing Education, Univ. of Nebraska Medical Center, Omaha, 9 May 1977), pp. 73–80.
3. D. R. Stoltz, in *ibid.*, pp. 101–106.
4. I. C. Munro, C. A. Moodie, D. Krewski, H. C. Grice, *Toxicol. Appl. Pharmacol.* **32**, 513 (1975).

## Drinking Water: Sources and Treatment

Nicholas Wade's article "Drinking water: Health hazards still not resolved" (News and Comment, 24 June, p. 1421) is an excellent statement of the issues. Because decades may pass before the hazards of using polluted sources for drinking water can be adequately evaluated, prudence is called for on the part of those charged with protecting the public health. Such prudence would, I agree, call for replacing the sand in conventional filters with activated carbon, at the very least.

However, we cannot be sanguine about the efficacy of even this measure, as all synthetic organic chemicals are not removed by activated carbon, particularly when the carbon filters are not properly operated. More than 99 percent of public community water systems in the United States serve fewer than 50,000 people, and such systems seldom have the professional supervision that can ensure adequate monitoring and treatment. Nevertheless, we should move ahead with at least this minor measure for health protection.

What troubles me is that our policies for drinking water permit and even encourage the continued construction of new intakes for potable water supply from our polluted watercourses. Rivers that drain large urban and industrial areas *inevitably* receive pollution. The releases of Kepone into the James River