

Chemical for Developmental and Reproductive Toxicant Identification Committee (DART IC)

Review Consideration:

Trihalomethanes

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Evidence available for prioritization of *Trihalomethanes (THMs)*

Major source in the environment:

THMs are produced mainly as byproducts of water disinfection with halogenated compounds

The most common THMs are:

Bromodichloromethane (BDCM, CAS# 75-27-4)

Dibromochloromethane (DBCM, CAS# 124-48-1)

Tribromomethane (bromoform, CAS# 75-25-2)

Trichloromethane (chloroform, CAS# 67-66-3)



THMs: Epidemiologic Data

- Six epidemiologic studies reported increased risk of adverse developmental or reproductive outcomes
- Five studies reported no increased risk
- Eleven other related studies or meeting presentations were also identified



THMs: Epidemiologic Data

Epidemiologic studies found as follows:

- **BDCM:** Four studies reporting increased risk and four studies reporting no increased risk of adverse developmental or reproductive outcomes were identified. Four related articles or meeting abstracts on BDCM were identified.
- **DBCM:** One study reporting increased risk and one study reporting no increased risk of adverse developmental or reproductive outcomes and one related study were identified.
- **Bromoform:** Two studies reported no increased risk of adverse developmental or reproductive outcomes.
- **Chloroform:** Five studies reporting increased risk and three studies reporting no increased risk of adverse developmental or reproductive outcomes as well as four related or meeting abstracts were identified.



THMs: Epidemiologic Effects

- ventricular septal defects, cleft palate, and anencephaly
- stillbirths
- small for gestational age
- Effects on ovarian function (short cycle length, specially follicular phase)
- spontaneous abortion



THMs: Animal Data

- Two animal studies reported adverse developmental or reproductive outcomes.
- One study reported no increased risk of adverse developmental or reproductive outcomes.
- Six animal related and/or meeting abstracts were also identified for THMs.



THMs: Animal Data

Animal studies findings are as follows:

- **BDCM:** Five animal studies reported increased risk and five reported no increased risk of adverse developmental or reproductive outcomes. Nine related articles or meeting abstracts were identified.
- **DBCM:** There were no animal studies identified.
- **Bromoform :** Two studies reported increased risk and three reported no increased risk of adverse developmental or reproductive outcomes. There were three related articles or meeting abstracts.
- **Chloroform :** Three studies reported increased risk of adverse developmental or reproductive outcomes and one related article or meeting abstract was identified.



THMs: Animal Effects

- Rats: fetotoxic response; developmental toxicity; pregnancy loss, resorption.
- Testicular histopathology, sperm parameters.
- Decreased serum progesterone and luteinizing hormone (LH) levels in vivo; disruption of LH secretion, and disruption of the corpus luteum ability to respond to LH.



Table 1: Summary of the identified studies on the developmental and reproductive toxicity of THMs

Category	THM	BDCM	DBCM	Bromoform	Chloroform	Total number of studies*
Human studies						
Reporting increased risk	6	4	1	0	5	9
Reporting no increased risk	5	4	1	2	3	9***
Related studies and meeting abstracts	11	4	1	0	4**	15
Animal studies						
Positive	2	5	0	2	3	8
Negative	1	5	0	3	0	6***
Related studies and meeting abstracts	6	9	0	3	1	13
TOTAL						60***

* Number of studies in each category

** Includes one study without an abstract

*** Includes one study that is in two different categories; therefore the total number of studies is 58 (=60-2).

