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Table 1. Human Exposure estimates and long term carcinogenicity study data for Chromium IV, Benzo(a)pyrene and 1,2 Dichloroethane

Compound	Estimated Human Exposure Data (ng/kg bw/day)	Relevant Carcinogenicity Study	Route of Exposure	Species, strain sex	Doses	Cancer type	Results
Benzo(a)pyrene	<u>Drinking water</u> ^a 0.003- 0.03	Kroese et al., 2001	Oral gavage 5 or 7 days per week	Rat, Wistar, M + F	0, 3, 10, 30 mg/kg/d	Hepatocellular tumours	male 0/52, 4/52, 38/52, 51/52
	<u>Food</u> ^a 0.7 – 4.14						female 0/50, 2/52, 39/52, 51/52
	<u>Ambient Air</u> ^b 0.06 – 0.62						
	<u>Indoor Air</u> ^c 0.14 -0.714	Culp et al., 1998	Oral gavage 7 days a week	Mice, B6C3F ₁ , Female	0, 0.65, 3.5, 15.3 mg/kg/d	Forestomach (Papillomas and/or carcinomas) Eosphagus (squamous cell papillomas or carcinomas) Tongue (Papillomas and/or	1/48, 3/47, 36/46, 46/47 0/48, 0/48, 2/46, 23/46 0/48, 0/48, 2/46, 23/48

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						squamous cell carcinomas) Larynx (Squamous cell papillomas and/or carcinomas)	0/35, 0/35, 3/34, 5/38
1,2Dichloroethane	<u>Drinking water</u> ^d 1 – 3	NCI (1978)	Oral gavage for 5 days/week for 78 weeks	Rats Osborne-Mendel M + F	0, 47, 95 mg/kg/d Male	Stomach Squamous cell carcinoma	0/20, 3/50, 9/50
	<u>Food</u> ^d Neg					SC fibromas	0/20, 5/50, 6/50
	<u>Indoor Air</u> ^d <30 – 100					Mammary adenocarcinoma	2/20, 1/50, 18/50
	<u>Ambient Air</u> ^d 4 – 20					Mammary fibroadenoma	2/20, 14/50, 8/50
		NCI (1978)	Oral gavage for 5 days/week for 78 weeks	Mice, B6C3F ₁ M	0, 97, 195 mg/kg/d	Alveolar / bronchiolar adenomas	0/19, 1/47, 15/48

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		NCI (1978)	Oral gavage for 5 days/week for 78 weeks	Mice, B6C3F ₁ F	0,149, 229 mg/kg/d	Alveolar / bronchiolar adenomas Mammary gland adenocarcinoma Uterus Endometrial stromal polyp Uterus Endometrial stromal sarcoma	1/50, 7/50, 15/48 0/20, 9/50, 7/48 0/20, 3/49, 2/47 0/20, 2/49, 3/47
		Nagano (2006)	Inhalation, 6h/d, 5d/wk, 104 weeks	Rat, F344 rats Male	0, 10, 40, 160 ppm	Subcutaneous fibroma, Mammary gland fibroadenoma, Peritoneal mesothelioma	6/50, 9/50, 12/50, 15/50 0/50, 0/50, 1/50, 5/50 1/50, 1/50, 1/50, 5/50

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			Inhalation, 6h/d, 5d/wk, 104 weeks	Rat, F344 rats Female	0, 10, 40, 160 ppm	Subcutaneous fibroma, Mammary gland adenoma, Mammary gland Fibroadenoma, Mammary gland adenocarcinoma	0/50, 0/50, 1/50, 5/50 3/50, 5/50, 5/50, 11/50 4/50, 1/50, 6/50, 13/50 1/50, 2/50, 0/50, 5/50
			Inhalation, 6h/d, 5d/wk, 104 weeks	Mice, BDF1, male	0, 10, 30, 90 ppm	Liver hemangiosarcoma	0/50, 4/49, 6/50, 5/50
			Inhalation, 6h/d, 5d/wk, 104	Mice, BDF1, Female	0, 10, 30, 90 ppm	Bronchiolo-alveolar adenoma	4/49, 1/50, 3/50, 8/50

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			weeks			Bronchiolo-alveolar carcinoma	1/49, 0/50, 1/50, 3/50
						Endometrial stromal polyp	2/49, 0/50, 1/50, 6/50
						Mammary gland adenocarcinoma	1/49, 2/50, 1/50, 6/50
						Hepatocellular adenoma	1/49, 1/50, 1/50, 6/50
Chromium VI	<u>Drinking water</u> ^e 57.0	NTP 546 (2007) Draft REPORT	Drinking Water Study	Rats F344/N	Males 0.6, 2.2, 6, or 17 mg/kg bw/d	<u>Oral Mucosa:</u> squamous cell carcinoma	0/50, 0/50, 0/49, 0/50, 6/49
	<u>Food</u> ^e 3457 – 4843						
	<u>Indoor Air and Ambient Air</u> ^e 0.28 – 4.86 (total Chromium) 0.007 – 0.42 (Cr IV)	NTP 546 (2007) Draft REPORT	Drinking Water Study	Rats F344/N	Females 0.7, 2.7, 7, or 20 mg/kg bw d	<u>Oral Mucosa</u> squamous cell carcinoma	0/50, 0/50, 0/50, 2/50, 11/50

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		NTP 546 (2007) Draft REPORT	Drinking Water Study	Mice B6C3F1	Males 1.1, 2.6, 7, or 17 mg/kg bw/d	<p><u>Small Intestine, Duodenum:</u> adenoma</p> <p><u>Small Intestine, Duodenum, Jejunum, or Ileum:</u> adenoma</p> <p>carcinoma</p> <p>adenoma or carcinoma</p>	<p>1/50, 0/50, 1/50, 5/50, 15/50</p> <p>1/50, 1/50, 1/50, 5/50, 17/50</p> <p>0/50, 2/50, 1/50, 3/50, 5/50</p> <p>1/50, 3/50, 2/50, 7/50, 20/50</p>
		NTP 546 (2007) Draft REPORT	Drinking Water Study	Mice B6C3F1	Females 0, 1.1, 3.9, 9, 25 mg/kg bw/d	<p><u>Small Intestine, Duodenum:</u> adenoma</p>	<p>0/50, 0/50, 2/50, 13/50, 12/50</p>

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						carcinoma	0/50, 0/50, 0/50, 1/50, 6/50
						<u>Small Intestine, Jejunum:</u>	
						adenoma	0/50, 1/50, 0/50, 2/50, 5/50
						<u>Small Intestine, Duodenum, Jejunum, or Ileum:</u>	
						adenoma	0/50, 1/50, 2/50, 15/50, 16/50
						carcinoma	1/50, 0/50, 2/50, 3/50, 7/50
						adenoma or carcinoma	1/50, 1/50, 4/50, 17/50, 22/50

^a.EFSA “Opinion of the Scientific Committee on Food on the risks to human health of Polycyclic Aromatic Hydrocarbons in food”

^b. EHC 202 (1998) Selected non heterocyclic polycyclic aromatic hydrocarbons. IPCS, (European and US sources only)

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^c Waldman JM, Liou PJ, Greenberg A, & Butler JP (1991) Analysis of human exposure to benzo(a)pyrene via inhalation and food ingestion in the Total Human Environment Exposure Study (THEES). *J Exposure Anal Environ Epidemiol*, 1: 193-225

^d. EHC 176 (1995) 1,2 Dichloroethane (2nd edition). IPCS

^e. Rowbotham, A L : Levy, L S : Shuker, L K. Chromium in the environment: an evaluation of exposure of the UK general population and possible adverse health effects. *J-Toxicol-Environ-Health-B-Crit-Rev*. 2000, 3(3): 145-78.