Analysis of Concordance

Supplemental Material I: Database of Anatomically-based Tumour Sites in Animals and Humans

D. Krewski, J. M. Rice, M. Bird, B. Milton, B. Collins, P. Lajoie, M. Billard, Y. Grosse, V. Cogliano, J. Caldwell, I.I. Rusyn, C.J. Portier, R. Melnick, J. Little & J.M. Zielinski (deceased)

in collaboration with and endorsed by other participants (see the Contributors list) in the Workshop on Tumour Site Concordance and Mechanisms of Carcinogenesis, which was convened by IARC in April and November 2012 in Lyon

Krewski et al. (2018) conducted a comprehensive analysis of the concordance between tumours seen in animals and humans for 111 distinct Group-1 agents identified in the IARC Monographs programme through Volume 109, based on information abstracted from the IARC Monographs by Grosse et al. (2018). The format of data abstracted from the Monographs by Grosse et al. (2018) is illustrated in Table 3 of Krewski et al. (2018), which includes histological information on animal and human tumours associated with these 111 agents, as well as information on the route of exposure and the gender and species of experimental animal models used.

Because there currently exists no common tumour nomenclature for animal and human tumours, Krewski et al. (2018, Table 2) developed an anatomically-based tumour nomenclature system that permits comparison of tumours seen in animals and humans on a site-specific basis, as well as on the basis of organ and tissue systems comprised of anatomically-related tumour sites. This system was developed by first identifying the anatomical tumour sites seen in both animals and humans for the 111 Group-1 agents based on the data abstracted from the Monographs by Grosse et al. (2018), as summarized in Supplemental Table 1. This was done by recording the individual tumour sites seen in humans and animals in columns 3 and 4 in Supplemental Table 1, respectively, organized by the organ and tissue systems in column 1; column 2 provides the common anatomically-based tumour site used for both animal and human tumours occurring at this site. It should be noted that although sufficient evidence for sites in italics in Supplementary Table 1 was not available in either animals or humans for any of the 111 Group-1 agents, these sites are included to record that they were considered, but not observed for various reasons noted in the footnotes to Supplementary Table 1, including the possibility that only limited evidence of carcinogenicity was available. This analysis formed the basis for the harmonized, anatomically-based tumour nomenclature system used by Krewski et al. (2018) as the basis for evaluating concordance between animal and human tumours.

The IARC tumour site concordance database based on this anatomically-based tumour nomenclature system (Supplemental Table 2). A data dictionary describing the elements of Supplemental Table 2 is provided in Supplemental Table 3. Supplemental Table 4 provides the numerical codes assigned to the 47 individual tumour sites and 13 organ and tissue systems included in the database.

Distributions of tumours expressed by across the tumour sites listed in Supplemental Table 4 for humans, (all) animals, mice, and rats are shown in Supplemental Figures 1-4, respectively, by type of agent. [Although there are 47 tumour sites listed in Supplemental Table 4, the 111 Group-1 agents considered

here demonstrated animal and/or human tumours at only 39 of these 47 sites.] Similar results for the 15 organ and tissue systems are shown in Supplemental Figures 5-8.

The 60 Group-1 agents included in the analysis of concordance between animal and human tumours reported by Krewski et al. (2018) are summarized in Supplemental Table 5. Concordance analysis was necessarily restricted to these 60 agents because of the requirement of sufficient evidence of at least one tumour site in animals and sufficient evidence of at least one tumour site in humans.

References

Grosse. Y., Lajoie, P., Billard, M., Krewski, D., Rice, J.R., Cogliano, V., Straif, K., Bird, M. & Zielinski, J.M. (2018). Database of animal and human tumours based on 111 distinct Group-1 agents known to cause cancer in humans. [This volume.]

Krewski, D., Rice, J.M., Bird, M., Milton, B., Collins, B., Lajoie, P, Billard, M., Grosse, Y., Baan, R., Cogliano, V., Straif, K., Caldwell, J., Rusyn, I.I., Portier, C.J., Melnick, R., Little, J. & Zielinski, J.M., in collaboration with other participants in the IARC Workshop on 'Tumour-site Concordance and Mechanisms of Carcinogenesis' which convened in Lyon, April/November 2012 (2016). Concordance between sites of tumour development in humans and in experimental animals for 111 agents that are carcinogenic to humans. [This volume.]

List of Tables

- Supplemental Table 1. Animal and Human Tumour Sites for 111 Group-1 Agents Identified through Volume 109 of the IARC Monographs
- Supplemental Table 2. Database of Animal and Human Tumours for 111 IARC Group 1 Agents through Volume 109 of the IARC Monographs
- Supplemental Table 3. Data Dictionary for the Anatomically-based Tumour Site Concordance Database
- Supplemental Table 4. Numerical Coding of Anatomically-based Tumour Sites and Organ and Tissue Systems
- Supplemental Table 5. Supplemental Table 5. Group-1 Agents with at least One Tumour Site Specified in Humans and in Animals (60 agents)

List of Figures

- Supplemental Figure 1. Number of Agents Inducing Tumours in Humans in Each of 39 Tumour sites by Type of Agent
- Supplemental Figure 2. Number of Agents Inducing Tumours in Animals in Each of 39 Tumour sites by Type of Agent

- Supplemental Figure 3. Number of Agents Inducing Tumours in Mice in Each of 39 Tumour sites by Type of Agent
- Supplemental Figure 4. Number of Agents Inducing Tumours in Rats in Each of 39 Tumour Sites by Type of Agent
- Supplemental Figure 5. Number of Agents Inducing Tumours in Humans in Each of 15 Organ Systems by Type of Agent
- Supplemental Figure 6. Number of Agents Inducing Tumours in Animals in Each of 15 Organ Systems by Type of Agent
- Supplemental Figure 7. Number of Agents Inducing Tumours in Mice in Each of 15 Organ Systems by Type of Agent
- Supplemental Figure 8. Number of Agents Inducing Tumours in Rats in Each of 15 Organ Systems by Type of Agents

Supplemental Table 1. Animal and Human Tumour Sites for 111 Group-1 Agents Identified through Volume 109 of the IARC Monographsⁱ

Organ and Tissue System	Tumour Site	Sites with Sufficient Evidence	Sites with Sufficient Evidence for
		for Cancer in Humans	Cancer in Experimental Animals
Upper aerodigestive tract	Nasal cavity and paranasal sinuses	Nasal cavity and paranasal sinuses	Nasal cavity
	Nasopharynx	Nasopharynx	
	Oral cavity	Oral cavity	Oral cavity
			Lip (inner) "
	Pharynx	Pharynx (incl. oropharynx &	
		hypopharynx)	
	Tongue		Tongue
	Tonsil	Tonsil	
	Salivary gland	Salivary gland	
Descriptions	The share iii	Trachas	Treshee
Respiratory system	I rachea "	Iracnea	Iracnea
	Larynx	Larynx	Larynx
		Lung	Lung
	Lower respiratory tract		Lower respiratory tract (larynx,
			trachea, and lung)
Mesothelium	Mesothelium	Mesothelium	Pleural mesothelium
			Peritoneal mesothelium
			Peritesticular mesothelium
Digestive tract	Digestive tract (unspecified)	Digestive tract (unspecified)	
-	Oesophagus	Oesophagus	Oesophagus
	Stomach	Stomach	Forestomach
			Glandular stomach
	Intestine, including colon and	Colon and rectum	Small and/or large intestine
	rectum		
Digestive organs	Liver parenchyma and bile ducts	Liver (parenchyma) and bile ducts	Liver parenchyma
			Bile ducts
	Pancreas NOS	Gall bladder	Gall bladder ^{iv}
	Gall bladder	Pancreas NOS	Pancreas, exocrine
Nervous system and eye	Brain and spinal cord (CNS)	Brain and spinal cord (CNS)	Brain and spinal cord (CNS)
	Cranial and peripheral nerves ^v	Cranial and peripheral nerves	Cranial and spinal nerves
	Еуе	Eye (melanoma)	
Endocrino system	Thuroid follicular opitholium	Thuroid	Thuroid, folligular opitholium

	Adrenal gland (medulla, cortex, NOS) Pituitary		Adrenal gland (medulla, cortex, NOS) Pituitary
Kidney	Kidney (renal cell carcinoma)	Kidney, unspecified	Kidney, unspecified
Urothelium	Urothelium (renal pelvis, ureter, urinary bladder)	Renal pelvis Ureter Urinary bladder	Renal pelvis Ureter Urinary bladder
Lymphoid and haematopoietic tissues	Haematopoietic tissue Lymphoid tissue	Haematopoietic tissue (AML, ANLL) ^{vi} Leukaemia, unspecified Lymphoid tissue (lymphoid leukaemia/lymphoma)	Haematopoietic tissue (granulocytic leukaemia) Lymphoid tissue including thymus (leukaemia/ lymphoma)
Skin	Skin and adnexae Cutaneous melanocytes	Skin and adnexae (general body surface including scrotum, penis, anus and conjunctivae) <i>Lip (outer)^{vii}</i> Cutaneous melanocytes (malignant melanoma)	Skin and cutaneous sebaceous glands
Connective tissues	Soft connective tissue Blood vasculature (endothelium) Hard connective tissue (bone, cartilage)	Soft connective tissue Blood vasculature (endothelium) Angiosarcoma of the liver Hard connective tissue (bone, cartilage)	Soft connective tissue (incl. haemangiosarcoma) Hard connective tissue (bone, cartilage)
Female breast, female reproductive organs and	Breast Ovary	Breast Ovary	Mammary gland Ovary
reproductive tract	Uterus Uterine cervix Vulva/vagina	Uterus NOS Endometrium Uterine cervix Vulva/vagina	Uterus NOS
Male reproductive system viii	Testis, germ cells Testis, specialized gonadal stroma	Testis, germ cells Testis, specialized gonadal stroma	Testis, specialized gonadal stroma (Leydig cells)

	Prostate	Prostate	Prostate
Other groupings (not included in the concordance analysis)	All cancers combined All solid cancers <i>Solid cancers, aside from lung</i> <i>Multiple or unspecified sites</i> Exocrine glands NOS	All cancers combined All solid cancers Solid cancers aside from lung Multiple or unspecified sites Exocrine glands NOS	Non-digestive exocrine glands (including Harderian gland, Zymbal gland [ear duct], preputial gland)

ⁱ Although sites in italics were not in the concordance developed by Grosse et al. (2015), they are included in the anatomically-based tumour taxonomy system for completeness.

[&]quot; The monographs do not distinguish between inner and outer lip; this was inferred to be lip inner because of the Group-1 agent it relates to 'smokeless tobacco'

ⁱⁱⁱ Trachea was not found as a distinct site in the concordance database.

^{iv} The rat has no gall bladder

^v Cranial and peripheral nerves were not found as a distinct site in the current database.

^{vi} AML: Acute myeloid leukemia; ANLL: Acute non-lymphocytic leukemia.

^{vii} Lip (outer) provided only *limited evidence* in humans for solar radiation.

viii The male reproductive system provided on *limited evidence* in humans (in all three listed tumour sites).

			Supleme	ntal Table 2. Database of Anima	I and Human Tumour Si	tes for 111 Distinct Grou	p-1 Agents three	ough Volume 109 of the IAR	C Monographs				
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number						Site Number		Number	Tumour Site	Lack of	Upgrade	Tumour Site
										Specified	Animal Data*		Specified
Δ.	1	Aristolophic agid	Pot	Forestemach	Stomach	Stomach	15	Digestive treat	4	1	7 minur Data	1	0
A		Anstolochic acid	Rai	Folestomach	Stomach	Stomach	15	Digestive tract	4	1		1	0
A	1	Aristolochic acid	Rat	Renal pelvis	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		1	0
Δ	1	Aristolochic acid	Human	Not specified						1		1	0
~	2	Arieteleshis esid planta	Det	Forestemash	Stomach	Stomach	15	Dissetive treat	4	1		0	1
A	2	containing	Rai	Forestomach	Stomach	Stomach	15	Digestive tract	4	1		0	
A	2	Aristolochic acid, plants containing	Human	Renal pelvis	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
A	2	Aristolochic acid, plants containing	Rat	Renal pelvis	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
A	2	Aristolochic acid, plants containing	Human	Ureter	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
A	3	Azathioprine	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	3	Azathioprine	Human	Non-Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	3	Azathioprine	Mouse	Thymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	3	Azathioprine	Human	Skin (squamous cell carcinoma)	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
A	4	Busulfan	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	6	0	1
A	5	Chlorambucil	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
A	5	Chlorambucil	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	6	Chlornaphazine	Human	Bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	6	0	1
Α	7	Cyclophosphamide	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
Δ	7	Cyclophosphamide	Human	Bladder	Lirothelium (renal pelvis	Urothelium	27	Urothelium	9	1		0	1
~	1	Cyclophosphanide	numan	Diadder	ureter, urinary bladder)	orothenam	21	oromenum	3			0	
A	7	Cyclophosphamide	Rat	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
A	7	Cyclophosphamide	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
A	7	Cyclophosphamide	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	7	Cyclophosphamide	Mouse	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	8	Ciclosporine	Human	Non-Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	6	0	1
A	8	Ciclosporine	Human	Squamous cell carcinoma	Skin and adnexae	Skin and adnexae	30	Skin	11	0	6	0	1
Α	9	Diethylstilbestrol	Hamster	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
A	9	Diethylstilbestrol	Human	Breast (exposure while pregnant)	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	9	Diethylstilbestrol	Human	Cervix (clear cell adenocarcinoma, exposure in utero)	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	9	Diethylstilbestrol	Mouse	Uterine cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	9	Diethylstilbestrol	Mouse	Uterus	Uterus	Uterus	38	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	9	Diethylstilbestrol	Human	Vagina (clear cell adenocarcinoma, exposure in utero)	Vulva/vagina	Vulva/vagina	39	Female breast, female reproductive organs and reproductive tract	13	1		0	1

			Suplemer	ntal Table 2. Database of Anima	al and Human Tumour S	ites for 111 Distinct Grou	up-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number						Site Number		Number	Tumour Site Specified	Lack of Animal Data*	Upgrade	Tumour Site Specified
A	10	Estrogen-only menopausal therapy	Hamster	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
A	10	Estrogen-only menopausal therapy	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
Α	10	Estrogen-only menopausal	Mouse	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
	-	therapy		, , , , , , , , , , , , , , , , , , , ,				reproductive organs and					
								reproductive tract					
Α	10	Estrogen-only menopausal	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
		therapy		, ,				reproductive organs and					
								reproductive tract					
Α	10	Estrogen-only menopausal	Human	Ovary	Ovary	Ovary	36	Female breast, female	13	1		0	1
		therapy						reproductive organs and					
								reproductive tract					
A	10	Estrogen-only menopausal	Mouse	Uterine cervix	Uterine cervix	Cervix	37	Female breast, female	13	1		0	1
		therapy						reproductive organs and					
	40	Fotosona anti-management	Liveran	En de metricure	Literate	Literare		reproductive tract	40	4		0	4
A	10	Estrogen-only menopausal	Human	Endometrium	Uterus	Oterus	38	Female breast, remale	13	1		0	1
		therapy						reproductive organs and					
Δ	10	Estrogen-only menopausal	Mouse	Literus	Literus	Literus	38	Female breast female	13	1		0	1
~	10	therapy	Wiodoc	otorus	Otorus	Otorus	00	reproductive organs and	10			0	
								reproductive tract					
Α	11	Estrogen-progestogen	Human	Breast	Breast	Breast	35	Female breast, female	13	0	6	0	1
		menopausal therapy (combined)						reproductive organs and					
								reproductive tract					
Α	11	Estrogen-progestogen	Human	Endometrium (increased risk	Uterus	Uterus	38	Female breast, female	13	0	6	0	1
		menopausal therapy (combined)		for estrogen-induced				reproductive organs and					
				endometrial cancer decreases				reproductive tract					
				with the number of days per									
				used)									
A	12	Estrogen-progestogen oral	Human	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		0	1
Δ	12	Estrogen-progestogen oral	Human	Breast	Breast	Breast	35	Female breast female	13	1		0	1
^	12	contraceptives (combined)	riuman	Diedat	Diedast	Diedal	55	reproductive organs and	15			0	
		contracopartee (combined)						reproductive tract					
Α	12	Estrogen-progestogen oral	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female	13	1		0	1
		contraceptives (combined)					-	reproductive organs and					
								reproductive tract					
Α	12	Estrogen-progestogen oral	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
		contraceptives (combined)						reproductive organs and					
								reproductive tract					
A	13	Etoposide	Human	Not specified						0	4	1	0
A	14	Etoposide in combination with cisplatin and bleomycin	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoletic tissue	28	Lymphoid and haematopoietic tissues	10	0	2	0	1
A	15	Melphalan	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	7	0	1
A	16	Methoxsalen in combination with UVA	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
A	16	Methoxsalen in combination with UVA	Human	Skin (squamous cell carcinoma)	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
А	17	MOPP and other combined	Human	Lung	Lung	Lung	10	Respiratory system	2	0	2	0	1
1		chemotherapy including		, č	Ŭ	Ŭ							1
		alkylating agents											
A	17	MOPP and other combined	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and	10	0	2	0	1
		chemotherapy including						haematopoietic tissues					
<u> </u>	1.0	alkylating agents			10.1			101			1		
A	18	Phenacetin	Mouse	Kidney	Kidney	Kidney	26	Kidney	8	1		1	1
A	10	Phenacetin	Kat	Rianey Ropal polyic	Kidney	Lirotholium	20	Lirotholium	8	1		1	1
A	10	FIIEHAGettii	numan	iterial pervis	ureter, urinary bladder)	UTUTIEIIUITI	21	orourellum	9	1		I	
1					,,,								1
Α	18	Phenacetin	Rat	Renal pelvis	Urothelium (renal pelvis,	Urothelium	27	Urothelium	9	1	1	1	1
1					ureter, urinary bladder)								1
													<u> </u>

			Supleme	ntal Table 2. Database of Anima	I and Human Tumour Si	tes for 111 Distinct Grou	up-1 Agents three	ough Volume 109 of the IAR	C Monographs				
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
A	18	Phenacetin	Human	Ureter	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		1	1
A	19	Phenacetin, analgesic mixtures containing	Human	Renal pelvis	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	6	0	1
A	19	Phenacetin, analgesic mixtures containing	Human	Ureter	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	6	0	1
A	20	1-(2-Chloroethyl)-3-(4- methylcyclohexyl)- 1-nitrosourea (Methyl-CCNU)	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	6	0	1
A	21	Tamoxifen	Rat	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
A	21	Tamoxifen	Human	Endometrium	Uterus	Uterus	38	Female breast, female reproductive organs and reproductive tract	13	1		0	1
A	22	Thiotepa	Human	Leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and baematopojetic tissues	10	1		0	1
A	22	Thiotepa	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
A	23	Treosulfan	Human	Acute myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	5	0	1
В	24	Clonorchis sinensis (infection with)	Human	Cholangiocarcinoma	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	0	6	0	1
В	25	Epstein-Barr virus	Human	Nasopharyngeal carcinoma	Nasopharynx	Nasopharynx	2	Upper aerodigestive tract	1	0	3	0	1
В	25	Epstein-Barr virus	Human	Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	25	Epstein-Barr virus	Human	Immune-suppression-related non-Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	25	Epstein-Barr virus	Human	Burkitt lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	25	Epstein-Barr virus	Human	Estranodal NK/T-cell lymphoma (nasal type)	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	26	Helicobacter pylori (infection with)	Mouse	Glandular stomach	Stomach	Stomach	15	Digestive tract	4	1		0	1
В	26	Helicobacter pylori (infection with)	Human	Non-cardiac gastric carcinoma	Stomach	Stomach	15	Digestive tract	4	1		0	1
В	26	Helicobacter pylori (infection with)	Human	Low-grade B-cell MALT gastric lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
В	27	Hepatitis B virus	Human	Hepatocellular carcinoma	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	0	3	0	1
В	28	Hepatitis C virus	Human	Hepatocellular carcinoma	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	0	3	0	1
В	28	Hepatitis C virus	Human	Non-Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Non-Hodgkin lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Anus	Skin and adnexae	Skin and adnexae	30	Skin	11	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Conjuctiva	Skin and adnexae	Skin and adnexae	30	Skin	11	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Kaposi sarcoma	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	0	3	0	1
В	29	Human immunodeficiency virus type 1	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 16	Human	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	0	3	0	1
В	30	Human papillomavirus type 16	Human	Oropharynx	Pharynx	Pharynx	4	Upper aerodigestive tract	1	0	3	0	1
В	30	Human papillomavirus type 16	Human	LONSI	I ONSI	I ONSI	6	Upper aerodigestive tract	1	0	3	0	1
B	30	Human papillomavirus type 16	Human	Anus	Skin and adnexae	Skin and adnexae	30	SKIN	11	0	3	0	1
D	30	numan papiliomavitus type 16	nunlan	r et lls	ONITI ATTU AUTIEXAB	ONITI ATTU AUTIEXAE	30	JKIII		U	3	U	1

			Suplemen	tal Table 2. Database of Anima	al and Human Tumour Si	tes for 111 Distinct Grou	up-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
В	30	Human papillomavirus type 16	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 18	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 31	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 33	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 35	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 39	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 45	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 51	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 52	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 56	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 58	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 59	Human	Cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 16	Human	Vagina	Vulva/vagina	Vulva/vagina	39	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	30	Human papillomavirus type 16	Human	Vulva	Vulva/vagina	Vulva/vagina	39	Female breast, female reproductive organs and reproductive tract	13	0	3	0	1
В	31	Human T-cell lymphotropic virus type 1	Human	Adult T-cell leukaemia/lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	32	Kaposi sarcoma herpesvirus	Human	Primary effusion lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	3	0	1
В	32	Kaposi sarcoma herpesvirus	Human	Kaposi sarcoma	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	0	3	0	1
в	33	Opostnorchis viverrini (infection with)	Human	Cholangiocarcinoma	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	U	6	0	1
В	34	Schistosoma haematobium (infection with)	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	6	0	1
С	35	Arsenic and inorganic arsenic compounds	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	35	Arsenic and inorganic arsenic compounds	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	35	Arsenic and inorganic arsenic compounds	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
С	35	Arsenic and inorganic arsenic compounds	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
С	35	Arsenic and inorganic arsenic compounds	Rat	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
С	35	Arsenic and inorganic arsenic compounds	Human	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1

			Suplemen	tal Table 2. Database of Anima	I and Human Tumour Si	ites for 111 Distinct Grou	up-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Human	Larynx	Larynx	Larynx	9	Respiratory system	2	1		0	1
C	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
C	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Human	Mesothelioma	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Baboon	Mesothelium	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Hamster	Mesothelium	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Rat	Mesothelium	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
С	36	Asbestos (all forms, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite)	Human	Ovary	Ovary	Ovary	36	Female breast, female reproductive organs and reproductive tract	13	1		0	1
С	37	Beryllium and beryllium compounds	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	37	Beryllium and beryllium compounds	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	38	Cadmium and cadmium compounds	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	38	Cadmium and cadmium compounds	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	38	Cadmium and cadmium compounds	Rat	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
С	39	Chromium (VI) compounds	Rat	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
С	39	Chromium (VI) compounds	Rat	Tongue	Tongue	Tongue	5	Upper aerodigestive tract	1	1		0	1
С	39	Chromium (VI) compounds	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	39	Chromium (VI) compounds	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	39	Chromium (VI) compounds	Mouse	lleum	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
С	39	Chromium (VI) compounds	Mouse	Jejunum	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
С	39	Chromium (VI) compounds	Mouse	Small intestine	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
С	39	Chromium (VI) compounds	Mouse	Duodenum	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
С	39	Chromium (VI) compounds	Rat	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1	1	0	1
C	40	Erionite	Human	Mesothelioma	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
C	40	Erionite	Rat	Mesothelium	Mesothelium	Mesothelium	12	Mesothelium	3	1		0	1
С	41	Leather dust	Human	Nasal sinus	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	0	5	0	1
С	42	Nickel compounds	Human	Nasal cavity and paranasal sinuses	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
C	42	Nickel compounds	Human	Lung	Ling	Lung	10	Respiratory system	2	1		0	1
c c	42	Nickel compounds	Rat		Lung	Lung	10	Respiratory system	2	1	1	0	1
c c	42	Nickel compounds	Rat	Adrenal medulla			24	Endocrine system	7	1	1	0	1
C C	42	Nickel compounds	Hamster	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
Č	42	Nickel compounds	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1	1	0	1
U	42	Nicker compounds	IVIOUSE	SUIT USSUE	Son connective tissue	Son connective tissue	32	CONNECTIVE USSUES	12		1	U	1

			Suplement	tal Table 2. Database of Anima	al and Human Tumour S	ites for 111 Distinct Grou	up-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
C	42	Nickel compounds	Rat	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1	, uninai Data	0	1
c	43	Silica dust, crystalline, in the	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	43	Silica dust, crystalline, in the	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
С	43	Silica dust, crystalline, in the	Rat	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and	10	1		0	1
С	44	Wood dust	Human	Nasal sinus	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	0	4	0	1
C	44	Wood dust	Human	Nacaphaniny	Nacaphanias	Nacaphan/py	2	Lippor acrodigostivo tract	1	0	4	0	1
D	45	Fission products including Sr-90	Human	Leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and	10	1		0	1
D	45	Fission products including Sr-90	Dog	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	45	Fission products including Sr-90	Mouse	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	45	Fission products including Sr-90	Human	Solid cancers	All solid cancers	All solid cancers	44	Other groupings	15	1		0	1
D	46	Haematite mining with exposure to radon (underground)	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
D	46	Haematite mining with exposure to radon (underground)	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
D	47	lonizing radiation (all types)	Human	Not specified						1		0	0
D	48	Neutron radiation	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
D	48	Neutron radiation	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
D	48	Neutron radiation	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		1	0
D	48	Neutron radiation	Mouse	Adrenal gland	Adrenal gland	Adrenal gland	24	Endocrine system	7	1		1	0
D	48	Neutron radiation	Mouse	Pituitary gland	Pituitary	Pituitary	25	Endocrine system	7	1		1	0
D	48	Neutron radiation	Monkey (Rhesus)	Kidney	Kidney	Kidney	26	Kidney	8	1		1	0
D	48	Neutron radiation	Mouse	Haematopoietic tissue	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		1	0
D	48	Neutron radiation	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		1	0
D	48	Neutron radiation	Mouse	Thymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		1	0
D	48	Neutron radiation	Mouse	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and	13	1		1	0
								reproductive tract					
D	48	Neutron radiation	Rat	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and	13	1		1	0
-						-		reproductive tract					-
D	48	Neutron radiation	Mouse	Ovary	Ovary	Ovary	36	Female breast, female reproductive organs and reproductive tract	13	1		1	0
D	48	Neutron radiation	Mouse	Harderian gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		1	0
D	48	Neutron radiation	Human	Not specified						1		1	0
D	49	P-32, as phosphate	Human	Leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	7	0	1
D	50	Pu-239	Doa	Luna	Luna	Luna	10	Respiratory system	2	1		0	1
D	50	Pu-239	Human	Luna	Lung	Luna	10	Respiratory system	2	1	İ	0	1
D	50	Pu-239	Rat	Luna	Luna	Luna	10	Respiratory system	2	1	İ	0	1
D	50	Pu-239	Dog	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	50	Pu-239	Human	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	50	Pu-239	Human	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	50	Pu-239	Dog	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	50	Pu-239	Mouse	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1

			Suplemen	tal Table 2. Database of Anima	al and Human Tumour Si	tes for 111 Distinct Grou	p-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
D	50	Pu-239	Rat	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	51	Radioiodines, including I-131	Human	Thyroid	Thyroid	Thyroid	23	Endocrine system	7	1		0	1
D	51	Radioiodines, including I-131	Mouse	Thyroid	Thyroid	Thyroid	23	Endocrine system	7	1		0	1
D	51	Radioiodines, including I-131	Rat	Thyroid	Thyroid	Thyroid	23	Endocrine system	7	1		0	1
D	52	Internalized radionuclides that	Human	Not specified						1		0	0
0	52	emit alpha particles	numan	Not specified					-			0	0
D	52	Internalized radionuclides that emit alpha particles	Dog	Lung	Lung	Lung	10	Respiratory system	2	1		0	0
D	52	Internalized radionuclides that emit alpha particles	Hamster	Lung	Lung	Lung	10	Respiratory system	2	1		0	0
D	52	Internalized radionuclides that emit alpha particles	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	0
D	52	Internalized radionuclides that emit alpha particles	Dog	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	0
D	52	Internalized radionuclides that emit alpha particles	Mouse	Skeletal system	Hard connective tissue (bone_cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	0
D	52	Internalized radionuclides that	Rat	Skeletal system	Hard connective tissue (bone_cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that	Human	Not specified	(bone, barninge)					1		0	0
D	53	Internalized radionuclides that	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	0
D	53	Internalized radionuclides that	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	0
D	53	Internalized radionuclides that	Mouse	Thymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and	10	1		0	0
D	53	Internalized radionuclides that	Dog	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that	Rat	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that	Dog	Skeletal system	Hard connective tissue	Hard connective tissue	34	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that	Mouse	Skeletal system	Hard connective tissue	Hard connective tissue	34	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that	Rat	Skeletal system	Hard connective tissue	Hard connective tissue	34	Connective tissues	12	1		0	0
D	53	Internalized radionuclides that emit beta particles	Rat	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	0
D	54	Ra-224 and its decay products	Human	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	54	Ra-224 and its decay products	Dog	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	54	Ra-224 and its decay products	Mouse	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	55	Ra-226 and its decay products	Human	Paranasal sinus	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
D	55	Ra-226 and its decay products	Human	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	55	Ra-226 and its decay products	Human	Mastoid process	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	55	Ra-226 and its decay products	Dog	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	55	Ra-226 and its decay products	Mouse	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	56	Ra-228 and its decay products	Human	Bone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	56	Ra-228 and its decay products	Dog	Skeletal system	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
P	57	Rn-222 and its decay products	Human	Luna	Luna	Luna	10	Respiratory system	2	1		0	1
D	57	Rn-222 and its decay products	Rat	Lung	Lung	Lung	10	Respiratory system	2			0	1
	50		Maure		Chip and - draw-	Eurig Okin and a darawa	10		44	4		0	1
U D	58	Solar radiation	iviouse	SKIN	Skin and adhexae	Skin and adhexae	30	SKIN	11	1		U	1
D	58	Solar radiation	Rat	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
D	58	Solar radiation	Human	Skin (basal cell carcinoma,	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
				squamous cell carcinoma)	1	1		1		1	1		

			Suplemen	tal Table 2. Database of Anima	I and Human Tumour Si	tes for 111 Distinct Grou	p-1 Agents three	ough Volume 109 of the IAR	C Monographs				
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number	3					Site Number		Number	Tumour Site Specified	Lack of Animal Data*	Upgrade	Tumour Site Specified
D	58	Solar radiation	Human	Skin (malignant melanoma)	Cutaneous melanocytes	Cutaneous melanocytes	31	Skin	11	1		0	1
D	59	Th-232 (as Thorotrast)	Human	Extrahepatic bile ducts	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	59	Th-232 (as Thorotrast)	Hamster	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	59	Th-232 (as Thorotrast)	Human	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	59	Th-232 (as Thorotrast)	Rat	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	59	Th-232 (as Thorotrast)	Human	Gall bladder	Gall bladder	Gall bladder	19	Digestive organs	5	1		0	1
D	59	Th-232 (as Thorotrast)	Human	Leukaemia (excluding chronic	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and	10	1		0	1
	60	LIV radiation (bandwidth 100	Human	lymphocytic leukaemia)			20	haematopoietic tissues				0	
D	60	400 nm, encompassing UVC, UVB and UVA)	Human	Not specified						I		0	0
D	60	UV radiation (bandwidth 100- 400 nm, encompassing UVC, UVB and UVA)	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	0
D	60	UV radiation (bandwidth 100- 400 nm, encompassing UVC, UVB and UVA)	Rat	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	0
D	61	UV-emitting tanning devices	Human	Eye (melanoma)	Eye	Eye	22	Nervous system and eye	6	1		0	1
D	61	UV-emitting tanning devices	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
D	61	UV-emitting tanning devices	Human	Skin (melanoma)	Cutaneous melanocytes	Cutaneous melanocytes	31	Skin	11	1		0	1
D	62	X- and Gamma radiation	Human	Salivary gland	Salivary gland	Salivary gland	7	Upper aerodigestive tract	1	1		0	1
D	62	X- and Gamma radiation	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
D	62	X- and Gamma radiation	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
D	62	X- and Gamma radiation	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	1		0	1
D	62	X- and Gamma radiation	Human	Stomach	Stomach	Stomach	15	Digestive tract	4	1		0	1
D	62	X- and Gamma radiation	Human	Colon	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
D	62	X- and Gamma radiation	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
D	62	X- and Gamma radiation	Human	Brain and CNS	Brain and spinal cord (CNS)	CNS	20	Nervous system and eye	6	1		0	1
D	62	X- and Gamma radiation	Human	Thyroid	Thyroid	Thyroid	23	Endocrine system	7	1		0	1
D	62	X- and Gamma radiation	Rat	Thyroid	Thyroid	Thyroid	23	Endocrine system	7	1		0	1
D	62	X- and Gamma radiation	Mouse	Pituitary gland	Pituitary	Pituitary	25	Endocrine system	7	1		0	1
D	62	X- and Gamma radiation	Human	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
D	62	X- and Gamma radiation	Monkey (Rhesus)	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
D	62	X- and Gamma radiation	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
D	62	X- and Gamma radiation	Mouse	Haematopoietic tissue	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
D	62	X- and Gamma radiation	Human	Leukaemia (excl. chronic lymphocytic leukaemia)	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
D	62	X- and Gamma radiation	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
D	62	X- and Gamma radiation	Mouse	Thymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
D	62	X- and Gamma radiation	Human	Basal cell of the skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
D	62	X- and Gamma radiation	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
D	62	X- and Gamma radiation	Human	Bbone	Hard connective tissue (bone, cartilage)	Hard connective tissue	34	Connective tissues	12	1		0	1
D	62	X- and Gamma radiation	Human	Female breast	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	1
D	62	X- and Gamma radiation	Mouse	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	1

			Suplemen	ntal Table 2. Database of Anima	al and Human Tumour Si	tes for 111 Distinct Grou	up-1 Agents thr	ough Volume 109 of the IAR	C Monographs				
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number	Ũ					Site Number	ũ ,	Number	Tumour Site	Lack of	Upgrade	Tumour Site
										Specified	Animal Data*		Specified
D	62	X- and Gamma radiation	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
	-			, , , , , , , , , , , , , , , , , , , ,				reproductive organs and	-			-	
								reproductive tract					
D	62	X and Gamma radiation	Mouro	0.000	0.000	Over	26	Econolo broast fomalo	12	1		0	1
D	62	A- and Gamma radiation	wouse	Ovary	Ovary	Ovary	30	Female breast, remaie	13	1		0	1
								reproductive organs and					
								reproductive tract					
D	62	X- and Gamma radiation	Mouse	Harderian gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
E	63	Acetaldehyde associated with	Human	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	0	7	0	1
		consumption of alcoholic											
		beverages											
F	63	Acetaldehvde associated with	Human	Pharynx	Pharynx	Pharynx	4	Upper aerodigestive tract	1	0	7	0	1
-	00	consumption of alcoholic	- Turnan	1 Haryinx	i naijint	1 Halyint		oppor dorodigoodiro daor		Ŭ		Ũ	
		byoragos											
-		beverages					<u>^</u>		2	â	-		
E	63	Acetaldehyde associated with	Human	Larynx	Larynx	Larynx	9	Respiratory system	2	0	7	0	1
		consumption of alcoholic											
		beverages											
E	63	Acetaldehyde associated with	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	0	7	0	1
		consumption of alcoholic						-					
		beverages											
F	64	Alcoholic beverages	Human	Oral cavity	Oral cavity	Oral cavity	3	Lipper aerodigestive tract	1	1	1	0	1
	64	Alcoholic beverages	Dot	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	4	1	+	0	4
E	64	Alcoholic beverages	Rat	Ural cavity	Oral cavity	Ofai cavity	3	Upper aerodigestive tract	1	1		0	1
E	64	Alcoholic beverages	Human	Pharynx	Pharynx	Pharynx	4	Upper aerodigestive tract	1	1		0	1
E	64	Alcoholic beverages	Human	Larynx	Larynx	Larynx	9	Respiratory system	2	1		0	1
E	64	Alcoholic beverages	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	1		0	1
E	64	Alcoholic beverages	Human	Colorectum	Intestine, including	Intestine	16	Digestive tract	4	1		0	1
		_			colon and rectum			-					
F	64	Alcoholic beverages	Human	Hepatocellular carcinoma	Liver parenchyma and	Liver	17	Digestive organs	5	1		0	1
-	0.	, accricate perteragee	- Turnan	riopatoconalar caromonia	bile ducts	21101		Digeotive organie	ů.			Ū	
-	64	Alashalia bayaragaa	Human	broost	Breast	Broost	25	Famala bragat famala	10	1		0	1
E	64	Alcoholic beverages	Human	breast	Breast	Breast	35	Female breast, remale	13	.1		0	1
								reproductive organs and					
								reproductive tract					
E	65	Areca nut	Human	Not specified						1		0	0
E	65	Areca nut	Hamster	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	0
E	65	Areca nut	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	0
E	66	Betel guid with tobacco	Human	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	0	7	0	1
E	66	Betel guid with tobacco	Human	Pharynx	Pharynx	Pharynx	4	Upper aerodigestive tract	1	0	7	0	1
F	66	Betel guid with tobacco	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	0	7	0	1
F	67	Betel quid without tobacco	Human	Oral cavity	Oral cavity	Oral cavity	3	Lipper aerodigestive tract	1	1		0	1
	67	Betel quid without tobacco	Human	Occephogue	Oran cavity	Oran cavity	14	Digestive tract	1	1		0	1
	07	Betel quid without tobacco	Human	Oesophagus	Oesopriagus	Oesophagus	14	Digestive tract	4	1		0	1
E	67	Betel quid without tobacco	Hamster	Forestomach	Stomach	Stomach	15	Digestive tract	4	1		0	1
E	68	Coal, indoor emissions from	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
		household combusion of								L	L		
E	68	Coal, indoor emissions from	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
		household combusion of		-									
E	68	Coal, indoor emissions from	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1	1	0	1
1 -	20	household combusion of			erin erin aanonao	entre adrivido	50						
F	60	Ethanol in alcoholic beverages	Human	Not specified						1		0	0
	09	Ethonal in alcoholic beverages			Oral	Oral	0	Linner gerective to t	4	1		0	0
	69	Ethanol in alconolic beverages	Kat	Oral cavity	Ural cavity	Urai cavity	3	upper aerodigestive tract	1	1	+	U	U
E	70	N'-Nitrosonornicotine (NNN) and	Hamster	Nasal cavity	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	1		1	0
		4-(N-Nitrosomethylamino)-1-(3-			paranasal sinuses								
		pyridyl)-1-butanon (NNK)											
E	70	N'-Nitrosonornicotine (NNN) and	Hamster	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
1	-	4-(N-Nitrosomethylamino)-1-(3-		5	5		-						-
		pyridyl)-1-butanon (NNK)											
-	70	N! Nitroconomicating (NINN) and	Det	Lung	Lung	Lung	10	Beeniroten (evets	2	1	+	4	0
E	70	A (N Nitre constitution (NNN) and	Rat	Lung	Lung	Lung	10	Respiratory system	2	Т		'	U
1	1	4-(IN-INITrosomethylamino)-1-(3-			1								
		pyridyl)-1-butanon (NNK)											
E	70	N'-Nitrosonornicotine (NNN) and	Rat	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	1		1	0
		4-(N-Nitrosomethylamino)-1-(3-						-					
1	1	pyridyl)-1-butanon (NNK)			1								
F	70	N'-Nitrosonornicotine (NINN) and	Rat	liver	Liver narenchyma and	liver	17	Digestive organs	5	1		1	0
E	10	4 (N Nitrocomothylomine) 4 (2	ivat	LIVEI	bilo duoto	LIVEI		Digestive Organs	5			'	5
1	1	+-(IN-INITOSOTHETRYIAMINO)-1-(3-			Dile ducts								
		pyridyi)-1-butanon (NNK)											
E	70	N'-Nitrosonornicotine (NNN) and	Human	Not specified						1		1	0
		4-(N-Nitrosomethylamino)-1-(3-											
1	1	pyridyl)-1-butanon (NNK)			1								

	Suplemental Table 2. Database of Animal and Human Tumour Sites for 111 Distinct Group-1 Agents through Volume 109 of the IARC Monographs												
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number						Site Number		Number	Tumour Site Specified	Lack of Animal Data*	Upgrade	Tumour Site Specified
E	71	Salted fish, chinese style	Rat	Nasal cavity	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
E	71	Salted fish, chinese style	Rat	Paranasal sinus	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
E	71	Salted fish, chinese style	Rat	Nasopharvnx	Nasopharvnx	Nasopharvnx	2	Upper aerodigestive tract	1	1		0	1
E	71	Salted fish, chinese style	Human	Nasopharynx	Nasopharynx	Nasopharvnx	2	Upper aerodigestive tract	1	1		0	1
E	72	Second-hand tobacco smoke	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
E	72	Second-hand tobacco smoke	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
E	73	Tobacco smoking	Human	Nasal cavity	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
E	73	Tobacco smoking	Human	Paranasal sinus	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
E	73	Tobacco smoking	Human	Nasopharynx	Nasopharynx	Nasopharynx	2	Upper aerodigestive tract	1	1		0	1
E	73	Tobacco smoking	Human	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
E	73	Tobacco smoking	Human	pharynx (incl. oropharynx & hypopharynx)	Pharynx	Pharynx	4	Upper aerodigestive tract	1	1		0	1
E	73	Tobacco smoking	Human	Larynx	Larynx	Larynx	9	Respiratory system	2	1		0	1
E	73	Tobacco smoking	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
E	73	Tobacco smoking	Hamster	Larvnx	Larvnx	Larvnx	9	Respiratory system	2	1		0	1
E	73	Tobacco smoking	Mouse	Lung	Lung	Luna	10	Respiratory system	2	1		0	1
E	73	Tobacco smoking	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	73	Tobacco smoking	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	1		0	1
F	73	Tobacco smoking	Human	Stomach	Stomach	Stomach	15	Digestive tract	4	1		0	1
E	73	Tobacco smoking	Human	Colorectum	Intestine, including colon and rectum	Intestine	16	Digestive tract	4	1		0	1
E	73	Tobacco smoking	Human	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
E	73	Tobacco smoking	Human	Hepatoblastoma in children (parental smoking)	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
E	73	Tobacco smoking	Human	Pancreas	Pancreas NOS	Pancreas	18	Digestive organs	5	1		0	1
E	73	Tobacco smoking	Human	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
E	73	Tobacco smoking	Human	Ureter	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
E	73	Tobacco smoking	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
E	73	Tobacco smoking	Human	Myeloid leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
Е	73	Tobacco smoking	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
E	73	Tobacco smoking	Human	ovary	Ovary	Ovary	36	Female breast, female	13	1		0	1
		-						reproductive organs and reproductive tract					
E	73	Tobacco smoking	Human	Uterine cervix	Uterine cervix	Cervix	37	Female breast, female reproductive organs and reproductive tract	13	1		0	1
E	74	Tobacco, smokeless	Rat	Lip	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
E	74	Tobacco, smokeless	Human	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
E	74	Tobacco, smokeless	Rat	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
E	74	Tobacco, smokeless	Human	Oesophagus	Oesophagus	Oesophagus	14	Digestive tract	4	1		0	1
E	74	Tobacco, smokeless	Human	Pancreas	Pancreas NOS	Pancreas	18	Digestive organs	5	1		0	1
F	75	Acid mists, strong inorganic	Human	Larynx	Larynx	Larynx	9	Respiratory system	2	0	1	0	1
F	76	Aflatoxins	Human	Hepatocellular carcinoma	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	76	Aflatoxins	Rat	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	77	Aluminum production	Human	Lung	Lung	Lung	10	Respiratory system	2	0	7	0	1
F	77	Aluminum production	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	7	0	1
F	78	4-Aminobiphenyl	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	78	4-Aminobiphenyl	Dog	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1

	Suplemental Table 2. Database of Animal and Human Tumour Sites for 111 Distinct Group-1 Agents through Volume 109 of the IARC Monographs												
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number	-					Site Number		Number	Tumour Site	Lack of	Upgrade	Tumour Site
										Specified	Animal Data*		Specified
F	78	4-Aminobiphenyl	Human	Lirinary bladder	Urothelium (renal pelvis	Urothelium	27	Lirothelium	9	1		0	1
	10	4 / drintoolphenyi	riaman	officially bladder	urotor, urinony bladdor)	Crothendin	21	orotileilaitt	Ŭ			U U	
					ureter, unitary bladder)								
-	70			0.44					10				
F	78	4-Aminobiphenyl	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	79	Auramine production	Human	Urinary bladder	Urothelium (renal pelvis,	Urothelium	27	Urothelium	9	0	1	0	1
					ureter, urinary bladder)								
F	80	Benzene	Rat	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
F	80	Benzene	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
	80	Bonzono	Pot	Earostomach	Stomach	Stomach	16	Digostivo tract	4	1		0	1
	00	Berizerie	Rai	Folestollach	Stomach	Stomach	15	Digestive tract	4			0	
F	80	Benzene	Human	Acute myeloid leukaemia/acute	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and	10	1		0	1
				non-lymphocytic leukaemia				haematopoietic tissues					
F	80	Benzene	Mouse	Haematopoietic tissue	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and	10	1		0	1
					-	-		haematopoietic tissues					
F	80	Benzene	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and	10	1		0	1
	00	Denzene	Modoc	Lymphold dobde	Lymphold about	Lymphold lissue	20	boomotopoiotio tissuos	10			Ū	
-					1 1 1 1 2	1 1 1 1 2		Traematopoletic tissues	10				-
F	80	Benzene	Mouse	Inymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and	10	1		0	1
								haematopoietic tissues					
F	80	Benzene	Rat	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	80	Benzene	Mouse	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
				, , , , , , , , , , , , , , , , , , , ,				reproductive organs and					
								reproductive tract					
-		2		D	E : N00	E : N00	47		15				-
F	80	Benzene	Mouse	Preputial gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
F	80	Benzene	Mouse	Zymbal gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
F	80	Benzene	Rat	Zymbal gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
F	81	Benzidine	Mouse	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		0	1
					bile ducts			5 5					
F	81	Benzidine	Human	Lirinan/ bladder	Lirothelium (renal pelvis	Urothelium	27	Urothelium	9	1		0	1
	01	Denzidine	Tuman	Officary bladder	urster, urinen/ bladder)	orotheliditi	21	orothendrift	3	'		0	'
					ureter, unnary bladder)								
F	81	Benzidine	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
								reproductive organs and					
								reproductive tract					
F	82	Benzidine dves metabolized to	Mouse	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		1	0
	02	Denzialne, ayes metabolizea to	Mouse	Elvoi	bile ducts	Elver		Digestive organs	Ū				Ŭ
-	00	Descriding these models along the	Det	1 Summ	Lives a second	1.6	47	Discotive concern	5	4		4	0
F	82	Benzidine, dyes metabolized to	Rat	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		1	0
					bile ducts								
F	82	Benzidine, dyes metabolized to	Human	Not specified						1		1	0
F	83	Benzo[a]pyrene	Hamster	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
F	83	Benzo[a]pyrene	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
F	83	Benzola byrene	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
F	83	Benzolalovrene	Hamster	Lower respiratory tract (larvny	Lower respiratory tract	Lower respiratory tract	11	Respiratory system	2	1		1	0
1	00	Denzola Ibiterio	namotor	traches lung)	20.00 roopilatory tract	20.00 roopilatory tract			-	1 '			Ŭ
-	00	Penzel classes -	Hometer	Forestaresh	Charrent	Charren-h	45	Digeotive treat	4	4	1		-
	03	Denzola Ipyrene	mainster	Forestomach	Stomach	Siomach	15	Digestive tract	4				0
	83	Benzola jpyrene	Mouse	Forestomach	Stomach	Stomach	15	Digestive tract	4	1	1	1	0
F	83	Benzo[a]pyrene	Mouse	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		1	0
		<u> </u>			bile ducts		L		L	<u> </u>			
F	83	Benzo[a]pyrene	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and	10	1		1	0
1							-	haematopoietic tissues	-		1		
F	83	Benzolalovrene	Hamster	Skin	Skin and adnessa	Skin and adnesses	30	Skin	11	1	1	1	0
H	00	Benzolalpyrene	Mauga	Okin	Skip and adness	Skip and adness	30	Okin	44	1	1	4	0
<u> </u>	83	Benzola jpyrene	iviouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11			1	U
F -	83	Benzola jpyrene	Kat	Skin	Skin and adnexae	Skin and adnexae	30	SKIN	11	1		1	U
F	83	Benzo[a]pyrene	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		1	0
1					1	1		reproductive organs and	1		1		
1					1	1		reproductive tract	1		1		
F	83	Benzola lovrene	Human	Not specified			1		1	1	1	1	0
F	84	Bis(chloromethyl)ether:	Rat	Nasal cavity	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	1	1	0	1
1	04	chloromethyl methyl other	mai	Inabal Gavity	naranaeol cinucos	inasai cavity		opper derouigeauve tract	'	'		v	'
1		chorometry metry etter			paranasai sinuses	1		1	1		1		
		(technical-grade)									1		<u> </u>
F	84	Bis(chloromethyl)ether;	Human	Lung	Lung	Lung	10	Respiratory system	2	1	1	0	1
		chloromethyl methyl ether											
1		(technical-grade)			1	1		1	1		1		
F	84	Bis(chloromethyl)ether	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1	1	0	1
1	Ŭ.	chloromethyl methyl ether		0				C.a.i		· ·		Ŭ	
		(technical grade)											
L		(lecillical-grade)					1			1	1	1	

	Suplemental Table 2. Database of Animal and Human Tumour Sites for 111 Distinct Group-1 Agents through Volume 109 of the IARC Monographs												
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
F	84	Bis(chloromethyl)ether; chloromethyl methyl ether (technical-grade)	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	85	1,3-Butadiene	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	85	1,3-Butadiene	Mouse	Forestomach	Stomach	Stomach	15	Digestive tract	4	1		0	1
F	85	1,3-Butadiene	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	85	1,3-Butadiene	Human	Haematolymphatic organs	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
F	85	1,3-Butadiene	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
F	85	1,3-Butadiene	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	85	1,3-Butadiene	Mouse	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		0	1
F	85	1,3-Butadiene	Mouse	Harderian gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
F	85	1,3-Butadiene	Mouse	Preputial gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
F	86	Coal gasification	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	86	Coal gasification	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	87	Coal-tar distillation	Human	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
- F	87	Coal-tar distillation	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
- F	88	Coal-tar pitch	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	88	Coal-tar pitch	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	89	Coke production	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	89	Coke production	Nouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	89	Coke production	Rat	Lung	Lung Skip and adpayoe	Lung Skip and adnesses	10	Respiratory system	2	1		0	1
	09	Ethylene exide	Mouse	Skill	Skin and adhexae	Skin and adnexae	30	Beenirotory eveter	11	1		0	0
	90	Ethylene oxide	Rot	Boritonoum	Lung	Lung	10	Mosothalium	2	1		1	0
F	90	Ethylene oxide	Pat	Brain	Brain and spinal cord	CNS	20	Nervous system and eve	6	1		1	0
	90	Ethylene oxide	Rat		(CNS)	Lymphoid tissue	20	Lymphoid and	10	1		1	0
- ' - F	90	Ethylene oxide	Human	Not specified		Lymphold lissue	23	haematopoietic tissues	10	1		1	0
F	91	Formaldehyde	Rat	Nasal cavity	Nasal cavity and	Nasal cavity	1	Upper aerodigestive tract	1	1		0	1
F	91	Formaldehyde	Human	Nasopharynx	Nasopharvnx	Nasopharvnx	2	Upper aerodigestive tract	1	1		0	1
F	91	Formaldehyde	Human	Leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	1		0	1
F	92	Iron and steel founding (occupational exposure during)	Human	Lung	Lung	Lung	10	Respiratory system	2	0	1	0	1
F	93	Isopropyl alcohol manufacture using strong acids	Human	Nasal cavity	Nasal cavity and paranasal sinuses	Nasal cavity	1	Upper aerodigestive tract	1	0	1	0	1
F	94	Magenta production	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	1	0	1
F	95	4,4'-Methylenebis(2- chloroaniline) (MOCA)	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		1	0
F	95	4,4'-Methylenebis(2- chloroaniline) (MOCA)	Rat	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		1	0
F	95	4,4'-Methylenebis(2- chloroaniline) (MOCA)	Rat	Mammary gland	Breast	Breast	35	Female breast, female reproductive organs and reproductive tract	13	1		1	0
F	95	4,4'-Methylenebis(2- chloroaniline) (MOCA)	Human	Not specified						1		1	0
F	96	Mineral oils, untreated or mildly treated	Human	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	96	Mineral oils, untreated or mildly treated	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	97	2-Naphthylamine	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	97	2-Naphthylamine	Dog	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1

	Suplemental Table 2. Database of Animal and Human Tumour Sites for 111 Distinct Group-1 Agents through Volume 109 of the IARC Monographs												
Volume	Agent Number	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical Site Number	Organ System	Organ System Number	Animal Tumour Site Specified	Reason for Lack of Animal Data*	Mechanistic Upgrade	Human Tumour Site Specified
F	97	2-Naphthylamine	Hamster	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	97	2-Naphthylamine	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	97	2-Naphthylamine	Monkey	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	97	2-Naphthylamine	Rat	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	98	ortho-Toluidine	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	98	ortho-Toluidine	Rat	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	1		0	1
F	98	ortho-Toluidine	Rat	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	98	ortho-Toluidine	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	99	Painter, occupational exposure	Human	Lung	Lung	Lung	10	Respiratory system	2	0	1	0	1
F	99	Painter, occupational exposure	Human	Mesothelioma	Mesothelium	Mesothelium	12	Mesothelium	3	0	1	0	1
F	99	Painter, occupational exposure	Human	Urinary bladder	Urothelium (renal pelvis, ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	1	0	1
F	100	2,3,4,7,8- Pentachlorodibenzofuran	Human	Not specified					-	0	7	1	0
F	101	Rubber manufacturing industry	Human	Lung	Lung	Lung	10	Respiratory system	2	0	1	0	1
F	101	Rubber manufacturing industry	Human	Stomach	Stomach	Stomach	15	Digestive tract	4	0	1	0	1
F	101	Rubber manuracturing industry	Human	Uninary bladder	ureter, urinary bladder)	Urothelium	27	Urothelium	9	0	1	0	1
F	101	Rubber manufacturing industry	Human	Leukaemia	Haematopoietic tissue	Haematopoietic tissue	28	Lymphoid and haematopoietic tissues	10	0	1	0	1
F	101	Rubber manufacturing industry	Human	Lymphoma	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	0	1	0	1
F	102	Shale oils	Human	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
	102	Shale oils	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
F	103	Soot (as found in occupational exposure of chimney sweeps)	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
- F	103	exposure of chimney sweeps)	Mouse	Skin	Skin and adhexae	Skin and adnexae	30	Skin	11	1		0	1
	105	exposure of chimney sweeps)	Mouse	OKIT	Okin and adhexae		50	OKIT				0	
F	104	Sulfur mustard	Human	Lung	Lung	Lung	10	Respiratory system	2	0	6	0	1
F	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Rat	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
F	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
F	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Mouse	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Rat	Liver	Liver parenchyma and bile ducts	Liver	17	Digestive organs	5	1		0	1
F	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Mouse	Lymphoid tissue	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
F 	105	2,3,7,8-Tetrachlorodibenzo-para- dioxin	Mouse	Thymus	Lymphoid tissue	Lymphoid tissue	29	Lymphoid and haematopoietic tissues	10	1		0	1
F	105	2,3,7,8-1 etrachlorodibenzo-para- dioxin	Mouse	Skin	Skin and adnexae	Skin and adnexae	30	Skin	11	1		0	1
	105	2,3,7,8- i etracniorodibenzo-para- dioxin	Human	All cancers combined	All cancers combined	All cancers combined	43	Other groupings	15	1		0	1
F	106	Vinyi chlorida	Human	Lung Hepatocellular carcinoma	Lung	Lung	10	Respiratory system	<u>ک</u>	1		0	1
F	106	Vinyl chloride	Rat	Liver	bile ducts	Liver	17		5	1		0	1
Г	100	vinyi chionde	nat	LIVEI	bile ducts	LIVEI		Digeotive Olgano	5			5	

	Suplemental Table 2. Database of Animal and Human Tumour Sites for 111 Distinct Group-1 Agents through Volume 109 of the IARC Monographs												
Volume	Agent	Agent Name	Species	Site	Anatomical Site	Anatomical Site Label	Anatomical	Organ System	Organ System	Animal	Reason for	Mechanistic	Human
	Number						Site Number		Number	Tumour Site	Lack of	Upgrade	Tumour Site
										Specified	Animal Data*		Specified
F	106	Vinyl chloride	Mouse	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	106	Vinyl chloride	Rat	Soft tissue	Soft connective tissue	Soft connective tissue	32	Connective tissues	12	1		0	1
F	106	Vinyl chloride	Human	Angiosarcoma of the liver	Blood vasculature (endothelium)	Blood vasculature	33	Connective tissues	12	1		0	1
F	106	Vinyl chloride	Mouse	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
	1						1	reproductive organs and				1	1
							l	reproductive tract					·'
F	106	Vinyl chloride	Rat	Mammary gland	Breast	Breast	35	Female breast, female	13	1		0	1
	1						1	reproductive organs and				1	1
I							l	reproductive tract					L
F	106	Vinyl chloride	Rat	Zymbal gland	Exocrine glands NOS	Exocrine glands NOS	47	Other groupings	15	1		0	1
105	107	Engine Exhaust, diesel	Human	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
105	107	Engine Exhaust, diesel	Rat	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
106	108	Trichloroethylene	Mouse	Lung	Lung	Lung	10	Respiratory system	2	1		0	1
106	108	Trichloroethylene	Mouse	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		0	1
	'				bile ducts		1	-				'	1
106	108	Trichloroethylene	Human	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
106	108	Trichloroethylene	Rat	Kidney	Kidney	Kidney	26	Kidney	8	1		0	1
107	109	Polychlorinated biphenyls	Rat	Oral cavity	Oral cavity	Oral cavity	3	Upper aerodigestive tract	1	1		0	1
107	109	Polychlorinated biphenyls	Rat	Liver	Liver parenchyma and	Liver	17	Digestive organs	5	1		0	1
					bile ducts								1
107	109	Polychlorinated biphenyls	Human	Skin (melanoma)	Cutaneous melanocytes	Cutaneous melanocytes	31	Skin	11	1		0	1
109	110	Outdoor air pollution	Human	Lung	Lung	Lung	10	Respiratory system	2	0	7	0	1
109	111	Particulate matter in outdoor air	Human	Lung	Lung	Lung	10	Respiratory system	2	0	7	0	1
	'	pollution		-	-		1					'	1
		*Reasons for Lack	of Animal Data:	1 - Occupational exposure no	t replicable in laboratory	; 2 - Used in combinatior	n with no data c	on mixture; 3 - Animal mode	ls problematic d	ue to species	-specificity		
1			4 - Anima	al tosts inadoquato: 5 - No anir	nal data available: 6 - Lin	nited avidence in animal	c · 7 - Sufficion	tovidonco in animale, but n	a site specified	1 1			

Supplemental Table 3. Data Dictionary for the Anatomically-based Tumour Site Concordance Database

Data Element	Description	Coding
Volume	IARC Monographs Volume from which the data were abstracted	100A, 100B, 100C, 100D, 100E, 100F, 105, 106, 107, 109
Agent Number	Number assigned to agents listed in alphabetical order (see Table 1)	1, 2,,111
Agent Name	Name of the agent as listed in the IARC Monographs	
Species	Species from which the data were derived	Human, Rat, Mouse, Hamster, Dog, Monkey, Baboon
Site	The tumour site, as abstracted from the IARC Monographs (see Table 1)	
Anatomical Site	Coding of the tumour site into an anatomical site based on The Organ and Tumour Site Nomenclature Table	See Table 3
Anatomical Site Number	Number assigned to anatomical tumour site	1, 2,, 47(see Table 4)
Organ System	Organ and tissue system to which the anatomical tumour site belongs	See Table 3
Organ System Number	Number assigned to the organ and tissue system	1, 2,,15 (see Table 4)
Animal Data Available	Indicator variable indicating the availability of	0- No animal data available 1- Animal data available
Reason for Lack of Animal Data	Reason for lack of sufficient evidence of carcinogenicity in animals	 1-Occupational exposures are complex and likely could not be reliably replicated in the laboratory 2- Used in combination; no data available on mixture 3- Animal tests were conducted by are considered inadequate

		4-The use of animal models is problematic due to species-specificity and other limitations5- No animal data available
Mechanistic Upgrade	Indicator variable to identify agents assigned to Group-1 on the basis of a mechanistic upgrade	0- No mechanistic upgrade 1- Mechanistic upgrade
Tumour Site Specified	Indicator variable to confirm the determination of a specific tumour site by the WG	0- No tumour site specified 1- Tumour site(s) specified

Supplemental Table 4. Numerical Coding of Anatomically-based Tumour Sites and Organ and Tissue Systems

Anatomical Site	Anatomical Site Number
Upper Aerodigestive Tract (1)	
Nasal cavity and paranasal sinuses	1
Nasopharynx	2
Oral cavity	3
Pharynx	4
Tongue	5
Tonsil	6
Salivary gland	7
Respiratory System (2)	
Trachea	8
Larynx	9
Lung	10
Lower respiratory tract	11
Mesothelium (3)	
Mesothelium	12
Digestive Tract (4)	
Digestive tract, unspecified	13
Oesophagus	14
Stomach	15
Intestine (including colon and rectum)	16
Digestive Organs (5)	
Liver parenchyma and bile ducts	17
Pancreas NOS	18
Gall bladder	19
Nervous System and Eye (6)	

Brain and spinal cord (CNS)	20						
Cranial and peripheral nerves	21						
Еуе	22						
Endocrine System (7)							
Thyroid, follicular epithelium	23						
Adrenal gland (medulla, cortex, NOS)	24						
Pituitary	25						
Kidney (8)							
Kidney (renal cortex, renal medulla, kidney NOS)	26						
Urothelium (9)							
Urothelium (renal pelvis or ureter or urinary bladder)	27						
Lymphoid and Haematopoietic Tissues (10)							
Haematopoietic tissue	28						
Lymphoid tissue	29						
Skin (11)							
Skin and adnexae	30						
Cutaneous melanocytes	31						
Connective Tissues (12)							
Soft connective tissue	32						
Blood vasculature (endothelium)	33						
Hard connective tissue (bone, cartilage)	34						
Female Breast, Female Reproductive Organs and Reproduc	ctive Tract (13)						
Breast	35						
Ovary	36						
Uterine cervix	37						
Uterus	38						
Vulva/vagina	39						
Male Reproductive System (14)							

Testis, germ cells	40						
Testis, specialized gonadal stroma	41						
Prostate	42						
Other Groupings (15)							
All cancers combined	43						
All solid cancers	44						
Solid cancers, aside from lung	45						
Multiple or unspecified sites	46						
Exocrine glands NOS	47						

	Supplemental Table 5. Group-1 Agents With at	Least On	e Tumour Site Specified i	n Humans and in Animals (60 agents)
Volume	Agent	Species	Tissue Site	Organ and Tissue System
А	Aristolochic acid, plants containing	Rat	Stomach	Digestive tract
А	Aristolochic acid, plants containing	Human	Urothelium	Urothelium
A	Aristolochic acid, plants containing	Rat	Urothelium	Urothelium
A	Aristolochic acid, plants containing	Human	Urothelium	Urothelium
A	Azathioprine	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
A	Azathioprine	Human	Lymphoid tissue	Lymphoid and haematopoietic tissues
A	Azathioprine	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
A	Azatnioprine	Human	Skin and adnexae	SKIN
A	Chlorambucil	Mouso	Iumphoid tissue	Lymphoid and haematopoletic tissues
Δ	Cyclophosphamide	Mouse		Respiratory system
Δ	Cyclophosphamide	Human	Urothelium	Urothelium
A	Cyclophosphamide	Rat	Urothelium	Urothelium
A	Cyclophosphamide	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
A	Cyclophosphamide	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
А	Cyclophosphamide	Mouse	Breast	Female breast, female reproductive organs and reproductive tract
Α	Diethylstilbestrol	Hamster	Kidney	Kidney
А	Diethylstilbestrol	Human	Breast	Female breast, female reproductive organs and reproductive tract
А	Diethylstilbestrol	Human	Cervix	Female breast, female reproductive organs and reproductive tract
Α	Diethylstilbestrol	Mouse	Cervix	Female breast, female reproductive organs and reproductive tract
Α	Diethylstilbestrol	Mouse	Uterus	Female breast, female reproductive organs and reproductive tract
A	Diethylstilbestrol	Human	Vulva/vagina	Female breast, female reproductive organs and reproductive tract
A	Estrogen-only menopausal therapy	Hamster	Kidney	Kidney
Α	Estrogen-only menopausal therapy	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
A	Estrogen-only menopausal therapy	Mouse	Breast	Female breast, female reproductive organs and reproductive tract
A	Estrogen-only menopausal therapy	Kat	Breast	Female breast, female reproductive organs and reproductive tract
A	Estrogen-only menopausal therapy	Human	Ovary	Female breast, female reproductive organs and reproductive tract
A	Estrogen-only menopausal therapy	Mouse	Cervix	Female breast, female reproductive organs and reproductive tract
A	Estrogen only menopausal therapy	Human	Uterus	Female breast, remain reproductive organs and reproductive tract
A	Estrogen-only menopausal therapy	Niouse	Uterus	Permaie breast, female reproductive organs and reproductive tract
A	Estrogen-progestogen oral contraceptives (combined)	Human	Liver	Digestive organs
A	Estrogen-progestogen oral contraceptives (combined)	Human	Breast	Female breast, female reproductive organs and reproductive tract
A 	Estrogen progestagen oral contraceptives (combined)	Pot	Broast	Female breast, female reproductive organs and reproductive tract
^	Methovsalen in combination with LIVA	Mouse	Skin and adnesse	Ckin
Δ	Methoxsalen in combination with UVA	Human	Skin and adnexae	Skin
Δ	Phenacetin	Mouse	Kidney	Kidnev
Δ	Phenacetin	Rat	Kidney	Kidney
Δ	Phenacetin	Human	Urothelium	Urothelium
A	Phenacetin	Rat	Urothelium	Urothelium
A	Phenacetin	Human	Urothelium	Urothelium
А	Tamoxifen	Rat	Liver	Digestive organs
Α	Tamoxifen	Human	Uterus	Female breast, female reproductive organs and reproductive tract
А	Thiotepa	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
А	Thiotepa	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
В	Helicobacter pylori (infection with)	Mouse	Stomach	Digestive tract
В	Helicobacter pylori (infection with)	Human	Stomach	Digestive tract
В	Helicobacter pylori (infection with)	Human	Lymphoid tissue	Lymphoid and haematopoietic tissues
С	Arsenic and inorganic arsenic compounds	Human	Lung	Respiratory system
С	Arsenic and inorganic arsenic compounds	Mouse	Lung	Respiratory system
С	Arsenic and inorganic arsenic compounds	Mouse	Liver	Digestive organs
С	Arsenic and inorganic arsenic compounds	Human	Urothelium	Urothelium
С	Arsenic and inorganic arsenic compounds	Rat	Urothelium	Urothelium
С	Arsenic and inorganic arsenic compounds	Human	Skin and adnexae	Skin
С	Asbestos (all forms)	Human	Larynx	Respiratory system
C	Asbestos (all forms)	Human	Lung	Respiratory system
C	Asbestos (all forms)	Kat	Lung	Kespiratory system
C	Asbestos (all forms)	Human	iviesothelium Masathalium	Nessthelium
C C	Asbestos (all IOTIIIS)	Dau000	Mosotholium	Macathalium
C C	Ashertos (all forms)	Rat	Mesothelium	Mesothelium
C C	Ashestos (all forms)	Human	Ovary	Female breast female reproductive organs and reproductive tract
C	Bervilium and bervilium compounds	Human	Lung	Respiratory system
c.	Bervilium and bervilium compounds	Rat	Lung	Respiratory system
c	Cadmium and cadmium compounds	Human	Lung	Respiratory system
C	Cadmium and cadmium compounds	Rat	Lung	Respiratory system
С	Cadmium and cadmium compounds	Rat	Soft connective tissue	Connective tissues
С	Chromium (VI) compounds	Rat	Oral cavity	Upper aerodigestive tract
С	Chromium (VI) compounds	Rat	Tongue	Upper aerodigestive tract
С	Chromium (VI) compounds	Human	Lung	Respiratory system
С	Chromium (VI) compounds	Rat	Lung	Respiratory system
С	Chromium (VI) compounds	Mouse	Intestine	Digestive tract
С	Chromium (VI) compounds	Mouse	Intestine	Digestive tract
С	Chromium (VI) compounds	Mouse	Intestine	Digestive tract
С	Chromium (VI) compounds	Mouse	Intestine	Digestive tract
С	Chromium (VI) compounds	Rat	Soft connective tissue	Connective tissues
С	Erionite	Human	Mesothelium	Mesothelium
С	Erionite	Rat	Mesothelium	Mesothelium
С	Nickel compounds	Human	Nasal cavity	Upper aerodigestive tract
С	Nickel compounds	Human	Lung	Respiratory system
С	Nickel compounds	Rat	Lung	Respiratory system

	Supplemental Table 5. Group-1 Agents With at	Least On	e Tumour Site Specified i	n Humans and in Animals (60 agents)
Volume	Agent	Species	Tissue Site	Organ and Tissue System
С	Nickel compounds	Rat	Adrenal gland	Endocrine system
С	Nickel compounds	Hamster	Soft connective tissue	Connective tissues
С	Nickel compounds	Mouse	Soft connective tissue	Connective tissues
С	Nickel compounds	Rat	Soft connective tissue	Connective tissues
C	Silica dust, crystalline, in the form of quartz or cristobalite	Human	Lung	Respiratory system
C	Silica dust, crystalline, in the form of guartz or cristobalite	Rat	Lung	Respiratory system
C	Silica dust, crystalline, in the form of quartz or cristobalite	Rat	Lymphoid tissue	lymphoid and baematopoietic tissues
D	Fission products including Sr-90	Human	Haematonoietic tissue	Lymphoid and haematopoletic tissues
D	Fission products including Sr-50	Dog	Hard connective tissue	
D	Fission products including St-50	Maura	Hard connective tissue	Connective tissues
D	Fission products including St-90	Niouse	All collid concorre	Other groupings
D	Pission products including SI-90	Human		
D	Haematite mining with exposure to radon (underground)	Human	Lung	Respiratory system
D	Haematite mining with exposure to radon (underground)	Rat	Lung	Respiratory system
D	Pu-239	Dog	Lung	Respiratory system
D	Pu-239	Human	Lung	Respiratory system
D	Pu-239	Rat	Lung	Respiratory system
D	Pu-239	Dog	Liver	Digestive organs
D	Pu-239	Human	Liver	Digestive organs
D	Pu-239	Human	Hard connective tissue	Connective tissues
D	Pu-239	Dog	Hard connective tissue	Connective tissues
D	Pu-239	Mouse	Hard connective tissue	Connective tissues
D	Pu-239	Rat	Hard connective tissue	Connective tissues
D	Radioiodines, including I-131	Human	Thyroid	Endocrine system
D	Radioiodines, including I-131	Mouse	Thyroid	Endocrine system
D	Radioiodines, including I-131	Rat	Thyroid	Endocrine system
D	Ra-224 and its decay products	Human	Hard connective tissue	Connective tissues
D	Ra-224 and its decay products	Dog	Hard connective tissue	Connective tissues
D	Ra-224 and its decay products	Mouse	Hard connective tissue	Connective tissues
D	Ra-226 and its decay products	Human	Nasal cavity	Upper aerodigestive tract
D	Ra-226 and its decay products	Human	Hard connective tissue	Connective tissues
D	Ra-226 and its decay products	Human	Hard connective tissue	Connective tissues
D	Ra-226 and its decay products	Dog	Hard connective tissue	Connective tissues
D	Ra-226 and its decay products	Mouse	Hard connective tissue	Connective tissues
D	Ra-228 and its decay products	Human	Hard connective tissue	Connective tissues
D	Ra-228 and its decay products	Dog	Hard connective tissue	Connective tissues
D	Rn-222 and its decay products	Human	Lung	Respiratory system
D	Rn-222 and its decay products	Rat	Lung	Respiratory system
D	Solar radiation	Mouse	Skin and adnexae	Skin
D	Solar radiation	Rat	Skin and adnexae	Skin
D	Solar radiation	Human	Skin and adnexae	Skin
D	Solar radiation	Human	Cutaneous melanocytes	Skin
D	Th-232 (as Thorotrast)	Human	Liver	Digestive organs
D	Th-232 (as Thorotrast)	Hamster	Liver	Digestive organs
D	Th-232 (as Thorotrast)	Human	Liver	Digestive organs
D	Th-232 (as Thorotrast)	Rat	Liver	
D	Th-232 (as Thorotrast)	Human	Gall bladder	
D	Th-232 (as Thorotrast)	Human	Haematonoietic tissue	Lymphoid and haematopoietic tissues
D	IIV-emitting tanning devices	Human	Eve	Nervous system and eve
D	IV emitting tanning devices	Mouro	Skin and adnovao	Ckin
D	UV emitting tanning devices	Human		Skin
D	V and Comma radiation	Human	Calivory gland	Jone paradigestive tract
D		Human	Salivary glallu	
D		numan		
D	A- driu Gamma radiation	IVIOUSE	Luiig	Respiratory system
D	X- and Gamma radiation	Human	Oesophagus	Digestive tract
U		riuman	Stomach	Digestive tract
D	x- and Gamma radiation	Human	intestine	Digestive tract
υ	x- and Gamma radiation	Mouse	Liver	Digestive organs
D	X- and Gamma radiation	Human	CNS	Nervous system and eye
D	X- and Gamma radiation	Human	Thyroid	Endocrine system
D	X- and Gamma radiation	Kat	Thyroid	Endocrine system
D	X- and Gamma radiation	Mouse	Pituitary	Endocrine system
D	X- and Gamma radiation	Human	Kidney	Kidney
D	X- and Gamma radiation	Monkey	Kidney	Kidney
D	X- and Gamma radiation	Human	Urothelium	Urothelium
D	X- and Gamma radiation	Mouse	Haematopoietic tissue	Lymphoid and haematopoietic tissues
D	X- and Gamma radiation	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
D	X- and Gamma radiation	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
D	X- and Gamma radiation	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
D	X- and Gamma radiation	Human	Skin and adnexae	Skin
D	X- and Gamma radiation	Mouse	Soft connective tissue	Connective tissues
D	X- and Gamma radiation	Human	Hard connective tissue	Connective tissues
D	X- and Gamma radiation	Human	Breast	Female breast, female reproductive organs and reproductive tract
D	X- and Gamma radiation	Mouse	Breast	Female breast, female reproductive organs and reproductive tract
D	X- and Gamma radiation	Rat	Breast	Female breast, female reproductive organs and reproductive tract
D	X- and Gamma radiation	Mouse	Ovary	Female breast, female reproductive organs and reproductive tract
D	X- and Gamma radiation	Mouse	Exocrine glands NOS	Other groupings
E	Alcoholic beverages	Human	Oral cavity	Upper aerodigestive tract
E	Alcoholic beverages	Rat	Oral cavity	Upper aerodigestive tract
E	Alcoholic beverages	Human	Pharynx	Upper aerodigestive tract
E	Alcoholic beverages	Human	Larynx	Respiratory system
E	Alcoholic beverages	Human	Oesophagus	Digestive tract

	Supplemental Table 5. Group-1 Agents With at	Least On	e Tumour Site Specified i	n Humans and in Animals (60 agents)
Volume	Agent	Species	Tissue Site	Organ and Tissue System
E	Alcoholic beverages	Human	Intestine	Digestive tract
E	Alcoholic beverages	Human	Liver	Digestive organs
E	Alcoholic beverages	Human	Breast	Female breast, female reproductive organs and reproductive tract
Е	Betel quid without tobacco	Human	Oral cavity	Upper aerodigestive tract
Е	Betel quid without tobacco	Human	Oesophagus	Digestive tract
E	Betel quid without tobacco	Hamster	Stomach	Digestive tract
E	Coal, indoor emissions from household combusion of	Human	Lung	Respiratory system
E	Coal, indoor emissions from household combusion of	Mouse	Lung	Respiratory system
E	Coal, indoor emissions from household combusion of	Mouse	Skin and adnexae	Skin
E	Salted fish, chinese style	Rat	Nasal cavity	Upper aerodigestive tract
Е	Salted fish, chinese style	Rat	Nasal cavity	Upper aerodigestive tract
E	Salted fish, chinese style	Rat	Nasopharynx	Upper aerodigestive tract
E	Salted fish, chinese style	Human	Nasopharynx	Upper aerodigestive tract
F	Second-hand tobacco smoke	Human	Lung	Respiratory system
F	Second-hand tobacco smoke	Mouse	Lung	Respiratory system
F	Tobacco smoking	Human	Nasal cavity	Upper aerodigestive tract
F	Tobacco smoking	Human	Nasal cavity	Upper aerodigestive tract
F	Tobacco smoking	Human	Nasonharvny	Upper aerodigestive tract
F	Tobacco smoking	Human	Oral cavity	Upper perodigestive tract
F	Tobacco smoking	Human	Pharway	Upper aerodigestive tract
с с	Tobacco smoking	Human		Posniratory system
E .	Tobacco smoking	Human		Perpiratory system
с г		Human	Luiig	
E r	Tobacco smoking	Mourse	Lai yiix	Nespiratory system
с г	Tobacco smoking	Pot	Lung	Nespiratory system
E r	Tobassa smalling	ndt	Luiig	Nespiratory system
E r	Tobacco smoking	Human	Oesophagus Chamainh	Digestive tract
E	Tobacco smoking	Human	Stomacn	Digestive tract
E –		Human	intestine	Digestive tract
E	I ODACCO SMOKING	Human	Liver	Digestive organs
E	Tobacco smoking	Human	Liver	Digestive organs
E	Tobacco smoking	Human	Pancreas	Digestive organs
E	Tobacco smoking	Human	Kidney	Kidney
E	Tobacco smoking	Human	Urothelium	Urothelium
E	Tobacco smoking	Human	Urothelium	Urothelium
E	Tobacco smoking	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
E	Tobacco smoking	Mouse	Skin and adnexae	Skin
E	Tobacco smoking	Human	Ovary	Female breast, female reproductive organs and reproductive tract
E	Tobacco smoking	Human	Cervix	Female breast, female reproductive organs and reproductive tract
E	Tobacco, smokeless	Rat	Oral cavity	Upper aerodigestive tract
E	Tobacco, smokeless	Human	Oral cavity	Upper aerodigestive tract
E	Tobacco, smokeless	Rat	Oral cavity	Upper aerodigestive tract
Е	Tobacco, smokeless	Human	Oesophagus	Digestive tract
E	Tobacco, smokeless	Human	Pancreas	Digestive organs
F	Aflatoxins	Human	Liver	Digestive organs
F	Aflatoxins	Rat	Liver	Digestive organs
F	4-Aminobiphenyl	Mouse	Liver	Digestive organs
F	4-Aminobiphenyl	Dog	Urothelium	Urothelium
F	4-Aminobiphenyl	Human	Urothelium	Urothelium
F	4-Aminobiphenyl	Mouse	Soft connective tissue	Connective tissues
F	Benzene	Rat	Oral cavity	Upper aerodigestive tract
F	Benzene	Mouse	Lung	Respiratory system
F	Benzene	Rat	Stomach	Digestive tract
F	Renzene	Human	Haematonoietic tissue	Lymphoid and baematopoietic tissues
F	Benzene	Mouse	Haematopoletic tissue	Lymphoid and haematopoletic tissues
F	Benzene	Mouse	Lymnhoid tissue	Lymphoid and haematopoietic tissues
F	Benzene	Mouse	Lymphoid tissue	Lymphoid and haematopoletic tissues
r' E	Renzene	Rat	Skin and adnesse	Skin
r c	Renzene	Mource	Breast	Emale breast, female reproductive organs and reproductive tract
r r	Penzene	Mouse	Everine glands NOC	Other groupings
r	Ponzono	Mouse		Other groupings
r	Benzene	Not	Exocrime glands NOS	Other groupings
۲ ج	Denziding	ndl	EXOLUTINE gidmus INOS	Digestive ergans
F	Benzialie	iviouse	Liver	Digestive organs
F	Benziaine	Human	orothelium	urotnellum
F	Benzidine	Rat	Breast	Female breast, female reproductive organs and reproductive tract
F	Bis(cnioromethyl)ether; chloromethyl methyl ether (technical-grade)	кat	Nasal cavity	Upper aerodigestive tract
F	Bis(chloromethyl)ether; chloromethyl methyl ether (technical-grade)	Human	Lung	Respiratory system
F	Bis(cnioromethyl)ether; chioromethyl methyl ether (technical-grade)	Mouse	Skin and adnexae	skin
F	Bis(chloromethyl)ether; chloromethyl methyl ether (technical-grade)	Mouse	Soft connective tissue	Connective tissues
F	1,3-Butadiene	Mouse	Lung	Respiratory system
F	1,3-Butadiene	Mouse	Stomach	Digestive tract
F	1,3-Butadiene	Mouse	Liver	Digestive organs
F	1,3-Butadiene	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
F	1,3-Butadiene	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
F	1,3-Butadiene	Mouse	Soft connective tissue	Connective tissues
F	1,3-Butadiene	Mouse	Breast	Female breast, female reproductive organs and reproductive tract
F	1,3-Butadiene	Mouse	Exocrine glands NOS	Other groupings
F	1,3-Butadiene	Mouse	Exocrine glands NOS	Other groupings
F	Coal gasification	Human	Lung	Respiratory system
F	Coal gasification	Mouse	Skin and adnexae	Skin
F	Coal-tar distillation	Human	Skin and adnexae	Skin
F	Coal-tar distillation	Mouse	Skin and adnexae	Skin

	Supplemental Table 5. Group-1 Agents With at	e Tumour Site Specified i	n Humans and in Animals (60 agents)	
Volume	Agent	Species	Tissue Site	Organ and Tissue System
F	Coal-tar pitch	Human	Lung	Respiratory system
F	Coal-tar pitch	Mouse	Skin and adnexae	Skin
F	Coke production	Human	Lung	Respiratory system
F	Coke production	Mouse	Lung	Respiratory system
F	Coke production	Rat	Lung	Respiratory system
F	Coke production	Mouse	Skin and adnexae	Skin
F	Formaldehyde	Rat	Nasal cavity	Upper aerodigestive tract
F	Formaldehyde	Human	Nasopharynx	Upper aerodigestive tract
F	Formaldehyde	Human	Haematopoietic tissue	Lymphoid and haematopoietic tissues
F	Mineral oils, untreated or mildly treated	Human	Skin and adnexae	Skin
F	Mineral oils, untreated or mildly treated	Mouse	Skin and adnexae	Skin
F	2-Naphthylamine	Mouse	Liver	Digestive organs
F	2-Naphthylamine	Dog	Urothelium	Urothelium
F	2-Naphthylamine	Hamster	Urothelium	Urothelium
F	2-Naphthylamine	Human	Urothelium	Urothelium
F	2-Naphthylamine	Monkey	Urothelium	Urothelium
F	2-Naphthylamine	Rat	Urothelium	Urothelium
F	ortho-Toluidine	Human	Urothelium	Urothelium
F	ortho-Toluidine	Rat	Urothelium	Urothelium
F	ortho-Toluidine	Rat	Skin and adnexae	Skin
F	ortho-Toluidine	Mouse	Soft connective tissue	Connective tissues
F	Shale oils	Human	Skin and adnexae	Skin
F	Shale oils	Mouse	Skin and adnexae	Skin
F	Soot (as found in occupational exposure of chimney sweeps)	Human	Lung	Respiratory system
F	Soot (as found in occupational exposure of chimney sweeps)	Human	Skin and adnexae	Skin
F	Soot (as found in occupational exposure of chimney sweeps)	Mouse	Skin and adnexae	Skin
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Rat	Oral cavity	Upper aerodigestive tract
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Rat	Lung	Respiratory system
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Mouse	Liver	Digestive organs
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Rat	Liver	Digestive organs
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Mouse	Lymphoid tissue	Lymphoid and haematopoietic tissues
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Mouse	Skin and adnexae	Skin
F	2,3,7,8-Tetrachlorodibenzo-para-dioxin	Human	All cancers combined	Other groupings
F	Vinyl chloride	Mouse	Lung	Respiratory system
F	Vinyl chloride	Human	Liver	Digestive organs
F	Vinyi chloride	Rat	Liver	Digestive organs
F	Vinyi chloride	Niouse	Soft connective tissue	Connective tissues
г г	Vinyi chloride	Kdl	Soft connective tissue	Connective tissues
F	Vinyl chloride	Mouse	Broast	Eemale breast, female reproductive organs and reproductive tract
F	Vinyl chloride	Rat	Breast	Female breast, female reproductive organs and reproductive tract
F	Vinyl chloride	Rat	Exocrine glands NOS	Other groupings
F	Engine Exhaust diesel	Human		Respiratory system
F	Engine Exhaust, diesel	Rat		Respiratory system
F	Trichloroethylene	Mouse	Lung	Respiratory system
F	Trichloroethylene	Mouse	Liver	Digestive organs
F	Trichloroethylene	Human	Kidney	Kidney
F	Trichloroethylene	Rat	Kidney	Kidney
F	Polychlorinated biphenyls	Rat	Oral cavity	Upper aerodigestive tract
F	Polychlorinated biphenyls	Rat	Liver	Digestive organs
F	Polychlorinated biphenyls	Human	Cutaneous melanocytes	Skin



Supplemental Figure 1: Number of Agents Inducing Tumours in Humans in Each of 39 Tumour Sites by Type of Agent

Supplemental Figure 2: Number of Agents Inducing Tumours in Animals in Each of 39 Tumour Sites by Type of Agent

Supplemental Figure 3: Number of Agents Inducing Tumours in Mice in Each of 39 Tumour Sites by Type of Agent

Supplemental Figure 4: Number of Agents Inducing Tumours in Rats in Each of 39 Tumour Sites by Type of Agent

Volume

Pharmaceuticals Biologicals Arsenic, Metals, Fibres & Dusts Radiation Lifestyle Chemicals

Supplemental Figure 5: Number of Agents Inducing Tumours in Humans in Each of 15 Organ/Tissue Systems by Type of Agent

Volume

- Pharmaceuticals Biologicals
- Arsenic, Metals, Fibres & Dusts
- Radiation
- Lifestyle
- Chemicals

Supplemental Figure 6: Number of Agents Inducing Tumours in Animals in Each of 15 Organ/Tissue Systems by Type of Agent

Supplemental Figure 7: Number of Agents Inducing Tumours in Mice in Each of 15 Organ/Tissue Systems by Type of Agent

Volume

- Pharmaceuticals
- Biologicals
- Arsenic, Metals, Fibres & Dusts
- Radiation
- Lifestyle
- Chemicals

Supplemental Figure 8: Number of Agents Inducing Tumours in Rats in Each of 15 Organ/Tissue Systems by Type of Agent