

CXR Biosciences Ltd.
James Lindsay Place
DUNDEE DD1 5JJ

REPORT

**4-WEEK STUDY TO INVESTIGATE PERFLUOROOCTANE SULFONATE
(PFOS)-INDUCED HEPATOMEGLY IN MALE SPRAGUE DAWLEY RATS.**

CXR STUDY NUMBER: CXR0481s

Sponsor: 3M

Sponsors Representative: Dr John Butenhoff
3M Medical Department
3M Center
Building 220-06-W-08,
St. Paul, Minnesota 55144-1000

Study Director: B M Elcombe, CXR Biosciences

Test facility CXR Biosciences, James Lindsay Place,
Dundee Technopole, Dundee, DD1 5JJ.
and
Biological Sciences Resource Unit (BSRU),
Dundee University, Dundee, DD1 5EH.

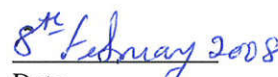
"In Life" Start Date: 7th November 2006

"In Life" Finish Date: 5th December 2006

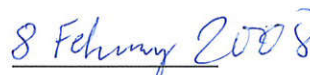
CIRCULATION

Signed Original: Study File/Archives
Sponsor
Copies to: Study Director
Sponsor

Author 
Barbara Elcombe, Study Director


Date

Approved 
Director, CXR Biosciences


Date

CONTENTS

CONTENTS	2
SUMMARY	4
1. INTRODUCTION	6
2. ANIMALS (Scientific Procedures) ACT 1986 COMPLIANCE	7
2.1 Licensee Responsibilities	7
3. MATERIALS AND METHODS	7
3.1 Test Substances.....	7
3.2 Safety Precautions.....	7
3.3 Diet.....	7
3.4 Animals	8
3.5 Animal Accommodation and Husbandry	8
4. EXPERIMENTAL DESIGN.....	8
5. EXPERIMENTAL PROCEDURES	9
5.1 Bodyweight	9
5.2 Clinical Observations.....	9
5.3 Food Consumption.....	10
5.4 Intercurrent Deaths	10
5.5 Terminal Procedures	10
6. BIOCHEMICAL MEASUREMENTS	11
6.1 Clinical Chemistry	11
6.2 Peroxisome Proliferation.....	11
6.3 DNA Content of Liver	11
6.4 Total Cytochrome P450	11
6.5 Lauric Acid 12-Hydroxylation (LAH)	11
6.6 Pentoxeresorufin- <i>O</i> -depentylation (PROD).....	11
6.7 Testosterone 6 β -Hydroxylation	12
6.8 Western Blotting.....	12
6.9 Protein Determination	12
6.10 Statistical Analysis.....	12
6.11 Additional Analyses.....	12
7. HISTOPATHOLOGY	12
8. SPECIMEN SHIPMENT	13
9. PROTOCOL AMENDMENTS	13
10. RESULTS.....	13
10.1 Bodyweights, Food Consumption and Liver Weights	13
10.1.1 Bodyweights.	13
10.1.2 Food consumption.....	14
10.1.3 Liver weights.	16
10.2 Clinical Chemistry	18
10.3 Liver Biochemistry	23
10.3.1 DNA content of liver.....	23
10.3.2 Peroxisome proliferation	25
10.3.3 Total cytochrome P450 content of liver	26
10.3.4 Lauric acid hydroxylation	27
10.3.5 Pentoxeresorufin- <i>O</i> -depentylation.....	28
10.3.6 Testosterone hydroxylation	29
10.4 Western Blotting	30
10.5 Histopathology.....	35

10.5.1 Liver H&E	35
10.5.2 Hepatic Apoptosis	35
10.5.3 Cell proliferation in liver	36
10.5.4 Thyroid H&E	37
10.5.5 Thyroid <i>in situ</i> cell death	37
10.5.6 Cell proliferation in thyroid	37
11. DISCUSSION	39
12. DATA STORAGE AND ARCHIVING	39
13. REPORT	40
14. QUALITY ASSURANCE	40
15. STUDY DIRECTORS STATEMENT	40
APPENDIX 1. PATHOLOGY REPORT	41

SUMMARY

- The mean ingested doses of Test Items calculated for the duration of the study were: 1.66 ± 0.03 (PFOS 20ppm), 7.90 ± 0.17 (PFOS 100ppm), 41.79 ± 0.66 (PB) and 4.65 ± 0.07 (Wy14,643) mg Test Item / kg bwt / day.
- No adverse clinical observations were made throughout the study.
- Administration of dietary PFOS (100ppm) and Wy14,643 (50ppm) to rats led to decreased body weights after 28 days of exposure. This effect was not observed in the animals receiving dietary PFOS (20ppm) or PB (500ppm).
- Absolute liver weights were increased with time following exposure to both dose levels of PFOS, PB and Wy14,643, reaching 116%, 114%, 126% and 161% of control values at Day 29 respectively. Relative liver weights were markedly increased by all compounds studied. Increases to approximately 116%, 145%, 121% and 180% of control values were observed following 28 days of exposure.
- A lack of overt hepatotoxicity was indicated for all compounds by the absence of toxicologically significant increases in plasma ALT and AST.
- Plasma cholesterol and triglycerides were markedly decreased by PFOS and Wy14,643. PFOS was especially potent in this respect.
- CN⁻ - insensitive palmitoyl CoA oxidation was induced by Wy14,643 and both dose levels of PFOS in a time- and dose-dependent manner. PB was without effect.
- All compounds studied had marked and characteristic effects on cytochromes P450 and related monooxygenase activities. At Day 29, 20ppm PFOS, 100ppm PFOS and PB increased total hepatic microsomal cytochrome P450 to 186%, 333% and 218% of control values. Wy14,643 had no effect on total cytochrome P450 content. However, all compounds altered the P450 isoform profiles substantially. SDS-PAGE and western blotting of hepatic microsomes, using specific antibodies to cytochrome P450 isoforms, revealed the induction of CYP2B, CYP2E1 and CYP3A1 by phenobarbital and PFOS. Wy14,643 had no effect on the expression of these isoforms. Wy14,643 was a rapid and potent inducer of the CYP4A1 isoform with marked effects seen 24hr after the first dose of compound. PFOS also induced CYP4A1, however the kinetics of induction were much slower. PB had no effect on CYP4A1 expression.
- These compound-induced alterations in cytochrome P450 isoform profiles were

reflected by changes in pentoxoresorufin-*O*-depropylation (CYP2B), testosterone-6 β -hydroxylation (CYP3A1) and lauric acid-12-hydroxylation (CYP4A1).

- In the liver, histopathology revealed decreased glycogen vacuolation by all three compounds. However this was more marked and seen earlier following the administration of Wy14,643. A minimal to slight, mainly centrilobular hepatocellular hypertrophy was noted, dose related in severity, in the animals of the 20ppm PFOS, 100ppm PFOS and 500ppm PB groups after 7 and 28 days of treatment. In the animals treated with 50ppm Wy14,683 a similar but mainly diffuse hepatocellular hypertrophy was seen in all rats at all time points. The severity of this finding was also increased with the duration of treatment
- 100ppm PFOS, PB and Wy14,643 administration decreased the hepatic apoptotic index at all time points studied. This effect was seen after 1 day and was maintained to Day 29. Apoptotic indices of 40%, 40% and 50% of control values for PFOS, PB and Wy14,643, respectively, were recorded after 28 days of treatment.
- 20ppm PFOS, 100ppm PFOS, PB and Wy14,643 administration all increased the hepatocellular labelling index (S-phase) at all time points studied. These increases were 2-, 3-, 6- and 10-fold, respectively, 1 day after commencement of treatment. After 7 days of treatment, the levels of S-phase activity reached a maximum of 4-, 5-, 7- and 25-fold, respectively. By 28 days of treatment, the labelling indices were apparently decreasing toward control values and were 2-, 5-, 2- and 11-fold respectively of concurrent control values.
- In the thyroid gland, no microscopic findings considered to be related to the treatment with the test items were recorded. The number of apoptotic cells found in all treatment groups, at all time points, was minimal. Regardless of treatment, it was usual to find either no cells or just one cell per thyroid staining in the TUNEL assay as apoptotic.
- Wy14,643 administration increased the thyroid follicular cell labelling index (S-phase) after 1 and 7 days of treatment, whilst PB administration increased the level of S-phase activity only after 7 days of treatment. After 28 days of treatment the labelling indices had returned to control values in both Wy14,643- and PB- treated animals. 20ppm PFOS and 100ppm PFOS treatment had no effect on S-phase at any time point studied.

1. INTRODUCTION

A variety of non-genotoxic chemicals elicit hepatocellular adenomas and carcinomas when administered to rats in long-term studies. The appearance of tumours is preceded by the rapid and early stimulation of hepatomegaly.

The liver enlargement seen following the administration of such “liver growth carcinogens” to rats is a result of both hypertrophy and hyperplasia. Depending on the particular chemical, the hypertrophy is characterised by proliferation of peroxisomes and/or smooth endoplasmic reticulum, induction of peroxisomal enzymes and induction of cytochrome P450 isoforms. The hyperplasia is characterised by stimulation of hepatocellular proliferation (S-phase, labelling index) and inhibition of apoptosis.

PFOS has previously been shown to elicit liver growth in rats, and this study aimed to characterise the hepatomegaly in these terms. Thyroid follicular cell adenoma effects have also been reported in male rats after the administration of 20ppm PFOS in the diet for one year followed by up to one year of control rat diet. However, male rats given PFOS in the diet at the same dose continuously for up to two years did not experience an increase in the tumour.

This study used liver, serum, thyroid and duodenal (for assessing BrdU labelling) samples generated over a time course including exposure for 1, 7 and 28 days. Phenobarbital (PB) and Wy14,643 were used as positive controls. The following parameters were studied:

- Bodyweights
- Liver weights (relative and absolute)
- Clinical chemistry (5 parameters).
- Haematoxylin and eosin (H&E) histopathology (liver and thyroid)
- Apoptotic indices analysed using the TUNEL assay (liver and thyroid)
- BrdU incorporation analysed as a measure of cell proliferation (liver and thyroid)
- The DNA content of liver was measured using the diphenylamine reaction
- Acyl CoA oxidase activity was determined in liver heavy pellets as CN⁻-insensitive palmitoyl CoA oxidation
- Total P450 content was determined in liver microsomes
- Lauric acid hydroxylation (LAH, CYP4A) was determined in liver microsomes
- Pentoxyresorufin-*O*-depentylation (PROD, CYP2B) was determined in liver microsomes
- Testosterone hydroxylation (CYP 3A) was determined in liver microsomes
- Expression of CYPs 2B1/2, 2E1, 3A1 and 4A1 by SDS-PAGE and Western blotting in liver microsomes. These blots were only performed on controls, high dose PFOS, Wy 14,643 and PB livers

2. ANIMALS (Scientific Procedures) ACT 1986 COMPLIANCE

The in-life procedures undertaken during the course of this Study were subject to the provisions of the United Kingdom Animals (Scientific Procedures) Act 1986. The Act, administered by the UK Home Office, regulates all scientific procedures in living animals which may cause pain, suffering, distress or lasting harm and provides for the designation of establishments where procedures may be undertaken, the licensing of trained individuals who perform the practical techniques, and the issue of project licences for specified programmes of work.

This Study complied with all applicable sections of the Act and the associated Codes of Practice for the Housing and Care of Animals used in Scientific Procedures and the Humane Killing of Animals under Schedule 1 to the Act, issued under section 21 of the Act.

2.1 Licensee Responsibilities

The procedure performed was PD1 as detailed in the PD project licence (60/3005).

The severity limit for this procedure is MODERATE. Mr F Simeons returned the animals at the start of the study under the PD project licence.

3. MATERIALS AND METHODS

3.1 Test Substances

Perfluorooctane sulfonate potassium salt (PFOS K⁺, Lot no. 217, purity 87.6%) supplied by 3M Company, St. Paul Minnesota, USA, was a white powder.

Wy14,643 was purchased from Alexis Biochemicals (ALX-270-198).

Phenobarbital, sodium salt, was purchased from Sigma (P5178).

They were handled, and their identity verified, according to CXR Biosciences SOP 0010. This SOP describes routine procedures for the receipt, identification, labelling, handling, sampling and storage of Test and Reference Items. These procedures are implemented to ensure that:

- Test and Reference Items used are those Items specified in Study Protocols.
- Handling and storage of Test and Reference Items preserves their identity and integrity during use.

3.2 Safety Precautions

The normal safety precautions as detailed in the relevant Sop's and COSHH assessments were applied, no additional precautions were considered necessary.

3.3 Diet

RM1 powdered diet (Special Diet Services Ltd., Stepfield, Witham, Essex, UK) was used; Biological Sciences Resource Unit (BSRU) hold the specification of the diet.

The Sponsor requested the dietary route of administration.

The test diets, containing 20ppm PFOS, 100ppm PFOS, 500ppm PB or 50ppm Wy14,643 were prepared by CXR Biosciences (Laboratory Method Sheet [LMS] TSC-002) and samples were retained for analysis by the Sponsor.

Rats were fed RM1 powdered diet or test diets *ad libitum* throughout the study.

3.4 Animals

A sufficient number of male 6-7 week old Charles River Sprague Dawley (CD) rats were obtained from Charles River, UK. On arrival in the BSRU the rats were housed 2 per cage on sawdust in solid -bottom, polypropylene cages. The rats were acclimatised for a period of at least 5 days before use. No animals were excluded from the study. Environmental enhancing additions were not used in the cages prior to the start of the Study.

The Sprague Dawley (CD) rat was the test system of choice for this study because previous work on PFOS has been undertaken using this strain. In addition, CXR Biosciences has extensive experience in the use of this strain of rat, and the strain is well accepted by the regulatory authorities.

3.5 Animal Accommodation and Husbandry

The environment was controlled in the animal room to provide conditions suitable for the Sprague Dawley (CD) strain of rat. The temperature was maintained within a range of 19-23°C and relative humidity within a range of 40-70%. There were a nominal 14-15 air changes per hour. Twelve-hour periods of light were cycled with twelve-hour periods of darkness.

Drinking water was taken from the local supply and provided in bottles. Drinking water was provided *ad libitum* prior to and throughout the study.

Prior to the start of the study the rats were allowed powdered RM1 diet *ad libitum*.

4. EXPERIMENTAL DESIGN

The animals were uniquely numbered by ear-punch and randomly allocated to groups up to one week after arrival. An experimental card was placed on each cage and showed the project licence code, treatment group, study number, sex and individual numbers of the rats within, and identified the Home Office Licensee. In addition, these cards were colour-coded to correlate with the coding for the treatment group on the diet boxes and jars.

The study consisted of one control and four test groups, each containing 30 male animals. Control animals received powdered RM1 diet *ad libitum* for the duration of the study. The test groups of animals were administered either 20ppm PFOS, 100ppm PFOS, 500ppm PB or 50ppm Wy14,643 in the diet *ad libitum* for either 1, 7 or 28 days. The concentration of PFOS in powdered RM1 diet was prepared with purity correction. The dietary concentrations of PB and Wy14,643 were made up without any correction for purity. The corresponding PFOS,

PB, and Wy14,643 concentrations in the powdered RM1 diet will be analyzed by the Sponsor. Ten animals from each group were sacrificed on Days 2, 8 and 29.

Animals were implanted with osmotic pumps (Alzet 2ML1) containing bromodeoxyuridine (BrdU, 15mg/mL in phosphate buffered saline [PBS], pH7.4) 5 days before termination, whilst still receiving the treatment regimen (Table 1). Animals sacrificed after exposure to diet for 1 day were administered BrdU (15mg/mL in PBS, 5mL/kg bodyweight) by subcutaneous injection 2 hours prior to sacrifice.

TABLE 1
EXPERIMENTAL DESIGN

Group	Colour code	Animal No	Treatment	Dates			
				Arrival	Start	Implant	Kill
1	Blue	1 – 10	Control	31/10/06	07/11/06	08/11/06*	08/11/06
		11 – 20				09/11/06	14/11/06
		21 – 30				30/11/06	05/12/06
2	Green	31 – 40	PFOS 20ppm	31/10/06	07/11/06	08/11/06*	08/11/06
		41 – 50				09/11/06	14/11/06
		51 – 60				30/11/06	05/12/06
3	Yellow	61 – 70	PFOS 100ppm	31/10/06	07/11/06	08/11/06*	08/11/06
		71 – 80				09/11/06	14/11/06
		81 – 90				30/11/06	05/12/06
4	Red	91 – 100	PB 500ppm	31/10/06	07/11/06	08/11/06*	08/11/06
		101 – 110				09/11/06	14/11/06
		111 – 120				30/11/06	05/12/06
5	Black	121 – 130	Wy-14,643 50ppm	31/10/06	07/11/06	08/11/06*	08/11/06
		131 – 140				09/11/06	14/11/06
		141 – 150				30/11/06	05/12/06

* = subcutaneous injection

5. EXPERIMENTAL PROCEDURES

5.1 Bodyweight

The bodyweight of each rat was recorded at the start of the study. The animals were weighed weekly on the same day of the week. All animals were weighed prior to termination. Bodyweights were recorded electronically and records of the weights were stored in the Study File.

5.2 Clinical Observations

Prior to the start of the study, all rats were observed to ensure that they were physically normal and that they exhibited normal activity. Each rat was observed at least once daily

during the study. Clinical abnormalities of individual animals were recorded in the Study Diary. This was kept in the BSRU until completion of the in life phase of the study and then transferred to the Study File for retention and archiving.

5.3 Food Consumption

Food consumption was measured every time the diet jars were changed / refilled, and when the animals were sacrificed. Animals on diet for 7 days or greater had their diet jars weighed on the same day of the week, regardless of refilling, so that weekly food consumption could be recorded. Evidence of excessive diet spillage was noted if it occurred.

5.4 Intercurrent Deaths

There were no rats requiring euthanasia during the study, nor were there any intercurrent deaths.

5.5 Terminal Procedures

On the day of termination the rats were weighed and transferred to the post mortem room. The rats were killed by exposure to a rising concentration of CO₂.

- Approximately 6 to 10 mL of venous blood was taken by cardiac puncture and dispensed at equal volume into uncoated tubes (to obtain serum) and lithium/heparin-coated tubes (to obtain plasma). The tubes were mixed on a roller for 10 min then cooled on ice. Serum and plasma were prepared by centrifugation (2,000 rpm for 10 min at 8 - 10°C) then stored at approximately -70°C pending analysis. The pellet was discarded.
- The liver was removed from each animal and weighed.
- 2 samples of liver, approximately 2mm strips, were taken, one from the Left lobe and one from the Median lobe. These were placed in 10% neutral buffered formaldehyde (NBF), for approximately 48hours, for BrdU immunohistochemistry and analysis of the apoptotic index.
- 2 samples of liver, approximately 2mm strips, were taken, one from the Left lobe and one from the Median lobe. These were placed in NBF, for at least 1 week, for H&E histopathology.
- 1 sample of liver, of approximately 0.25g, was weighed and then flash frozen in liquid nitrogen then stored at approximately -70°C for DNA determination.
- 2 samples of liver, of approximately 1g each, were flash frozen in liquid nitrogen then stored at approximately -70°C prior to dispatch, on dry ice, to the Sponsor for further analytical determination under a separate protocol
- The remainder of the liver was weighed and scissor-minced in ice-cold 1.15% (w/v) KCl prior to subcellular fractionation according to Laboratory Method Sheet (LMS) Cent-001. Samples of homogenate, heavy pellet and microsomes were stored at approximately -70°C prior to analysis. Samples of cytosol were stored at approximately -70°C prior to

dispatch, on dry ice, to the Sponsor for further analytical determination under a separate protocol.

- 1 sample of duodenal small intestine, of approximately 1cm, was taken and placed in NBF, for approximately 48 hours, as a positive control for BrdU immunohistochemistry.
- The thyroid was removed from each animal, including the parathyroid gland together with trachea and oesophagus. This tissue was placed in NBF, for approximately 48 hours, for BrdU immunohistochemistry, analysis of the apoptotic index and H&E histology.

6. BIOCHEMICAL MEASUREMENTS

6.1 Clinical Chemistry

Plasma samples, prepared as described above, were assayed for ALT, AST, cholesterol, glucose and triglycerides using a Roche Integra 400 automated analyser according to the manufacturer's instructions. System control samples and calibration standards were those supplied by the manufacturer. Results were maintained in the Study File.

6.2 Peroxisome Proliferation

CN⁻-insensitive acyl CoA oxidation was determined spectrophotometrically in liver heavy pellet, using palmitoyl CoA as a substrate, according to LMS Spec003. Results were expressed as nmol NAD⁺ reduced/min/mg protein. Results were maintained in the Study File.

6.3 DNA Content of Liver

The DNA content of liver was measured spectrophotometrically in whole tissue using the diphenylamine reaction, according to LMS Spec005. Results were expressed as µg DNA/g liver and mg DNA/whole liver. Results were maintained in the Study File.

6.4 Total Cytochrome P450

The total cytochrome P450 content of liver microsomes was determined by measuring the carbon monoxide difference spectrum of ferrocycytochrome P450 according to LMS Spec002. Results were expressed as nmol total P450/mg protein. Results were maintained in the Study File.

6.5 Lauric Acid 12-Hydroxylation (LAH)

The activity of CYP4A in liver microsomes was determined using lauric acid and LC-MS-MS. Results were expressed as nmols 12-OH lauric acid formed/10minutes/mg protein. Results were maintained in the Study File.

6.6 Pentoxyresorufin-*O*-depentylation (PROD)

The activity of CYP2B in liver microsomes was determined spectrofluorometrically by the

formation of resorufin from pentoxyresorufin, according to LMS Fluor-002. Results were expressed as pmols resorufin formed/minute/mg protein. Results were maintained in the Study File.

6.7 Testosterone 6 β -Hydroxylation

The activity of CYP3A in liver microsomes was determined by HPLC followed by UV detection, according to LMS HPLC-006. Results were expressed as nmols hydroxytestosterone formed/minute/mg protein. Results were maintained in the Study File.

6.8 Western Blotting

Expression of CYPs 2B1/2, 2E1, 3A1 and 4A1 was carried out by SDS-PAGE and Western blotting, using liver microsomes, according to LMS Elec006, Elec005 and Elec003. Results were maintained in the Study File.

6.9 Protein Determination

The protein concentration of tissue heavy pellets and microsomes was determined in aqueous solutions using a modification of the method of Lowry *et al.*, (1951) and bovine serum albumin standards, according to LMS Spec001. Results were maintained in the Study File.

6.10 Statistical Analysis

Statistical comparisons between treated and control groups have been undertaken for all numerical data sets. The statistical analyses performed are documented with the results.

6.11 Additional Analyses

The Sponsor has requested no additional analyses.

7. HISTOPATHOLOGY

Following fixation, all fixed liver and thyroid samples were processed, embedded and 5 μ M sections cut according to LMS Pat-005, Pat-006 and Pat-007.

Sections were:

- Stained using H&E, according to LMS Pat-010, Pat-011 and Pat-012.
- Analysed for *in situ* cell death. The method used was an indirect TUNEL labelling assay, according to LMS Pat-014.
- Analysed for BrdU incorporation as a measure of cell proliferation. The method used was an indirect BrdU labelling assay, according to LMS Pat-008.

H&E sections were evaluated by Dr. med. vet. Ortwin Vogel, Goethestraße 26, 24116 Kiel, Schleswig-Holstein, Deutschland. The histopathology report was maintained in the Study File and as an appendix to the Study Report.

8. SPECIMEN SHIPMENT

The powdered RM1 diets, cytosol, serum, and the liver samples designated for further analytical determination by the Sponsor were shipped on dry ice and sent to:

Dave Ehresman

3M Company

3M Center

Building 236-C148

St. Paul, MN 55144

9. PROTOCOL AMENDMENTS

There were no changes to the protocol, and no Protocol Amendments have been signed by the Study Director.

10. RESULTS

10.1 Bodyweights, Food Consumption and Liver Weights.

10.1.1 Bodyweights.

Administration of dietary PFOS (100ppm) and Wy14,643 (50ppm) to rats lead to decreased body weights (bwt) after 28 days of exposure (Table 2). This effect was not observed in the animals receiving dietary PFOS (20ppm) or PB (500ppm). No adverse clinical observations accompanied the decreased body weights.

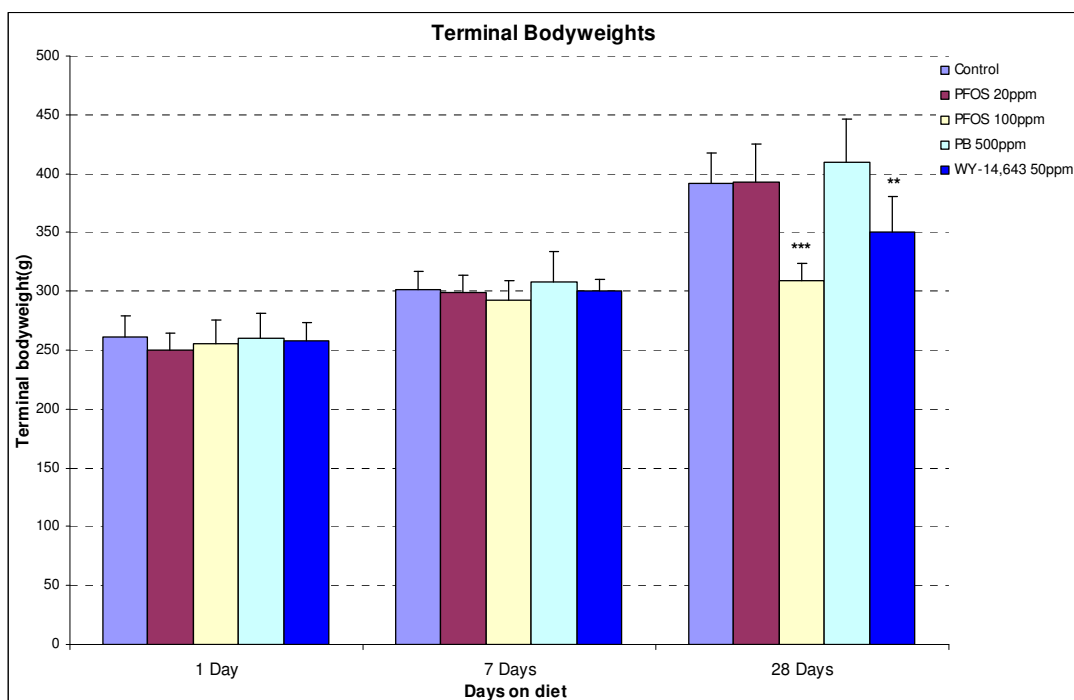
Table 2. Terminal Bodyweights

Days on diet	Bodyweight (g)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	WY14,643 50ppm
1	261.6 ± 17.3 ^a (100 ± 6.6)	249.8 ± 15.0 (95.5 ± 5.7)	255.6 ± 20.3 (97.7 ± 7.8)	259.7 ± 21.7 (99.3 ± 8.3)	257.9 ± 16.0 (98.6 ± 6.1)
7	300.9 ± 15.6 (100 ± 5.2)	299.1 ± 15.0 (99.4 ± 5.0)	292.3 ± 17.0 (97.1 ± 5.7)	307.7 ± 26.4 (102.3 ± 8.8)	299.8 ± 10.6 (99.6 ± 3.5)
28	391.9 ± 26.1 (100 ± 6.7)	392.7 ± 32.7 (100.2 ± 8.3)	309.1 ± 15.1*** (78.9 ± 3.9)	409.8 ± 37.0 (104.6 ± 9.5)	350.8 ± 29.4** (89.5 ± 7.5)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; **p<0.01; *** p<0.001.



10.1.2 Food consumption.

The food consumption of the PFOS 20ppm, PB and Wyl4,643-treated rats was essentially the same as control values throughout the experimental period. Administration of PFOS 100ppm decreased food consumption throughout the experimental period (Table 3.).

When diet consumption was calculated per unit body weight, that of PFOS 100ppm-treated animals was less than control values for the second and third weeks. The Wyl4,643-treated rats consumed more diet per unit body weight during week four of the experiment.

Table 3. Food Consumption

Days on diet	Diet Consumed (g) / Rat / Week				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
7	190.0 ± 15.8 ^a (100 ± 8.31)	193.1 ± 5.5 (101.6 ± 2.9)	179.9 ± 12.3 (94.7 ± 6.5)	196.0 ± 13.7 (103.2 ± 7.2)	205.8 ± 5.8* (108.3 ± 3.1)
14	204.7 ± 21.5 (100 ± 10.5)	193.1 ± 12.8 (94.3 ± 6.2)	161.9 ± 7.1*** (79.1 ± 3.5)	205.0 ± 18.0 (100.1 ± 8.8)	195.6 ± 23.2 (95.6 ± 11.4)
21	198.6 ± 18.6 (100 ± 9.4)	188.4 ± 13.3 (94.9 ± 6.7)	140.9 ± 9.2*** (70.9 ± 4.6)	195.9 ± 17.0 (98.6 ± 8.6)	198.0 ± 24.1 (99.7 ± 12.1)
28	176.9 ± 21.9 (100 ± 12.4)	174.6 ± 9.5 (98.7 ± 5.4)	126.8 ± 19.1** (71.7 ± 10.8)	187.9 ± 14.4 (106.2 ± 8.1)	190.2 ± 21.0 (107.5 ± 11.9)
Days on diet	Diet Consumed (g) / Kg Bwt / Day				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	99.9 ± 20.6 (100 ± 20.7)	106.1 ± 7.8 (106.3 ± 7.8)	110.5 ± 9.9 (110.6 ± 9.9)	106.2 ± 4.1 (106.3 ± 4.1)	118.4 ± 8.8 (118.6 ± 8.8)
7	90.2 ± 5.5 (100 ± 6.1)	92.3 ± 3.5 (102.4 ± 3.9)	87.9 ± 5.0 (97.5 ± 5.6)	91.1 ± 3.0 (101.0 ± 3.4)	98.1 ± 1.4** (108.8 ± 1.6)
14	86.4 ± 8.3 (100 ± 9.6)	80.7 ± 4.1 (93.4 ± 4.7)	75.6 ± 3.0* (87.5 ± 3.5)	82.3 ± 3.8 (95.3 ± 4.4)	86.6 ± 7.1 (100.3 ± 8.2)
21	77.9 ± 8.8 (100 ± 11.2)	73.5 ± 5.8 (94.3 ± 7.5)	64.8 ± 4.3** (83.1 ± 5.6)	72.8 ± 1.6 (93.5 ± 2.1)	84.7 ± 7.0 (108.8 ± 9.0)
28	64.5 ± 7.8 (100 ± 12.0)	63.5 ± 2.8 (98.5 ± 4.4)	58.1 ± 7.1 (90.2 ± 11.0)	65.6 ± 2.3 (101.7 ± 3.5)	77.4 ± 4.4** (120.0 ± 6.9)
Days on diet	Test Item Consumption: mg Test Item / Kg Bwt / Day				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	0 ± 0	2.12 ± 0.16	11.05 ± 0.99	53.09 ± 2.05	5.92 ± 0.44
7	0 ± 0	1.85 ± 0.07	8.79 ± 0.50	45.54 ± 1.52	4.90 ± 0.07
14	0 ± 0	1.61 ± 0.08	7.56 ± 0.30	41.15 ± 1.88	4.33 ± 0.35
21	0 ± 0	1.47 ± 0.12	6.47 ± 0.43	36.39 ± 0.80	4.24 ± 0.35
28	0 ± 0	1.27 ± 0.06	5.62 ± 0.76	32.79 ± 1.13	3.87 ± 0.22

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.

The mean ingested doses of PFOS 20ppm, PFOS 100ppm, PB and Wy14,643, calculated for the duration of the study, were 1.66 ± 0.03 , 7.90 ± 0.17 , 41.79 ± 0.66 and 4.65 ± 0.07 mg Test Item / kg bwt / day respectively.

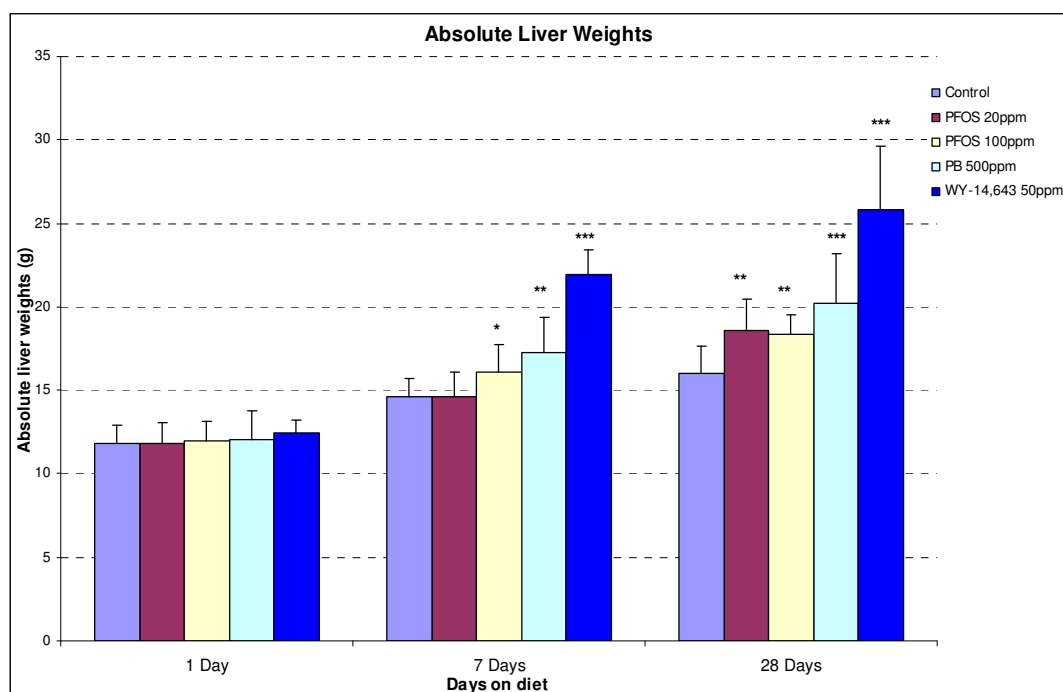
10.1.3 Liver weights.

Absolute liver weights were increased with time following exposure to both dose levels of PFOS, PB and Wy14,643, reaching 116%, 114%, 126% and 161% of control values at Day 29, respectively (Table 4).

Table 4. Absolute Liver Weights

Days on diet	Liver weight (g)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	11.81 ± 1.13^a (100 ± 9.6)	11.86 ± 1.19 (100.4 ± 10.1)	11.99 ± 1.13 (101.5 ± 9.5)	12.02 ± 1.71 (101.8 ± 14.5)	12.43 ± 0.82 (105.2 ± 6.9)
7	14.66 ± 1.07 (100 ± 7.3)	14.66 ± 1.47 (100.0 ± 10.1)	$16.07 \pm 1.64^*$ (109.6 ± 11.2)	$17.30 \pm 2.08^{**}$ (118.0 ± 14.2)	$21.91 \pm 1.54^{***}$ (149.5 ± 10.5)
28	16.03 ± 1.61 (100 ± 10.0)	$18.58 \pm 1.85^{**}$ (116.0 ± 11.53)	$18.33 \pm 1.21^{**}$ (114.4 ± 7.5)	$20.26 \pm 2.90^{***}$ (126.4 ± 18.1)	$25.79 \pm 3.85^{***}$ (160.9 ± 24.0)

^a Values are Mean $\pm$ SD. Values in parenthesis are mean % control $\pm$ SD. n = 10 per group. A Student's t-test (2-sided) was performed on the results; *statistically different from control $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.



After normalisation with respect to bodyweight, relative liver weights were markedly increased by all compounds studied within 28 days of treatment. Increases to approximately 116%, 145%, 121% and 180% of control values were observed following 28 days of exposure (Table 5).

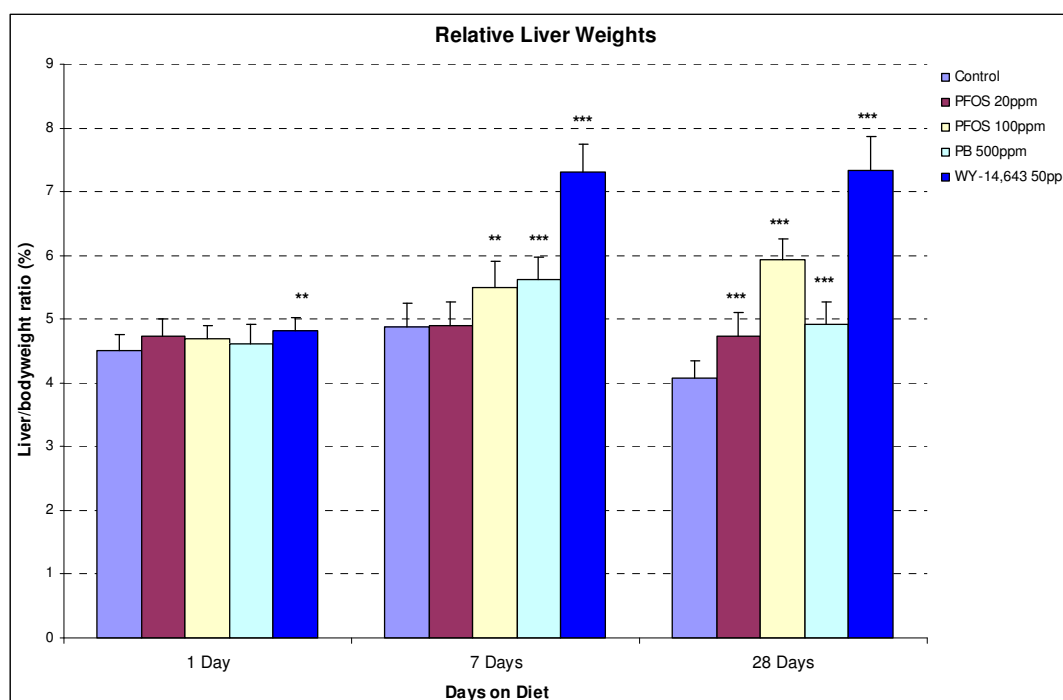
Table 5. Liver/bodyweight ratio (%)

Days on diet	Liver/bodyweight ratio (%)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	4.51 ± 0.24 ^a (100 ± 5.24)	4.74 ± 0.26 (105.02 ± 5.80)	4.69 ± 0.22 (103.94 ± 4.80)	4.61 ± 0.31 (102.19 ± 6.82)	4.82 ± 0.20** (106.87 ± 4.44)
7	4.88 ± 0.37 (100 ± 7.56)	4.90 ± 0.38 (100.44 ± 7.82)	5.49 ± 0.41** (112.64 ± 8.50)	5.62 ± 0.36*** (115.14 ± 7.28)	7.31 ± 0.44*** (149.83 ± 8.95)
28	4.09 ± 0.26 (100 ± 6.47)	4.74 ± 0.37*** (115.95 ± 9.08)	5.93 ± 0.33*** (145.20 ± 8.15)	4.93 ± 0.35*** (120.57 ± 8.56)	7.32 ± 0.55*** (179.20 ± 13.38)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.2 Clinical Chemistry

The lack of overt hepatotoxicity was indicated for all compounds by the absence of toxicologically significant increases in plasma ALT and AST (Tables 6 and 7).

Table 6. Plasma Alanine Aminotransferase Activity

Days on diet	ALT (U/L)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	142.4 ± 30.1 ^a (100 ± 21.1)	119.6 ± 17.0 (84.0 ± 12.0)	133.5 ± 39.1 (93.7 ± 27.4)	108.8 ± 28.2* (76.4 ± 19.8)	96.2 ± 12.5*** (67.5 ± 8.8)
7	102.3 ± 16.5 (100 ± 16.2)	99.1 ± 16.8 (96.8 ± 16.4)	87.2 ± 12.6* (85.2 ± 12.3)	87.3 ± 12.5* (85.3 ± 12.2)	88.9 ± 23.6 (86.9 ± 23.1)
28	80.7 ± 9.9 (100 ± 12.2)	78.6 ± 15.9 (97.4 ± 19.7)	88.9 ± 14.0 (110.2 ± 17.4)	79.3 ± 6.0 (98.3 ± 7.5)	60.7 ± 17.4** (75.2 ± 21.6)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.

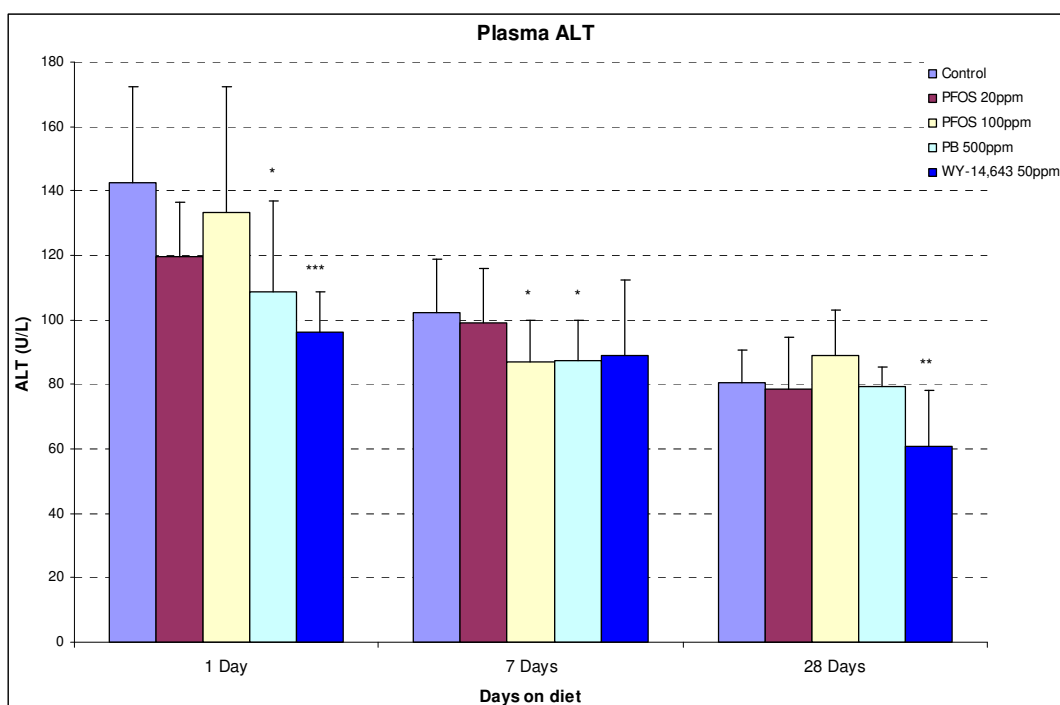


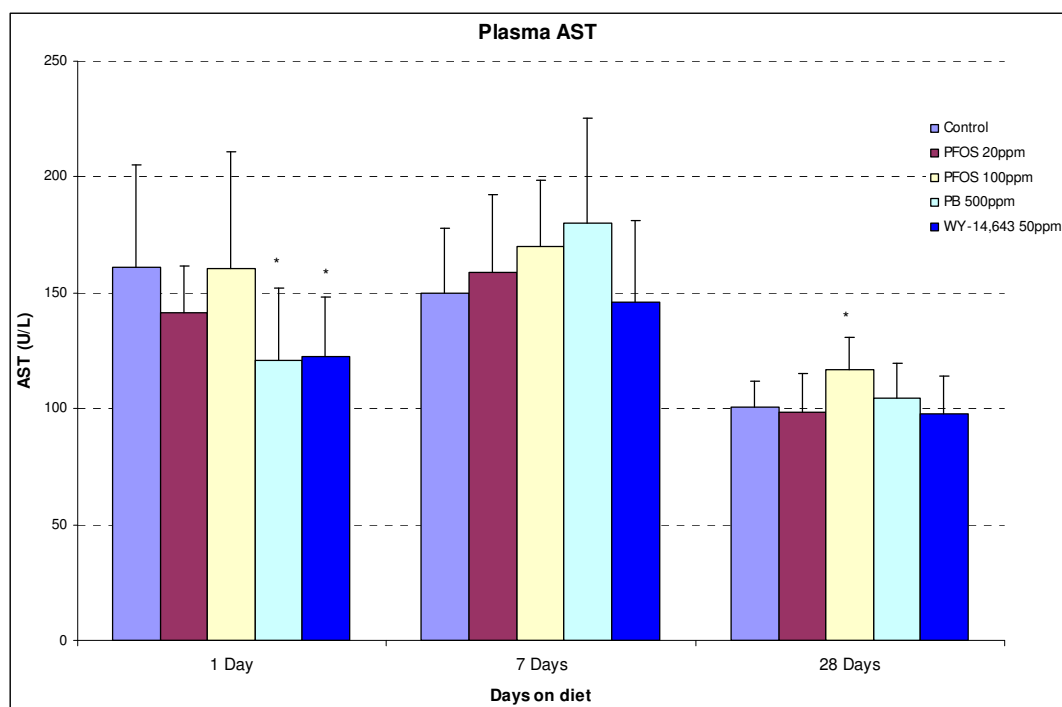
Table 7. Plasma Aspartate Transaminase Activity

Days on diet	AST (U/L)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	160.8 ± 44.7 ^a (100 ± 27.8)	141.2 ± 20.4 (87.8 ± 12.7)	160.4 ± 50.3 (99.8 ± 31.3)	121.0 ± 30.9* (75.2 ± 19.2)	122.6 ± 25.7* (76.2 ± 16.0)
7	149.9 ± 27.8 (100 ± 18.6)	158.8 ± 33.4 (105.9 ± 22.3)	169.9 ± 28.8 (113.4 ± 19.2)	180.3 ± 45.3 (120.3 ± 30.2)	146.0 ± 35.1 (97.4 ± 23.4)
28	100.6 ± 11.3 (100 ± 11.2)	98.7 ± 16.4 (98.2 ± 16.3)	117.1 ± 13.5* (116.5 ± 13.5)	104.5 ± 15.2 (103.9 ± 15.1)	97.9 ± 16.0 (97.3 ± 16.0)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



In general, mean plasma cholesterol concentrations were decreased by both Wy14,643 and PFOS at all time points (Table 8), while mean plasma glucose concentrations were initially decreased after 1 day by Wy14,643 but were significantly decreased after 28 days by PFOS at 100ppm (Table 9).

Table 8. Plasma Total Cholesterol Concentration

Days on diet	Total Cholesterol (mmol/L)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	2.39 ± 0.43 ^a (100 ± 17.86)	2.12 ± 0.39 (89.01 ± 16.26)	1.98 ± 0.24* (83.14 ± 10.05)	2.19 ± 0.46 (91.95 ± 19.42)	1.26 ± 0.22*** (52.75 ± 9.09)
7	2.10 ± 0.30 (100 ± 14.33)	1.61 ± 0.25** (77.00 ± 11.95)	1.29 ± 0.38*** (61.74 ± 18.07)	2.47 ± 0.77 (117.65 ± 36.72)	1.44 ± 0.30*** (68.70 ± 14.15)
28	2.11 ± 0.46 (100 ± 21.89)	1.21 ± 0.28*** (57.60 ± 13.41)	0.34 ± 0.14*** (16.09 ± 6.84)	2.13 ± 0.49 (101.00 ± 23.20)	1.74 ± 0.46 (82.62 ± 21.83)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.

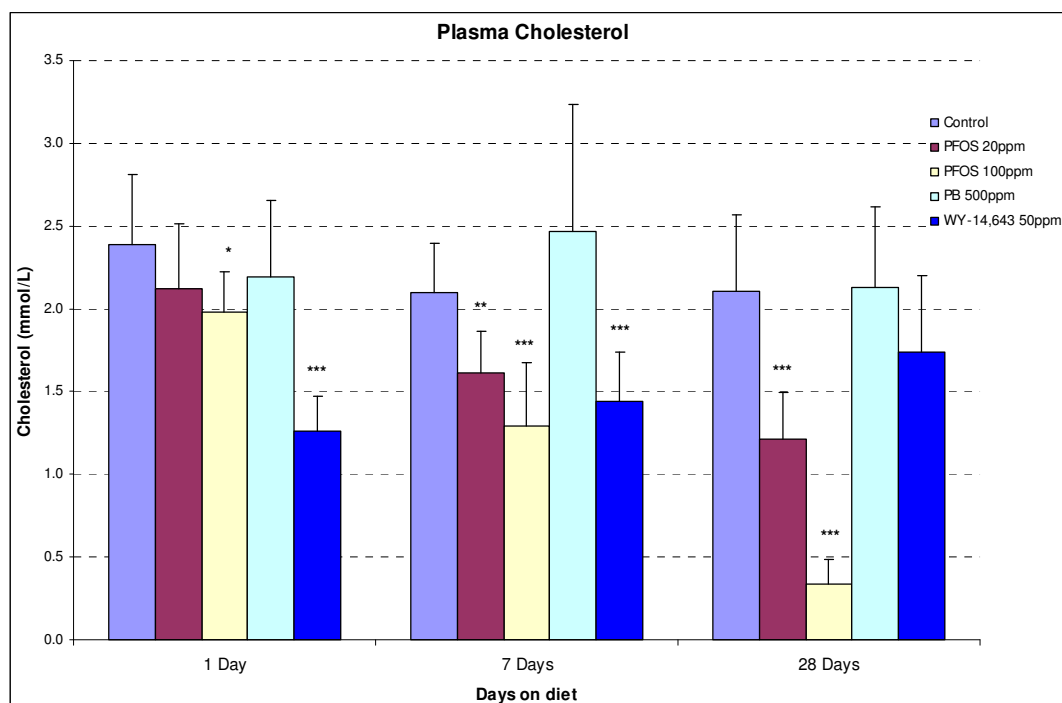


Table 9. Plasma Glucose Concentration

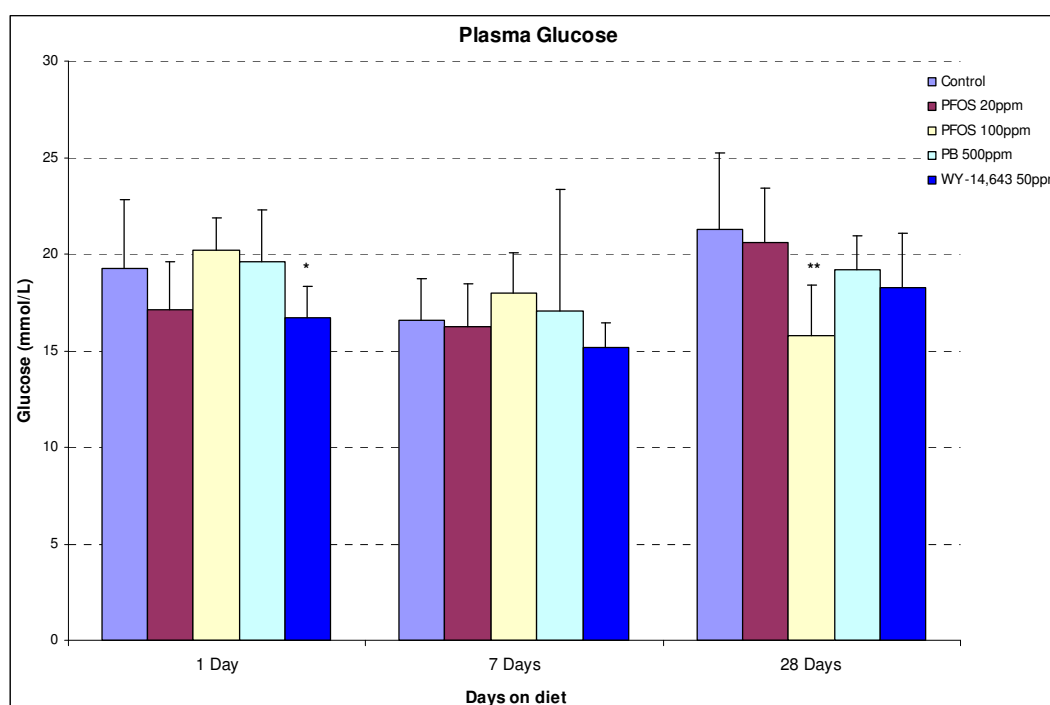
Days on diet	Glucose (mmol/L)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	19.28 ± 3.51 ^a (100 ± 18.20)	17.09 ± 2.52 (88.61 ± 13.09)	20.19 ± 1.71 (104.72 ± 8.89)	19.63 ± 2.64 (101.79 ± 13.67)	16.68 ± 1.64* (86.50 ± 8.51)
7	16.58 ± 2.14 (100 ± 12.93)	16.27 ± 2.17 (98.12 ± 13.12)	17.98 ± 2.10 (108.42 ± 12.64)	17.06 ± 6.28 (102.86 ± 37.89)	15.17 ± 1.30 (91.51 ± 7.82)
28	21.27 ± 3.95 (100 ± 18.56)	20.63 ± 2.78 (97.00 ± 13.08)	15.77 ± 2.59** (74.17 ± 12.19)	19.17 ± 1.79 (90.13 ± 8.43)	18.27 ± 2.80 (85.92 ± 13.17)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control

p<0.05; ** p<0.01; *** p<0.001.



After 1 day on diet, mean plasma triglyceride concentrations were slightly elevated by PB and reduced by Wy14,643. After 7 days there was a marked reduction produced by the administration of 100ppm PPFOS and Wy14,643. The plasma triglyceride concentrations continued to decrease in the animals administered 100ppm PFOS, but recovered to near control levels in the animals administered Wy14,643 (Table 10).

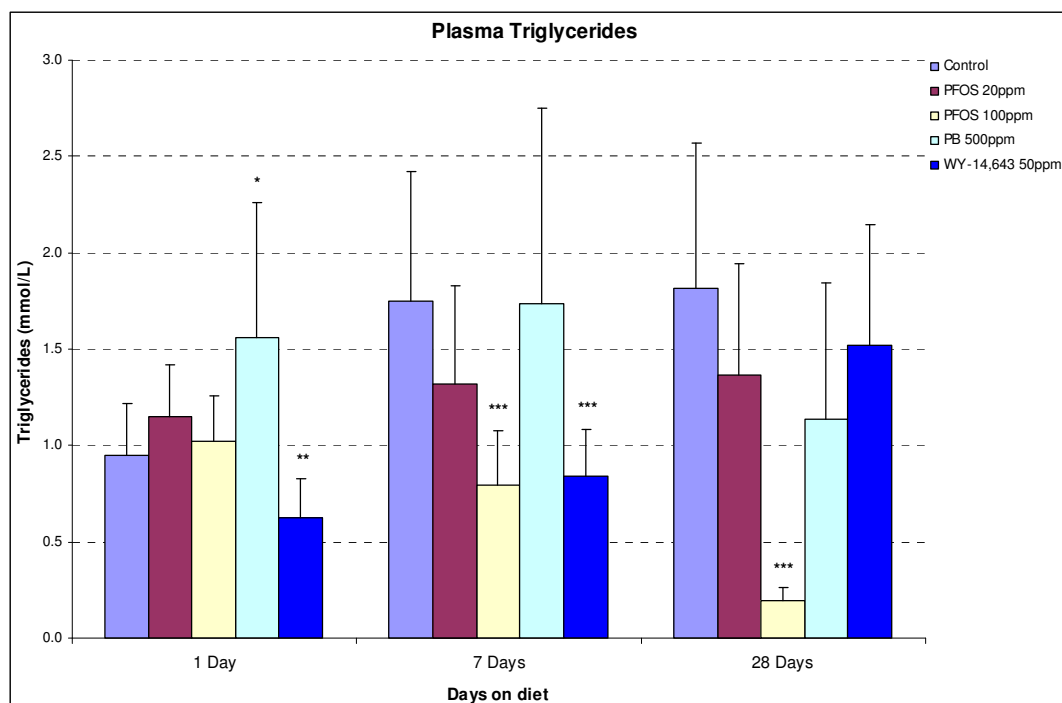
Table 10. Plasma Triglyceride Concentration

Days on diet	Triglycerides (mmol/L)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	0.95 ± 0.27 ^a (100 ± 28.4)	1.15 ± 0.27 (121.5 ± 28.5)	1.02 ± 0.24 (108.1 ± 24.9)	1.56 ± 0.70* (164.7 ± 74.2)	0.63 ± 0.20** (66.0 ± 21.5)
7	1.75 ± 0.67 (100 ± 38.5)	1.32 ± 0.51 (75.3 ± 29.2)	0.79 ± 0.29*** (45.4 ± 16.3)	1.73 ± 1.02 (99.2 ± 58.1)	0.84 ± 0.24*** (48.1 ± 14.0)
28	1.82 ± 0.76 (100 ± 41.7)	1.36 ± 0.58 (75.1 ± 32.1)	0.20 ± 0.06*** (10.9 ± 3.4)	1.13 ± 0.71 (62.4 ± 39.0)	1.52 ± 0.63 (83.6 ± 34.7)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.3 Liver Biochemistry

10.3.1 DNA content of liver

The mean hepatic concentration of DNA was initially increased by the 100ppm PFOS, PB and Wy14,643 treatments after 1 day on diet. Continued treatment resulted in decreased within-group mean liver DNA concentrations at all further time-points examined (Table 11).

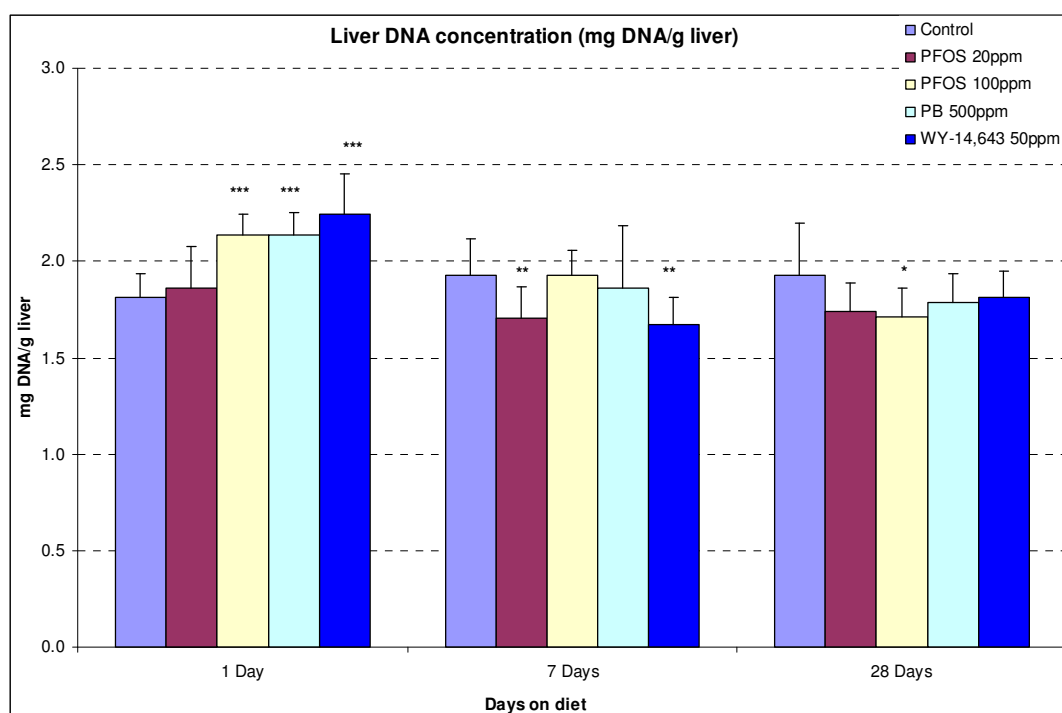
Table 11. Liver DNA Concentration (mg DNA/g liver)

Days on diet	Liver DNA (mg/g liver)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	1.82 ± 0.12 ^a (100 ± 6.7)	1.86 ± 0.22 (102.5 ± 11.9)	2.14 ± 0.11*** (117.5 ± 6.2)	2.14 ± 0.11*** (117.5 ± 6.3)	2.24 ± 0.21*** (123.4 ± 11.8)
7	1.93 ± 0.19 (100 ± 9.6)	1.71 ± 0.16** (88.5 ± 8.3)	1.93 ± 0.13 (99.7 ± 6.8)	1.86 ± 0.32 (96.5 ± 16.6)	1.67 ± 0.14** (86.7 ± 7.1)
28	1.93 ± 0.27 (100 ± 13.8)	1.74 ± 0.15 (90.2 ± 7.6)	1.71 ± 0.14* (88.8 ± 7.5)	1.78 ± 0.15 (92.4 ± 7.8)	1.82 ± 0.13 (94.2 ± 6.9)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



PFOS administration at 20ppm decreased the total liver content of DNA after 7 days on diet, whilst administration at 100ppm increased the total liver content of DNA after 1 and 7 days on diet, with a return to control levels after 28 days on diet for both dose levels. The administration of PB led to a sustained increase of approximately 20% at all time points examined, however administration of Wy14,643 led to marked increases of approximately 30% after 1 and 7 days on diet, and 60% after 28 days on diet (Table 12).

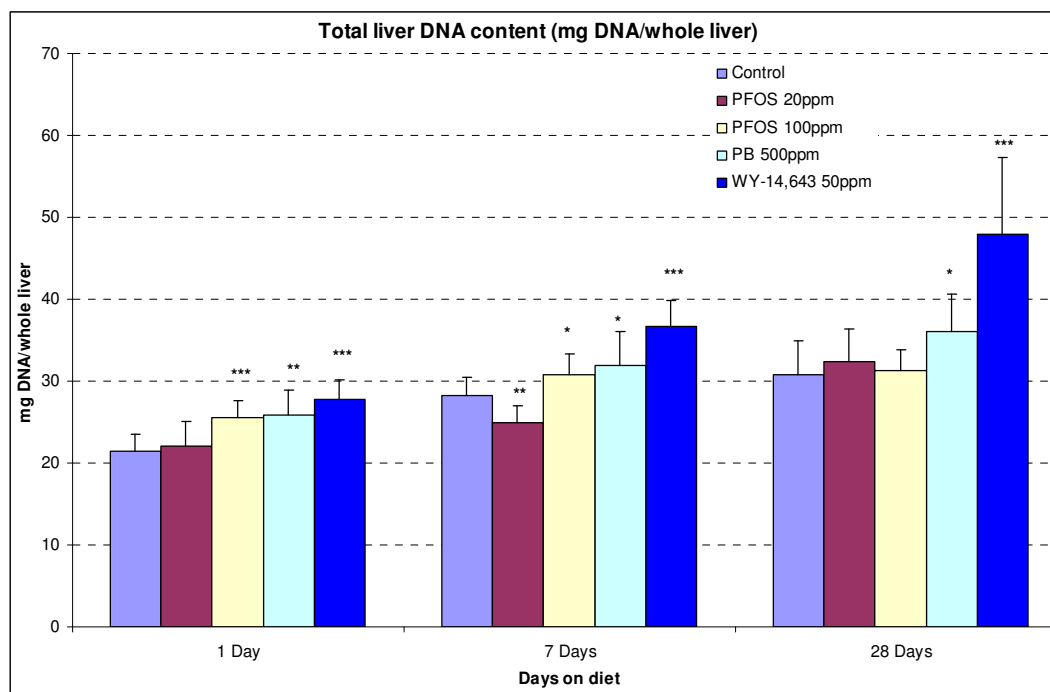
Table 12. Total Liver DNA Content (mg DNA/whole liver)

Days on diet	Liver DNA (mg/whole liver)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	21.42 ± 2.06 ^a (100 ± 9.6)	22.05 ± 3.03 (102.9 ± 14.1)	25.54 ± 2.14*** (119.2 ± 10.0)	25.85 ± 3.09** (120.7 ± 14.4)	27.78 ± 2.39*** (129.7 ± 11.2)
7	28.19 ± 2.27 (100 ± 8.1)	24.90 ± 2.11** (88.4 ± 7.5)	30.81 ± 2.51* (109.3 ± 8.9)	31.88 ± 4.15* (113.1 ± 14.7)	36.60 ± 3.28*** (129.9 ± 11.6)
28	30.76 ± 4.10 (100 ± 13.3)	32.33 ± 4.01 (105.1 ± 13.0)	31.34 ± 2.45 (101.9 ± 8.0)	35.96 ± 4.62* (116.9 ± 15.0)	47.89 ± 9.40*** (155.7 ± 30.6)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.3.2 Peroxisome proliferation

Administration of PFOS and Wy14,643 to rats resulted in marked increases in hepatic peroxisomal β -oxidation as determined by measurement of CN-insensitive palmitoyl CoA (PCO) oxidation. Both compounds increased PCO in a time dependent manner. Administration of PB, however, had no effect or a slight decrease in PCO (Table 13).

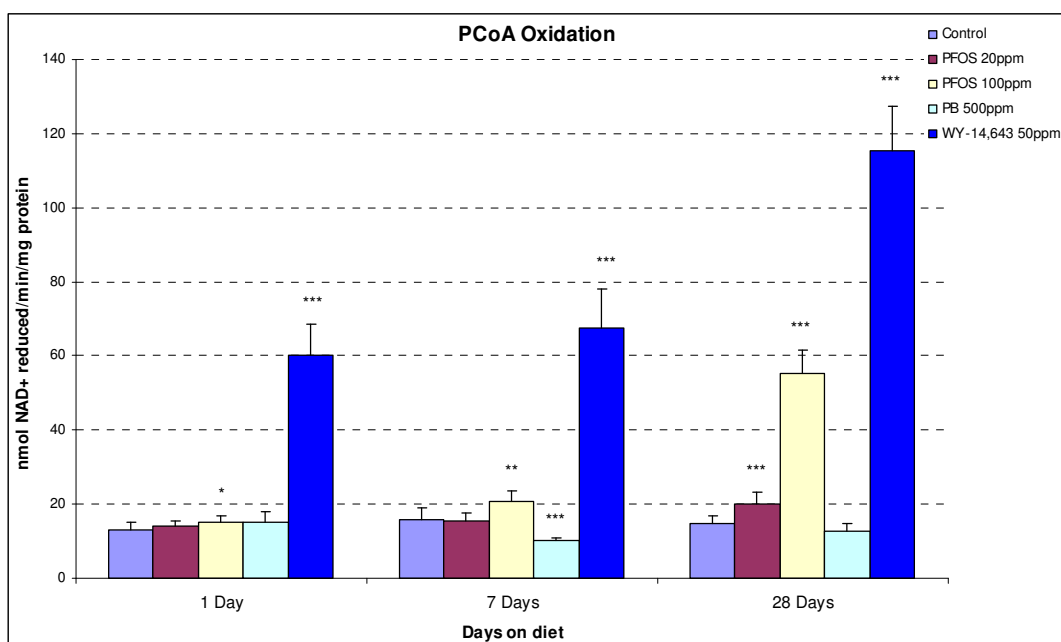
Table 13. Hepatic Cyanide-insensitive Palmitoyl CoA Oxidation (PCO)

Days on diet	PCO (nmol NAD ⁺ reduced/minute/mg protein)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	12.9 $\pm$ 2.0 ^a (100 $\pm$ 15.8)	14.0 $\pm$ 1.5 (108.0 $\pm$ 11.6)	15.1 $\pm$ 1.7* (117.0 $\pm$ 12.9)	15.0 $\pm$ 3.0 (116.3 $\pm$ 23.1)	60.3 $\pm$ 8.4*** (466.6 $\pm$ 64.9)
7	15.9 $\pm$ 2.9 (100 $\pm$ 18.4)	15.4 $\pm$ 2.2 (96.6 $\pm$ 14.0)	20.9 $\pm$ 2.7** (131.2 $\pm$ 17.0)	10.1 $\pm$ 1.0*** (63.3 $\pm$ 6.1)	67.4 $\pm$ 10.8*** (423.0 $\pm$ 68.0)
28	14.7 $\pm$ 2.2 (100 $\pm$ 15.2)	20.2 $\pm$ 3.2*** (136.9 $\pm$ 21.9)	55.3 $\pm$ 6.2*** (376.0 $\pm$ 41.9)	12.8 $\pm$ 2.2 (86.7 $\pm$ 14.8)	115.4 $\pm$ 11.9*** (783.9 $\pm$ 80.7)

^a Values are Mean $\pm$ SD. Values in parenthesis are mean % control $\pm$ SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.3.3 Total cytochrome P450 content of liver

Administration of PFOS and PB to rats resulted in marked increases in hepatic total P450. Administration of PFOS increased total P450 in both a time, and dose dependent manner. Administration of Wy14,643, however, had no effect on hepatic total P450 content (Table 14).

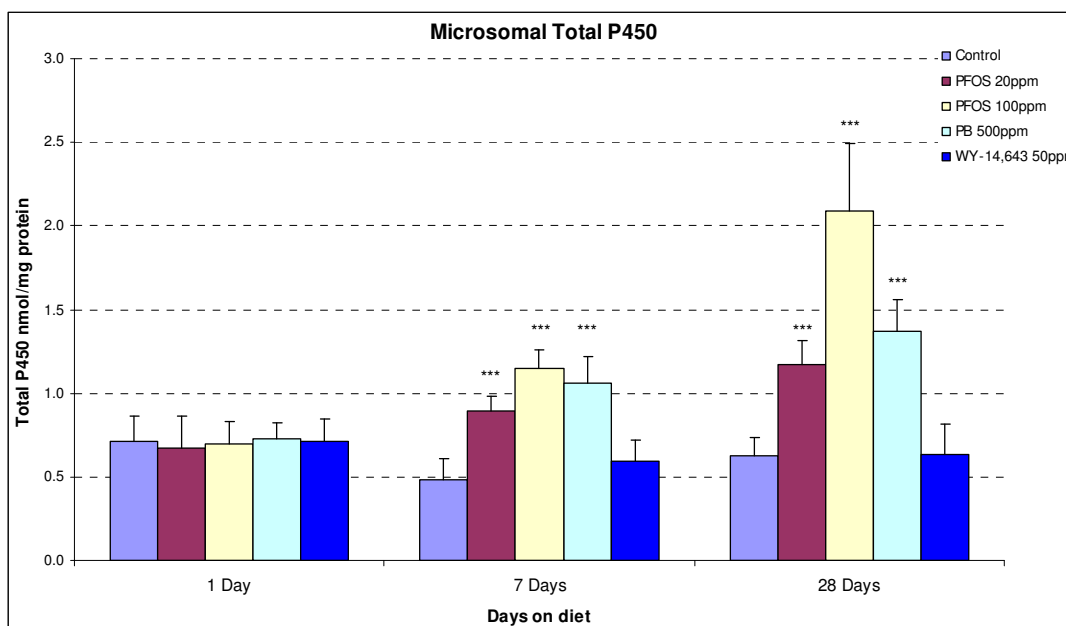
Table 14. Hepatic Total P450 Content

Days on diet	Total P450 (nmol/mg protein)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy-14,643 50ppm
1	0.71 ± 0.15 ^a (100 ± 20.9)	0.67 ± 0.19 (94.3 ± 27.0)	0.70 ± 0.14 (98.2 ± 19.1)	0.72 ± 0.10 (101.9 ± 14.3)	0.71 ± 0.14 (100.1 ± 19.2)
7	0.48 ± 0.13 (100 ± 26.7)	0.90 ± 0.09*** (187.1 ± 17.7)	1.14 ± 0.12*** (238.4 ± 24.3)	1.06 ± 0.16*** (220.7 ± 33.9)	0.60 ± 0.13 (124.0 ± 26.0)
28	0.63 ± 0.11 (100 ± 17.7)	1.17 ± 0.14*** (186.3 ± 22.8)	2.09 ± 0.40*** (333.4 ± 63.8)	1.37 ± 0.19*** (218.9 ± 29.5)	0.63 ± 0.19 (100.6 ± 29.4)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



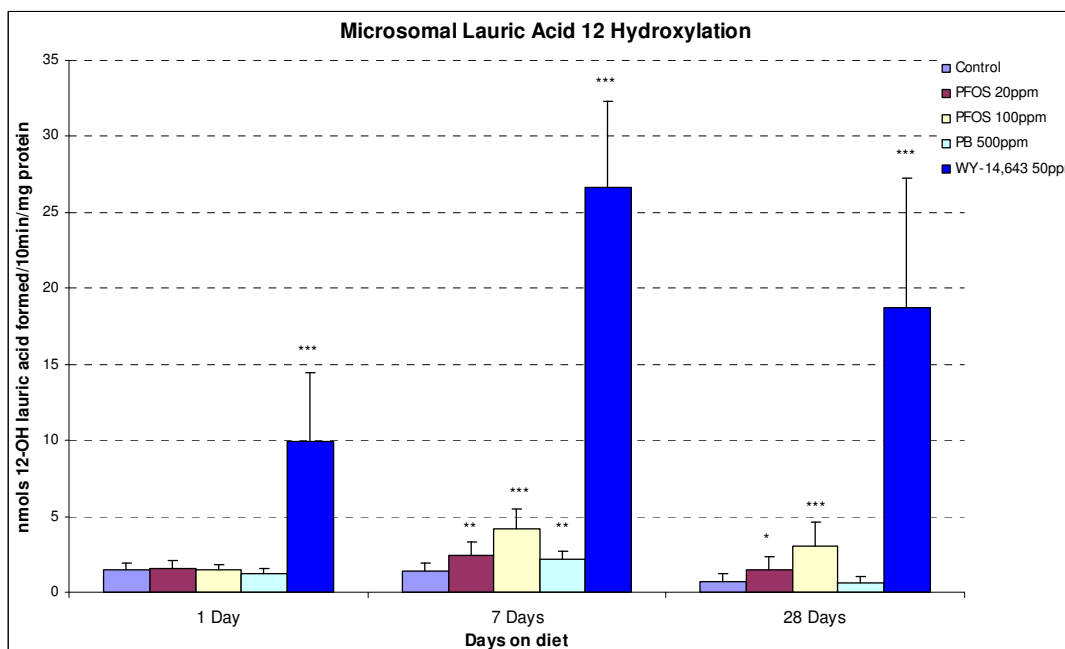
10.3.4 Lauric acid hydroxylation

Lauric acid 12-hydroxylation (12-OH LAH) is used as a marker for cytochrome P450 4A activity. PFOS administration at 20ppm increased the 12-OH LAH by approximately 1.75-fold after 7 days on diet, and 2-fold after 28 days on diet, whilst administration at 100ppm increased the 12-OH LAH by approximately 3-fold after 7 days on diet, and 4-fold after 28 days on diet. The administration of Wy14,643 led to very marked increases of approximately 6.5-fold, 20-fold and 25-fold after 1, 7 and 28 days on diet respectively. Administration of PB for up to 28 days, however, had essentially no effect on 12-OH LAH, with the exception of a 1.5-fold increase after 7 days on diet (Table 15).

Table 15. Lauric Acid 12-Hydroxylation

Days on diet	Lauric Acid 12 Hydroxylation (nmol/10minutes/mg protein)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	1.52 ± 0.41 ^a (100 ± 26.8)	1.59 ± 0.53 (105.0 ± 34.7)	1.45 ± 0.39 (95.3 ± 25.4)	1.19 ± 0.42 (78.7 ± 27.3)	9.96 ± 4.49*** (656.0 ± 295.8)
7	1.39 ± 0.49 (100 ± 35.1)	2.47 ± 0.86** (178.1 ± 62.1)	4.21 ± 1.27*** (303.2 ± 97.8)	2.15 ± 0.50** (155.1 ± 36.3)	26.62 ± 5.69*** (1918 ± 409.8)
28	0.73 ± 0.49 (100 ± 67.7)	1.50 ± 0.83* (205.6 ± 113.9)	3.05 ± 1.56*** (418.7 ± 214.6)	0.61 ± 0.42 (84.13 ± 57.3)	18.71 ± 8.54*** (2569 ± 1173)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD. n = 10 per group. A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



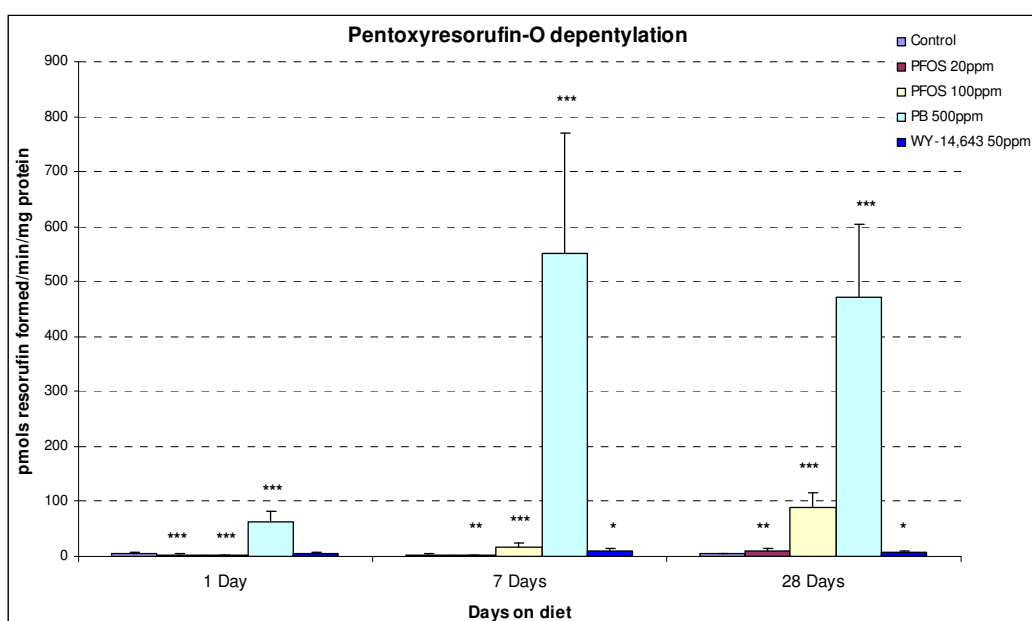
10.3.5 Pentoxoresorufin-*O*-depyntylation

Pentoxoresorufin-*O*-depyntylation (PROD) is used as a marker for cytochrome P450 2B activity. PFOS administration at 20ppm initially decreased the PROD activity by approximately half after 1 and 7 days on diet, followed by a 2.5-fold increase after 28 days on diet. PFOS administration at 100ppm also initially decreased the PROD activity by approximately half after 1 day on diet, followed by a 5-fold, then 22-fold increase after 7 and 28 days on diet respectively. The administration of Wy14,643 showed no significant change in PROD activity after 1 day on diet, followed by a 2.5-fold, then 1.5-fold increase after 7 and 28 days on diet respectively. Administration of PB elicited very marked increases in PROD activity of approximately 11.5-fold, 162-fold and 118-fold after 1, 7 and 28 days on diet respectively (Table 16).

Table 16. Pentoxoresorufin-*O*-depyntylation

Days on diet	PROD (pmols resorufin formed/minute/mg protein)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	5.43 ± 1.68 ^a (100 ± 31.0)	2.97 ± 0.93*** (54.7 ± 17.2)	2.89 ± 0.66*** (53.2 ± 12.1)	62.23 ± 19.68*** (1147 ± 363)	4.72 ± 1.67 (87.0 ± 30.9)
7	3.39 ± 1.23 (100 ± 36.4)	1.86 ± 0.64** (54.9 ± 19.0)	16.54 ± 6.99*** (488 ± 206)	551 ± 219*** (16272 ± 6490)	8.58 ± 6.47* (253 ± 191)
28	4.01 ± 1.13 (100 ± 28.1)	10.17 ± 5.25** (253 ± 131)	88.96 ± 27.55*** (2218 ± 687)	473 ± 131*** (11784 ± 3256)	6.64 ± 3.56* (165 ± 88.8)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD. n = 10 per group. A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



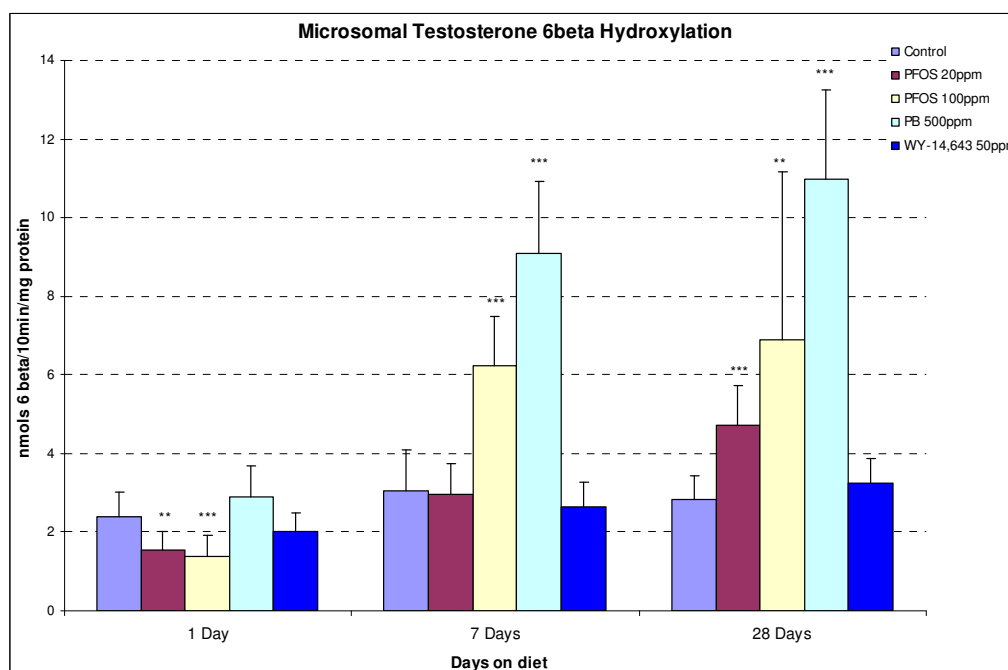
10.3.6 Testosterone hydroxylation

Testosterone 6 β -hydroxylation (Test-6 β -OH) is used as a marker for cytochrome P450 3A activity. PFOS administration at 20ppm initially decreased the Test-6 β -OH activity by approximately half after 1 day on diet, followed by a return to control levels after 7 days on diet, then a 1.5-fold increase after 28 days on diet. PFOS administration at 100ppm also initially decreased the Test-6 β -OH activity by approximately half after 1 day on diet, followed by a 2-fold, then 2.5-fold increase after 7 and 28 days on diet respectively. Administration of PB led to a 3-fold then 4-fold increase in Test-6 β -OH activity after 7 and 28 days on diet respectively. Administration of Wy14,643 for up to 28 days, however, had no effect on Test-6 β -OH activity (Table 17).

Table 17. Testosterone 6 β hydroxylation

Days on diet	Test-6 β -OH (nmols 6 β -OH formed/minute/mg protein)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	2.40 $\pm$ 0.64 ^a (100 $\pm$ 25.6)	1.54 $\pm$ 0.46** (64.2 $\pm$ 19.0)	1.40 $\pm$ 0.52*** (58.2 $\pm$ 21.5)	2.88 $\pm$ 0.80 (120.1 $\pm$ 33.4)	2.01 $\pm$ 0.48 (83.6 $\pm$ 19.8)
7	3.05 $\pm$ 1.03 (100 $\pm$ 33.9)	2.96 $\pm$ 0.78 (97.1 $\pm$ 25.5)	6.24 $\pm$ 1.24*** (204.6 $\pm$ 40.6)	9.09 $\pm$ 1.82*** (297.9 $\pm$ 59.6)	2.65 $\pm$ 0.63 (86.8 $\pm$ 20.6)
28	2.85 $\pm$ 0.59 (100 $\pm$ 20.6)	4.72 $\pm$ 0.99*** (165.8 $\pm$ 34.9)	6.90 $\pm$ 4.26** (242.6 $\pm$ 149.6)	10.99 $\pm$ 2.26*** (386.3 $\pm$ 79.4)	3.24 $\pm$ 0.64 (113.8 $\pm$ 22.4)

^a Values are Mean $\pm$ SD. Values in parenthesis are mean % control $\pm$ SD. n = 10 per group. A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.4 Western Blotting

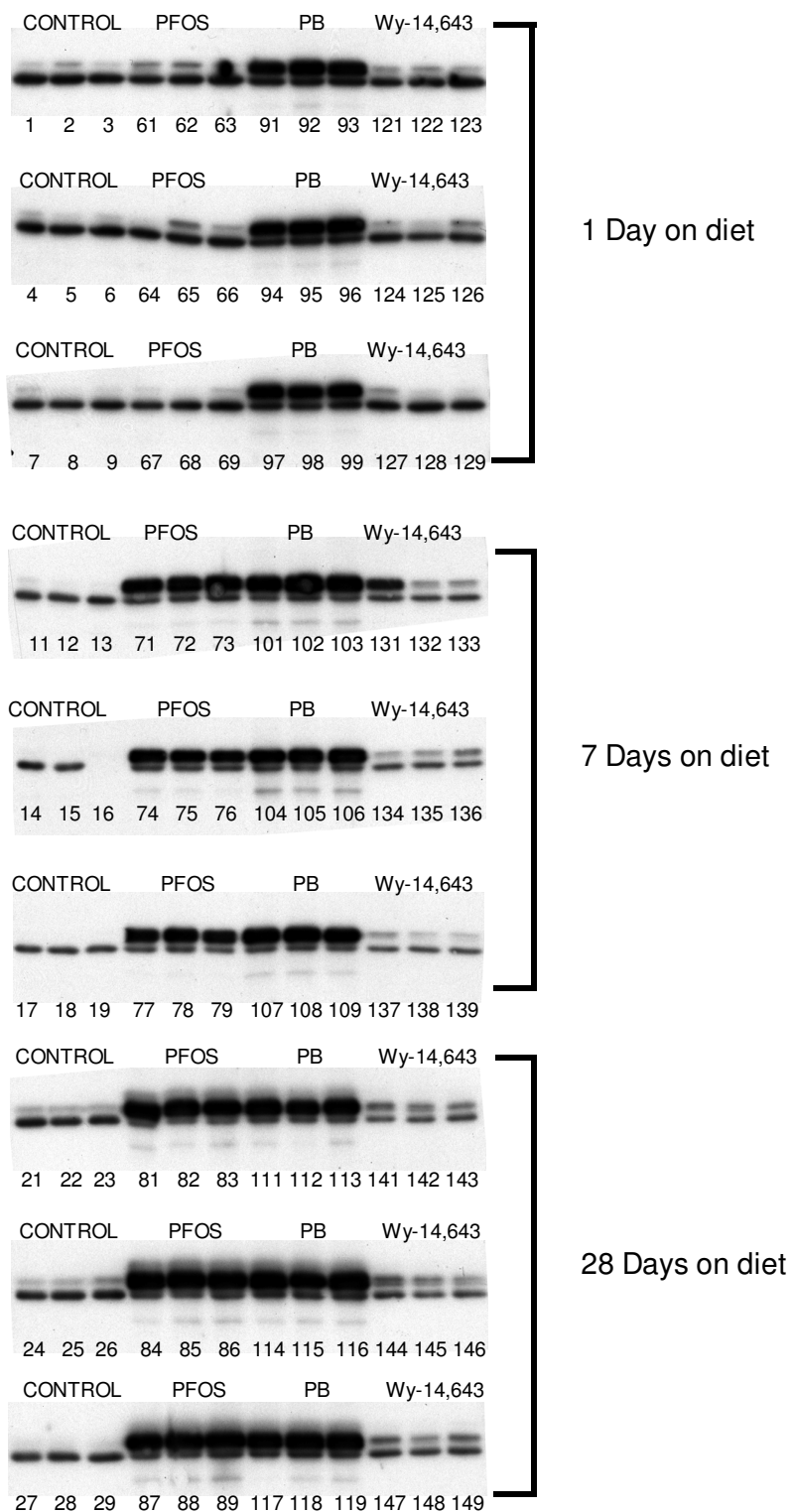
The induction of several microsomal cytochromes P450 was demonstrated by sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) and Western blotting (Figure 1).

SDS-PAGE and Western blotting was performed on hepatic microsomes obtained from 0ppm, PFOS 100ppm, PB 500ppm and Wy14,643 50ppm treated animals only. In each figure, the lane numbers refer to individual rat numbers as shown in Table 1

PFOS clearly induced CYP2B1/2, CYP2E1, CYP3A1 and CYP4A1. PB induced CYP2B1/2, CYP2E1 and CYP3A1, whilst Wy14,643 only induced CYP4A1.

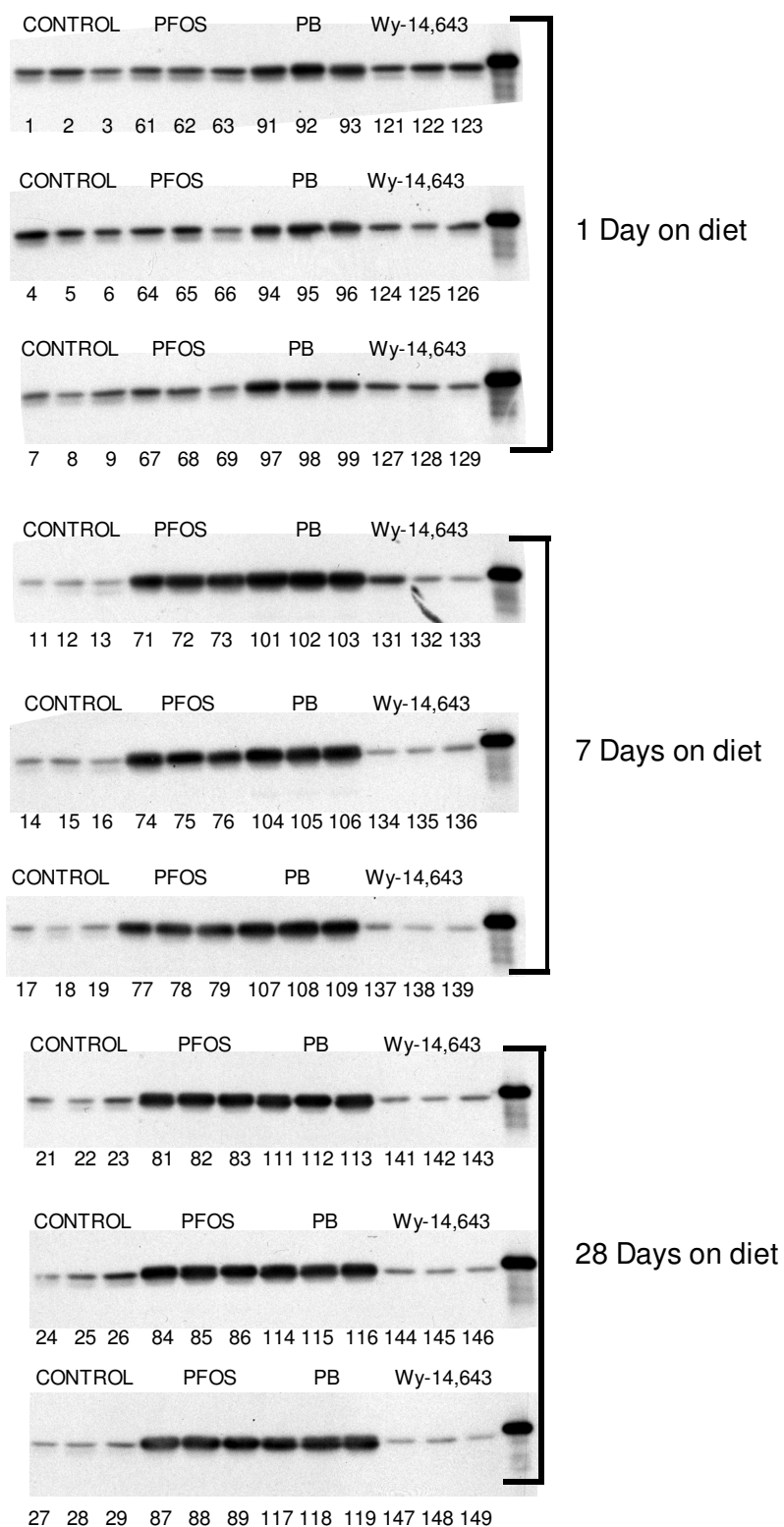
Figure 1. SDS-PAGE and Western Blotting of Hepatic Microsomes

Fig. 1A. CYP2B1/2



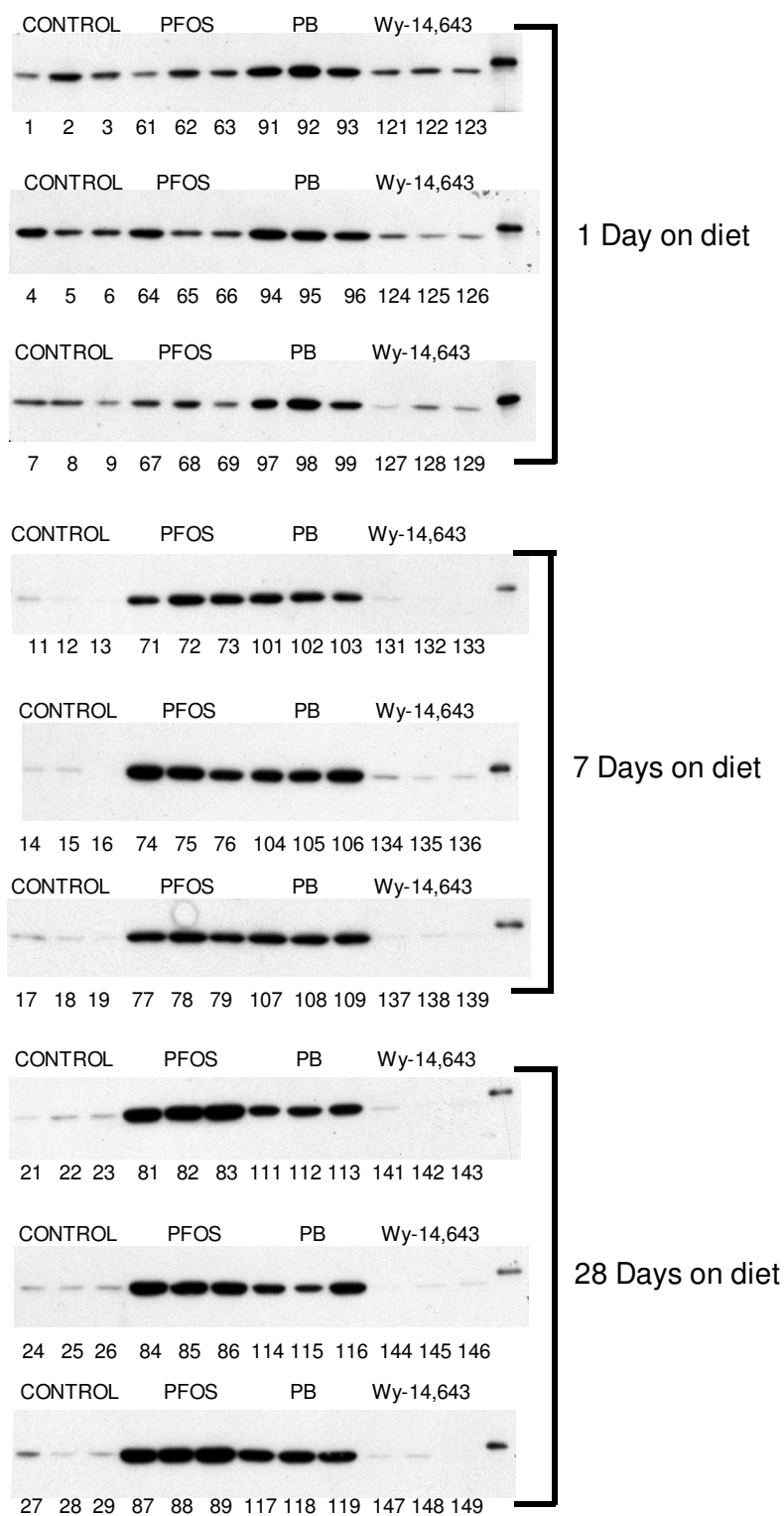
0ppm, PFOS 100ppm, PB 500ppm and Wy14,643 50ppm treated animals only.

Fig. 1B. CYP2E1



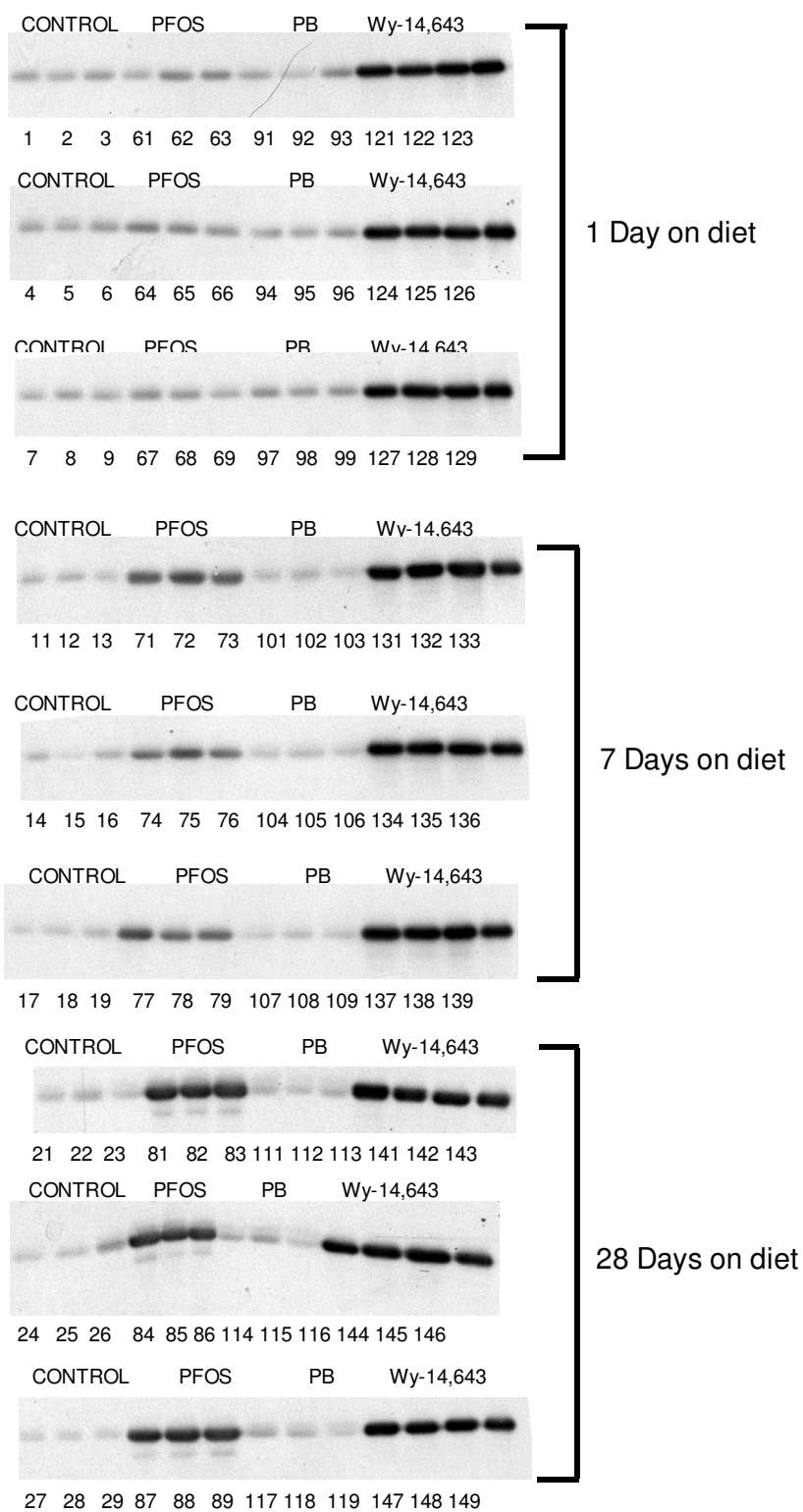
0ppm, PFOS 100ppm, PB 500ppm and Wy14,643 50ppm treated animals only.

Fig. 1C. CYP3A1



0ppm, PFOS 100ppm, PB 500ppm and Wy14,643 50ppm treated animals only.

Fig. 1D. CYP4A1



0ppm, PFOS 100ppm, PB 500ppm and Wy14,643 50ppm treated animals only.

10.5 Histopathology

10.5.1 Liver H&E

Microscopically, treatment related findings were recorded in the liver. When compared with the control animals, a decrease in the usual glycogen induced hepatocellular vacuolation was noted in the animals of the 20ppm and 100ppm PFOS, 500ppm PB and 50ppm Wy14,643 groups, sacrificed after 28 days of treatment. In the 50ppm Wy14,643 group the decrease was already present after 1 and 7 days of treatment.

Additionally, a minimal to slight, mainly centrilobular hepatocellular hypertrophy was noted, dose related in severity, in the animals of the 20ppm PFOS, 100ppm PFOS and 500ppm PB groups after 7 and 28 days of treatment. In the animals treated with 50ppm Wy14,643 a similar but mainly diffuse hepatocellular hypertrophy was recorded in all rats sacrificed after 1, 7 and 28 days of treatment. The severity of this finding was also increased with the duration of treatment.

10.5.2 Hepatic Apoptosis

PFOS 100ppm, PB and Wy14,643 administration decreased the hepatic apoptotic index at all time points studied, reaching a minimum of 40%, 40% and 50% of control values respectively after 28 days of treatment (Table 18).

Administration of PFOS 20ppm, however, resulted in a near 2-fold increase in apoptosis after 7 days of treatment, with a return to control values after 28 days of treatment.

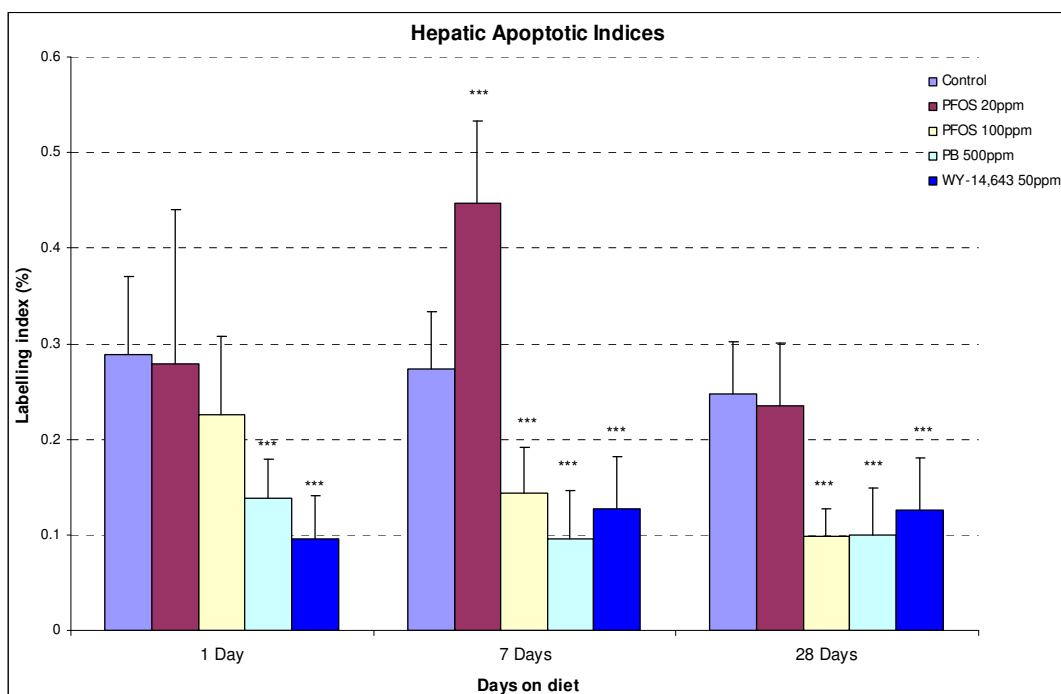
Table 18. Hepatic Apoptotic Indices

Days on diet	Apoptotic Index (%)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	0.29 ± 0.08 ^a (100 ± 28)	0.28 ± 0.16 (97 ± 56)	0.23 ± 0.08 (78 ± 29)	0.14 ± 0.04*** (48 ± 14)	0.10 ± 0.05*** (33 ± 16)
7	0.27 ± 0.06 (100 ± 22)	0.45 ± 0.09*** (164 ± 32)	0.14 ± 0.05*** (53 ± 17)	0.10 ± 0.05*** (35 ± 18)	0.13 ± 0.06*** (47 ± 20)
28	0.25 ± 0.06 (100 ± 23)	0.24 ± 0.07 (95 ± 27)	0.10 ± 0.03*** (40 ± 12)	0.10 ± 0.05*** (41 ± 20)	0.13 ± 0.05*** (51 ± 22)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.5.3 Cell proliferation in liver

20ppm PFOS, 100ppm PFOS, PB and Wy14,643 administration all increased the hepatocellular labelling index (S-phase) at all time points studied (Table 19). These increases were 2-, 3-, 6- and 10-fold, respectively, 1 day after commencement of treatment. After 7 days of treatment the levels of S-phase activity reached a maximum of 4-, 5-, 7- and 25-fold, respectively. By 28 days of treatment, the levels of S-phase activity reduced to 2-, 5-, 2- and 11-fold, respectively.

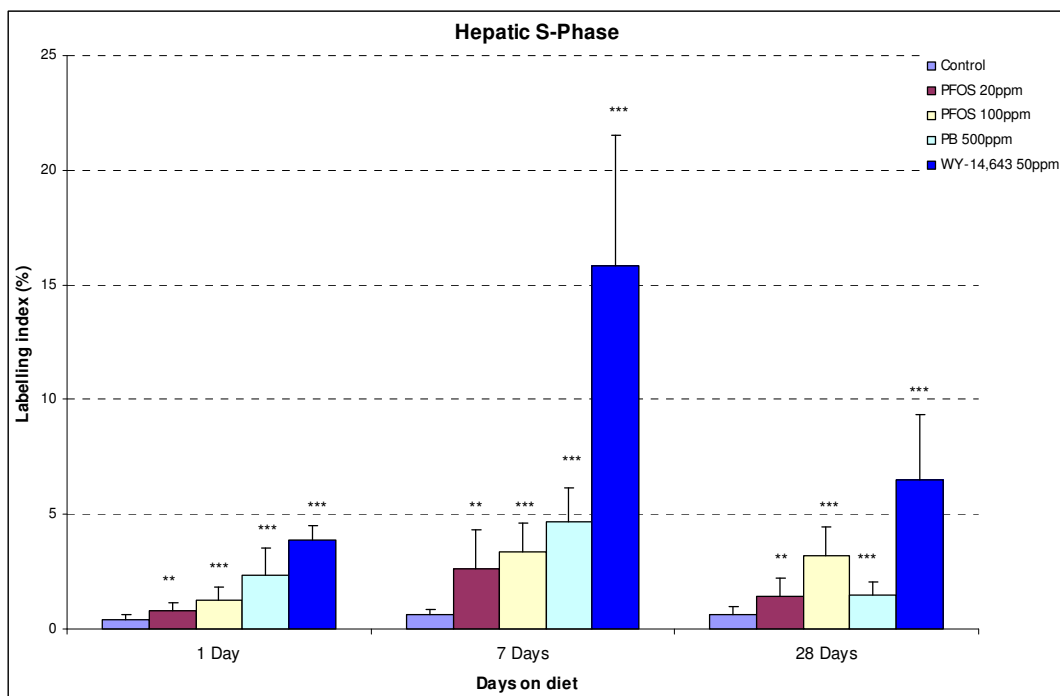
Table 19. Hepatic S-phase Labelling Indices

Days on diet	Labelling Index (%)				
	0ppm	PFOS 20ppm	PFOS 100ppm	PB 500ppm	Wy14,643 50ppm
1	0.40 ± 0.24 ^a (100 ± 61)	0.82 ± 0.32** (204 ± 81)	1.27 ± 0.56*** (318 ± 139)	2.31 ± 1.23*** (577 ± 306)	3.85 ± 0.66*** (961 ± 165)
7	0.64 ± 0.20 (100 ± 31)	2.62 ± 1.70** (411 ± 265)	3.37 ± 1.26*** (528 ± 197)	4.66 ± 1.50*** (730 ± 236)	15.83 ± 5.69*** (2479 ± 891)
28	0.61 ± 0.33 (100 ± 55)	1.43 ± 0.78** (233 ± 127)	3.20 ± 1.25*** (523 ± 204)	1.48 ± 0.55*** (241 ± 91)	6.49 ± 2.83*** (1059 ± 461)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group.

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



10.5.4 Thyroid H&E

In the thyroid gland, no microscopic findings considered to be related to the treatment with the test items were recorded.

10.5.5 Thyroid *in situ* cell death

The level of apoptosis found in all treatment groups, at all time points, was minimal. It was usual to find either no cells, or just one cell per thyroid, staining in the TUNEL assay as apoptotic, regardless of treatment.

10.5.6 Cell proliferation in thyroid

Wy14,643 administration increased the thyroid follicular cell labelling index (S-phase) after 1 and 7 days of treatment, whilst PB administration increased the level of S-phase activity only after 7 days of treatment (Table 20). After 28 days of treatment the levels of S-phase activity returned to control values in both Wy14,643 and PB treated animals.

PFOS 20ppm and PFOS 100ppm treatment had no effect on S-phase at any time point studied.

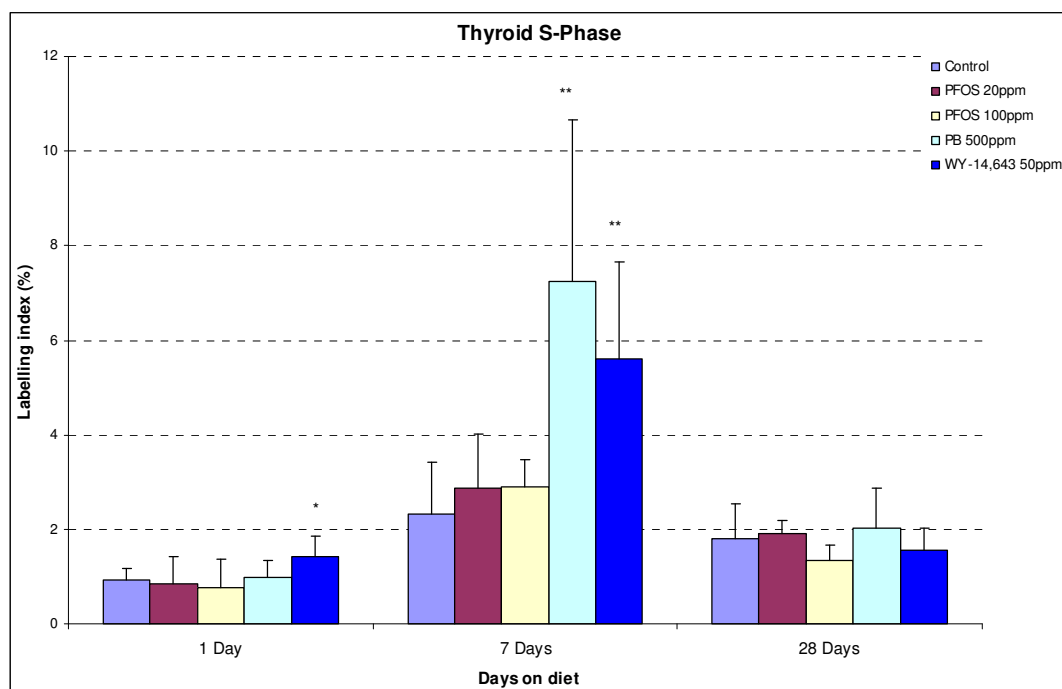
Table 20. Thyroid S-phase Labelling Indices

Days on diet	Labelling Index (%)				
	0ppm	PFOS ¹ 20ppm	PFOS ¹ 100ppm	PB ¹ 500ppm	Wy14,643 ¹ 50ppm
1	0.92 ± 0.27 ^a (100 ± 29)	0.85 ± 0.58 (92 ± 64)	0.78 ± 0.60 (84 ± 65)	0.99 ± 0.37 (108 ± 40)	1.42 ± 0.44* (154 ± 48)
7	2.32 ± 1.09 (100 ± 47)	2.87 ± 1.15 (124 ± 49)	2.89 ± 0.59 (124 ± 25)	7.24 ± 3.43** (311 ± 148)	5.61 ± 2.06** (241 ± 89)
28	1.81 ± 0.74 (100 ± 41)	1.92 ± 0.28 (106 ± 15)	1.35 ± 0.33 (74 ± 18)	2.03 ± 0.84 (112 ± 46)	1.55 ± 0.47 (86 ± 26)

^a Values are Mean ± SD. Values in parenthesis are mean % control ± SD.

n = 10 per group; ¹ n = 5 per group

A Student's t-test (2-sided) was performed on the results; *statistically different from control p<0.05; ** p<0.01; *** p<0.001.



11. DISCUSSION

In this study both Wy14,643 and phenobarbital exhibited their characteristic hepatic effects. These agents also had minimal effects in the thyroid follicular cells increasing S-phase by 2-3-fold after 7 days administration.

Wy14,643 induced hepatomegaly that was characterised by peroxisome proliferation, selective induction of CYP4A1, inhibition of apoptosis and stimulation of cell proliferation as determined by increased DNA synthesis. Marked decreases in plasma cholesterol and triglycerides were also seen; again characteristic of a peroxisome proliferator.

Phenobarbital also induced hepatomegaly but was not a peroxisome proliferator, however it did exhibit the prototypical effects of a (not surprisingly) “phenobarbital-like” enzyme inducer. That is, the liver enlargement was characterised by induction of CYP2B and CYP3A, inhibition of apoptosis and stimulation of cell proliferation demonstrated by an increased labelling index.

The peroxisome proliferation, the enzyme induction and the effects of these compounds on apoptosis and S-phase in the liver are transcriptionally regulated *via* members of the nuclear hormone receptor super family (e.g. PPAR α , CAR and PXR). These receptors play vital roles in the regulation of both intermediary metabolism, xenobiotic metabolism and in the regulation of liver growth. Evidence exists to suggest that the long-term activation of these receptors by non-genotoxic carcinogens is the initial step in such hepatocarcinogenesis.

In this study, PFOS appeared to exhibit the combined effects of PB and Wy14,643, thus behaving as a combined peroxisome proliferator and “phenobarbital-like” enzyme inducer. Thus, these data in totality suggest that PFOS may activate at least three nuclear receptors: PPAR α , CAR and PXR.

12. DATA STORAGE AND ARCHIVING

The data has been held in a Study File according to CXR Biosciences SOPs 0003 and 0005. On completion of the study, the following items will be retained in the CXR Archive:

- Study protocol and possible amendments
- Study Report and possible amendments
- Study File (including Study Diary)
- Relevant correspondence

All items will be kept for two years from the date of signing the Study Report unless, in the opinion of CXR Biosciences, the quality of the specimens no longer allows evaluation. At the end of the two-year period, the Study Sponsor will be contacted and the items either sent to the Study Sponsor or retained by CXR Biosciences under a separate agreement.

13. REPORT

The Study Report has been prepared as described in CXR Biosciences SOP 0004.

14. QUALITY ASSURANCE

Study activities at the Test Facility (CXR Biosciences Ltd and BSRU) have been conducted according to relevant SOPs.

There were no deviations from this protocol.

No claim of GLP compliance has been made for this study.

15. STUDY DIRECTORS STATEMENT

Final Report signature by the Study Director indicates acceptance of responsibility for the validity and integrity of the Study data.

APPENDIX 1. PATHOLOGY REPORT

PATHOLOGY REPORT		CXR	:	0481/s
TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO	
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07	
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2	

PREPARED BY: Dr. med. vet. Ortwin Vogel
Veterinary Pathologist

PATHOLOGY REPORT	PAGE	:	I
	CXR	:	0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TABLE OF CONTENTS

	PAGE :	
AUTHENTICATION		1
PRINCIPAL SECTION SUMMARY	2 -	3
METHODS	4 -	5
RESULTS	6 -	7
CONCLUSIONS	8 -	9
REFERENCES		10
EXPLANATION OF CODES AND SYMBOLS		11
SUMMARY TABLES		
SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX NECROPSY STATUS: INTERIM SACRIFICE GROUP (K1)		12
SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX NECROPSY STATUS: INTERIM SACRIFICE GROUP (K2)		13
SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX NECROPSY STATUS: INTERIM SACRIFICE GROUP (K3)		14
INDIVIDUAL ANIMAL DATA		
TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)	15 -	29
ANIMAL HEADING DATA DOSE GROUP 01		30
TEXT OF MICROSCOPIC FINDINGS DOSE GROUP 01	31 -	45
ANIMAL HEADING DATA DOSE GROUP 02		46
TEXT OF MICROSCOPIC FINDINGS DOSE GROUP 02	47 -	61

PATHOLOGY REPORT

PAGE : II
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TABLE OF CONTENTS

PAGE :

ANIMAL HEADING DATA DOSE GROUP 03	62
TEXT OF MICROSCOPIC FINDINGS DOSE GROUP 03	63 - 77
ANIMAL HEADING DATA DOSE GROUP 04	78
TEXT OF MICROSCOPIC FINDINGS DOSE GROUP 04	79 - 93
ANIMAL HEADING DATA DOSE GROUP 05	94
TEXT OF MICROSCOPIC FINDINGS DOSE GROUP 05	95 - 109

PATHOLOGY REPORT

PAGE : 1/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

AUTHENTICATION

The undersigned hereby declares that the histopathology data in this report were compiled by him, and that they reflect accurately the raw data records.

Dr. med. vet. Ortwin Vogel
Veterinary Pathologist

TPC
Toxicologic Pathology Consultancy
Goethestr. 26
D-24116 Kiel

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 2/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

SUMMARY

To evaluate possible toxic effects of the test item "PFOS", pathomorphological examinations were performed on 150 male Sprague Dawley rats. The rats were allocated to 5 dose groups each consisting of 30 males and received the test items via the feed at dose levels of 20 ppm "PFOS", 100 ppm "PFOS", 500 ppm "PB" or 50 ppm "Wyeth 14,643" (groups 02, 03, 04 and 05, respectively) for a treatment period of 1 (sacrifice K1), 7 (sacrifice K2) or 28 days (sacrifice K3). The rats of group 01 received the same diet without any test item and served as control animals. At the end of the treatment periods, the rats were sacrificed and detailed necropsies performed. Histopathological examination was performed on the liver and thyroid from all animals of all groups.

All animals survived the duration of the study.

Microscopically, treatment related findings were recorded in the liver.

When compared with the control animals, a decrease in the usual glycogen induced hepatocellular vacuolation was noted in the animals of groups 02 (20 ppm PFOS), 03 (100 ppm PFOS), 04 (500 ppm PB) and 05 (50 ppm Wyeth 14,643), sacrificed after 28 days of treatment. In group 05 (50 ppm Wyeth 14,643) the decrease was already present after 1 and 7 days of treatment.

In addition, a minimal to slight, mainly centrilobular hepatocellular hypertrophy was noted, dose related in severity, in the animals of groups 02 - 04 after 7 and 28 days of treatment. In the animals treated with 50 ppm Wyeth 14,643 (group 05), a similar but mainly diffuse hepatocellular hypertrophy was recorded in all rats sacrificed after 1, 7 and 28 days of treatment. The severity of this finding was also increased with the duration of treatment.

In the thyroid gland, no microscopic finding was recorded, that is considered to be related to the treatment with the test items.

All other microscopic findings recorded did not distinguish significantly treated rats from vehicle control rats or the differences noted were regarded as random effects. All these findings are considered to be spontaneous in nature and within the normal background pathology commonly seen in rats of these strains and age.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 3/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

SUMMARY

Under the conditions of this study, the repeated administration of 20 or 100 ppm "PFOS", 500 ppm "PB" or 50 ppm "Wyeth 14,643" via the feed to rats of the Sprague Dawley strain for a treatment period of up to 28 days produced morphological evidence of a liver toxicity.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 4/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

METHODS

Group Design for Pathological Evaluation

Dose Group	Pathdata Group	Test item*	Number of Rats* Males	Animal numbers Males
01	01	0 (Control)	10** 10*** 10****	1 - 10 11 - 20 21 - 30
02	02	20 ppm PFOS	10** 10*** 10****	31 - 40 42 - 50 51 - 60
03	03	100 ppm PFOS	10** 10*** 10****	61 - 70 71 - 80 81 - 90
04	04	500 ppm PB	10** 10*** 10****	91 - 100 101 - 110 111 - 120
05	05	50 ppm Wyeth 14,643	10** 10*** 10****	121 - 130 131 - 140 141 - 150

* strain: Sprague Dawley (CD), (Breeder: Charles River, UK);
** These animals are listed in the tables under necropsy status K1.
*** These animals are listed in the tables under necropsy status K2.
**** These animals are listed in the tables under necropsy status K3.

Administration of the Test Item

The in-life part of the study was performed at CXR Biosciences Ltd., James Lindsay Place, Dundee DD1 5JJ, UK. The animals were administered either 20 ppm PFOS (group 02), 100 ppm PFOS (group 03), 500 ppm PB (group 04) or 50 ppm Wyeth 14,643 (group 05) in the diet ad libitum for either 1 (sacrifice K1), 7 (sacrifice K2) or 28 days (sacrifice K3). The animals of group 01 received the same diet without the test items and served as control animals.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 5/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

METHODS

Necropsy and Histopathology

At the end of the assigned study periods (1 day, (K1), 7 days (K2) or 28 days (K3) after administration), the rats were killed by exposure to a rising concentration of CO₂. Two samples of the liver (one from the left lobe, one from the median lobe) and the thyroid including parathyroid gland together with trachea and oesophagus were taken and preserved in 10% neutral buffered formaldehyde (NBF).

Histotechnique was performed at CXR Biosciences Ltd., UK. The preserved liver and thyroid samples of all rats of all groups were trimmed, processed, embedded in paraffin wax and sectioned at a nominal thickness of about 5 µm. All sections were stained with haematoxylin and eosin. One section of each organ sample was examined by the undersigned pathologist by light microscope.

Data compilation

The animal heading data and necropsy findings recorded by CXR at post-mortem examination were taken from the post-mortem records and entered manually into the PathData Computer system, current version, under Pathology No. 07041 (PathData is a registered trademark of Pathology Data Systems, Inc.). Microscopic findings are recorded by the undersigned pathologist during histopathological examination using on-line data input into the pathology computer system.

All microscopic observations are presented for each rat in the "Table of Individual Microscopic Findings" as well as in full descriptive terms in the "Individual Animal Data - Text of Gross and Microscopic Findings". The incidence of microscopic findings is also presented in tabular form. Incidence tables were created by the Pathdata software. Histologic alterations were described, wherever possible, according to their distribution, severity and morphologic character. Severity scores were assigned as given under "Explanation of Codes and Symbols".

The slides were evaluated during the period July 16 - 28, 2007.

Archive

For archiving purposes, the raw data including a CD-ROM containing the electronic study data and the microscopic slides will be returned to CXR Biosciences Ltd., James Lindsay Place, Dundee DD1 5JJ, UK.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 6/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

RESULTS

Mortality

All animals survived the duration of the study.

Microscopic findings

At histopathologic examination, few microscopic findings were recorded. These findings are described in detail in the "Individual Animal Data Text of Gross and Microscopic Findings".

Liver:

Sacrifice after 1 day of treatment:

A slight to moderate, periportal hepatocellular vacuolation that is considered to be due to an intracytoplasmic glycogen accumulation was prominent in the control animals of group 01. Hepatocellular vacuolation was also present, similar in incidence and severity, in the animals of groups 02 (20 ppm PFOS), 03 (100 ppm PFOS) and 04 (500 ppm PB). In group 05 (50 ppm Wyeth 14,643), this kind of vacuolation occurred, minimal in degree, in 1 rat only. In contrast, a slight, mainly diffuse hepatocellular hypertrophy, that was not observed in the animals of groups 01 - 04, was recorded in all animals of this group instead.

Sacrifice after 7 days of treatment:

A similar hepatocellular vacuolation as recorded in the liver of the animals sacrificed after 1 day of treatment was also noted, minimal to marked in degree, in the control and treated animals of groups 01 - 04. A minimal hepatocellular vacuolation occurred also in 3 animals of group 05 (50 ppm Wyeth 14,643). In addition, hepatocellular hypertrophy that did not occur in control animals was noted in all treated groups. Dose dependent in severity, this mainly centrilobular finding was observed in 7 animals of group 02 (20 ppm PFOS, mean severity 1.0) and all animals of groups 03 (100 ppm PFOS, mean severity 1.4) and 04 (500 ppm PB, mean severity 2.0). In group 05 (50 ppm Wyeth 14,643) a mainly diffuse hepatocellular hypertrophy was found in all animals with a mean severity of 2.7).

Sacrifice after 28 days of treatment:

Hepatocellular vacuolation similar to the finding noted in the animals after 1 and 7 days of treatment was recorded also in all control animals. A decrease in incidence and severity of this finding was noted in groups 02 - 05. In contrast, hepatocellular hypertrophy was noted the animals of these groups. This alteration occurred, minimal to moderate in degree, in

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 7/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

RESULTS

all animals of group 02 (20 ppm PFOS, mean severity 2.1), 03 (100 ppm, PFOS, mean severity 2.0) and 04 (500 ppm PB, mean severity 2.7). In group 05 (50 ppm Wyeth 14,643) a mainly diffuse hepatocellular hypertrophy was found in all animals with a mean severity of 2.9.

Thyroid:

There were no microscopic findings recorded that are considered to be related to the treatment with any test items in either sacrifice group.

The type, incidence and severity of all other microscopic alterations noted did not indicate a relationship to the treatment with the test item or the differences noted were regarded as random effects. These findings were regarded to be spontaneous in nature and within the normal background pathology commonly seen in rats of these strains and age.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 8/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

CONCLUSIONS

In this 28-day toxicity study of the test item "PFOS" administered with the feed to Sprague Dawley rats at dose levels of 0 ppm (control), 20 ppm PFOS, 100 ppm PFOS, 500 ppm Pb or 50 ppm Wyeth 14,643, no premature death occurred.

A similar incidence and severity of hepatocellular vacuolation, occurred in rats of groups 01 - 04 sacrificed after 1 or 7 days of treatment. In the animals of group 05 (50 ppm Wyeth 14,643), the degree of vacuolation was markedly decreased. After 28 days of treatment, a similar vacuolation (mean severity 2.6) was also recorded in the control animals. In the treated animals of groups 02 - 05, a decrease in the degree of this vacuolation was recorded (mean severity 1.8, 1.0, 1.4, 1.0). This kind of vacuolation is considered to be due to the intracytoplasmic presence of glycogen and is quite commonly observed in well-fed, untreated rodents. The difference between control and treated animals noted in this study after 1 day (group 05), 7 (group 05) and 28 days of treatment (groups 02 - 05) is considered to be related to the treatment with the test items.

A slight, mainly centrilobular hepatocellular hypertrophy was noted, dose related in severity, in the animals of groups 02 - 04 after 7 days of treatment and was increased in severity after 28 days of treatment. In the animals treated with 50 ppm Wy-14,643, a similar but mainly diffuse hepatocellular hypertrophy was recorded in all rats sacrificed after 1, 7 and 28 days of treatment. The severity of this finding was also increased with the duration of treatment. In the absence of any hepatocellular hypertrophy in the control animals, this alteration is considered to be related to the treatment with the various test items. A large number of medicinal agents with different chemical structures and therapeutic activities produce liver enlargement when given in high doses to species used in toxicity studies (Greaves, 1990). This enlargement that may be characterized morphologically by hepatocyte hypertrophy, hepatocyte hyperplasia or both may be accompanied by an increase in activity of the hepatic microsomal drug metabolizing enzymes in the absence of any morphological evidence of hepatocellular damage. The changes are typically reversible on cessation of treatment.

There were no microscopic findings recorded in the thyroid gland that are considered to be related to the treatment with any test items in either sacrifice group.

PATHOLOGY REPORT
PRINCIPAL SECTION

PAGE : 9/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

CONCLUSIONS

All other microscopic findings recorded did not distinguish significantly treated rats from vehicle control rats or the differences noted were regarded as random effects. All these findings are considered to be spontaneous in nature and within the normal background pathology commonly seen in rats of these strains and age.

Under the conditions of this study, the repeated administration of 20 or 100 ppm "PFOS", 500 ppm "PB" or 50 ppm "Wyeth 14,643 via the feed to rats of the Sprague Dawley strain for a treatment period of up to 28 days produced morphological evidence of a liver toxicity.

PATHOLOGY REPORT	PAGE	:	10/ 109
PRINCIPAL SECTION	CXR	:	0481/s

TEST ITEM	:	Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	:	RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	:	CXR Biosciences Ltd.	PathData@System	V6.2c2

REFERENCES

Greaves P. (1990): Histopathology of Preclinical Toxicity Studies: Interpretation and Relevance in Drug Safety Evaluation. Digestive System I, 278-392.
Elsevier, Amsterdam New York Oxford

PATHOLOGY REPORT

PAGE : 11/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

EXPLANATION OF CODES AND SYMBOLS

CODES AND SYMBOLS USED AT ANIMAL LEVEL:

M = Male animal
K1...K9 = Interim sacrifice groups 1...9

CODES AND SYMBOLS USED AT ORGAN LEVEL:

' = Histologic examination not required
+ = Organ examined, findings present
- = Organ examined, no pathologic findings noted (AOFT only)
(= Only one of paired organs examined/present

CODES AND SYMBOLS USED AT FINDING LEVEL:

GRADE 1 = Minimal / very few / very small
GRADE 2 = Slight / few / small
GRADE 3 = Moderate / moderate number / moderate size
GRADE 4 = Marked / many / large
P = Finding present, severity not scored
(= Finding unilateral in paired organs

PATHOLOGY REPORT
SUMMARY TABLES

PAGE : 12/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX Necropsy Status: INTERIM SACRIFICE GROUP (K1)						
Sex		Males				
Dose Group No. Animals per Dose Group		01 10	02 10	03 10	04 10	05 10
LIVER	No.Examined	10	10	10	10	10
	- mononuclear cell infiltrate(s) GRADE 1	8	4	7	8	7
	TOTAL AFFECTED	8	4	7	8	7
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
	- (mixed) inflammatory cell infiltration GRADE 1	8	7	5	4	8
	TOTAL AFFECTED	8	7	5	4	8
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
	- vacuolation GRADE 1	-	-	-	-	1
	GRADE 2	6	3	5	4	-
	GRADE 3	4	7	5	5	-
	TOTAL AFFECTED	10	10	10	9	1
	MEAN SEVERITY	2.4	2.7	2.5	2.6	1.0
	- hypertrophy GRADE 2	-	-	-	-	10
	TOTAL AFFECTED	-	-	-	-	10
	MEAN SEVERITY	-	-	-	-	2.0
	THYROID GLAND No.Examined	10	10	10	10	10
	- branchiogenic cyst GRADE 1	-	-	-	1	-
	TOTAL AFFECTED	-	-	-	1	-
	MEAN SEVERITY	-	-	-	1.0	-
	- cyst GRADE 1	-	-	-	1	-
	TOTAL AFFECTED	-	-	-	1	-
	MEAN SEVERITY	-	-	-	1.0	-
	- mononuclear cell infiltrate(s) GRADE 1	-	1	-	-	1
	TOTAL AFFECTED	-	1	-	-	1
	MEAN SEVERITY	-	1.0	-	-	1.0

PATHOLOGY REPORT
SUMMARY TABLES

PAGE : 13/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX Necropsy Status: INTERIM SACRIFICE GROUP (K2)						
Sex		Males				
Dose Group		01	02	03	04	05
No. Animals per Dose Group		10	10	10	10	10
LIVER	No.Examined	10	10	10	10	10
- mononuclear cell infiltrate(s)	GRADE 1	3	4	2	1	1
	TOTAL AFFECTED	3	4	2	1	1
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
- (mixed) inflammatory cell infiltration	GRADE 1	7	3	8	9	8
	TOTAL AFFECTED	7	3	8	9	8
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
- vacuolation	GRADE 1	-	-	-	1	3
	GRADE 2	4	2	5	7	-
	GRADE 3	5	8	5	2	-
	GRADE 4	1	-	-	-	-
	TOTAL AFFECTED	10	10	10	10	3
	MEAN SEVERITY	2.7	2.8	2.5	2.1	1.0
- hypertrophy	GRADE 1	-	7	6	-	-
	GRADE 2	-	-	4	10	3
	GRADE 3	-	-	-	-	7
	TOTAL AFFECTED	-	7	10	10	10
	MEAN SEVERITY	-	1.0	1.4	2.0	2.7
THYROID GLAND	No.Examined	10	10	10	10	10
- branchiogenic cyst	GRADE 1	3	1	1	2	1
	TOTAL AFFECTED	3	1	1	2	1
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
- mononuclear cell infiltrate(s)	GRADE 1	-	2	-	-	-
	TOTAL AFFECTED	-	2	-	-	-
	MEAN SEVERITY	-	1.0	-	-	-

PATHOLOGY REPORT
SUMMARY TABLES

PAGE : 14/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

SUMMARY INCIDENCE OF GRADINGS BY ORGAN/GROUP/SEX Necropsy Status: INTERIM SACRIFICE GROUP (K3)						
Sex		Males				
Dose Group No. Animals per Dose Group		01 10	02 10	03 10	04 10	05 10
LIVER - mononuclear cell infiltrate(s)	No.Examined	10	10	10	10	10
	GRADE 1	3	2	5	-	1
	TOTAL AFFECTED	3	2	5	-	1
	MEAN SEVERITY	1.0	1.0	1.0	-	1.0
- (mixed) inflammatory cell infiltration	GRADE 1	10	6	4	9	5
	TOTAL AFFECTED	10	6	4	9	5
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0
- fatty change (vacuolation)	GRADE 2	-	-	3	-	-
	TOTAL AFFECTED	-	-	3	-	-
	MEAN SEVERITY	-	-	2.0	-	-
- vacuolation	GRADE 1	-	3	3	5	8
	GRADE 2	4	4	-	4	-
	GRADE 3	6	1	-	-	-
	TOTAL AFFECTED	10	8	3	9	8
	MEAN SEVERITY	2.6	1.8	1.0	1.4	1.0
- hypertrophy	GRADE 1	-	1	-	-	-
	GRADE 2	-	7	10	3	1
	GRADE 3	-	2	-	7	9
	TOTAL AFFECTED	-	10	10	10	10
	MEAN SEVERITY	-	2.1	2.0	2.7	2.9
THYROID GLAND - branchiogenic cyst	No.Examined	10	10	10	10	10
	GRADE 1	2	1	1	1	1
	TOTAL AFFECTED	2	1	1	1	1
	MEAN SEVERITY	1.0	1.0	1.0	1.0	1.0

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 15/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 01, Control

ANIMAL NUMBER :

	1	2	3	4	5	6	7	8	9	10
	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	1.	1.	.	1.	1.	.	1.	1.	1.	1.
- inflammatory cell	.	1.	1.	.	1.	1.	1.	1.	1.	1.
- vacuolation, hepat.	3.	3.	2.	2.	3.	2.	2.	3.	2.	2.
.....										
THYROID GLAND	-	-	+	-	(-	-	-	-	+	-
- ectopic thymus	.	.	P.	.	.	.	.	.	(P.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 16/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 01, Control

ANIMAL NUMBER :

	11	12	13	14	15	16	17	18	19	20
	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	.	1.	.	.	.	1.	.	.	.	1.
- inflammatory cell	1.	1.	1.	1.	.	1.	.	.	1.	1.
- vacuolation, hepat.	4.	3.	3.	3.	3.	2.	3.	2.	2.	2.
.....										
THYROID GLAND	(+	-	-	-	-	+	-	+	-	-
- ectopic thymus	.	.	.	.	.	(P.	.	.	.	.
- branchiogenic cyst	(1.	.	.	.	.	(1.	.	(1.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 17/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 01, Control

ANIMAL NUMBER :

	21	22	23	24	25	26	27	28	29	30
	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	.	.	.	1.	.	1.	.	1.	.	.
- inflammatory cell	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
- vacuolation, hepat.	3.	3.	2.	3.	3.	2.	3.	2.	2.	3.
.....										
THYROID GLAND	-	-	-	+	+	-	-	+	-	-
- ectopic thymus	.	.	.	(P.	.	.	.	(P.	.	.
- branchiogenic cyst	.	.	.	1. (1.	.	.	.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 18/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 02, PFOS 20 ppm

ANIMAL NUMBER :	31	32	33	34	35	36	37	38	39	40
	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	1.	.	.	1.	.	.	.	1.	.	1.
- inflammatory cell	.	1.	1.	1.	1.	1.	.	.	1.	1.
- vacuolation, hepat.	3.	3.	3.	3.	2.	2.	3.	3.	2.	3.
.....										
THYROID GLAND	-	-	+	-	-	-	-	-	-	-
- mononuclear infilt.	.	.	(1.	.	.	.	.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 19/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 02, PFOS 20 ppm

ANIMAL NUMBER :	41	42	43	44	45	46	47	48	49	50
	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	1.	.	.	1.	.	1.	1.	.	.	.
- inflammatory cell	.	.	1.	.	.	1.	.	.	.	1.
- vacuolation, hepat.	3.	3.	3.	3.	3.	2.	3.	3.	2.	3.
- hypertrophy, hepat.	1.	1.	1.	.	1.	.	1.	.	1.	1.
.....										
THYROID GLAND	-	+	-	-	-	-	+	+	(-	-
- branchiogenic cyst	.	(1.	.	.	.	.	.	.	.	.
- mononuclear infilt.	.	.	.	.	.	.	(1.	(1.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 20/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 02, PFOS 20 ppm

ANIMAL NUMBER :	51	52	53	54	55	56	57	58	59	60
	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	.	.	.	1.	.	.	.	.	.	1.
- inflammatory cell	.	1.	1.	1.	.	1.	1.	1.	.	.
- vacuolation, hepat.	2.	1.	1.	2.	2.	1.	2.	.	.	3.
- hypertrophy, hepat.	2.	2.	2.	3.	2.	2.	2.	2.	3.	1.
.....										
THYROID GLAND	+	-	-	-	-	+	-	-	-	-
- ectopic thymus	.	.	.	.	.	(P.	.	.	.	.
- branchiogenic cyst	(1.	.	.	.	.	.	.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 21/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 03, PFOS 100 ppm

ANIMAL NUMBER :										
	61	62	63	64	65	66	67	68	69	70
	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	1.	1.	1.	1.	1.	1.	1.	.	.	.
- inflammatory cell	.	1.	1.	1.	.	.	.	1.	1.	.
- vacuolation, hepat.	3.	2.	2.	3.	2.	3.	3.	3.	2.	2.
.....										
THYROID GLAND	-	-	-	-	-	-	-	-	-	-
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 22/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 03, PFOS 100 ppm

ANIMAL NUMBER :	71	72	73	74	75	76	77	78	79	80
	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	1.	.	.	1.	.	.	.	.	.	.
- inflammatory cell	.	1.	1.	.	1.	1.	1.	1.	1.	1.
- vacuolation, hepat.	3.	3.	3.	3.	2.	3.	2.	2.	2.	2.
- hypertrophy, hepat.	1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
.....										
THYROID GLAND	+	-	-	-	-	-	-	-	-	-
- branchiogenic cyst	(1.	.	.	.	.	.	.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 23/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 03, PFOS 100 ppm

ANIMAL NUMBER :	81	82	83	84	85	86	87	88	89	90
	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	1.	1.	1.	.	.	1.	.	1.	.	.
- inflammatory cell	.	1.	.	.	1.	1.	.	.	1.	.
- fatty change	2.	2.	.	.	.	.	.	.	.	2.
- vacuolation, hepat.	.	.	1.	1.	1.	.	.	.	.	.
- hypertrophy, hepat.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
.....										
THYROID GLAND	-	-	-	-	-	-	-	-	-	+
- branchiogenic cyst	.	.	.	.	.	.	.	.	.	(1.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 24/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 04, PB 500 ppm

ANIMAL NUMBER :

	91	92	93	94	95	96	97	98	99	100
	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1
LIVER	+	+	+	+	+	+	+	+	+	-
- mononuclear infiltr.	1.	1.	1.	1.	.	1.	1.	1.	1.	.
- inflammatory cell	.	.	.	1.	1.	1.	.	.	1.	.
- vacuolation, hepat.	3.	3.	3.	3.	3.	2.	2.	2.	2.	.
.....										
THYROID GLAND	+	-	-	(-	-	-	-	+	-	-
- ectopic thymus	(P.	.	.	.	.	.	.	.	.	.
- branchiogenic cyst	.	.	.	.	.	.	.	(1.	.	.
- cyst	.	.	.	.	.	.	.	(1.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 25/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 04, PB 500 ppm

ANIMAL NUMBER :	101	102	103	104	105	106	107	108	109	110
	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	.	1.	.	.	.	.	.	.	.	.
- inflammatory cell	1.	.	1.	1.	1.	1.	1.	1.	1.	1.
- vacuolation, hepat.	2.	3.	1.	2.	2.	2.	2.	3.	2.	2.
- hypertrophy, hepat.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
.....										
THYROID GLAND	-	-	-	(-	-	-	-	+	(+	-
- branchiogenic cyst	.	.	.	.	.	.	.	(1.	(1.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 26/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 04, PB 500 ppm

ANIMAL NUMBER :

	111	112	113	114	115	116	117	118	119	120
	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3
LIVER	+	+	+	+	+	+	+	+	+	+
- inflammatory cell	1.	1.	1.	1.	.	1.	1.	1.	1.	1.
- vacuolation, hepat.	2.	1.	1.	.	2.	1.	2.	1.	2.	1.
- hypertrophy, hepat.	3.	2.	3.	3.	2.	3.	2.	3.	3.	3.
.....										
THYROID GLAND	-	-	-	-	-	-	-	-	-	+
- branchiogenic cyst	.	.	.	.	.	.	.	.	.	(1.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 27/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 05, Wy-14,634 50 ppm

ANIMAL NUMBER :	121	122	123	124	125	126	127	128	129	130
	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1	MK1
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infilt.	.	.	1.	.	1.	1.	1.	1.	1.	1.
- inflammatory cell	1.	1.	1.	1.	1.	.	1.	.	1.	1.
- vacuolation, hepat.	1.	.	.	.	.	.	.	.	.	.
- hypertrophy, hepat.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
.....										
THYROID GLAND	-	-	-	-	-	-	+	-	+	-
- ectopic thymus	.	.	.	.	.	.	.	.	(P.	.
- mononuclear infilt.	.	.	.	.	.	.	(1.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 28/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 05, Wy-14,634 50 ppm

ANIMAL NUMBER :	131	132	133	134	135	136	137	138	139	140
	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2	MK2
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	.	.	.	.	1.	.	.	.	.	.
- inflammatory cell	1.	1.	.	1.	1.	1.	1.	.	1.	1.
- vacuolation, hepat.	1.	1.	1.	.	.	.	.	.	.	.
- hypertrophy, hepat.	2.	2.	2.	3.	3.	3.	3.	3.	3.	3.
.....										
THYROID GLAND	-	-	-	-	-	-	+	-	-	-
- branchiogenic cyst	.	.	.	.	.	.	(1.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 29/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TABLE OF INDIVIDUAL MICROSCOPIC FINDINGS (AOFT)
DOSE GROUP : 05, Wy-14,634 50 ppm

ANIMAL NUMBER :	141	142	143	144	145	146	147	148	149	150
	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3	MK3
LIVER	+	+	+	+	+	+	+	+	+	+
- mononuclear infiltr.	.	.	.	.	.	1.	.	.	.	.
- inflammatory cell	.	1.	1.	.	.	.	1.	1.	.	1.
- vacuolation, hepat.	1.	1.	1.	1.	1.	1.	.	.	1.	1.
- hypertrophy, hepat.	3.	3.	3.	3.	3.	3.	3.	3.	3.	2.
.....										
THYROID GLAND	-	-	+	-	-	-	-	-	-	-
- branchiogenic cyst	.	.	(1.	.	.	.	.	.	.	.
.....										

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 30/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

ANIMAL HEADING DATA
DOSE GROUP : 01, Control

ANIMAL NUMBER	SEX M/F	DEFINED AND FINAL STATE OF NECROPSY		TEST DAYS	FIRST AND LAST DAY UNDER TEST		DATE OF NECROPSY
1	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
2	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
3	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
4	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
5	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
6	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
7	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
8	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
9	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
10	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
11	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
12	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
13	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
14	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
15	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
16	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
17	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
18	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
19	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
20	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
21	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
22	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
23	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
24	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
25	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
26	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
27	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
28	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
29	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
30	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 31/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 1

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 2

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-(mixed) inflammatory cell infiltration, focal, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 32/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 3

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

- ectopic thymus, bilateral

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 4

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 33/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K1

DAYS ON TEST : 1

* ANIMAL NO. : 5

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Only one of paired organs examined/present
Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1

DAYS ON TEST : 1

* ANIMAL NO. : 6

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 34/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K1

DAYS ON TEST : 1 * ANIMAL NO. : 7

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1

DAYS ON TEST : 1 * ANIMAL NO. : 8

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 35/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 9

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

- ectopic thymus, unilateral

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 10

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

- Organ examined, no pathologic findings noted
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 36/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 11

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 4

THYROID GLAND (BOTH LOBES):

- Only one of paired organs examined/present
- branchiogenic cyst, unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 12

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

- Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 37/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 13
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 14
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 38/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 15

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 16

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

-ectopic thymus, unilateral

-branchiogenic cyst, unilateral, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 39/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 17

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 18

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

-branchiogenic cyst, unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 19

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 40/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 20

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 21

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 41/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 22

.....

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 23

.....

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 42/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 24

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

- ectopic thymus, unilateral
 - branchiogenic cyst, bilateral, grade 1
-

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 25

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 43/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 26

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 27

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 44/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 28

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

- ectopic thymus, unilateral

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 29

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 45/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 01, Control

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 30

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1

- vacuolation, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 46/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

ANIMAL HEADING DATA
DOSE GROUP : 02, PFOS 20 ppm

ANIMAL NUMBER	SEX M/F	DEFINED AND FINAL STATE OF NECROPSY	TEST DAYS	FIRST AND LAST DAY UNDER TEST	DATE OF NECROPSY
31	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
32	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
33	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
34	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
35	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
36	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
37	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
38	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
39	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
40	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
41	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
42	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
43	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
44	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
45	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
46	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
47	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
48	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
49	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
50	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
51	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
52	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
53	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
54	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
55	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
56	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
57	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
58	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
59	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
60	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 47/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 31

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 32

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 48/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 33

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

- mononuclear cell infiltrate(s), unilateral, grade 1

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 34

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 49/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 35

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 36

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 50/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 37

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 38

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 39

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 2

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 51/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

CONT./FF. ANIMAL NO. : 39

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1

DAYS ON TEST : 1

* ANIMAL NO. : 40

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2

DAYS ON TEST : 7

* ANIMAL NO. : 41

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 52/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 42

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3
-hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

-branchiogenic cyst, unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 43

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1
-vacuolation, hepatocellular, periportal, grade 3
-hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 53/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 44

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 45

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3
-hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 54/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 46
.....

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 47
.....

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

- mononuclear cell infiltrate(s), unilateral, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 55/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 48
.....

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

-mononuclear cell infiltrate(s), unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 49
.....

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 2

-hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Only one of paired organs examined/present

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 56/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 50

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 51

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 57/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 52

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 53

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 58/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 54

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 55

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 59/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 56
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

- ectopic thymus, unilateral

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 57
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 60/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 58
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 59
.....

* MICROSCOPIC FINDINGS

LIVER:

- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 60
.....

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 61/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 02, PFOS 20 ppm

MALE

CONT./FF. ANIMAL NO. : 60

.....

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 62/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

ANIMAL HEADING DATA
DOSE GROUP : 03, PFOS 100 ppm

ANIMAL NUMBER	SEX M/F	DEFINED AND FINAL STATE OF NECROPSY		TEST DAYS	FIRST AND LAST DAY UNDER TEST		DATE OF NECROPSY
61	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
62	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
63	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
64	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
65	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
66	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
67	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
68	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
69	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
70	M	K1	K1	1	07-NOV-06	07-NOV-06	08-NOV-06
71	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
72	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
73	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
74	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
75	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
76	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
77	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
78	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
79	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
80	M	K2	K2	7	07-NOV-06	13-NOV-06	14-NOV-06
81	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
82	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
83	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
84	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
85	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
86	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
87	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
88	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
89	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06
90	M	K3	K3	28	07-NOV-06	04-DEC-06	05-DEC-06

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 63/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm

MALE

* STATE AT NECROPSY: K1

DAYS ON TEST : 1

* ANIMAL NO. : 61

.....

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1

-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1

DAYS ON TEST : 1

* ANIMAL NO. : 62

.....

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1

-(mixed) inflammatory cell infiltration, focal, grade 1

-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 64/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 63

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 64

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 65/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 65

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 66

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 66/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 67

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 68

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 67/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 69
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 70
.....

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 71
.....

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 68/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

CONT./FF. ANIMAL NO. : 71

.....
THYROID GLAND (BOTH LOBES):
-branchiogenic cyst, unilateral, grade 1

.....
* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 72

.....
* MICROSCOPIC FINDINGS

LIVER:
-(mixed) inflammatory cell infiltration, focal, grade 1
-vacuolation, hepatocellular, periportal, grade 3
-hypertrophy, hepatocellular, centrilobular, grade 1
THYROID GLAND (BOTH LOBES):
Organ examined, no pathologic findings noted

.....
* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 73

.....
* MICROSCOPIC FINDINGS

LIVER:
-(mixed) inflammatory cell infiltration, focal, grade 1
-vacuolation, hepatocellular, periportal, grade 3
-hypertrophy, hepatocellular, centrilobular, grade 1
THYROID GLAND (BOTH LOBES):
Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 69/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 74

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 75

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 70/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 76

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 1

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 77

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 71/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 78

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 79

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 72/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 80

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 81

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- fatty change (vacuolation), midzonal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 73/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 82

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- fatty change (vacuolation), midzonal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 83

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 74/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 84

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 1
-hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 85

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1
-vacuolation, hepatocellular, periportal, grade 1
-hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 75/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 86

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 87

* MICROSCOPIC FINDINGS

LIVER:

- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 76/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 88

.....

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1

-hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 89

.....

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1

-hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 77/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 03, PFOS 100 ppm

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 90

.....

* MICROSCOPIC FINDINGS

LIVER:

-fatty change (vacuolation), midzonal, grade 2

-hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

-branchiogenic cyst, unilateral, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 78/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

ANIMAL HEADING DATA
DOSE GROUP : 04, PB 500 ppm

ANIMAL NUMBER	SEX M/F	DEFINED AND FINAL STATE OF NECROPSY	TEST DAYS	FIRST AND LAST DAY UNDER TEST	DATE OF NECROPSY
91	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
92	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
93	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
94	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
95	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
96	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
97	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
98	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
99	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
100	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
101	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
102	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
103	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
104	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
105	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
106	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
107	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
108	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
109	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
110	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
111	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
112	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
113	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
114	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
115	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
116	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
117	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
118	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
119	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
120	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 79/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 91

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

-ectopic thymus, unilateral

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 92

* MICROSCOPIC FINDINGS

LIVER:

-mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
-vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 80/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 93

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 94

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Only one of paired organs examined/present
Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 81/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 95

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 96

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 82/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 97

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 98

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1
- cyst, unilateral, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 83/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 99

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1 * ANIMAL NO. : 100

* MICROSCOPIC FINDINGS

No microscopic findings noted.

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 101

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 84/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 102

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 103

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 85/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 104

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Only one of paired organs examined/present
Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 105

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 86/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 106
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 107
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 87/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 108
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 3
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 109
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

- Only one of paired organs examined/present
- branchiogenic cyst, unilateral, grade 1

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 88/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 110

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 111

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, centrilobular, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 89/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 112
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 113
.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 90/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 114

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 115

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 91/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 116

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 117

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 92/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 118

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 119

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 2
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 93/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 04, PB 500 ppm

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 120

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 3

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 94/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

ANIMAL HEADING DATA
DOSE GROUP : 05, Wy-14,634 50 ppm

ANIMAL NUMBER	SEX M/F	DEFINED AND FINAL STATE OF NECROPSY	TEST DAYS	FIRST AND LAST DAY UNDER TEST	DATE OF NECROPSY
121	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
122	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
123	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
124	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
125	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
126	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
127	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
128	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
129	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
130	M	K1 K1	1	07-NOV-06 07-NOV-06	08-NOV-06
131	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
132	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
133	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
134	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
135	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
136	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
137	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
138	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
139	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
140	M	K2 K2	7	07-NOV-06 13-NOV-06	14-NOV-06
141	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
142	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
143	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
144	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
145	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
146	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
147	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
148	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
149	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06
150	M	K3 K3	28	07-NOV-06 04-DEC-06	05-DEC-06

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 95/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 121

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 122

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 96/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 123

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 124

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 97/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 125

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 126

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 98/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 127

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

- mononuclear cell infiltrate(s), unilateral, grade 1

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 128

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- hypertrophy, hepatocellular, centrilobular, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 99/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 129

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

- ectopic thymus, unilateral

* STATE AT NECROPSY: K1
DAYS ON TEST : 1

* ANIMAL NO. : 130

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

- Organ examined, no pathologic findings noted
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 100/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 131

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 132

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 101/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 133

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 134

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 102/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 135

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7

* ANIMAL NO. : 136

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 103/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm MALE

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 137

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1
-hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

-branchiogenic cyst, unilateral, grade 1

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 138

* MICROSCOPIC FINDINGS

LIVER:

-hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2
DAYS ON TEST : 7 * ANIMAL NO. : 139

* MICROSCOPIC FINDINGS

LIVER:

-(mixed) inflammatory cell infiltration, focal, grade 1
-hypertrophy, hepatocellular, diffuse, grade 3

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 104/ 109
CXR : 0481/s

TEST ITEM : Perfluorooctane Sulfonate (PFOS) PATHOL. NO.: 07041 VOO
TEST SYSTEM : RAT, 28 days, feeding DATE : 12-OCT-07
SPONSOR : CXR Biosciences Ltd. PathData@System V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm MALE

CONT./FF. ANIMAL NO. : 139

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K2

DAYS ON TEST : 7

* ANIMAL NO. : 140

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1

- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 141

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 1

- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 105/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 142

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 143

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

- branchiogenic cyst, unilateral, grade 1
-

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 106/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 144

.....

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 1

-hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 145

.....

* MICROSCOPIC FINDINGS

LIVER:

-vacuolation, hepatocellular, periportal, grade 1

-hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 107/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 146

* MICROSCOPIC FINDINGS

LIVER:

- mononuclear cell infiltrate(s), periportal/peribiliar, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28

* ANIMAL NO. : 147

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 108/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS
DOSE GROUP : 05, Wy-14,634 50 ppm MALE

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 148

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

* STATE AT NECROPSY: K3
DAYS ON TEST : 28 * ANIMAL NO. : 149

.....

* MICROSCOPIC FINDINGS

LIVER:

- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 3

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted

PATHOLOGY REPORT
INDIVIDUAL ANIMAL DATA

PAGE : 109/ 109
CXR : 0481/s

TEST ITEM	: Perfluorooctane Sulfonate (PFOS)	PATHOL. NO.:	07041 VOO
TEST SYSTEM	: RAT, 28 days, feeding	DATE	: 12-OCT-07
SPONSOR	: CXR Biosciences Ltd.	PathData@System	V6.2c2

TEXT OF MICROSCOPIC FINDINGS

DOSE GROUP : 05, Wy-14,634 50 ppm

MALE

* STATE AT NECROPSY: K3

DAYS ON TEST : 28

* ANIMAL NO. : 150

.....

* MICROSCOPIC FINDINGS

LIVER:

- (mixed) inflammatory cell infiltration, focal, grade 1
- vacuolation, hepatocellular, periportal, grade 1
- hypertrophy, hepatocellular, diffuse, grade 2

THYROID GLAND (BOTH LOBES):

Organ examined, no pathologic findings noted
