

IMMUNOTOXICITY OF DIOXINS AND POPS

COMPARATIVE *IN VITRO* IMMUNOTOXICOLOGY OF ORGANOCHLORINE MIXTURES IN MARINE MAMMALS AND MICE.

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Introduction

Immunotoxicity of organochlorines has been demonstrated in laboratory animals and suspected but not proven in marine mammals. Exposure to individual PCB congeners have been previously studied in laboratory animals, but little work has been done with mixtures of organochlorines, which may act synergistically, additively, or antagonistically on immune functions. The present study is aimed at characterizing immunotoxic potential for mixtures of organochlorines compared to that of individual compounds, and compares the relative sensitivity of different species of marine mammals.

Methods and Materials

Four PCB congeners, PCB 138, PCB 153, PCB 169, and PCB 180, as well as 2,3,7,8-TCDD were tested. All combinations of PCBs and TCDD were tested with a final concentration of 5 ppm for each PCB congener and 10 pg/ml for TCDD. Two different mitogens were used to stimulate cell proliferation, lipopolysaccharide (LPS) and concanavalin A (ConA). Beluga whale and harbor seal peripheral blood mononuclear cells (PMBC) were tested. Murine splenocytes were used in parallel with marine mammal cells to insure validity, reproducibility, and quality control of the *in vitro* assays.

Results and Discussion

Preliminary results in mice suggest that some of the mixtures of organochlorines reduce lymphocyte proliferation, compared to unexposed lymphocytes and cells exposed to individual organochlorines. Previous results in beluga whales showed a synergistic effect of PCB 138, 153 and 180, the combination of which significantly reduces lymphocyte proliferation. The addition of PCB 169 to the mixture resulted in alleviation of the inhibition (not significantly different from unexposed control), which demonstrate antagonistic effects. Current work is addressing the same issues with all possible combinations of these compounds in beluga and harbor seals. Results of the present study will provide insights on the interactions of PCBs in mixtures, determine the differences in sensitivity between different species of marine mammals, and will help to assess and manage the risk associated with exposure to mixtures of organochlorines.

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