

## **Augmentation of Allergic Reaction by Ingestion of Chlorinated Organic Solvents in Drinking Water**

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The incidence of allergic diseases has been increasing. Some epidemiological studies suggested that this is due to exposure of environmental pollutants. Trichloroethylene (TCE) and tetrachloroethylene (PCE) are chlorinated organic solvents and used as dry-cleaning and metal-degreasing agents in industrial operations. It has been a social problem that TCE and PCE have been commonly detected in waters, airs and soils as an environmental pollutant. In this study, we examined the enhancing effect of TCE and PCE ingestion from drinking water on allergic responses.

Various environmental chemicals were screened on their effects of histamine release from rat intraperitoneal mast cells, and TCE and PCE were found to have enhancing effect on the histamine release. Therefore we examined the effect of TCE and PCE on allergic reaction *in vivo*. We used passive cutaneous anaphylaxis (PCA) and active cutaneous anaphylaxis (ACA) reaction models to evaluate the toxic effect, augmentation of allergic reaction, of TCE or PCE ingestion from drinking water. For the both reaction models, significant augmentation of the allergic reaction was observed on the mice treated with TCE or PCE in drinking water prepared at the concentrations of 0.03 mg/L or 0.01 mg/L respectively, which are Japanese standards for water quality. The enhanced reactions were in a dose-dependent and time-dependent manner. From the results of pathological studies, inflammation of TCE- or PCE-treated mice were exacerbated and infiltration of lymphocytes and accumulation of mast cells around the vessel were observed. Furthermore, interleukin-4 (IL-4) mRNA expressions from mesenteric lymph nodes were significantly increased.