

溶媒対照 13 物質を加えても、発がん性物質に偏っている。TG 試験結果と発がん性の相関性を検討するためには非発がん物質の情報を増やすことが重要である。一方で、発がん性未知物質の TG データが 68 件あり、発がん性の情報がない状況において *in vivo* 遺伝毒性試験として TG 試験が多く行われていることを示している。TG 試験のほとんどはマウスを用いて行われており、発がん性との比較にはラットを用いた TG 試験データの充実が必要と考える。

2011 年に公開された OECD ガイドラインの推奨プロトコルは、28 日間反復経口投与、最終投与 3 日後に組織採取となっているが、過去の試験の多くが短期間の投与で実施されたものであり、今後はガイドライン準拠の試験データの充実が求められる。その結果をふまえて、標的組織における検出感度など、必要に応じて試験プロトコルの最適化についても検討する余地があると考えられる。

TG 試験データがある 128 の発がん性物質と 23 の非発がん性物質を用いて、TG 試験の判定と発がん性の有無との相関について検討した結果、Sensitivity は 73.4%、Specificity は 65.2%、Concordance は 72.2%であった。このうち TG 試験データのある発がん標的臓器全てで TG 陰性のものが 26 あった。このカテゴリには、いわゆる非遺伝毒性発がん物質が分類されると考えられる。発がん標的での変異原性の有無はリスク評価において重要であるが、TG 試験は用量、投与期間等が発がん実験と異なるため、結果の解釈には注意が必要である。

118 の発がん性物質について Ames 試験結果と TG 試験との相関を検討した結果、Ames 試験が陽性かつ TG 試験が陰性のものが 15 物質あった。このうち 6 物質は発がん標的組織と TG 試験実施組織が異なっていたため解釈には注意が必要である。一方、*in vitro* 試験のみでみられた変異原性が発がん性に関与しているかどうかについては、メカニズムに関する個別の議論が必要である。また、Ames 試験が陰性かつ TG 試験が陽性のものが 15 物質あった。投与期間が比較的長い試験

が含まれており、酸化ストレス等を介した間接的な DNA 損傷の関与など、変異誘発メカニズムに関する議論が必要である。

厚生労働省の委託試験で実施された食品関連物質および一般化学物質については、OECD ガイドラインの推奨する 28 日間反復経口投与、最終投与 3 日後に組織採取の方法が用いられている。20 物質中 19 物質が発がん性未知、1 物質が非発がん性であり、試験結果は 18 物質が陰性、1 物質 (Allura Red AC) が疑陽性、1 物質 (Kidachi aloe extract) が陽性であった。

TG 試験から遺伝毒性の定量的指標を導出するためには、多くの化学物質の試験を共通のプロトコルで行い結果を比較することが有効と考えられるが、*in vivo* 試験ではヒトへの曝露経路や発がん標的組織を考慮した試験デザインを重視するため、共通プロトコルでの運用になじまない側面もある。また、発がん性との量的相関を調べるためには、発がん性試験と同条件の試験を行い、発がん標的組織において遺伝毒性を検索することが望ましいが、発がん性未知の物質ではそうした設定は不可能である。TG 試験はコストの点から解析する組織の数が限られるため、曝露や毒性の情報を考慮しつつ、解析組織を注意深く選択することが必要である。今後は、TG 試験における突然変異体頻度の増加率 (fold-increase) および発がん性における TD50 のような指標を参考に、実験条件の違いと用量・反応関係への影響を検討し、遺伝毒性の量的指標を用いた評価を試みる。

## E. 結論

既存の TG 試験データが存在する 128 の発がん性物質、23 の非発がん物質、68 の発がん性未知物質についてデータベースに追加した。TG 試験の判定と発がん性の有無の一致率は 72.2%であった。発がん性物質のうち、Ames 試験陽性かつ TG 試験陰性が 15 物質、Ames 試験陰性かつ TG 試験陽性が 15 物質あった。

## F. 健康危機情報

なし

## G. 研究発表

### 1. 論文発表

なし

### 2. 学会発表
















- 1) K. Masumura, N. Toyoda-Hokaiwado, N. Osugi, Y. Ishii, T. Umemura, H. Takagi, A. Nishikawa, T. Nohmi, M. Honma, Spontaneous point mutations and deletions increased with aging in *gpt* delta transgenic mice and rats, 11th International Conference on Environmental Mutagens, Brazil (2013.11)
- 2) K. Masumura, Aging and accumulation of gene mutations: Identification of spontaneous mutations in the tissues of *gpt* delta transgenic mice, National Cancer Forum 2013, Thailand (2013.8)
- 3) 増村健一, 第6回IWGT報告および共同研究進捗報告：生殖細胞に影響を及ぼす変異原の同定, MMS研究会第63回定例会, 岡山 (2013.11)

## H. 知的財産権の出願・登録状況

なし

## Appendix 1

TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in target)	Ref	Comment
	17-B-Estradiol	50-28-2	-	breast (mammary gland)	-	Marianatha et al. (2006)	
	2,3,7,8-tetrachlorodibenzo-p-dioxin	1746-01-6	-	liver	-	Thronton et al. (2007)	
	Acetaminophen	103-90-2	-	liver	-	Kanki et al. (2005)	
	Carbon tetrachloride	56-23-5	-	liver	-	Hachiya and Mohashi (2000), Tombolan et al. (1993)	
	Chloroform	67-66-3	-	liver	-	Butterworth et al. (1998)	
	Clofibrate	637-07-0	-	liver	-	Boerigter (2004)	
	Di(2-ethylhexyl)phthalate	117-81-7	-	liver	-	Gunz, Shepard and Lutz (1993), Kanki et al. (2005)	
	D-limonene	5999-27-5	-	kidney	-	Turner et al. (2001)	Tg negative in kidney, liver
	Hexachlor	76-44-8	-	liver	-	Gunz, Shepard and Lutz (1993)	
	Methyl clofenapate	21340-68-1	-	liver	-	Lefevre et al. (1994)	
	Saccharin, sodium	128-44-9	-	bladder	-	Turner et al. (2001)	Tg negative in bladder, liver
	Trichloroethylene (with and without epichlorohydrin)	79-01-6	-	liver, lung	-	Douglas et al. (1999)	Tg negative in bone marrow, kidney, liver, lung, spleen, testicular germ cells
	1,2-dibromoethane	106-93-4	+	liver, lung	-	Hachiya and Mohashi (2000), Schmeizer et al. (1998)	
	Hydrazine sulphate	10034-93-2	+	liver, lung	-	Douglas, Gingerich and Soper (1998)	Tg negative in bone marrow, liver, lung
	Phenobarbital	50-06-6	+	liver	-	Shane et al. (2000), Mirsate et al. (2005), Singh et al. (2001), Gunz, Shepard and Lutz (1993), Tombolan et al. (1999), Sykes et al. (2001)	
















16 Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	4-chloro-5-(2,3-xylylidino)-2-pyrimidinylthioacetic acid (AKA Wyeth 14,643)	56892-23-4	-	liver	+	Bieringer (2004), Singh et al. (2001), Trapp, Schwarz and Epe (2007)	positive in liver
	Benzene	71-43-2	-	lung, haematopoietic (bone marrow)	+	Mullin et al. (1995), Provost et al. (1995)	
	Oxazepam	604-75-1	-	kidney, liver, thyroid gland	+	Miralis et al. (2005), Singh et al. (2001), Shane et al. (1999)	T positive in liver
	Procarbazine HCl (Matulan)	365-70-1	-	lung, haematopoietic (bone marrow)	+	Suzuki et al. (1999), Myhr (1991), Hoorn et al. (1993), Pietsa et al. (1997)	Tg positive in bone marrow, kidney, lung, spleen, testes
	Uracil	66-22-8	-	bladder	+	Takahashi et al. (2000)	
	1,3-butadiene	109-69-0	+	liver, haematopoietic (bone marrow)	+	Reico et al. (1992), Reico and Goldsworthy (1995), Reico et al. (1996), Sisk et al. (1994)	liver negative
	1-[(5-nitrofururydene)amino]hydantoin (AKA Nitrofurantoin)	67-20-9	+	kidney	+	Guillardet et al. (2006)	
	1-ethyl-1-nitrosourea	759-73-9	+	liver, lung, haematopoietic (bone marrow)	+	Itai and Shimada (1987), Uricubo et al. (2002), Miralles et al. (1990), Nishi (1991), Lynch, Goodenham and Boots (1996), Zimmer et al. (1999), Mei et al. (2005), Wang et al. (2004), Hara et al. (1999), Piegorsch et al. (1995), Krebs and Favor (1997), Douglas et al. (1996), Takahashi, Kubota and Sato (1993), Reico et al. (1992), Hoom et al. (1993), Monroe and Mitchell (1993), Miyazaki et al. (2005), Nohmi et al. (1996), Itoh, Mura and Shimada (1993), Yeuk et al. (2005), Collaborative Study Group for the Transgenic Mouse Mutation Assay (1995), Sun, Shima and Heddle (1999)	
	2,4-diaminotoluene	95-80-7	+	liver	+	Hayward et al. (1995), Suter et al. (1996), Kirkland and Beevers (2006), Cunningham et al. (1996)	
	2-Acetylaminofluorene	63-96-3	+	liver, bladder	+	Poss and Leavitt (1998), Gunz, Shephard and Lutz (1993), van Steeg (2001), Brooks et al. (1995)	
	2-amino-1-methyl-5-phenylimidazo[4,5-f]pyridine hydrochloride (PhIP.HCl)	105650-23	+	liver, haematopoietic (bone marrow)	+	Masumura et al. (1999), Klein et al. (2001), Stuart et al. (2000), Okonogi et al. (1997), Lynch, Goodenham and Boots (1996), Zhang et al. (1996), Yang et al. (2001), Yang, Glickman and de Boer (2002), Itoh et al. (2005), Nakai, Nelson and De Marco (2007), Shen et al. (2004), Okochi et al. (1999)	haematopoietic (bone marrow), lymphocytes and T-cells tissues negative
	2-amino-3,4-dimethylimidazo[4,5-f]quinoline (MeIQx)	77094-11-2	+	liver, stomach, colon	+	Suzuki et al. (1996)	
	2-amino-3,8-dimethylimidazo[4,5-f]quinoxaline (MeIQTx)	77900-04-0	+	liver, lung	+	Masumura et al. (2003), Hoshi et al. (2004), Ryu et al. (1999), Itoh et al. (2000), Davis et al. (1996)	liver positive, lung negative
	2-amino-3-methylimidazo[4,5-f]quinoline (IQ)	76180-96-6	+	colon	+	Moller et al. (2002), Dybdahl et al. (2003), Hansen et al. (2004), Itoh et al. (2003)	
	2-amino-3-methylimidazo[4,5-f]quinoline HCl (IQ.HCl)		+	liver	+	Hansen et al. (2004), Dybdahl et al. (2003), Kanki et al. (2005), Davis et al. (1996), Moller et al. (2002), Bol et al. (2000)	
















TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	2-amino-9H-pyrido(2,3-b)indole (A-alpha-C)	26148-68-5	+	liver	+	Davis et al. (1996)	
	2-nitro-p-phenylenediamine	5307-14-2	+	liver	+	Suter et al. (1996)	Tg positive in male, negative in female
	4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone	64081-91-4	+	liver, lung	+	Hashimoto, Ohsawa and Kimura (2004), von Pressentin, Chen and Guttenplan (2001), Ikeda et al. (2007), Miyazaki et al. (2005)	
	4-aminobiphenyl	92-67-1	+	liver, bladder	+	Fletcher, Tinwell and Ashby (1996), Chen et al. (2005), Turner et al. (2001)	
	4-chloro-o-phenylenediamine	95-83-0	+	liver	+	Suter et al. (1996), Suter et al. (1998)	
	4-nitroquinoline-N-oxide	56-57-5	+	lung, oral tissue	+	Nakajima et al. (1999), von Pressentin, El Bayoumy and Guttenplan (2000), von Pressentin, Kosinska and Guttenplan (1999), Guttenplan et al. (2007)	
	7,12-dimethylbenzo[aj]anthracene	57-97-6	+	liver, lung, breast (mammary gland)	+	Kohara et al. (2001), Hachiya et al. (1999), Chen et al. (2005), Hashimoto, Ohsawa and Kimura (2004), Ohsawa et al. (2000), Manjaniatra et al. (2000)	
	Aflatoxin B1	1162-65-8	+	liver, kidney, colon	+	Astrup, Jørgensen and Jensen (1996), Dycisco et al. (1996), Davies et al. (1997), Thornton et al. (2004)	colon negative
	Aristolochic acid	319-67-7	+	lung, kidney, stomach	+	Kohara et al. (2002), Chen et al. (2006)	
	Aristolochic acid sodium salt	10190-99-5	+	ear, small intestine, stomach, haem	+		Tg positive in bladder, bone marrow, colon, kidney, liver, lung, spleen, stomach, negative in testes
	Azathioprine	445-85-6	+	haematopoietic (bone marrow, lymph)	+	Smith et al. (1990)	
	Benz[a]pyrene	50-32-8	+	stomach, oral tissue	+	Hakura et al. (1998), Yamada et al. (2002), von Pressentin, Kosinska and Guttenplan (1999), Kosinska, von Pressentin and Guttenplan (1999), Guttenplan et al. (2004)	
	beta-Propiolactone	57-67-8	+	stomach	+	Brault et al. (1999)	
	Bromate, potassium	7758-01-2	+	kidney	+	Umemura et al. (2006)	
	C.I. Solvent yellow 3 (6-aminoazobenzene)	97-55-3	+	liver, lung	+	Ohsawa et al. (2000), Kohara et al. (2001), Ohsawa et al. (2000)	Tg positive in bladder, colon, kidney, liver, negative in lung













TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	Chlorambucil	305-03-3	+	haematopoietic (bone marrow, lymph nodes)	+	Hoorn et al. (1983), Myhr (1991), Smith et al. (1989)	
	Dichloroacetic acid	79-43-6	+	liver	+	Leavitt et al. (1997)	
	Ethylene oxide	75-21-8	+	lung, haematopoietic (bone marrow, lymph nodes)	+	Slak et al. (1997), Repp et al. (2004)	Tg positive in lung, negative in bone marrow, spleen, spleen cell fraction, testicular germ cells
	Methyl methanesulphonate	66-27-3	+	haematopoietic (bone marrow, lymph nodes)	+	Tinwell, Lefevre and Ashby (1998)	
	N-hydroxy-2-acetylaminofluorene	59-96-2	+	liver	+	Chen et al. (2001)	
	N-methyl-N'-nitro-N-nitrosoguanidine	70-25-7	+	stomach	+	Brault et al. (1983), Brooks and Dean (1996)	
	N-nitrosodimethylamine (diethylnitrosamine)	55-18-5	+	liver, lung, haematopoietic (bone marrow, lymph nodes)	+	Okada et al. (1997), Sizuki, Hayashi and Sofuni (1984), Meniges et al. (1998), Mirsalis et al. (2005)	Tg positive in liver, lung, negative in bone marrow, spleen, testes
	N-nitrosodimethylamine (dimethylnitrosamine)	62-75-9	+	liver, lung, kidney	+	Mirsalis et al. (1993), Mirsalis et al. (2005), Lefevre et al. (1994), Tinwell, Lefevre and Ashby (1994), Tinwell et al. (1995), Hayward et al. (1995), Cunningham et al. (1996), Souliotis et al. (1998), Shams et al. (2000), Suzuki et al. (1995), Shephard, Gunz and Schlatter (1995), Fletcher, Tinwell and Ashby (1998), Gofspud, Jackson and Stott (1998), Jiao et al. (1997), Butterworth et al. (1998), Souliotis et al. (1998), Suzuki et al. (1996)	Tg positive in kidney, liver, lung, spleen, negative in bladder, bone marrow, forestomach, testes
	N-nitrosodipropylamine	621-64-7	+	liver, lung, kidney	+	Itoh et al. (1999)	Tg positive in bone marrow, kidney, liver, lung, negative in testes
	N-nitroso-N-methylurea	684-93-5	+	lung, haematopoietic (bone marrow, lymph nodes)	+	Provost et al. (1993), Shephard, Gunz and Schlatter (1995), Shima, Swiger and Heddle (2000)	kidney negative, stomach negative
	N-nitrosopyrrolidine	930-55-2	+	liver	+	Kanski et al. (2005)	
	N-propyl-N-nitrosourea	816-57-9	+	haematopoietic (bone marrow, lymph nodes)	+	Hara et al. (1999)	Tg positive in bone marrow, heart, kidney, liver, lung, spleen, testes
	o-Cresidine	120-71-8	+	liver, nasal cavity, urinary bladder	+	Jakubczak et al. (1996)	Tg positive in bladder
	Streptozotocin	16983-66-4	+	kidney, liver, pancreas, lung, uterus	+	Schmezer, Eckert and Liebbel (1994)	Tg positive in kidney, liver
	Tris(2,3-dibromopropyl)phosphite	126-72-7	+	liver, kidney, stomach	+	Provost et al. (1996), de Boer et al. (1995), de Boer et al. (2000)	liver negative, stomach negative

TG Data of Carcinogens














Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	Urethane	51-78-6	+	liver, lung, haematopoietic (bone marrow)	+	Mrsala et al. (2005), Singer (2006), Williams et al. (1998), Shephard, Gunz and SchNater (1995), Chang et al. (2003), Hernandez and Forkert (2007), Chang et al. (2003)	Tg positive in bone marrow, forestomach, liver, lung, spleen
	Vinyl carbamate	13805-79-9	+	liver, lung, skin, vascular system	+	Hernandez and Forkert (2007)	Tg positive in lung, small intestine
	Acrylonitrile	107-13-1	+	ear/Zymbal's gland, nervous system	na (-)		Tg negative in bone marrow, brain, lung, splenic lymphocytes, testicular germ cells
	Ethyl methanesulphonate	62-60-0	+	kidney, lung, thymus	+		Tg positive in bone marrow, epididymal sperm, liver, negative in brain, small intestine
	Hexachlorobutadiene	67-66-3	-	kidney	+		Tg positive in kidney, negative in bone marrow, liver
	3-methylcholanthrene	56-49-6	+	lung, skin, mammary gland	na (+)		Tg positive in liver
	Metronidazole	443-48-1	+	pituitary gland, testes, liver, mamma	na (-)		Tg negative in stomach
	Mithramycin C	50-07-7	+	intestine, mammary gland, peritones	na (+)		Tg positive in bone marrow, liver, negative in small intestine, testes
	12-O-tetradecanoylphorbol 13-acetate	16961-29-6	-	carcinogenicity unknown	na (-)		Tg negative in skin
	Thio-tepa	62-24-4	+	ear/Zymbal's gland, haematopoietic	na (+)		Tg positive in splenic lymphocytes
	Fumezique	6295-25-6	-	liver	-	Kurokwa et al. (2007)	
	Dimethylarsinic acid	75-60-5	-	lung, bladder	-	Noda et al. (2002)	Tg negative in lung
	Nickel subsulfide	12035-72-2	-	lung	-	Mayer et al. (1989)	
	3-Chloro-4-(dichloromethyl)-5-hydroxy-2(3H)-furanone (MX)	77439-76-0	+	liver, lung	-	Nishikawa et al. (2006)	
	Coal tar	8007-45-2	+	liver, lung, small intestine, stomach	na (+)	Trenn et al. (2000)	Tg positive in skin, negative in liver

TG Data of Carcinogens














Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	3-Nitrocarbazone	17117-34-9	+	lung	-	Airt et al. (2004)	
	Chrysene	218-01-9	+	lung	-	Yamada et al. (2005)	
	Methyl bromide	74-93-9	+	stomach	-	Pletsa et al. (1999)	Tg negative in glandular stomach, liver
	3-Amino-1-methyl-5-hydroxy-4,5-biindole (Tro-P-2)	82450-07-1	+	small intestine	-	Itoh et al. (2003)	
	Arsenite bisulfide	1327-53-3	-	lung	-	Neda et al. (2002)	
	High-fat diet			colon	-	Hernandez and Heddl (2005)	Tg negative in bone marrow, colon, small intestine
	Cotinine	72999-57-8	-	liver, urinary bladder	+	Mei et al. (2005), Mei et al. (2006)	Tg positive in liver
	Cyproterone acetate	427-51-0	-	liver, stomach	+	Topinka et al. (2004), Wolf et al. (2001), Krebs et al. (1998)	Tg positive in liver
	Cytosol	512638-83-6	-	liver	+	Umemura et al. (2007)	Female positive, male negative
	Tamoxifen	10549-29-1	-	liver, cervix, uterus, testes, ovary	+	Slyes et al. (2001), Daves et al. (1999), da Costa et al. (2002), Chen et al. (2002)	Tg positive in liver
	Amosite asbestos	12172-73-5	-	lung	+	Loil et al. (2004), Topinka et al. (2004)	
	Crocidolite asbestos	12001-20-4	-	lung, peritoneal cavity	+	Rhyn et al. (2000)	Tg positive in lung, omentum
	Ferric nitroglucelate	10449-54-7	-	kidney	+	Jlanri et al. (2006)	
	5-Fluorouracil	334-69-4	+	liver	+	Miyata et al. (1998)	
	7H-Dibenz[ghi]perylene (DBP)	194-59-2	+	liver	+	Renaut et al. (1998)	










TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref	Comment
	Aflatoxin B1	21899-65-1	+	liver, colon	+	Masumura et al. (2003)	
	Cisplatin	15683-27-1	+	liver	+	Louro, Silva and Boavida (2002)	
	Gamma rays		+	liver, lung, haematopoietic (bone marrow)	+	Masumura et al. (2002), Takahashi, Kubota and Sato (1998), Hayes et al. (1998), Ikeda et al. (2007), Luke, Fiches and Bryant (1997)	lung negative
	Quinoline	91-22-5	+	liver	+	Suzuki et al. (2000), Miyata et al. (1998)	Tg positive in liver, negative in bone marrow, kidney, lung, spleen, testicular germ cells
	Riddelline	23245-98-0	+	haematopoietic system, liver, vasculature	+	Me et al. (2004)	Tg positive in liver
	X-ray		+	liver, lung	+	Kind et al. (2001), Ono et al. (1999), Gossen et al. (1995), Masumura et al. (2002), Martus et al. (1998)	
	1,6-Dinitroprrene	42397-84-8	+	lung	+	Hashimoto et al. (2006)	
	Cyclophosphamide	56-18-0	+	lung, haematopoietic (bone marrow)	+	Gorelick et al. (1999), Myhr (1991), Hoom et al. (1999)	Tg positive in bone marrow, bladder, liver, lung, spleen, negative in kidney, splenic lymphocytes, testes
	Hexavalent chromium	7440-47-3	+	lung	+	Cheng et al. (2000), Cheng, Liu and Dixon (1999)	
	NN-Nitrosomethylornithine (NNNO)	80508-23-2	+	lung, nasal cavity, oesophagus	+	von Preussler, Chen and Gutterglan (2001), von Preussler, Kosriska and Gutterglan (1999)	Tg positive in kidney, liver, lung, oesophagus, oral tissue, tongue
	Benzo(a)pyrene	11059-06-7	+	kidney	+	Gutterglan et al. (2004)	
	3-Aminobiphenyl	95-94-0	+	kidney, thyroid gland, urinary bladder	+	Ashby et al. (1984)	Tg positive in bladder, negative in liver
	NN-Nitrosomethylbenzylamine	937-40-6	+	oral tissue	+	de Boer et al. (2004)	
	6-Nitrochrysene	7498-02-8	+	breast (mammary gland)	+	Boyi et al. (2004)	
	6,9-Dimethylbenzo(a)carbazole (DMDBC)	89163-04-8	+	liver	+	Renaut et al. (1998), Tombolan et al. (1999)	













TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	6-(6-Dimethylaminohexyl)azobenzothiazole	18463-85-9	+	liver	+	Lefevre, Tinwell and Ashby (1997), Flatbher et al. (1999)	
	Diesel exhaust			lung	+	Dybdahl et al. (2004), Sato et al. (2000), Hashimoto et al. (2007), Muller et al. (2004)	
	5-Bromo-2'-deoxyuridine	59-14-3	-	testes, kidney, thyroid	na (-)		Tg negative in small intestine
	1,2,3,4-Dioxepentane	1464-63-5	+	nasal mucosa, lung, skin, Harderian	na (-)		Tg negative in bone marrow, ovarian granulosa
	1,2-Dichloroethane	107-06-2	+	stomach, subcutaneous tissue, vasc	na (-)		Tg negative in liver, testes
	Genistein	446-72-0	+	uterus	na (-)		Tg negative in heart, mammary gland
	Folic acid	50-30-4	+	thyroid	na (-)		Tg negative in liver
	Acrylamide	79-06-1	-	nervous system, peritoneal cavity, th	na (+)		Tg positive in bone marrow, negative in liver, testicular germ cell
	OC-1065	6956-21-3	-	lung	na (+)		Tg positive in liver
	1,2-Dibromo-3-chloropropane	96-12-8	+	nasal cavity, oral cavity, stomach, ac	na (+)		Tg positive in testis, negative in liver
	1,8-Dibromoprene	42397-65-9	+	adrenal, haematopoietic system, ma	na (+)		Tg positive in bone marrow, testis, spleen, negative in brain, liver, lung
	Ethylmethanesulphonate (EMS)	62-50-0	+	kidney, lung, thymus	na (+)		Tg positive in bone marrow, epididymal sperm, liver, negative in brain, small intestine
	Isopropylmethanesulphonate (IPMS)	926-06-7	+	thymus	na (+)		Tg positive in epididymal sperm, testes, testicular germ cells
	NF-Methylbenzothiazobenzothiazole (M109C)	27093-62-5	+	nd (+)	na (+)		Tg positive in liver, skin
	UVB		+	skin	+		


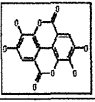
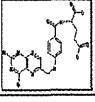
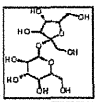
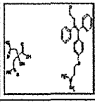

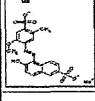
TG Data of Carcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg performed in targets	Ref.	Comment
	Hexachlorobutadiene	87-68-2	+	kidney	+		Tg positive in kidney, negative in bone marrow, liver
		16561-29-8	-	skin	-		Tg negative in skin
	Benzo(a)pyrene diol epoxide (BPDE)	36917-67-2	+	carcinogenicity unknown (maybe ca)	na (+)		Tg positive in skin
	Cycloamide	5694-05-8	+	carcinogenicity unknown (maybe ca)	na (+)		Tg positive in liver
	X-rays		+	haematopoietic system, liver, lung, n	-		Tg positive in brain, embryo, liver, lung, skin, small intestine, spleen, vas deferens sperm
	Potassium bromide	7758-01-2	+	kidney	-		Tg positive in kidney
	6,11-Dimethylbenzo(b)thiophene-2,3-dithiophene	32362-68-8		carcinogenicity inconclusive	na (+)		Tg positive in skin
	7-Methoxy-2-hydroxyanthracene-9,10-dione (R7000)	76965-74-1	+	carcinogenicity inconclusive	na (+)		Tg positive in caecum, colon, intestine, small intestine, stomach, negative in bladder, liver, oesophagus.
	For Tg data, results given as follows:						
	+ = positive in carcinogenicity target						
	- = negative in carcinogenicity target						
	na (+) = Tg positive but not in carcinogenicity target						
	na (-) = Tg negative but not in carcinogenicity target						
	(a) carcinogenicity studies not referenced are presented as follows:						
	TR: NTP technical report						
	V: IARC monograph on the evaluation of carcinogenic risk to humans						
	S: supplement to IARC monograph						
	For in vitro data, results given as follows:						
	+ = positive						
	- = negative						
	E = equivocal result, when response is weak or not reproducible between experiments or between laboratories						
	TC = technically compromised						
	Where call changed, author's original call is given in ** next to reference						
	Other symbols used in this appendix are:						
	! = inconclusive or (more usually) inadequately tested (e.g. not tested both - and + S9, insufficient concentrations, insufficient toxicity etc.)						
	# = untestable through instability, insolubility, causing acidic pH shifts or elevated osmolality						
	## = not testable (rapidly hydrolysed at neutral pH)						
	** = numerical aberrations only						
	~ = requires TA102						
	Δ = hyperploidy induced						
	** = probably resulting from high osmolality						
	*** = probably resulting from low pH						
	R = positive with reductive or anaerobic incubation						












TD Data of Noncarcinogens

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment			
	Eugenol	97-59-0	-	noncarcinogen	-		liver			
	1-Nitronaphthalene	89-57-7	+	noncarcinogen	-		liver, skin, urinary bladder			
	2,6-Diaminotoluene	623-40-6	+	noncarcinogen	-		liver			
	2.45 GHz radiofrequency		-	noncarcinogen	-		brain, liver, spleen, testis			
	3-Fluoroguanoline	396-31-6	-	noncarcinogen	-		bone marrow, liver, testicular germ cells			
	NNK + 8-methoxypsoralen			noncarcinogen	-		lung			
	4-Acetylaminofluorene	28322-02-3	-	noncarcinogen	+		liver			
	4-Hydroxybiphenyl	92-69-3	+	noncarcinogen	-		liver			
	5-(p-Dimethylamino)phenylazobenzocinnoline	19463-90-6	+	noncarcinogen	+		liver			
	Acetic acid	64-19-7	-	noncarcinogen	+		skin			
	Acetone	67-64-1	-	noncarcinogen	-		skin			
	all-trans-Retinol	68-26-8	+	noncarcinogen	-		liver			
	Benzo[quinoline	85-02-9	+	noncarcinogen	+		liver			

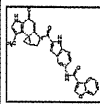
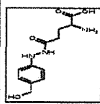
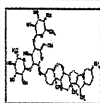
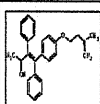
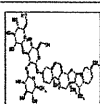
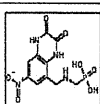
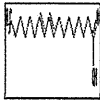
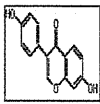
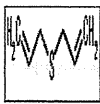
TG Data of Nuts and Nuts

	Benzothioquinoline	230-27-3	+	noncarcinogen	+	lung			
	Ellagic acid	476-66-4	-	noncarcinogen	-	oesophagus			
	Folic acid	69-30-3	-	noncarcinogen	-	colonic epithelium			
	Glass wool fibres		-	noncarcinogen	-	lung			
	Green tea		-	noncarcinogen	-	oesophagus			
	Rock wool fibres			noncarcinogen	+	lung			
	Sucrose	67-50-1	-	noncarcinogen	+	Tg positive in colon, liver			
	Terephthalate	89778-27-8		noncarcinogen	-	liver			
	trans-4-Hydroxy-2-nonenal	128946-66-6	-	noncarcinogen	-	kidney, liver, lung			
	Allura Red AC	29958-17-5	-	noncarcinogen	na (+-)	mhwh, † 2012 Tg positive in liver (Spi- only), negative in colon in vivo corneal negative	和名: 食用染色料40号		
	For explanation of in vitro results, authors' original calls, and other symbols: see footnotes to Carcinogen								
	For Tg data, results given as follows:								
	++ = positive in carcinogenicity target								
	- = negative in carcinogenicity target								
	na(+)=Tg positive but not in carcinogenicity target								
	na(-)=Tg negative but not in carcinogenicity target								








TG Data: Carcinogenicity Unknown

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	1,10-Diazachrysene	218-21-3	+	carcinogenicity unknown	na (+)		Tg positive in bone marrow, colon, kidney, liver, lung, spleen
	1,2-Epoxy-3-butene	930-22-3	+	carcinogenicity unknown	na (+)		Tg positive in bone marrow, lung
	1,4-Phenylenedic(methylene)selenocyanate (p-XSC)	85539-63-8		carcinogenicity unknown	na (-)		Tg negative in tongue
	1,7-Phenanthroline	230-46-6	+	carcinogenicity unknown	na (+)		Tg positive in liver, lung, negative in bone marrow, kidney, spleen
	1.5 GHz electromagnetic near field			carcinogenicity unknown	na (-)		Tg negative in brain
	10-Azabenzopyrene	189-92-4	+	carcinogenicity unknown	na (+)		Tg positive in colon, liver, negative in bone marrow, forestomach, kidney, lung, spleen, stomach
	<sup>113m</sup> In internal radiation			carcinogenicity unknown	na (+)		Tg positive in liver, negative in spleen, testes
	1-Chloromethylpyrene	1085-00-6	+	carcinogenicity unknown	na (+)		Tg positive in skin, negative in stomach
	1-Methylphenanthrene	632-69-9	+	carcinogenicity unknown	na (-)		Tg negative in bone marrow, epididymis, liver, spleen
	2-Nitrophenanthrene	581-99-6	+	carcinogenicity unknown	na (+)		Tg positive in liver, urinary bladder, negative in skin
	1,10-Diazachrysene	218-34-8	+	carcinogenicity unknown	na (+)		Tg positive in bone marrow, colon, kidney, liver, lung, spleen
	4-Monochlorobiphenyl (PCBS)	2051-62-9		carcinogenicity unknown (IARC 2A)	na (+)		Tg positive in liver
	5-(2-Chloroethyl)-2'-deoxyuridine (CEOU)	90301-89-0	+	carcinogenicity unknown	na (+)		Tg positive in bone marrow, lung, spleen

TG Data: Carcinogenicity Unknown

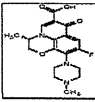
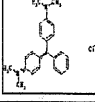
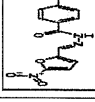
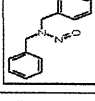
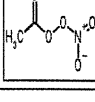
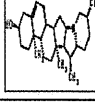
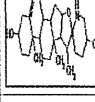
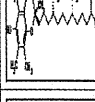
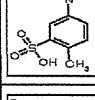
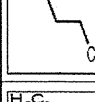
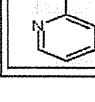
Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment			
	87-966			carcinogenicity unknown	na (+)		Tg positive in bone marrow, spleen			
	<sup>90</sup> Sr internal radiation			carcinogenicity unknown	na (+)		Tg positive in liver, negative in bone marrow, spleen			
	Adozeleson	110314-46-2		carcinogenicity unknown	na (+)		Tg positive in liver			
	Arginine	2757-80-6	+	carcinogenicity unknown	na (+)		Tg positive in forestomach, kidney			
	alpha-Chaconine	30562-03-2	-	carcinogenicity unknown	na (+)		Tg positive in liver			
	alpha-Hydroxystamoxifen	97151-02-6		carcinogenicity unknown	na (+)		Tg positive in liver			
	alpha-Solanine	20562-02-1	-	carcinogenicity unknown	na (+)		Tg positive in liver			
	AMP397	186986-80-2	+	carcinogenicity unknown	na (-)		Tg negative in colon, liver			
	Bitumen fumes	8052-42-4		carcinogenicity unknown	na (-)		Tg negative in lung			
	CM 44 glass fibres			carcinogenicity unknown	na (-)		Tg negative in lung			
	Conjugated linoleic acid (CLA)	1839-11-8		carcinogenicity unknown	na (-)		Tg negative in caecum, distal colon, prostate			
	Daidzein	486-66-8	-	carcinogenicity unknown	na (-)		Tg negative in mammary gland			
	Dialkyl sulphide	592-88-1	-	carcinogenicity unknown	na (-)		Tg negative in oesophagus			

T6 Data: Carcinogenicity Unknown

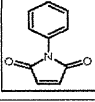
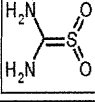
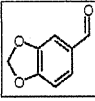
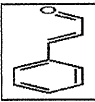
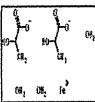
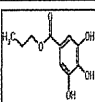
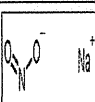
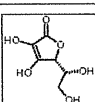
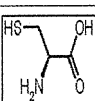
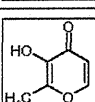
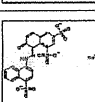
Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment
	Diallyl sulphone	16841-48-8		carcinogenicity unknown	na (-)		Tg negative in lung, small intestine
mixture?	Dinitropyrenes			carcinogenicity unknown	na (+)		Tg positive in bone marrow, colon, liver, lung, stomach
	Etoposide	33419-42-0	+	carcinogenicity unknown	na (-)		Tg negative in bone marrow, liver, lung, testes
肝経	Fasciola hepatica			carcinogenicity unknown	na (+)		Tg positive in liver
	Fructose	57-46-7		carcinogenicity unknown	na (-)		Tg negative in colon
	Glucose	50-99-7	-	carcinogenicity unknown	na (-)		Tg negative in colon
	Green tea		+	carcinogenicity unknown	na (-)		Tg negative in oesophagus
	Heavy-ion radiation			carcinogenicity unknown	na (+)		Tg positive in kidney, liver, spleen, negative in testes
	High-energy charged particle (Fe)			carcinogenicity unknown	na (+)		Tg positive in brain
	Hydroxyurea	127-07-1	+	carcinogenicity unknown	na (+)		Tg positive in lung, testes, negative in spleen
高血糖	Hyperglycaemia			carcinogenicity unknown	na (+)		Tg positive in embryo
	Jervine	469-69-0		carcinogenicity unknown	na (+)		Tg positive in liver
	Leucomalachite green	129-73-7	-	carcinogenicity unknown	na (+)		Tg positive in liver



TG Data: Carcinogenicity Unknown

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment			
	Levofloxacin	100986-85-4	-	carcinogenicity unknown	na (-)		Tg negative in bone marrow, liver, sperm, testes			
	Malachite green	569-84-2	+	carcinogenicity equivocal	na (-)		Tg negative in liver			
	Nitrofurazone	565-52-6	+	carcinogenicity unknown	na (-)		Tg negative in bladder, caecum, colon, kidney, lung, small intestine, spleen, stomach			
	N-Nitrosodibenzylamine (NDBZA)	5336-53-9	+	carcinogenicity unknown	na (+)		Tg positive in liver, negative in bone marrow			
	Peroxacylnitrate (PAN)	2278-22-0	+	carcinogenicity unknown	na (+)		Tg positive in lung			
	Falphenon E	189265-33-0	-	carcinogenicity unknown	na (-)		Tg negative in liver, lung, spleen			
	Proton radiation			carcinogenicity unknown	na (+)		Tg positive in brain, spleen			
	Solanidine	80-76-4	-	carcinogenicity unknown	na (+)		Tg positive in liver			
	Solasodine	126-17-0		carcinogenicity unknown	na (+)		Tg positive in liver			
	Vitamin E	59-02-9	-	carcinogenicity unknown	na (-)		Tg negative in adipose tissue, heart, liver, testicular germ cells, thymus			
	2-methyl-5-nitrobenzenesulfonic acid	121-03-8	+	carcinogenicity unknown	na (-)	mhlw i2012	Tg negative in liver, bone marrow, stomach, testis			
	1-Bromo-3-chloropropane	109-70-5	+	carcinogenicity unknown	na (-)	mhlw i2012	Tg negative in liver, bone marrow, stomach, testis			
	2-Vinylpyridine	100-69-6	+	carcinogenicity unknown	na (-)	mhlw i2012	Tg negative in liver, bone marrow, stomach, testis			

TG Data: Carcinogenicity Unknown

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref.	Comment			
	N-phenylmaleimide	941-69-5	+	carcinogenicity unknown	na (-)	mhlw, f 2012	Tg negative in liver, bone marrow, stomach, testis			
	Thiourea dioxide	4189-44-0	+	carcinogenicity unknown	na (-)	mhlw, j 2012	Tg negative in liver, bone marrow, testis			
	Rumput roman extract	223747-93-1		carcinogenicity unknown	na (-)	mhlw, f 2012	Tg negative in liver, stomach			
	Piperonal	120-57-0	-	carcinogenicity unknown	na (-)	mhlw, f 2011	Tg negative in liver, kidney			
	Cinnamaldehyde	14371-10-9	-	carcinogenicity unknown	na (-)	mhlw, f 2011	Tg negative in liver, small intestine			
	Ferrous lactate trihydrate	8047-24-1		carcinogenicity unknown	na (-)	mhlw, f 2011	Tg negative in liver, kidney			
	Kidachi aloes extract			carcinogenicity unknown	na (+)	mhlw, f 2010, 2011	Tg positive in liver and stomach, negative in colon			
	Propyl gallate	121-79-9	-	carcinogenicity unknown	na (-)	mhlw, f 2010	Tg negative in liver, stomach			
	Sodium nitrite	7632-00-0	+	carcinogenicity unknown	na (-)	mhlw, f 2010	Tg negative in liver, stomach			
	D-Isoscorbic acid	99-05-6	+	carcinogenicity unknown	na (-)	mhlw, f 2010	Tg negative in liver, stomach			
	L-Cysteine	7048-04-6	+	carcinogenicity unknown	na (-)	mhlw, f 2010	Tg negative in liver, stomach			
	Maltol (3-Hydroxy-2-methyl-4-pyrone)	119-71-8	+	carcinogenicity unknown	na (-)	mhlw, f 2010	Tg negative in liver, stomach			
	New Coccine (Acid Red 18)	2611-82-7	-	carcinogenicity unknown	na (-)	mhlw, f 2009	Tg negative in liver, stomach	in vivo 4和名: 食用赤色102号		

TG Data: Carcinogenicity Unknown

Structure	Chemical	CAS No.	Ames	Carcinogenicity targets	Tg (performed in targets)	Ref	Comment			
	Phloxine B (Acid Red 93)	18472-87-2	-	carcinogenicity unknown	na (-)	mhlw_f 2009	Tg negative in liver, stomach in vivo 4 和名:食用赤色104号			
	Rose bengal (Acid Red 94)	832-69-9	-	carcinogenicity unknown	na (-)	mhlw_f 2009	Tg negative in liver, stomach in vivo 4 和名:食用赤色105号			
	Sesame seed oil unsaponification matter			carcinogenicity unknown	na (-)	mhlw_f 2008	Tg negative in liver, kidney 和名:ゴマ油不けん化物			
For explanation of in vitro results, author's original calls, and other symbols see footnotes to Carcinogen										
For Tg data, results given as follows:										
+ = positive in carcinogenicity target										
- = negative in carcinogenicity target										
na(+) = Tg positive but not in carcinogenicity target										
na(-) = Tg negative but not in carcinogenicity target										

Tg data summary (2014.02)  
 Serial 230 (Carcinogen 128, noncarcinogen 23, carcinogenicity unknown 88, combined exposure 40, vehicle 13)  
 ①04にはOECD Detailed Review Paperのデータベース登録の238の試験物質、うち1100の誘がん物質、28の非誘がん物質、vehicle 13物質を含む。

1-1) 「誘がん性物質」かつ「誘がん臓器組織でのTg dataあり」  
 105物質

「誘がん性物質」かつ「(少なくとも一つの臓器組織で)Tg陽性」:78物質  
 Sensitivity: 78/105 = 0.75

「誘がん性物質」かつ「Tgデータのある誘がん臓器組織全てでTg陽性」:20物質

Chemical	Carcinogenicity targets (with Tg data) Tg (performed in carcinogenic targets) Comment
2,3,7,8-tetrachlorodibenzo-p-dioxin	liver -
Acetaminophen	liver -
Carbon tetrachloride	liver -
Chloroform	liver -
Cisflurans	liver -
Di(2-ethylhexyl)phthalate	liver -
Flumazenil	liver -
Hexachlor	liver -
Methyl clofenapate	liver -
Phenacetylal	liver -
1,2-dibromoethane	liver, lung -
2-Chloro-4-(dichloromethyl-5-hydroxy-2(5H)-furanone (MX)	liver, lung -
Hydrazine sulphate	liver, lung -
Trifluoroethylene (with and without epichlorohydrin)	liver -
2-Nitroethanethione	lung -
Arsenite trioxide	lung -
Chrysene	lung -
Nickel subsulfide	lung -
Dimethylarsinic acid	lung, bladder -
Saccharin, sodium	bladder -
D-Dimercane	kidney -
17-β-Estradiol	breast (mammary gland) -
Methyl bromide	stomach -
3-Amino-1-methyl-5-thiopyridin(6,3-b)indole (Tg-P-2)	small intestine -
High-fat diet	colon -
Phenol-12-sulfonate-13-acetate (TPA)	skin -

1-2) 「誘がん性物質」かつ「Tg dataあり」  
 128物質

(= 105物質 + 誘がん臓器とTg解析組織が異なる19物質 + 誘がん臓器不明4物質)

「誘がん性物質」かつ「(少なくとも一つの)Tg陽性データ」:64物質  
 Sensitivity: 64/128 = 0.50

「誘がん臓器とTg解析組織が異なる19物質は以下の通り」

Chemical	Carcinogenicity targets (with Tg data) Tg (performed in carcinogenic targets) Comment
1,2-Dibromo-3-chloropropane	nasal cavity, oral cavity, stomach, skin (♂) Tg positive in testis, negative in liver
1,3-Dinitrobenzene	adrenal, haemolymphatic system, mam (♂) Tg positive in bone marrow, oesophagus, negative in brain, liver, lung
Acrylamide	nerve system, peritoneal cavity, thymus (♂) Tg positive in bone marrow, negative in liver, testicular germ cell
CD-1095	lung (♂) Tg positive in liver
Ethylmethylsulfonate (EMS)	kidney, lung, thymus (♂) Tg positive in bone marrow, epididymal sperm, liver, negative in brain, small intestine
Isopropylmethanesulfonate (IPMS)	thymus (♂) Tg positive in epididymal sperm, testes, testicular germ cells
Mitomycin-C	intestine, mammary gland, peritoneal (♂) Tg positive in bone marrow, liver, negative in small intestine, testis
Thiouracil	esophagus, thyroid, haematopoietic (♂) Tg positive in splenic lymphocytes
17-Methyltestosterone, esters (NMD01)	ad (♂) Tg positive in liver, skin
7-Methoxy-2-nitrofluorene (R7000)	carcinogenicity inconclusive (♂) Tg positive in caecum, colon, intestine, small intestine, stomach, negative in bladder, liver, oesophagus, spleen
Olydamide	testis, thyroid, oral cavity, Harderian gland (♂) Tg positive in liver
Coal tar	liver, lung, small intestine, stomach (♂) Tg positive in skin, negative in liver
3-methylcholanthrene	lung, skin, mammary gland (♂) Tg positive in liver
5,11-Dimethylbenzofluoranthene (DMBF)	carcinogenicity inconclusive (♂) Tg positive in skin
Benzo(a)fluorene dihydrodiol (BFDH)	carcinogenic as a metabolite of BDF (♂) Tg positive in skin

「誘がん性物質」かつ「Tg陽性」: 28物質  
 「誘がん臓器とTg解析組織が異なる8物質は以下の通り」

Chemical	Carcinogenicity targets (with Tg data) Tg (performed in carcinogenic targets) Comment
1,2,4-Dioxycubane	nasal mucosa, lung, skin, Harderian gland (♂) Tg negative in bone marrow, ovarian granulosa
1,2-Dichloroethane	stomach, subcutaneous tissue, vasculature (♂) Tg negative in liver, testis
5-Bromo-2'-deoxyuridine	testes, kidney, thyroid (♂) Tg negative in small intestine
Acrylonitrile	salivary gland, nervous system, ad (♂) Tg negative in bone marrow, brain, lung, splenic lymphocytes, testicular germ cells
Genistein	uterus (♂) Tg negative in heart, mammary gland
Kojic acid	thyroid (♂) Tg negative in liver
Matrine sulfate	pituitary gland, testes, liver, mammary (♂) Tg negative in stomach
Methylisocyanate	carcinogenicity equivocal (♂) Tg negative in liver

2) 「誘がん性物質」かつ「Tg dataあり」:24物質

「非誘がん性物質」かつ「(少なくとも一つの)Tg陽性データ」:8物質  
 「非誘がん性物質」かつ「Tg陰性」:16物質  
 Specificity: 15/23 = 0.65

Chemical	Carcinogenicity targets (with Tg data) Tg	Targets performed in Tg
1-Hydroxyphenanthrene	noncarcinogen	liver, skin, urinary bladder
2,6-Diaminotoluene	noncarcinogen	liver
2.45 GHz radiofrequency	noncarcinogen	brain, liver, spleen, testis
3-Fluorquinoline	noncarcinogen	bone marrow, liver, testicular germ cells
NNK + 5-methoxypropylalan	noncarcinogen	lung
4-Hydroxybiphenyl	noncarcinogen	liver
Acetone	noncarcinogen	skin
all-trans-Retinol	noncarcinogen	liver
Ellagic acid	noncarcinogen	oesophagus
Elgastol	noncarcinogen	liver
Folic acid	noncarcinogen	colonic epithelium
Glass wool fibres	noncarcinogen	lung
Green tea	noncarcinogen	oesophagus
Transferrin citrate	noncarcinogen	liver
trans-2-Hydroxy-2-nonenal	noncarcinogen	kidney, liver, lung
4-Acetylaminofluorene	noncarcinogen	liver
5-(4-Dimethylaminophenylazo)benzothiazole	noncarcinogen	liver
Acetic acid	noncarcinogen	skin
Benzo(b)quinoline	noncarcinogen	liver
Benzo(k)quinoline	noncarcinogen	lung
Rock wool fibres	noncarcinogen	lung
Sucrose	noncarcinogen	colon, liver
Alura Red AG	noncarcinogen (♂)	Tg positive in liver (Spc+ only), negative in colon

3) 溶媒:13物質

- Carboxymethylcellulose
- Corn oil
- Methyl cellulose
- Olive oil
- Phosphate buffer
- Propylene glycol
- Saline
- Sesame oil
- Sodium bicarbonate
- Soy oil
- Triticappin
- Triacetin
- Water