PCB's: How Toxic?

Polychlorinated biphenyls (PCB's) are recognized as ubiquitous environmental contaminants. In 1973, this worldwide problem resulted in a decision by the Organization for Economic Cooperation and Development to control the use and disposal of PCB's (*1*). At present, both the U.S. and Canadian governments are preparing legislation for the control of toxic substances.

The concern over PCB's is based on two factors, namely their environmental persistence and their toxicity. Recent results, however, cast doubts on the latter. Bowes *et al.* (*2*) observed concentrations of highly toxic polychlorinated dibenzofurans (PCDF's) ranging from 0.1 to 0.5 microgram per gram in all but one of the North American PCB's (Aroclor). Earlier studies by Vos *et al.* (*3*) had indicated that only PCB's manufactured in Japan (Kanechlor) and Europe (Clophen, Phenochlor) contained such impurities. In addition, PCDF's and other by-products were recently found in "pure" PCB isomers (*4*).

The toxicity of PCDF's exceeds that of PCB's by approximately four to six orders of magnitude. Their presence in PCB's has, therefore, significant bearing on toxicity studies on PCB's, commercial mixtures, and isomer preparations alike. Yet, in only a small proportion of the scientific reports on this subject is the problem of PCDF impurities in PCB's discussed. Obviously, the degree of this contamination is variable with the origin and probably also with other details of the manufacturing processes.

I strongly recommend, therefore, that in all future toxicity studies and for as many past studies as can be documented, precise information on the PCB's used (source, date of manufacture, lot number, and so forth) be recorded. I further recommend that past experiments for which such information is available be reevaluated in view of the strong possibility of the presence of PCDF's and their overriding toxic effects.

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Membrane Protein Assay

We have recently been informed that the detergent Lubrol PX, which is an important component in our new immunoelectrophoretic assay for membrane proteins (Reports, 8 Aug. 1975, p. 469), is no longer commercially available. We have tested other nonionic detergents and find that Triton N-101 (Rohm and Haas) and Emulophogene BC 720 (GAF) may be substituted for the Lubrol PX with comparable results. Another detergent, Triton X-100, is not quite as effective in this technique since some sodium dodecyl sulfate still enters the agarose-antibody layer. When analyzing heavily loaded gels, we use a 6- to 8-millimeter strip of the detergent, 1.7 percent in agarose, slightly wider than the dimension recommended in our report, for the best results.

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Cell Bank Established

To facilitate research on cell genetics in relation to aging, a bank of mutant and normal cells has been established by the National Institute on Aging (NIA) at the Institute for Medical Research in Camden, New Jersey. Cell cultures are developed and banked in response to research needs. Recommendations of general policy, specific policy, and selection of classes of cells or specific cell lines are made by an advisory committee. Most lines are of human origin, but a limited number of nonhuman lines with unique or valuable genetic characteristics will be accepted. Cultures are grown without antibiotics after primary culture and stored in liquid nitrogen at early passage.

This NIA Mutant Cell Bank is working in close cooperation with the National Institute of General Medical Sciences Genetic Mutant Cell Repository established at the same institution. The purpose of that repository is the study of hereditary diseases.

In addition to the responsibility for a cell repository, an annual workshop on cell culture and somatic cell genetics as they relate to aging research is held each year in May. Suggestions, inquiries, and contributions to the NIA cell bank are invited.

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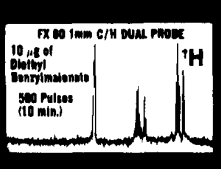

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