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Carcinogenic and Mutagenic Metal Compounds. Environmental and Analytical Chemistry and Biological Effects

Edited by E. Merian, R. W. Frei, W. Härdi and Ch. Schlatter. *Current Topics in Environmental and Toxicological Chemistry, Volume* 8. Pp. xii + 549. Gordon and Breach. 1987. Price $95. ISBN 2 88124 022 4.

". . . Carcinogenic and/or mutagenic metal compounds behave quite differently from carcinogenic and mutagenic organic compounds." So begins this book, which consists of papers presented at a workshop organised in Geneva in September 1983 by the International Association of Environmental Analytical Chemistry. Seven parts of the book address, successively, distribution and biomonitoring; analytical methods; *in vitro* and *in vivo* bioassays; the effects of chromium, nickel and cobalt; the effects of beryllium, cadmium and selenium; the effects of arsenic, platinum, palladium and rhodium; and occupational risks and speculations concerning mechanisms.

The first three chapters provide a bird's eye view of the distribution of heavy metals in the environment, and the next eight bring together information on the analytical methods available for monitoring soil, water, air, plant and animal tissues for metals.

The theory that all carcinogens are mutagens (which of course was obviously wrong from the start!) has led some investigators to the confident hope that carcinogenicity could be reliably predicted by short-term tests for mutagenicity. With the rapid growth in examples of non-genotoxic carcinogens, confidence in this hope has waned: However, there are still many who are prepared to devote their life's energy to finding out why carcinogenic metals give negative or variable results in *in vitro* mutagenicity tests. Norton Nelson summarises the position succinctly on p. 526 of the book: "*In vitro* studies are at this time not in a state permitting their full understanding with respect to their relevance for cancer. Their present use is no doubt most important in relationship to the mechanism of action of the metallic compounds."

insert (A)

Much more to the point, therefore, is research on the mechanisms underlying *in vivo* mutagenicity and carcinogenicity—and it is to this topic that arguably too little of the present volume is devoted. However, Christian Schlatter, in the final chapter, does summarise the state of the art in this respect: "We really do not know the different mechanisms of carcinogenic action of metal compounds." "The main gap which should be closed in the following years would be first: better knowledge on the speciation, intracellular distribution, subtle biological effects, such as effects on cell turnover, enzyme activities in mammals, not only *in vitro* but in the living mammal."

insert (B)

There are some who believe that metals generally—and not only toxic heavy metals—are implicated to a major extent in all manifestations of carcinogenesis. If this is so, then scattered throughout the present book are, doubtless, gems of information which if brought together and properly arranged might shed light on issues well beyond its title.

Francis J. C. Roe

FJCR/ST 3rd August, 1987

The Editor,
The Analyst,
The Royal Society of Chemistry,
Burlington House,
LONDON W1V OBN

Dear Sir,

Proof -
Carcinogenic and Mutagenic Metal Compounds.
Environmental and Analytical Chemistry and Biological Effects

We have checked the attached proof and find it to be satisfactory except there are missing sections from the quotations at the end of paragraphs 3 and 4. Please insert the the missing parts as follows:-

End of Paragraph 3

(A) "..... metallic compounds. Neither human observational studies nor animal experiments have yet provided (with the exception of a few anecdotal or experimental reports) definite evidence of aid in interpreting the likelihood of the production of heritable mutations from exposure to metal compounds."

End of Paragraph 4

(B) "....in the living mammal. And then..... a better correlation with the in vitro studies."

These omissions are entirely our fault and we are extremely sorry if they have caused any inconvenience to you. Please accept our sincere apologies.

Yours faithfully,

Francis J.C. Roe

enclosure