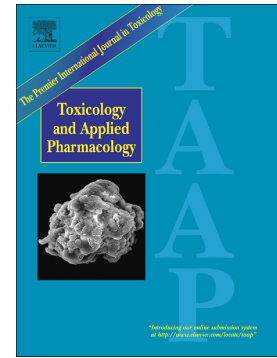


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Environmental exposure to perchlorate: A review of toxicology and human health

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**Environmental Exposure to Perchlorate: A Review of Toxicology and Human Health****Richard C. Pleus<sup>a</sup>****Lisa M. Corey<sup>a</sup>****Corresponding Author:****Richard C. Pleus****<sup>a</sup>Intertox, Inc.****600 Stewart Street, Suite 1101****Seattle, WA 98101****Phone: (206) 443-2115****Fax: (206) 443-2117****Email: rcpleus@intertox.com****Abstract**

Perchlorate pharmacology and toxicology studies date back at least 65 years in the peer-reviewed literature. Repeated studies in animals and humans have demonstrated perchlorate's mechanism of action, dose-response, and adverse effects over a range of doses. The first measurable effect of perchlorate is inhibition of iodine uptake to the thyroid gland. Adequate levels of thyroid hormones are critical for the development of the fetal nervous system. With sufficient dose and exposure duration, perchlorate can reduce thyroid hormones in the pregnant or non-pregnant woman via this mechanism. The developing fetus is the most sensitive life stage for chemical agents that affect iodide uptake to the thyroid.

Perchlorate has a half-life of eight hours, is not metabolized, does not bioaccumulate, is not a mutagen or carcinogen, and is not reprotoxic or immunotoxic. More recently, epidemiological and biomonitoring studies have been published in the peer-reviewed literature characterizing the thyroidal effects of perchlorate and other goitrogens. While the results from most

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