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Effects of 2-Bromopropane on Mouse Embryo Development in Vitro

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Recently we have demonstrated that a 12-day s.c. dose of 2-Bromopropane(2-BP) to pregnant mice during pregnancy resulted in significant developmental toxicity at dose levels of above 1250 mg/kg/day. However, the cause and effect relationship between maternal and developmental toxicities could not be elucidated in the previous study. The present study was conducted to determine the relationship between maternal and developmental toxicities of 2-BP using a whole embryo culture technique. ICR mouse embryos were explanted on gestational day 8.5 and cultured for 48 hrs in the immediately centrifuged and heat-inactivated rat serum containing 0, 2.5, 5 or 10 mg 2-BP/ml. After 48 hrs in culture, the growth and development of embryos were compared and each embryo was evaluated for the presence of any malformations. At above 5 mg/ml of culture medium, decreases in developmental score and protein content and an increase in the incidence of morphological alterations were observed. Characteristic malformations included microcephaly, shortened proscencephalon, open anterior neuropore, open cranial neuropore, kinked somite, and abnormal axial rotation. There were no adverse effects on embryonic growth and development at a concentration level of 2.5 mg 2-BP/ml of culture medium. The results showed that exposure of 2-BP to mouse embryos caused a direct developmental toxicity.

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