

Effects of the 900 MHz radiation on the development of cancer in mice (RF-1)

Report of Peer Review of Pre-Neoplastic and Neoplastic Lesions

prepared for:

Forschungsgemeinschaft Funk (FGF)

Fraunhofer Institute of Toxicology and Aerosol Research

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Summary

The Fraunhofer Institute of Toxicology and Aerosol Research, Hannover, Germany (Fraunhofer ITA) was asked to perform a peer review (coded slides) of all pre-neoplastic and neoplastic lesions in female CBA/S mice from a long-term carcinogenicity study. The study was conducted at the Department of Environmental Sciences, University of Kuopio, Finland and titled 'Effects of the 900 MHz radiation on the development of cancer in mice (RF-1)'.

The most important findings were:

- No difference with respect to the number of tumour-bearing animals and the total number of tumours was observed between the groups receiving only ionizing radiation ('initiation' treatment) and the groups which had additional radio frequency (RF) or 50 Hz magnetic field (ELF) exposure ('promotion' treatment).
- With respect to the organ-related incidence of pre-neoplastic and neoplastic findings, a significant increase of basophilic foci in the liver was observed in the ELF-'promotion' group compared to the ELF-sham group (25/50 vs. 9/50, pairwise Fisher test, $p < 0.001$). Due to an increase of malignant liver tumours, the total number of hepatocellular neoplasms was also higher in the ELF-'promotion' group compared to the ELF-sham group (26/50 vs. 21/50) (Note: the lifetime of the animals was not taken into consideration, this will be done separately in the report of the original study).
- With respect to the organ-related incidence of pre-neoplastic and neoplastic findings, no significant difference could be observed between the RF sham group and any of the RF 'promotion' groups .

Introduction

Fraunhofer ITA was requested to conduct a "blind" histopathological re-evaluation of all pre-neoplastic and neoplastic lesions in all organs and tissues from the long-term carcinogenicity study 'Effects of the 900 MHz radiation on the development of cancer in female CBA/S mice (RF-1)'. The study was conducted at the Department of Environmental Sciences, University of Kuopio, Finland.

The reviewing pathologist received the haematoxylin and eosin-stained original microscopic slides with hyperplastic and neoplastic lesions from 300 animals, which had previously been evaluated by the study pathologist (Prof. Dr. Kosma, Kuopio, Finland) for the original report.

The histopathological review was performed by:

Dr. med. vet. Heinrich Ernst
Fraunhofer Institute of Toxicology and Aerosol Research
Department of Pathology

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Material and Methods

The review was performed on all organ sections of all animals. The numbers of animals are listed in the following table:

Group	Treatment*	Females
A	No treatment	50
J	4 Gy, ELF-sham	50
K	4 Gy, RF-sham	50
L	4 Gy, ELF	50
M	4 Gy, puls. RF	50
P	4 Gy, cont. RF	50

*for details see study protocol

The sections submitted to the reviewing pathologist were labelled with group-related codes (A, J, K, L, M, P) and animal numbers. The treatment of the groups was unknown until all diagnoses were made and agreed upon by the study pathologist and the reviewing pathologist. At the end of the peer review process and after re-evaluation of the revised findings by the study pathologist, several diagnoses which remained controversial were discussed and finally decided during a pathology panel meeting at the Fraunhofer Institute in Hannover from April 8.-9., 1999. Members of the panel were:

Prof. Dr. med. Veli-Matti Kosma, University of Kuopio (study pathologist)
 Dr. med. vet. Heinrich Ernst, Fraunhofer ITA Hannover (reviewing pathologist)
 Dr. med. vet. Susanne Rittinghausen, Fraunhofer ITA Hannover
 Prof. Dr. med., DDr. h.c. Ulrich Mohr, Medical School Hannover

The panel reviewed slides of different organs from a total of 65 animals from all study groups. Diagnostic problems mainly arose with respect to 'foci of cellular alteration' in the liver (differential diagnosis to hepatocellular adenoma and hepatocellular carcinoma) and to lesions of the ovaries and uterus. Where applicable, WHO/IARC diagnostic criteria (International Classification of Rodent Tumours, Part II: The Mouse, eds.: Mohr, U. et al., Springer Verlag, 1999, in press) for proliferative lesions in mice were used by the panel as the main guideline. The meeting ended after a unanimous decision had been achieved for each of the controversial diagnoses.

Data Recording and Statistics

Following the panel review, the individual histopathological diagnoses were entered into the P.L.A.C.E.S. (Pathology Lexicon, Acquisition, Correlation and Evaluation System) computer system, version 2000.1. All incidence tables (Appendices 1-5) were produced with the P.L.A.C.E.S. program.

Incidences of histopathological lesions were statistically evaluated with the pairwise Fisher test.

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Results

A summary of the number of tumour-bearing animals and the total number of tumours is given in Appendix 1 (Tumour Table). The incidences for neoplastic and relevant pre-neoplastic lesions for all groups are shown in Appendix 2 (Summary of neoplastic and pre-neoplastic findings). Appendices 3 and 4 include a comparison of neoplastic and pre-neoplastic findings between the ELF and RF treatment groups, respectively, and the corresponding sham control groups.

The unmerged histopathological findings showing individual animal numbers are given in Appendix 5.

The most important findings were:

- No difference with respect to the number of tumour-bearing animals and the total number of tumours was observed between the groups receiving only ionizing radiation ('initiation'-treatment) and the groups which had additional radio frequency (RF) or 50 Hz magnetic field (ELF) exposure ('promotion' treatment). The number of tumour-bearing animals in the treatment groups was about twice as high as in the non-treated negative control group, while the total number of tumours was 3- to 4-fold higher (Appendix 1).
- With respect to the organ-related incidence of pre-neoplastic and neoplastic findings, a significant increase of basophilic foci in the liver was observed in the ELF-'promotion' group compared to the ELF-sham group (25/50 vs. 9/50, pairwise Fisher test, $p < 0.001$). Although statistically not significant, the total number of hepatocellular neoplasms was also higher in the ELF-'promotion' group as compared to the ELF-sham group (26/50 vs. 21/50 plus 1/50 haemangiosarcoma). This was due to an increase of malignant liver tumours (hepatocellular adenomas: ELF-exposure, 12/50 vs. ELF-sham, 14/50; hepatocellular carcinomas: ELF-exposure, 14/50 vs. ELF-sham, 7/50) (Appendix 3). However, the lifetime of the animals was not taken into consideration (this will be done separately in the report of the original study).
- With respect to the organ-related incidence of pre-neoplastic and neoplastic findings, no significant difference could be observed between the RF-sham group and any of the RF-'promotion' groups (Appendix 4).

Hannover, May 27, 1999

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Signature

Dr. med. vet. Heinrich Ernst
Fraunhofer Institute of Toxicology and Aerosol Research
Department of Pathology

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Appendix 1

Tumour Table

		TUMOUR TABLE					
		Females					
LESIONS	TREATMENT	!no !treat- !ment !(A)	!4 Gy !ELF- !sham !(J)	!4 Gy !RF- !sham !(K)	!4 Gy !ELF !(L)	!4 Gy !puls. !RF !(M)	!4 Gy !cont. !RF !(P)
NUMBER OF ANIMALS		! 50	! 50	! 50	! 50	! 50	! 50
NUMBER OF ANIMALS WITH TUMOURS		! 24	! 48	! 49	! 48	! 47	! 49
NUMBER OF ANIMALS WITH SINGLE TUMOURS		! 19	! 11	! 14	! 8	! 13	! 17
NUMBER OF ANIMALS WITH MULTIPLE TUMOURS		! 5	! 37	! 35	! 40	! 34	! 32
NUMBER OF ANIMALS WITH BENIGN TUMOURS		! 20	! 37	! 42	! 42	! 41	! 38
NUMBER OF ANIMALS WITH MALIGNANT TUMOURS		! 5	! 31	! 20	! 32	! 25	! 28
NUMBER OF ANIMALS WITH METASTASISING TUMOURS		!	! 2	! 2	! 3	! 1	! 4
TOTAL NUMBER OF TUMOURS		! 29	! 139	! 109	! 141	! 109	! 113
TOTAL NUMBER BENIGN TUMOURS		! 24	! 102	! 85	! 102	! 83	! 83
TOTAL NUMBER OF MALIGNANT TUMOURS		! 5	! 37	! 24	! 39	! 26	! 30
TOTAL NUMBER OF METASTASISING TUMOURS		!	! 2	! 2	! 3	! 1	! 4
% ANIMALS WITH TUMOURS		! 48	! 96	! 98	! 96	! 94	! 98
% ANIMALS WITH SINGLE TUMOURS		! 38	! 22	! 28	! 16	! 26	! 34
% ANIMALS WITH MULTIPLE TUMOURS		! 10	! 74	! 70	! 80	! 68	! 64
% ANIMALS WITH BENIGN TUMOURS		! 40	! 74	! 84	! 84	! 82	! 76
% ANIMALS WITH MALIGNANT TUMOURS		! 10	! 62	! 40	! 64	! 50	! 56
% ANIMALS WITH METASTASISING TUMOURS		!	! 4	! 4	! 6	! 2	! 8

*** Listing Complete ***

Study : RF-1* APPROVED PROTOCOL *

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Appendix 2

Summary of neoplastic and pre-neoplastic findings, all groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS (PERCENT)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
PITUITARY		(50)	(50)	(50)	(50)	(50)	(50)
Pars distalis ADENOCARCINOMA [M]		0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)
Pars distalis ADENOMA [B]		0 (0%)	2 (4%)	1 (2%)	2 (4%)	2 (4%)	3 (6%)
Pars distalis hyperplasia		0 (0%)	1 (2%)	1 (2%)	4 (8%)	4 (8%)	0 (0%)
EYES		(50)	(50)	(50)	(50)	(50)	(50)
Corneal epithelial hyperplasia		0 (0%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)	1 (2%)
HARDERIAN GLANDS		(50)	(50)	(50)	(50)	(50)	(50)
CARCINOMA [M]		0 (0%)	1 (2%)	1 (2%)	1 (2%)	1 (2%)	1 (2%)
ADENOMA (TA) [B]		10 (20%)	29*** (58%)	23* (46%)	32*** (64%)	28*** (56%)	30*** (60%)
Hyperplasia		5 (10%)	6 (12%)	13 (26%)	11 (22%)	7 (14%)	5 (10%)
LUNGS		(50)	(50)	(50)	(50)	(50)	(50)
BRONCHIOLO-ALVEOLAR CARCINOMA (TA) [M]		2 (4%)	5 (10%)	3 (6%)	5 (10%)	2 (4%)	1 (2%)
BRONCHIOLO-ALVEOLAR ADENOMA [B]		2 (4%)	5 (10%)	5 (10%)	7 (14%)	9* (18%)	5 (10%)
Bronchiolo-alveolar hyperplasia		1 (2%)	3 (6%)	3 (6%)	5 (10%)	5 (10%)	4 (8%)
THYROID		(50)	(50)	(50)	(50)	(50)	(50)
FOLLICULAR CELL ADENOMA [B]		0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

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Summary of neoplastic and pre-neoplastic findings, all groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS (PERCENT)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
THYROID		(50)	(50)	(50)	(50)	(50)	(50)
C-CELL ADENOMA [B]		0	0	0	0	1	0
Follicular-cell hyperplasia		25	15*	13*	5***	19	10**
C-cell hyperplasia		0	1	0	1	1	0
THORACIC CAVITY		(50)	(50)	(50)	(50)	(50)	(50)
FIBROSARCOMA [M]		0	1	0	0	0	0
FORESTOMACH		(50)	(50)	(50)	(50)	(50)	(50)
SQUAMOUS-CELL PAPILOMA [B]		1	0	0	0	0	0
Squamous-cell hyperplasia		0	1	1	1	0	1
GLANDULAR STOMACH		(50)	(50)	(50)	(50)	(50)	(50)
ADENOMA [B]		0	1	0	1	0	0
LIVER		(50)	(50)	(50)	(50)	(50)	(50)
HEPATOCELLULAR CARCINOMA [M]		1	7	4	14***	4	7
HAEMANGIOSARCOMA [M]		0	1	0	0	0	0
HEPATOCELLULAR ADENOMA(TA) [B]		7	14	9	12	5	5
Basophilic focus/foci		14	9	18	25*	12	17

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05, **P<0.01, ***P<0.001

[B] Benign tumour
[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically
The absence of a numeral indicates that the lesion specified was not identified

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Summary of neoplastic and pre-neoplastic findings, all groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS (PERCENT)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
LIVER		(50)	(50)	(50)	(50)	(50)	(50)
Eosinophilic focus/foci		3 (6%)	4 (8%)	0 (0%)	4 (8%)	2 (4%)	2 (4%)
Clear-cell focus/foci		10 (20%)	5 (10%)	3* (6%)	3* (6%)	0*** (0%)	2* (4%)
Bile duct hyperplasia		1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
PANCREAS		(50)	(50)	(50)	(50)	(50)	(50)
Acinar-cell ADENOMA [B]		1 (2%)	2 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Islet-cell ADENOMA [B]		1 (2%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)
Acinar-cell hyperplasia		11 (22%)	9 (18%)	8 (16%)	12 (24%)	11 (22%)	5 (10%)
Islet-cell hyperplasia		17 (34%)	17 (34%)	7* (14%)	17 (34%)	4** (8%)	10 (20%)
MESENTERY		(50)	(50)	(50)	(50)	(50)	(50)
SARCOMA, NOS [M]		0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)
DUODENUM		(50)	(50)	(50)	(50)	(50)	(50)
ADENOCARCINOMA [M]		0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)
ADENOMA [B]		0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
JEJUNUM		(50)	(50)	(50)	(50)	(50)	(50)
ADENOMA [B]		0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05, **P<0.01, ***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

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Summary of neoplastic and pre-neoplastic findings, all groups

		INCIDENCE OF LESIONS (PERCENT)					
		Females					
LESIONS	TREATMENT	no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
KIDNEYS		(50)	(50)	(50)	(50)	(50)	(50)
CARCINOMA [M]		0	0	0	1	0	2
		(0%)	(0%)	(0%)	(2%)	(0%)	(4%)
ADENOMA [B]		0	4	1	2	2	0
		(0%)	(8%)	(2%)	(4%)	(4%)	(0%)
Atypical tubular hyperplasia		1	0	0	0	1	0
		(2%)	(0%)	(0%)	(0%)	(2%)	(0%)
Tubular hyperplasia		3	5	5	8	6	4
		(6%)	(10%)	(10%)	(16%)	(12%)	(8%)
ADRENALS		(50)	(50)	(50)	(50)	(50)	(50)
PHAEOCHROMOCYTOMA [M]		0	0	1	0	0	0
		(0%)	(0%)	(2%)	(0%)	(0%)	(0%)
PHAEOCHROMOCYTOMA [B]		1	2	4	3	0	0
		(2%)	(4%)	(8%)	(6%)	(0%)	(0%)
Cortical ADENOMA [B]		0	1	1	0	2	1
		(0%)	(2%)	(2%)	(0%)	(4%)	(2%)
Subcapsular-cell ADENOMA [B]		0	12***	7*	4	4	5
		(0%)	(24%)	(14%)	(8%)	(8%)	(10%)
Medullary hyperplasia		1	4	3	2	1	2
		(2%)	(8%)	(6%)	(4%)	(2%)	(4%)
Cortical hyperplasia		1	1	2	3	0	0
		(2%)	(2%)	(4%)	(6%)	(0%)	(0%)
Subcapsular-cell hyperplasia		50	49	50	50	50	50
		(100%)	(98%)	(100%)	(100%)	(100%)	(100%)
PREPUTIAL/(CLITORIAL) GLANDS		(50)	(50)	(50)	(50)	(50)	(50)
BASAL-CELL CARCINOMA [M]		0	1	0	0	0	0
		(0%)	(2%)	(0%)	(0%)	(0%)	(0%)
OVARIES		(50)	(50)	(50)	(50)	(50)	(50)
HAEMANGIOSARCOMA [M]		0	0	0	0	1	0
		(0%)	(0%)	(0%)	(0%)	(2%)	(0%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, all groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS (PERCENT)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
OVARIES		(50)	(50)	(50)	(50)	(50)	(50)
GRANULOSA CELL TUMOUR [M]		0	1	0	1	1	1
		(0%)	(2%)	(0%)	(2%)	(2%)	(2%)
GRANULOSA CELL TUMOUR [B]		0	1	1	3	1	0
		(0%)	(2%)	(2%)	(6%)	(2%)	(0%)
LUTEOMA [B]		0	0	0	0	0	2
		(0%)	(0%)	(0%)	(0%)	(0%)	(4%)
CYSTADENOMA [B]		0	1	0	1	0	0
		(0%)	(2%)	(0%)	(2%)	(0%)	(0%)
Tubulostromal ADENOMA(TA) [B]		0	20***	23***	24***	23***	23***
		(0%)	(40%)	(46%)	(48%)	(46%)	(46%)
Tubulostromal hyperplasia		2	26***	26***	27***	29***	26***
		(4%)	(52%)	(52%)	(54%)	(58%)	(52%)
Granulosa-cell hyperplasia		0	0	0	1	0	0
		(0%)	(0%)	(0%)	(2%)	(0%)	(0%)
UTERUS		(50)	(50)	(50)	(50)	(50)	(50)
Endometrial ADENOCARCINOMA [M]		0	0	0	0	2	0
		(0%)	(0%)	(0%)	(0%)	(4%)	(0%)
Endometrial ADENOMA [B]		0	0	0	0	0	1
		(0%)	(0%)	(0%)	(0%)	(0%)	(2%)
ENDOMETRIAL STROMAL POLYP [B]		0	6*	4	7*	3	5
		(0%)	(12%)	(8%)	(14%)	(6%)	(10%)
GLANDULAR POLYP [B]		0	1	6*	2	3	0
		(0%)	(2%)	(12%)	(4%)	(6%)	(0%)
Decidual reaction		0	1	0	0	0	0
		(0%)	(2%)	(0%)	(0%)	(0%)	(0%)
Adenomyosis		1	0	1	0	1	0
		(2%)	(0%)	(2%)	(0%)	(2%)	(0%)
Squamous metaplasia		0	1	0	0	0	1
		(0%)	(2%)	(0%)	(0%)	(0%)	(2%)
Endometrial stromal hyperplasia		2	2	0	0	0	0
		(4%)	(4%)	(0%)	(0%)	(0%)	(0%)
Cystic endometrial hyperplasia		36	35	44	40	45*	37
		(72%)	(70%)	(88%)	(80%)	(90%)	(74%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, all groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS (PERCENT)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
VAGINA		(50)	(50)	(50)	(50)	(50)	(50)
Stromal ADENOMATOUS POLYP [B]		1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
SKIN		(50)	(50)	(50)	(50)	(50)	(50)
SCHWANNOMA [M]		0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
MALIGNANT FIBROUS HISTIOCYTOMA [M]		0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
MELANOMA [M]		0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)
HAEMANGIOMA [B]		0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)
Epidermal hyperplasia		0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
HAEMATOP./LYMPHORET.TISSUE		(50)	(50)	(50)	(50)	(50)	(50)
LYMPHOMA [M] pleomorphic		0 (0%)	13*** (26%)	12*** (24%)	10*** (20%)	10*** (20%)	11*** (22%)
LYMPHOMA [M] lymphoblastic		0 (0%)	2 (4%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)
HISTIOCYTIC SARCOMA [M]		1 (2%)	2 (4%)	2 (4%)	5 (10%)	3 (6%)	4 (8%)
ADDITIONAL ORGANS				(1)			
CARCINOMA, NOS [M] (primary site unknown)				1 (100%)			
PERITONEUM		(1)					
MESOTHELIOMA [M]		1 (100%)					

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05, **P<0.01, ***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, all groups

		INCIDENCE OF LESIONS (PERCENT)					
		Females					
LESIONS	TREATMENT	!no	!4 Gy	!4 Gy	!4 Gy	!4 Gy	!4 Gy
		!treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
SKULLCAP		!	!	!	!	!	!
		!	!	!	!	!	!(1)
SARCOMA, NOS [M]		!	!	!	!	!	!
		!	!	!	!	!	!(100%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Listing Complete ***

Fraunhofer-ITA:

Report of Peer Review of Pre-Neoplastic and Neoplastic Lesions in CBA/S mice of RF-1 Study

Appendix 3

Summary of neoplastic and pre-neoplastic findings, ELF - groups

		INCIDENCE OF	
		Females	
LESIONS	TREATMENT	4 Gy ELF- sham (J)	4 Gy ELF (L)
PITUITARY			
		(50)	(50)
Pars distalis ADENOMA [B]		2 (4%)	2 (4%)
Pars distalis hyperplasia		1 (2%)	4 (8%)
HARDERIAN GLANDS			
		(50)	(50)
Uni-lateral metastasizing CARCINOMA [M]		1 (2%)	1 (2%)
ADENOMA (TA) [B]		29 (58%)	32 (64%)
Hyperplasia		6 (12%)	11 (22%)
LUNGS			
		(50)	(50)
BRONCHIOLO-ALVEOLAR CARCINOMA (TA) [M]		5 (10%)	5 (10%)
BRONCHIOLO-ALVEOLAR ADENOMA [B]		5 (10%)	7 (14%)
Bronchiolo-alveolar hyperplasia		3 (6%)	5 (10%)
THYROID			
		(50)	(50)
Follicular-cell hyperplasia		15 (30%)	5* (10%)
C-cell hyperplasia		1 (2%)	1 (2%)
THORACIC CAVITY			
		(50)	(50)
FIBROSARCOMA [M]		1 (2%)	0 (0%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, ELF - groups

LESIONS	TREATMENT	INCIDENCE OF	
		4 Gy	4 Gy
		ELF-	ELF
		sham	(L)
		(J)	(L)
FORESTOMACH		(50)	(50)
Squamous-cell hyperplasia		1 (2%)	1 (2%)
GLANDULAR STOMACH		(50)	(50)
ADENOMA [B]		1 (2%)	1 (2%)
LIVER		(50)	(50)
HEPATOCELLULAR CARCINOMA [M]		7 (14%)	14 (28%)
HAEMANGIOSARCOMA [M]		1 (2%)	0 (0%)
HEPATOCELLULAR ADENOMA(TA) [B]		14 (28%)	12 (24%)
Basophilic focus/foci		9 (18%)	25*** (50%)
Eosinophilic focus/foci		4 (8%)	4 (8%)
Clear-cell focus/foci		5 (10%)	3 (6%)
PANCREAS		(50)	(50)
Acinar-cell ADENOMA [B]		2 (4%)	0 (0%)
ISLET CELL ADENOMA [B]		0 (0%)	1 (2%)
Acinar-cell hyperplasia		9 (18%)	12 (24%)
Islet-cell hyperplasia		17 (34%)	17 (34%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, ELF - groups

		INCIDENCE OF	
		Females	
LESIONS	TREATMENT	4 Gy	4 Gy
		ELF-	ELF
		sham	(L)
		(J)	(L)
DUODENUM		(50)	(50)
ADENOCARCINOMA [M]		0	1
		(0%)	(2%)
ADENOMA [B]		1	0
		(2%)	(0%)
JEJUNUM		(50)	(50)
ADENOMA [B]		0	1
		(0%)	(2%)
KIDNEYS		(50)	(50)
CARCINOMA [M]		0	1
		(0%)	(2%)
ADENOMA [B]		4	2
		(8%)	(4%)
Tubular hyperplasia		5	8
		(10%)	(16%)
ADRENALS		(50)	(50)
PHAEOCHROMOCYTOMA [B]		2	3
		(4%)	(6%)
Cortical ADENOMA [B]		1	0
		(2%)	(0%)
Subcapsular-cell ADENOMA [B]		12	4
		(24%)	(8%)
Medullary hyperplasia		4	2
		(8%)	(4%)
Cortical hyperplasia		1	3
		(2%)	(6%)
Subcapsular-cell hyperplasia		49	50
		(98%)	(100%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, ELF - groups

LESIONS	TREATMENT	INCIDENCE OF	
		4 Gy ELF-sham (J)	4 Gy ELF (L)
PREPUTIAL/(CLITORIAL) GLANDS		(50)	(50)
BASAL-CELL CARCINOMA [M]		1 (2%)	0 (0%)
OVARIES		(50)	(50)
GRANULOSA CELL TUMOUR [M]		1 (2%)	1 (2%)
GRANULOSA CELL TUMOUR [B]		1 (2%)	3 (6%)
CYSTADENOMA [B]		1 (2%)	1 (2%)
Tubulostromal ADENOMA(TA) [B]		20 (40%)	24 (48%)
Tubulostromal hyperplasia		26 (52%)	27 (54%)
Granulosa-cell hyperplasia		0 (0%)	1 (2%)
UTERUS		(50)	(50)
ENDOMETRIAL STROMAL POLYP [B]		6 (12%)	7 (14%)
GLANDULAR POLYP [B]		1 (2%)	2 (4%)
Decidual reaction		1 (2%)	0 (0%)
Squamous metaplasia		1 (2%)	0 (0%)
Endometrial stromal hyperplasia		2 (4%)	0 (0%)
Cystic endometrial hyperplasia		35 (70%)	40 (80%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, ELF - groups

		INCIDENCE OF	
		Females	
LESIONS	TREATMENT	4 Gy	4 Gy
		ELF-	ELF
		sham	(L)
		(J)	(L)
SKIN		(50)	(50)
SCHWANNOMA [M]		1	0
		(2%)	(0%)
MALIGNANT FIBROUS HISTIOCYTOMA [M]		1	0
		(2%)	(0%)
MELANOMA [M]		1	0
		(2%)	(0%)
Epidermal hyperplasia		1	0
		(2%)	(0%)
HAEMATOP./LYMPHORET.TISSUE		(50)	(50)
LYMPHOMA [M] pleomorphic		13	10
		(26%)	(20%)
LYMPHOMA [M] lymphoblastic		2	1
		(4%)	(2%)
HISTIOCYTIC SARCOMA [M]		2	5
		(4%)	(10%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001
 [M] Malignant tumour
 Figures in brackets represent the number of animals from which this tissue was examined microscopically
 The absence of a numeral indicates that the lesion specified was not identified
 *** Listing Complete ***

Fraunhofer-ITA:

Report of Peer Review of Pre-Neoplastic and Neoplastic Lesions in CBA/S mice of RF-1 Study

Appendix 4

Summary of neoplastic and pre-neoplastic findings, RF - groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS!		
		Females		
		!4 Gy	!4 Gy	!4 Gy
		!RF-	!puls.	!cont.
		!sham	!RF	!RF
		!(K)	!(M)	!(P)
PITUITARY		! (50)	! (50)	! (50)
Pars distalis ADENOMA [B]		! 1	! 2	! 3
		! (2%)	! (4%)	! (6%)
Pars distalis hyperplasia		! 1	! 4	! 0
		! (2%)	! (8%)	! (0%)
Pars distalis ADENOCARCINOMA [M]		! 0	! 1	! 0
		! (0%)	! (2%)	! (0%)
EYES		! (50)	! (50)	! (50)
Uni-lateral corneal epithelial hyperplasia		! 1	! 0	! 1
		! (2%)	! (0%)	! (2%)
HARDERIAN GLANDS		! (50)	! (50)	! (50)
Uni-lateral metastasizing CARCINOMA [M]		! 0	! 1	! 1
		! (0%)	! (2%)	! (2%)
ADENOMA (TA) [B]		! 23	! 28	! 30
		! (46%)	! (56%)	! (60%)
Hyperplasia		! 13	! 7	! 5
		! (26%)	! (14%)	! (10%)
Uni-lateral CARCINOMA [M]		! 1	! 0	! 0
		! (2%)	! (0%)	! (0%)
LUNGS		! (50)	! (50)	! (50)
BRONCHIOLO-ALVEOLAR CARCINOMA (TA) [M]		! 3	! 2	! 1
		! (6%)	! (4%)	! (2%)
BRONCHIOLO-ALVEOLAR ADENOMA [B]		! 5	! 9	! 5
		! (10%)	! (18%)	! (10%)
Bronchiolo-alveolar hyperplasia		! 3	! 5	! 4
		! (6%)	! (10%)	! (8%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, RF - groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS!		
		Females		
		!4 Gy !	!4 Gy !	!4 Gy !
		!RF- !	!puls. !	!cont. !
		!sham !	!RF !	!RF !
		!(K) !	!(M) !	!(P) !
THYROID		! (50) !	! (50) !	! (50) !
Follicular-cell hyperplasia		! 13 !	! 19 !	! 10 !
		! (26%) !	! (38%) !	! (20%) !
C-cell hyperplasia		! 0 !	! 1 !	! 0 !
		! (0%) !	! (2%) !	! (0%) !
C-CELL ADENOMA [B]		! 0 !	! 1 !	! 0 !
		! (0%) !	! (2%) !	! (0%) !
FOLLICULAR CELL ADENOMA [B]		! 0 !	! 0 !	! 2 !
		! (0%) !	! (0%) !	! (4%) !
FORESTOMACH		! (50) !	! (50) !	! (50) !
Squamous-cell hyperplasia		! 1 !	! 0 !	! 1 !
		! (2%) !	! (0%) !	! (2%) !
LIVER		! (50) !	! (50) !	! (50) !
HEPATOCELLULAR CARCINOMA [M]		! 4 !	! 4 !	! 7 !
		! (8%) !	! (8%) !	! (14%) !
HEPATOCELLULAR ADENOMA(TA) [B]		! 9 !	! 5 !	! 5 !
		! (18%) !	! (10%) !	! (10%) !
Basophilic focus/foci		! 18 !	! 12 !	! 17 !
		! (36%) !	! (24%) !	! (34%) !
Eosinophilic focus/foci		! 0 !	! 2 !	! 2 !
		! (0%) !	! (4%) !	! (4%) !
Clear-cell focus/foci		! 3 !	! 0 !	! 2 !
		! (6%) !	! (0%) !	! (4%) !
PANCREAS		! (50) !	! (50) !	! (50) !
Acinar-cell hyperplasia		! 8 !	! 11 !	! 5 !
		! (16%) !	! (22%) !	! (10%) !
Islet-cell hyperplasia		! 7 !	! 4 !	! 10 !
		! (14%) !	! (8%) !	! (20%) !

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, RF - groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS!		
		Females		
		!4 Gy !	!4 Gy !	!4 Gy !
		!RF- !	!puls. !	!cont. !
		!sham !	!RF !	!RF !
		!(K) !	!(M) !	!(P) !
MESENTERY		! (50) !	! (50) !	! (50) !
SARCOMA, NOS [M]		! 0 !	! 1 !	! 0 !
		! (0%) !	! (2%) !	! (0%) !
KIDNEYS		! (50) !	! (50) !	! (50) !
CARCINOMA [M]		! 0 !	! 0 !	! 2 !
		! (0%) !	! (0%) !	! (4%) !
ADENOMA [B]		! 1 !	! 2 !	! 0 !
		! (2%) !	! (4%) !	! (0%) !
Tubular hyperplasia		! 5 !	! 5 !	! 4 !
		! (10%) !	! (10%) !	! (8%) !
Bi-lateral tubular hyperplasia		! 0 !	! 1 !	! 0 !
		! (0%) !	! (2%) !	! (0%) !
Uni-lateral atypical tubular hyperplasia		! 0 !	! 1 !	! 0 !
		! (0%) !	! (2%) !	! (0%) !
ADRENALS		! (50) !	! (50) !	! (50) !
PHAECHROMOCYTOMA [B]		! 4 !	! 0 !	! 0 !
		! (8%) !	! (0%) !	! (0%) !
Cortical ADENOMA [B]		! 1 !	! 2 !	! 1 !
		! (2%) !	! (4%) !	! (2%) !
Subcapsular-cell ADENOMA [B]		! 7 !	! 4 !	! 5 !
		! (14%) !	! (8%) !	! (10%) !
Medullary hyperplasia		! 3 !	! 1 !	! 2 !
		! (6%) !	! (2%) !	! (4%) !
Cortical hyperplasia		! 2 !	! 0 !	! 0 !
		! (4%) !	! (0%) !	! (0%) !
Subcapsular-cell hyperplasia		! 50 !	! 50 !	! 50 !
		! (100%) !	! (100%) !	! (100%) !
Uni-lateral PHAECHROMOCYTOMA [M]		! 1 !	! 0 !	! 0 !
		! (2%) !	! (0%) !	! (0%) !

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, RF - groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS		
		Females		
		!4 Gy	!4 Gy	!4 Gy
		!RF-	!puls.	!cont.
		!sham	!RF	!RF
		!(K)	!(M)	!(P)
OVARIES		!(50)	!(50)	!(50)
GRANULOSA CELL TUMOUR [M]		! 0	! 1	! 1
		!(0%)	!(2%)	!(2%)
GRANULOSA CELL TUMOUR [B]		! 1	! 1	! 0
		!(2%)	!(2%)	!(0%)
Tubulostromal ADENOMA(TA) [B]		! 23	! 23	! 23
		!(46%)	!(46%)	!(46%)
Tubulostromal hyperplasia		! 26	! 29	! 26
		!(52%)	!(58%)	!(52%)
Uni-lateral LUTEOMA [B]		! 0	! 0	! 2
		!(0%)	!(0%)	!(4%)
Uni-lateral HAEMANGIOSARCOMA [M]		! 0	! 1	! 0
		!(0%)	!(2%)	!(0%)
UTERUS		!(50)	!(50)	!(50)
ENDOMETRIAL STROMAL POLYP [B]		! 4	! 3	! 5
		!(8%)	!(6%)	!(10%)
GLANDULAR POLYP [B]		! 6	! 3	! 0*
		!(12%)	!(6%)	!(0%)
Squamous metaplasia		! 0	! 0	! 1
		!(0%)	!(0%)	!(2%)
Cystic endometrial hyperplasia		! 44	! 45	! 37
		!(88%)	!(90%)	!(74%)
Adenomyosis		! 1	! 1	! 0
		!(2%)	!(2%)	!(0%)
Endometrial ADENOMA(TA) [B]		! 0	! 0	! 1
		!(0%)	!(0%)	!(2%)
Endometrial ADENOCARCINOMA [M]		! 0	! 2	! 0
		!(0%)	!(4%)	!(0%)
SKIN		!(50)	!(50)	!(50)
Metastasizing MALIGNANT MELANOMA [M]		! 0	! 0	! 1
		!(0%)	!(0%)	!(2%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour
[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically
The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Summary of neoplastic and pre-neoplastic findings, RF - groups

LESIONS	TREATMENT	INCIDENCE OF LESIONS		
		Females		
		!4 Gy	!4 Gy	!4 Gy
		!RF-	!puls.	!cont.
		!sham	!RF	!RF
		!(K)	!(M)	!(P)
SKIN		! (50)	! (50)	! (50)
HAEMANGIOMA [B]		! 0	! 0	! 1
		! (0%)	! (0%)	! (2%)
HAEMATOP./LYMPHORET.TISSUE		! (50)	! (50)	! (50)
LYMPHOMA [M] pleomorphic		! 12	! 10	! 11
		! (24%)	! (20%)	! (22%)
LYMPHOMA [M] lymphoblastic		! 0	! 0	! 1
		! (0%)	! (0%)	! (2%)
HISTIOCYTIC SARCOMA [M]		! 2	! 3	! 4
		! (4%)	! (6%)	! (8%)
ADDITIONAL ORGANS		! (1)	!	!
Metastasizing CARCINOMA, NOS [M]		! 1	!	!
		! (100%)	!	!
SKULLCAP		!	!	! (1)
Metastasizing SARCOMA, NOS [M]		!	!	! 1
		!	!	! (100%)

Significance of difference in a pairwise Fisher's test between control and treatment groups: *P<0.05,**P<0.01,***P<0.001

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Listing Complete ***

Fraunhofer-ITA:

Report of Peer Review of Pre-Neoplastic and Neoplastic Lesions in CBA/S mice of RF-1 Study

Appendix 5

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		!treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
PITUITARY		(50)	(50)	(50)	(50)	(50)	(50)
Pars distalis ADENOCARCINOMA [M]						000220	
Pars distalis ADENOMA [B]		000063	000148	000161	000210	000263	
		000083		000193	000237	000272	
						000292	
Pars distalis hyperplasia		000087	000108	000154	000209		
				000156	000211		
				000195	000219		
				000199	000242		
EYES		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral corneal epithelial hyperplasia				000115			000253
HARDERIAN GLANDS		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral metastasizing CARCINOMA [M]			000095		000179	000238	000292
Uni-lateral CARCINOMA [M]				000108			
Uni-lateral ADENOMA [B]		000010	000052	000101	000151	000204	000253
		000015	000053	000102	000152	000206	000256
		000016	000056	000103	000154	000208	000257
		000023	000059	000106	000155	000209	000258
		000027	000062	000107	000157	000212	000260
		000040	000063	000108	000158	000213	000262
		000043	000065	000109	000161	000215	000264
		000045	000067	000115	000162	000216	000266
			000070	000119	000163	000225	000268
			000072	000121	000164	000226	000269
			000075	000122	000165	000227	000270
			000077	000123	000170	000230	000271
			000078	000125	000171	000231	000276
			000079	000129	000172	000232	000277
			000082	000130	000173	000234	000278
			000086	000132	000174	000235	000283
			000088	000137	000175	000239	000284
			000089	000140	000176	000240	000286
			000091	000141	000177	000242	000289

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
HARDERIAN GLANDS							
Uni-lateral ADENOMA [B]		(50)	(50)	(50)	(50)	(50)	(50)
		!000092!	!000148!	!000179!	!000246!	!000290!	
		!000093!	!000149!	!000182!	!000247!	!000291!	
		!000096!		!000184!	!000249!	!000297!	
		!000098!		!000185!		!000298!	
		!000099!		!000190!		!000299!	
				!000191!			
				!000192!			
				!000194!			
				!000195!			
				!000196!			
				!000197!			
Bi-lateral ADENOMATA [B]		!000024!	!000058!	!000136!	!000153!	!000217!	!000251!
		!000048!	!000061!	!000142!	!000169!	!000221!	!000265!
		!000064!			!000222!	!000281!	
		!000069!			!000236!	!000285!	
		!000076!			!000237!	!000287!	
		!			!000243!	!000294!	
Uni-lateral hyperplasia		!000002!	!000051!	!000105!	!000156!	!000216!	!000255!
		!000007!	!000060!	!000110!	!000159!	!000219!	!000256!
		!000011!	!000068!	!000112!	!000172!	!000223!	!000267!
		!000032!	!000084!	!000118!	!000173!	!000224!	!000278!
		!000037!	!000097!	!000120!	!000178!	!000241!	!000283!
		!	!000100!	!000124!	!000181!	!000242!	
				!000128!	!000183!	!000245!	
				!000134!	!000187!		
				!000135!	!000191!		
				!000146!	!000198!		
				!000147!	!000199!		
				!000149!			
				!000150!			
LUNGS		(50)	(50)	(50)	(50)	(50)	(50)
Multiple BRONCHIOLO-ALVEOLAR CARCINOMATA [M]		!000038!					
BRONCHIOLO-ALVEOLAR CARCINOMA [M]		!000008!	!000051!	!000105!	!000154!	!000209!	!000252!
			!000056!	!000123!	!000156!	!000239!	
			!000059!	!000125!	!000188!		

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		! treat-	! ELF-	! RF-	! ELF-	! puls.	! cont.
		! ment	! sham	! sham	!	! RF	! RF
		! (A)	! (J)	! (K)	! (L)	! (M)	! (P)
LUNGS		!	!	!	!	!	!
BRONCHIOLO-ALVEOLAR CARCINOMA [M]		! (50)	! (50)	! (50)	! (50)	! (50)	! (50)
		!	!000062!	!	!000190!	!	!
BRONCHIOLO-ALVEOLAR ADENOMA [B]		!	!000079!	!	!000193!	!	!
		!	!000003!	!000066!	!000102!	!000151!	!000208!
		!	!000046!	!000070!	!000117!	!000156!	!000215!
		!	!	!000087!	!000123!	!000161!	!000216!
		!	!	!000091!	!000129!	!000168!	!000217!
		!	!	!000093!	!000132!	!000179!	!000222!
		!	!	!	!	!000187!	!000226!
		!	!	!	!	!000188!	!000231!
		!	!	!	!	!000239!	!
Bronchiolo-alveolar hyperplasia		!	!	!	!	!000250!	!
		!	!000003!	!000060!	!000121!	!000160!	!000216!
		!	!	!000067!	!000124!	!000163!	!000221!
		!	!	!000077!	!000130!	!000166!	!000233!
		!	!	!	!	!000188!	!000238!
		!	!	!	!	!000199!	!000246!
THYROID		!	!	!	!	!	!
FOLLICULAR CELL ADENOMA [B]		! (50)	! (50)	! (50)	! (50)	! (50)	! (50)
		!	!	!	!	!	!
C-CELL ADENOMA [B]		!	!	!	!	!	!
Follicular-cell hyperplasia		!	!	!	!	!	!
		!	!000004!	!000051!	!000102!	!000158!	!000206!
		!	!000007!	!000052!	!000103!	!000176!	!000207!
		!	!000009!	!000059!	!000105!	!000188!	!000209!
		!	!000011!	!000060!	!000107!	!000196!	!000211!
		!	!000014!	!000063!	!000109!	!000200!	!000212!
		!	!000015!	!000065!	!000114!	!	!000215!
		!	!000016!	!000067!	!000117!	!	!000216!
		!	!000018!	!000069!	!000119!	!	!000221!
		!	!000020!	!000074!	!000123!	!	!000223!
		!	!000021!	!000075!	!000125!	!	!000230!
		!	!000022!	!000076!	!000145!	!	!000233!
		!	!000023!	!000086!	!000148!	!	!000235!
		!	!000024!	!000091!	!000149!	!	!000236!
		!	!000025!	!000096!	!	!	!000237!
		!	!000026!	!000100!	!	!	!000242!
		!	!	!	!	!	!

[B] Benign tumour
[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically
The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
THYROID		(50)	(50)	(50)	(50)	(50)	(50)
Follicular-cell hyperplasia		000029				000243	
		000030				000244	
		000032				000249	
		000037				000250	
		000039					
		000040					
		000041					
		000043					
		000044					
		000048					
C-cell hyperplasia			000058		000156	000230	
THORACIC CAVITY		(50)	(50)	(50)	(50)	(50)	(50)
FIBROSARCOMA [M]			000097				
FORESTOMACH		(50)	(50)	(50)	(50)	(50)	(50)
SQUAMOUS-CELL PAPILOMA [B]		000044					
Squamous-cell hyperplasia			000069	000136	000185		000286
GLANDULAR STOMACH		(50)	(50)	(50)	(50)	(50)	(50)
ADENOMA [B]			000069		000193		
LIVER		(50)	(50)	(50)	(50)	(50)	(50)
Metastasizing HEPATOCELLULAR CARCINOMA [M]			000056	000126	000190		000270
HEPATOCELLULAR CARCINOMA [M]		000007	000059	000121	000154	000216	000260
			000062	000140	000155	000234	000264
			000066	000145	000156	000236	000265
			000074		000158	000249	000266
			000086		000166		000287
			000099		000171		000299
					000176		
					000179		

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
LIVER		!	!	!	!	!	!
HEPATOCELLULAR CARCINOMA [M]		!(50)	!(50)	!(50)	!(50)	!(50)	!(50)
		!	!	!	!000185!	!	!
		!	!	!	!000192!	!	!
		!	!	!	!000196!	!	!
		!	!	!	!000197!	!	!
HAEMANGIOSARCOMA [M]		!	!000060!	!	!	!	!
Multiple HEPATOCELLULAR ADENOMATA [B]		!000007!	!000064!	!000141!	!000152!	!000225!	!
		!000039!	!000066!	!	!	!	!
		!	!000067!	!	!	!	!
		!	!000069!	!	!	!	!
		!	!000078!	!	!	!	!
		!	!000082!	!	!	!	!
		!	!000086!	!	!	!	!
		!	!000098!	!	!	!	!
HEPATOCELLULAR ADENOMA [B]		!000016!	!000052!	!000102!	!000153!	!000211!	!000257!
		!000022!	!000061!	!000105!	!000154!	!000219!	!000258!
		!000024!	!000075!	!000106!	!000166!	!000233!	!000275!
		!000034!	!000089!	!000108!	!000170!	!000235!	!000281!
		!000040!	!000093!	!000122!	!000172!	!	!000284!
		!	!000096!	!000124!	!000173!	!	!
		!	!	!000126!	!000180!	!	!
		!	!	!000145!	!000184!	!	!
		!	!	!	!000188!	!	!
		!	!	!	!000190!	!	!
		!	!	!	!000191!	!	!
Basophilic focus/foci		!000013!	!000054!	!000102!	!000151!	!000202!	!000256!
		!000017!	!000069!	!000104!	!000153!	!000205!	!000258!
		!000020!	!000072!	!000110!	!000155!	!000211!	!000261!
		!000022!	!000074!	!000111!	!000156!	!000213!	!000262!
		!000024!	!000076!	!000112!	!000158!	!000216!	!000264!
		!000026!	!000087!	!000114!	!000159!	!000219!	!000265!
		!000030!	!000093!	!000115!	!000162!	!000225!	!000266!
		!000038!	!000096!	!000117!	!000163!	!000226!	!000270!
		!000039!	!000099!	!000118!	!000164!	!000238!	!000276!
		!000040!	!	!000123!	!000166!	!000239!	!000281!
		!000042!	!	!000126!	!000169!	!000242!	!000283!
		!000044!	!	!000127!	!000170!	!000249!	!000285!
		!000047!	!	!000130!	!000171!	!	!000287!
		!	!	!	!	!	!

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
LIVER		(50)	(50)	(50)	(50)	(50)	(50)
Basophilic focus/foci		!000048!	!	!000134!	!000172!	!	!000291!
		!	!	!000140!	!000173!	!	!000293!
		!	!	!000145!	!000177!	!	!000294!
		!	!	!000149!	!000179!	!	!000300!
		!	!	!000150!	!000180!	!	!
		!	!	!	!000183!	!	!
		!	!	!	!000188!	!	!
		!	!	!	!000190!	!	!
		!	!	!	!000193!	!	!
		!	!	!	!000195!	!	!
		!	!	!	!000197!	!	!
		!	!	!	!000200!	!	!
Eosinophilic focus/foci		!000043!	!000060!	!	!000161!	!000203!	!000275!
		!000048!	!000077!	!	!000171!	!000238!	!000292!
		!000050!	!000091!	!	!000177!	!	!
		!	!000093!	!	!000178!	!	!
Clear-cell focus/foci		!000006!	!000052!	!000142!	!000165!	!	!000268!
		!000007!	!000063!	!000146!	!000179!	!	!000290!
		!000015!	!000095!	!000149!	!000191!	!	!
		!000017!	!000098!	!	!	!	!
		!000023!	!000100!	!	!	!	!
		!000038!	!	!	!	!	!
		!000039!	!	!	!	!	!
		!000040!	!	!	!	!	!
		!000043!	!	!	!	!	!
		!000049!	!	!	!	!	!
Bile duct hyperplasia		!000040!	!	!	!	!	!
PANCREAS		(50)	(50)	(50)	(50)	(50)	(50)
Acinar-cell ADENOMA [B]		!000012!	!000060!	!	!	!	!
		!	!000069!	!	!	!	!
Islet-cell ADENOMA [B]		!000039!	!	!	!000156!	!	!
Islet-cell hyperplasia		!000005!	!000056!	!000107!	!000152!	!000227!	!000254!
		!000008!	!000060!	!000108!	!000153!	!000230!	!000256!
		!000015!	!000063!	!000112!	!000156!	!000243!	!000260!
		!000017!	!000064!	!000117!	!000160!	!000249!	!000267!
		!000018!	!000066!	!000143!	!000162!	!	!000277!

[B] Benign tumour
 Figures in brackets represent the number of animals from which this tissue was examined microscopically
 The absence of a numeral indicates that the lesion specified was not identified
 *** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
PANCREAS		(50)	(50)	(50)	(50)	(50)	(50)
Islet-cell hyperplasia		000021	000067	000148	000163	000278	000287
		000023	000071	000150	000168	000287	000292
		000024	000074		000169	000292	000297
		000026	000082		000170	000297	000299
		000033	000085		000173	000299	
		000035	000086		000176		
		000039	000087		000185		
		000040	000089		000187		
		000044	000093		000190		
		000045	000096		000193		
		000048	000098		000197		
		000050	000099		000200		
Acinar-cell hyperplasia		000001	000056	000103	000152	000202	000275
		000003	000065	000104	000154	000207	000276
		000010	000071	000108	000156	000208	000277
		000013	000078	000117	000170	000211	000288
		000016	000082	000118	000182	000212	000293
		000017	000086	000121	000184	000236	
		000018	000089	000124	000185	000237	
		000024	000093	000140	000188	000242	
		000026	000098		000190	000244	
		000043			000191	000246	
		000050			000197	000247	
					000200		
MESENTERY		(50)	(50)	(50)	(50)	(50)	(50)
SARCOMA, NOS [M]						000247	
DUODENUM		(50)	(50)	(50)	(50)	(50)	(50)
ADENOCARCINOMA [M]					000185		
ADENOMA [B]			000088				
JEJUNUM		(50)	(50)	(50)	(50)	(50)	(50)
ADENOMA [B]					000175		

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*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
KIDNEYS		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral CARCINOMA [M]					000184		000262
Uni-lateral ADENOMA [B]			000067	000130	000160	000230	
			000079		000161	000231	
			000089				
			000098				
Uni-lateral atypical tubular hyperplasia		000023				000201	
Uni-lateral tubular hyperplasia		000001	000063	000108	000153	000213	000264
		000008	000066	000117	000156	000216	000281
		000018	000067	000122	000169	000221	000287
			000095	000148	000170	000225	000294
			000100	000150	000178	000249	
					000180		
					000188		
					000196		
Bi-lateral tubular hyperplasia						000239	
ADRENALS		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral PHAEOCHROMOCYTOMA [M]				000108			
Uni-lateral PHAEOCHROMOCYTOMA [B]		000001	000063	000112	000168		
			000099	000117	000173		
				000119	000191		
				000123			
Uni-lateral cortical ADENOMA [B]			000091	000118		000226	000297
						000242	
Uni-lateral subcapsular-cell ADENOMA [B]			000051	000101	000182	000205	000276
			000060	000103	000184	000235	000277
			000062	000115	000192	000242	000278
			000066	000135	000195	000249	000281
			000067	000141			000287
			000069	000144			
			000076	000148			
			000077				
			000079				
			000088				

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		treat-	ELF-	RF-	ELF	puls.	cont.
		ment	sham	sham		RF	RF
		(A)	(J)	(K)	(L)	(M)	(P)
ADRENALS							
Uni-lateral subcapsular-cell ADENOMA [B]		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral subcapsular-cell hyperplasia			000089!				
Bi-lateral subcapsular-cell hyperplasia			000100!		000189!		
		000001!	000051!	000101!	000151!	000201!	000251!
		000002!	000052!	000102!	000152!	000202!	000252!
		000003!	000053!	000103!	000153!	000203!	000253!
		000004!	000054!	000104!	000154!	000204!	000254!
		000005!	000056!	000105!	000155!	000205!	000255!
		000006!	000057!	000106!	000156!	000206!	000256!
		000007!	000058!	000107!	000157!	000207!	000257!
		000008!	000059!	000108!	000158!	000208!	000258!
		000009!	000060!	000109!	000159!	000209!	000259!
		000010!	000061!	000110!	000160!	000210!	000260!
		000011!	000062!	000111!	000161!	000211!	000261!
		000012!	000063!	000112!	000162!	000212!	000262!
		000013!	000064!	000113!	000163!	000213!	000263!
		000014!	000065!	000114!	000164!	000214!	000264!
		000015!	000066!	000115!	000165!	000215!	000265!
		000016!	000067!	000116!	000166!	000216!	000266!
		000017!	000068!	000117!	000167!	000217!	000267!
		000018!	000069!	000118!	000168!	000218!	000268!
		000019!	000070!	000119!	000169!	000219!	000269!
		000020!	000071!	000120!	000170!	000220!	000270!
		000021!	000072!	000121!	000171!	000221!	000271!
		000022!	000073!	000122!	000172!	000222!	000272!
		000023!	000074!	000123!	000173!	000223!	000273!
		000024!	000075!	000124!	000174!	000224!	000274!
		000025!	000076!	000125!	000175!	000225!	000275!
		000026!	000077!	000126!	000176!	000226!	000276!
		000027!	000078!	000127!	000177!	000227!	000277!
		000028!	000079!	000128!	000178!	000228!	000278!
		000029!	000080!	000129!	000179!	000229!	000279!
		000030!	000081!	000130!	000180!	000230!	000280!
		000031!	000082!	000131!	000181!	000231!	000281!
		000032!	000083!	000132!	000182!	000232!	000282!
		000033!	000084!	000133!	000183!	000233!	000283!
		000034!	000085!	000134!	000184!	000234!	000284!
		000035!	000086!	000135!	000185!	000235!	000285!

[B] Benign tumour
 Figures in brackets represent the number of animals from which this tissue was examined microscopically
 The absence of a numeral indicates that the lesion specified was not identified
 *** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		no ! (A)	4 Gy ! (J)	4 Gy ! (K)	4 Gy ! (L)	4 Gy ! (M)	4 Gy ! (P)
ADRENALS							
Bi-lateral subcapsular-cell hyperplasia		(50)	(50)	(50)	(50)	(50)	(50)
		000036	000087	000136	000186	000236	000286
		000037	000088	000137	000187	000237	000287
		000038	000089	000138	000188	000238	000288
		000039	000090	000139	000190	000239	000289
		000040	000091	000140	000191	000240	000290
		000041	000092	000141	000192	000241	000291
		000042	000093	000142	000193	000242	000292
		000043	000094	000143	000194	000243	000293
		000044	000095	000144	000195	000244	000294
		000045	000096	000145	000196	000245	000295
		000046	000097	000146	000197	000246	000296
		000047	000098	000147	000198	000247	000297
		000048	000099	000148	000199	000248	000298
		000049	000100	000149	000200	000249	000299
Uni-lateral medullary hyperplasia		000050	000150	000250	000300		
		000046	000059	000106	000153	000234	000288
			000060	000114	000163		000298
			000077	000123			
Uni-lateral cortical hyperplasia			000089				
		000046	000097	000101	000151		
				000109	000156		
					000197		
PREPUTIAL/(CLITORIAL) GLANDS		(50)	(50)	(50)	(50)	(50)	(50)
BASAL-CELL CARCINOMA [M]			000070				
OVARIES		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral HAEMANGIOSARCOMA [M]					000209		
Uni-lateral GRANULOSA CELL TUMOUR [M]			000064		000197	000208	000300
Uni-lateral GRANULOSA CELL TUMOUR [B]			000099	000129	000153	000206	
					000161		
					000179		
Uni-lateral LUTEOMA [B]						000278	
						000287	
Uni-lateral CYSTADENOMA [B]			000052		000179		

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

		INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
LESIONS	TREATMENT	no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
OVARIES		(50)	(50)	(50)	(50)	(50)	(50)
Bi-lateral tubulostromal ADENOMATA [B]		000070	000110	000163	000203	000257	
		000078	000121	000188	000212	000262	
		000089	000134	000193	000233	000272	
		000096	000142	000199		000284	
			000145			000293	
			000148			000298	
Uni-lateral tubulostromal ADENOMA [B]		000053	000112	000151	000201	000251	
		000055	000113	000152	000202	000253	
		000060	000114	000156	000210	000258	
		000063	000117	000158	000213	000260	
		000065	000119	000162	000215	000265	
		000069	000120	000164	000221	000270	
		000074	000122	000167	000222	000273	
		000075	000123	000169	000224	000275	
		000079	000130	000170	000226	000278	
		000082	000136	000171	000230	000280	
		000083	000137	000172	000232	000283	
		000086	000138	000173	000234	000285	
		000087	000141	000177	000235	000288	
		000091	000143	000180	000236	000289	
		000098	000144	000182	000237	000290	
		000099	000149	000184	000241	000297	
			000150	000185	000246	000299	
				000190	000248		
				000192	000249		
				000195	000250		
Uni-lateral tubulostromal hyperplasia		000028	000052	000101	000153	000201	000252
		000044	000056	000102	000155	000206	000255
			000058	000106	000158	000207	000263
			000059	000107	000161	000209	000264
			000060	000109	000168	000214	000265
			000061	000112	000171	000215	000266
			000065	000117	000172	000216	000268
			000066	000118	000179	000219	000270
			000072	000120	000180	000220	000273
			000074	000122	000181	000221	000275
			000077	000125	000182	000222	000276

[B] Benign tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
OVARIES		(50)	(50)	(50)	(50)	(50)	(50)
Uni-lateral tubulostromal hyperplasia		!000079!	!000127!	!000183!	!000227!	!000277!	!
		!000081!	!000130!	!000184!	!000228!	!000280!	!
		!000086!	!000132!	!000187!	!000229!	!000281!	!
		!000087!	!000135!	!000190!	!000230!	!000282!	!
		!000091!	!000137!	!000192!	!000232!	!000283!	!
		!000093!	!000140!	!000194!	!000234!	!000288!	!
		!000098!	!000141!	!000196!	!000236!	!000289!	!
		!000146!	!000197!	!000237!	!000290!	!	!
		!000149!	!000200!	!000238!	!000294!	!	!
		!000150!	!	!000239!	!000296!	!	!
		!	!	!000241!	!000297!	!	!
		!	!	!000242!	!000300!	!	!
		!	!	!000243!	!	!	!
		!	!	!000244!	!	!	!
		!	!	!000247!	!	!	!
		!	!	!000248!	!	!	!
Bi-lateral tubulostromal hyperplasia		!000051!	!000104!	!000159!	!000204!	!000256!	!
		!000054!	!000105!	!000160!	!000225!	!000269!	!
		!000062!	!000115!	!000165!	!	!000291!	!
		!000071!	!000128!	!000174!	!	!	!
		!000073!	!000131!	!000175!	!	!	!
		!000088!	!	!000186!	!	!	!
		!000095!	!	!000191!	!	!	!
		!000100!	!	!	!	!	!
Uni-lateral granulosa-cell hyperplasia		!	!	!000200!	!	!	!
UTERUS		(50)	(50)	(50)	(50)	(50)	(50)
Endometrial ADENOCARCINOMA [M]		!	!	!	!	!	!
		!	!	!	!000202!	!	!
		!	!	!	!000250!	!	!
Endometrial ADENOMA [B] : with atypia		!	!	!	!	!000262!	!
ENDOMETRIAL STROMAL POLYP [B]		!	!000064!	!000103!	!000157!	!000207!	!000273!
		!	!000065!	!000104!	!000161!	!000208!	!000277!
		!	!000078!	!000124!	!000169!	!000215!	!000284!
		!	!000089!	!000128!	!000179!	!	!000285!
		!	!000093!	!	!000184!	!	!000292!
		!	!000096!	!	!000185!	!	!
		!	!	!	!	!	!

[B] Benign tumour

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		no	4 Gy	4 Gy	4 Gy	4 Gy	4 Gy
		Females					
		!no	!4 Gy	!4 Gy	!4 Gy	!4 Gy	!4 Gy
		!treat-	!ELF-	!RF-	!ELF	!puls.	!cont.
		!ment	!sham	!sham	!	!RF	!RF
		!(A)	!(J)	!(K)	!(L)	!(M)	!(P)
UTERUS		!	!	!	!	!	!
ENDOMETRIAL STROMAL POLYP [B]		!(50)	!(50)	!(50)	!(50)	!(50)	!(50)
GLANDULAR POLYP [B]		!	!	!	!000190!	!	!
		!	!000077!	!000105!	!000153!	!000221!	!
		!	!	!000107!	!000158!	!000242!	!
		!	!	!000115!	!	!000249!	!
		!	!	!000118!	!	!	!
		!	!	!000143!	!	!	!
		!	!	!000145!	!	!	!
Decidual reaction		!	!000064!	!	!	!	!
Adenomyosis		!000049!	!	!000115!	!	!000209!	!
Squamous metaplasia		!	!000087!	!	!	!	!000291!
Endometrial stromal hyperplasia		!000009!	!000052!	!	!	!	!
		!000042!	!000054!	!	!	!	!
Cystic endometrial hyperplasia		!000001!	!000051!	!000101!	!000151!	!000201!	!000251!
		!000002!	!000053!	!000102!	!000152!	!000202!	!000252!
		!000004!	!000056!	!000103!	!000153!	!000203!	!000253!
		!000006!	!000059!	!000104!	!000154!	!000205!	!000254!
		!000007!	!000060!	!000105!	!000156!	!000206!	!000256!
		!000010!	!000062!	!000106!	!000157!	!000207!	!000257!
		!000011!	!000063!	!000107!	!000158!	!000208!	!000258!
		!000012!	!000064!	!000108!	!000161!	!000209!	!000259!
		!000013!	!000065!	!000109!	!000162!	!000210!	!000260!
		!000014!	!000066!	!000110!	!000163!	!000211!	!000261!
		!000015!	!000067!	!000112!	!000164!	!000212!	!000262!
		!000016!	!000068!	!000114!	!000166!	!000213!	!000263!
		!000017!	!000069!	!000115!	!000168!	!000214!	!000265!
		!000018!	!000070!	!000116!	!000169!	!000215!	!000266!
		!000020!	!000071!	!000117!	!000170!	!000216!	!000267!
		!000021!	!000074!	!000118!	!000171!	!000217!	!000268!
		!000022!	!000075!	!000119!	!000172!	!000218!	!000269!
		!000023!	!000076!	!000120!	!000173!	!000219!	!000270!
		!000024!	!000077!	!000121!	!000174!	!000221!	!000274!
		!000025!	!000079!	!000122!	!000175!	!000222!	!000275!
		!000028!	!000082!	!000123!	!000176!	!000223!	!000276!
		!000029!	!000083!	!000124!	!000177!	!000225!	!000277!
		!000030!	!000084!	!000125!	!000178!	!000226!	!000278!
		!000032!	!000086!	!000126!	!000179!	!000228!	!000280!
		!000035!	!000087!	!000127!	!000180!	!000229!	!000281!
		!000036!	!000088!	!000128!	!000182!	!000230!	!000284!

[B] Benign tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Continued

Unmerged histopathological findings (neoplastic and preneoplastic only)

LESIONS	TREATMENT	INCIDENCE OF LESIONS (ANIMAL REFERENCES)					
		Females					
		no treat- ment (A)	4 Gy ELF- sham (J)	4 Gy RF- sham (K)	4 Gy ELF (L)	4 Gy puls. RF (M)	4 Gy cont. RF (P)
HAEMATOP./LYMPHORET.TISSUE		(50)	(50)	(50)	(50)	(50)	(50)
HISTIOCYTIC SARCOMA [M]					000160	000222	000276
					000176		000286
					000194		
LYMPHOMA [M] pleomorphic			000053	000106	000151	000206	000255
			000054	000108	000161	000210	000259
			000055	000113	000165	000214	000267
			000058	000127	000167	000224	000271
			000072	000128	000172	000225	000273
			000073	000130	000181	000227	000279
			000078	000131	000183	000229	000282
			000081	000133	000186	000240	000295
			000084	000135	000189	000245	000296
			000085	000139	000198	000248	000298
			000090	000146			000299
			000092	000147			
			000100				
LYMPHOMA [M] lymphoblastic			000061		000187		000254
			000068				
ADDITIONAL ORGANS							
Metastasizing CARCINOMA, NOS [M] (primary site unknown)				(1)			
					000146		
PERITONEUM		(1)					
MALIGNANT MESOTHELIOMA [M]		000029					
SKULLCAP							(1)
Metastasizing SARCOMA, NOS [M]							000253

[M] Malignant tumour

Figures in brackets represent the number of animals from which this tissue was examined microscopically

The absence of a numeral indicates that the lesion specified was not identified

*** Listing Complete ***