
Laboratory Report
Interim Report of Preliminary Data for
26 Week Capsule Toxicology Study with PFOS in Cynomolgus Monkeys

Laboratory Report No. FACT-TOX-030
Covance 6329-223

Testing Laboratory

3M Environmental Technology & Safety Services
3M Environmental Laboratory
Fluorine Analytical Chemistry Team (FACT)
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Requester

Andrew Seacat and Marv Case
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220-2E-02
St. Paul, MN

1 Introduction

This study was designed to establish a PFOS dietary in-take level at which there are no observable adverse effects observed in Cynomolgus monkeys. Test animals were dosed daily by oral gavage with various amounts of PFOS in lactose within a gelatin capsule. There were three dose groups and one group of control animals. Sera samples were collected from all test animals at 11 different time points over the course of the 26-week study. Sera samples collected from the animals were sent to the Environmental Lab and analyzed quantitatively for perfluorooctane sulfonate (PFOS).

Sera samples were extracted using an ion-pairing extraction procedure. The extracts were quantitatively analyzed using high-pressure liquid chromatography/electrospray tandem mass spectrometry (HPLC/ESMSMS), and evaluated versus an extracted curve. Analytical details are available in the study binder maintained by FACT. The presence or absence of known fluorochemical contaminants and metabolites is determined by inspection.

In all dose groups, PFOS levels generally increased through the 26-week time point. A relatively dramatic increase occurred between the week 2 and the week 4 sampling interval. Male and female PFOS levels tracked fairly closely throughout the study. All matrix spike samples were within the QC guideline specified by the method.

Rigorous quality control measures and 3M Environmental Laboratory Standard Operating Procedures were followed in the preparation and analysis of samples, according to applicable methods established according to Good Laboratory Practices guidelines. These results should be considered preliminary and are subject to change. Data presented here is the highest quality data available at this time.

2 Sample Receipt

Sera samples were shipped to the Environmental Lab by Covance Laboratory. Samples included in this report, were received between 10/6/98 and 3/2/99. Environmental Lab personnel initiated a chain-of-custody upon receipt of the samples.

3 Holding Times

There is no holding time criteria associated with these samples for LC/ESMSMS analysis.

4 Methods - Analytical and Preparatory

Analytical methods

FACT-M-1.0, Extraction of Potassium Perfluorooctanesulfonate or Other Anionic Fluorochemical Surfactants from Liver for Analysis Using HPLC/ESMS
FACT-M-2.0, Analysis of Fluorochemicals in Liver Extract Using HPLC-Electrospray/Mass Spectrometry
FACT-M-3.1, Extraction of Potassium Perfluorooctanesulfonate or Other Fluorochemical Compounds from Serum or Other Fluid for Analysis Using HPLC-Electrospray/Mass Spectrometry
FACT-M-4.1, Analysis of Potassium Perfluorooctanesulfonate or Other Fluorochemical on Serum or Other Fluid Using HPLC-Electrospray/Mass Spectrometry

Sample preparation - aqueous samples, HPLC/ESMSMS: ion-pairing extraction

Analyte is extracted from a sample matrix with ion pairing reagent [tetrabutyl ammonium hydrogen sulfate (TBA)] in a pH-controlled environment. The cationic reagent selectively targets anionic fluorochemicals. Once the anion-TBA pair is formed, the analyte is transferred into a non-polar organic solvent (methyl-*tert*-butyl ether), dried, and reconstituted in methanol for MS analysis.

HPLC/ESMSMS: for detailed qualitative work

In HPLC, an aliquot of extract is injected and passed through a reverse phase liquid chromatographic column. Based on the affinity of the analyte for the stationary phase in the column relative to the liquid mobile phase, the analyte is retained for a characteristic amount of time. For example, in a standard solution PFOS may elute at 8.0 minutes. Retention times between a standard PFOS solution and the analyte extracted from groundwater in this analysis were matched on the HPLC system to within 1%.

Following HPLC separation, ESMSMS provides a rapid and accurate means for analyzing a wide range of organic compounds, including fluorochemicals. Electrospray, an ionization technique used primarily for detection of molecular ions, is generally operated at relatively mild temperatures. Molecules are ionized, and a primary ion, characteristic of the analyte, is selected. This ion is bombarded with high-energy gas; subsequent collisions create smaller secondary ionic fragments unique to the primary ion, which are detected.

For example, for PFOS ($C_8F_{17}SO_3$) analysis, ion 499 is selected as the characteristic primary ion. This ion is fragmented into other ions such as 80 amu (corresponding to SO_3), and 230 amu ($C_3F_6SO_3$). Each of these secondary fragments is detected and can be used to differentiate PFOS from other compounds that might have the same characteristic 499 amu primary ion, but different chemical compositions and secondary ion fragmentation patterns.

5 Analysis

5.1 Calibration

A mid-level, extracted matrix calibration check standard is analyzed every 5-10 samples to monitor instrumental drift. Calibration check standards are compliant if instrumental response is within +/- 30% of the expected value.

Quantitation of the target analytes is based on linear regression analysis (weighted $1/x$, if appropriate) of two extracted matrix curves bracketing each group of samples. Quantitation of each analyte is based in the response of one or more specific daughter ions using the multiple response-monitoring mode of the instrument.

5.2 Blanks

Two extraction blanks, utilizing water as surrogate matrix, are extracted with each batch of samples. Additionally, two samples of blank matrix, used for the extracted calibration curves, are extracted along with each batch of samples and curves.

Blanks are compliant if no target analyte is detected above the limit of detection for a specific analyte. In this study, all blanks were compliant.

5.3 Surrogates

Tetra-hydro perfluorooctane sulfonate is used as a surrogate in this analysis. Surrogate response is monitored to confirm gross instrumental failure, if necessary.

5.4 Matrix Spikes

Duplicate matrix spike analyses utilizing all target analytes were prepared and analyzed for one control animal. For sera analysis, recoveries were within the acceptable range of 70-130%. Recoveries outside this range may be re-evaluated.

5.5 Laboratory Control Samples

Laboratory Control Samples are not a component of this study.

5.6 Sample Related Comments

Extracted tissue samples were screened for other known metabolites of Et-FOSE-OH and for POAA. No other metabolites were detected. If necessary, extracts may be scanned for currently uncharacterized metabolites using a time-of-flight tandem mass spectrometer.

6 Data Summary

In all dose groups, PFOS levels generally increased through the 26-week time point. A relatively dramatic increase occurred between the week 2 and the week 4 sampling interval. Male and female PFOS levels tracked fairly closely throughout the study. All matrix spike samples were within the QC guideline specified by the method. A full table of results is attached.

This report reflects the most accurate data available at this time. However, all numbers should be considered to be preliminary and are subject to change.

7 Data / Sample Retention

Samples and extracts will be retained for future evaluation, if necessary.

8 Attachments

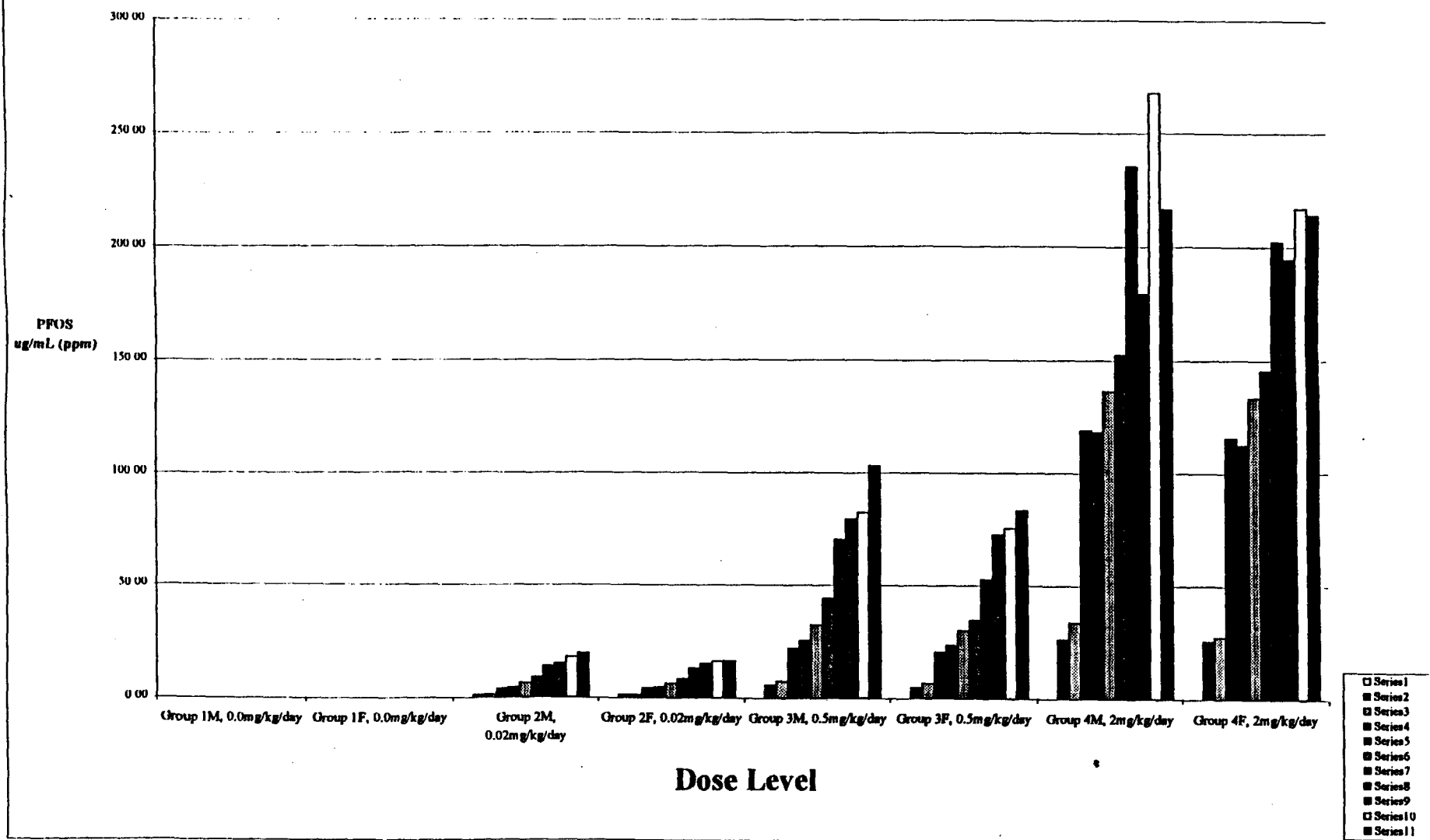
- 8.1 Attachment A: Graphical and numeric summary of average PFOS levels in sera
- 8.2 Attachment B: Full table of results for PFOS levels in sera

9 Signatures

Lisa A. Clemen 03/29/99
Lisa Clemen, Analytical Chemist Date

Kris Hansen 3/26/99
Kris Hansen, Ph.D., Study Director Date

Monkey Serum 6329-223



Study
Product Number (Test Substance)
Matrix

26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
T-6295 (PFOS)
Monkey Serum

Sample Data		02/09/99 RWW		02/05/99 SAH		02/09/99 JCP		03/02/99 SAH/RWW		03/10/99 SAH		03/03/99 RWW/JCP		03/03/99 RWW/JCP	
Monkey Serum		Baseline		Week 1		Week 2		Week 4		Week 6		Week 8		Week 12	
Group Dose	Sample #	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1														
Method Blk	H2O Blk-2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
QC - 250 ppb		117%	5%	123%	0%	120%	2%	96%	3%	98%	2%	77%	11%	77%	11%
Group 1M, 0.0mg/kg/day		<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<LOQ	<LOQ	<MDL	<MDL	<MDL	<MDL	0.0333	0.00409
Group 1F, 0.0mg/kg/day		<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<LOQ	<LOQ	<MDL	<MDL	<MDL	<MDL	<LOQ	<LOQ
Group 2M, 0.02mg/kg/day		<MDL	<MDL	1.08	0.183	1.37	0.104	3.99	0.720	4.30	0.537	6.36	0.58	8.92	0.766
Group 2F, 0.02mg/kg/day		<MDL	<MDL	1.18	0.137	1.37	0.120	4.25	0.363	4.63	0.520	6.38	0.75	8.42	0.945
Group 3M, 0.5mg/kg/day		<MDL	<MDL	5.74	0.976	7.25	1.16	22.2	2.10	25.5	2.06	32.4	4.12	44.0	6.73
Group 3F, 0.5mg/kg/day		<MDL	<MDL	4.63	0.568	6.73	1.16	20.6	2.34	23.5	2.68	30.0	3.82	34.7	4.97
Group 4M, 2mg/kg/day		<MDL	<MDL	26.2	1.96	33.6	4.41	119	87.8	118	10.1	136	22.8	152	29.9
Group 4F, 2mg/kg/day		<MDL	<MDL	25.5	3.38	27.5	4.05	116	49.4	112	8.88	133	14.8	145	14.6

Sample Data		3/12/99 SAH/RWW		3/15/99 JCP/SAH		3/16/99 RWW/SAH		3/16/99 RWW/SAH	
Monkey Serum		Week 16		Week 20		Week 24		Week 26	
Group Dose	Sample #	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1								
Method Blk	H2O Blk-2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-2	99%	4%	89%	11%	89%	8%	85%	17%
QC - 250 ppb		106%	16%	78%	2%	90%	2%	86%	1%
Group 1M, 0.0mg/kg/day		<LOQ	<LOQ	0.0531	0.0162	0.0612	0.0109	0.0623	0.0143
Group 1F, 0.0mg/kg/day		<LOQ	<LOQ	0.0690	0.0065	0.0544	0.0084	0.0729	0.0158
Group 2M, 0.02mg/kg/day		14.0	3.05	15.3	1.74	18.1	3.81	19.8	1.76
Group 2F, 0.02mg/kg/day		13.1	2.37	15.3	2.23	16.3	0.842	16.4	1.77
Group 3M, 0.5mg/kg/day		70.1	7.29	79.3	8.37	82.3	8.58	103	31.4
Group 3F, 0.5mg/kg/day		52.6	5.04	72.5	18.4	75.4	9.04	83.3	13.5
Group 4M, 2mg/kg/day		235	19.8	179	13.7	268	31.1	216	45.5
Group 4F, 2mg/kg/day		202	24.1	194	27.2	217	26.0	214	27.7

FACT TOX-030
Covance# 6329-223

Study:
Product Number(Test Substance):
Matrix:
Method/Revision:
Analytical Equipment System Number:
Instrument Software/Version:
Filename:
R-Squared Value:
Slope:
Y-Intercept:
Date of Extraction/Analyst:
Date of Analysis/Analyst:
Date of Data Reduction/Analyst:

26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
T-6295(PFOS) — T62.95.7 (15...)
Monkey Sera
FACT-M-3.1 & FACT-M-4.1
Soup 020199
MassLynx 3.1
See Attachments
See Attachments
See Attachments
See Attachments
02/09/99 RWV
02/13/99 MEE
02/15/99 KJH
Sample Data

Date/Sample taken?

BASELINE MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	<MDL	<MDL		
Method Blk	H2O Blk-2	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	<MDL	<MDL		
Matrix Blk	Rabbit Sera Blk-2	<MDL	<MDL	<MDL	<MDL
QC - 250 ppb	MKS02059-MS	298	120%		
	MKS02059-MSD	283	114%	117%	5%
Group 1 Control 0.0 mg/kg/day	I05508M	1.64	<MDL		
	I05517M	1.68	<MDL		
	I05519M	3.42	<MDL		
	I05520M	1.81	<MDL		
	I05526M	1.97	<MDL		
	I05527M	1.83	<MDL	<MDL	<MDL
	I05529F	2.39	<MDL		
	I05530F	1.50	<MDL		
	I05531F	2.07	<MDL		
	I05535F	1.82	<MDL		
Group 2 Low-Dose 0.02 mg/kg/day	I05544F	1.95	<MDL		
	I05549F	5.57	<MDL	<MDL	<MDL
	I05513M	2.93	<MDL		
	I05514M	1.94	<MDL		
	I05515M	0.94	<MDL		
	I05516M	2.94	<MDL		
	I05521M	2.06	<MDL		
	I05525M	2.23	<MDL	<MDL	<MDL
	I05537F	1.68	<MDL		
	I05541F	2.54	<MDL		
Group 3 Mid-Dose 0.5 mg/kg/day	I05543F	2.83	<MDL		
	I05546F	2.80	<MDL		
	I05547F	2.03	<MDL		
	I05550F	1.85	<MDL	<MDL	<MDL
	I05505M	3.40	<MDL		
	I05510M	1.41	<MDL		
	I05518M	1.86	<MDL		
	I05523M	1.31	<MDL		
	I05524M	2.15	<MDL		
	I05528M	2.98	<MDL	<MDL	<MDL
Group 4 High-Dose 2.0 mg/kg/day	I05532F	3.40	<MDL		
	I05538F	2.57	<MDL		
	I05539F	2.47	<MDL		
	I05545F	3.53	<MDL		
	I05548F	3.85	<MDL		
	I05552F	2.35	<MDL	<MDL	<MDL
	I05506M	2.50	<MDL		
	I05507M	3.07	<MDL		
	I05509M	2.38	<MDL		
	I05511M	2.98	<MDL		
	I05512M	2.93	<MDL		
	I05522M	3.02	<MDL	<MDL	<MDL
	I05533F	2.35	<MDL		
	I05534F	2.83	<MDL		
	I05536F	3.13	<MDL		
	I05540F	3.70	<MDL		
	I05542F	2.27	<MDL		
	I05551F	3.77	<MDL	<MDL	<MDL

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL

Date Entered/By: 02/17/99 LAC
Date Verified/ By: 03/23/99 GML

PFOS = Perfluorooctanesulfonate

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	FACT-M-3.1 & FACT-M-4.1
Analytical Equipment System Number:	Madeline 041098 & Amelia 062498
Instrument Software/Version:	MassLynx 3.1
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	02/05/99 SAH
Date of Analysis/Analyst:	02/08/99, 02/10/99, 02/12/99, 02/17/99 HOJ/DRB
Date of Data Reduction/Analyst:	02/10/99, 02/16/99, 02/26/99 HOJ/DRB

Sample Data

WEEK 1 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	<MDL	<MDL	<MDL	<MDL
Method Blk	H2O Blk-2	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-2	<MDL	<MDL	<MDL	<MDL
QC - 250 ppb	MKS02059-MS	305	123%	123%	0%
	MKS02059-MSD	304	123%		
Group 1 Control 0.0 mg/kg/day	I05508M	0.00	<MDL		
	I05517M	0.00	<MDL		
	I05519M	0.00	<MDL		
	I05520M	0.00	<MDL		
	I05526M	0.00	<MDL		
	I05527M	0.00	<MDL	<MDL	<MDL
	I05529F	0.00	<MDL		
	I05530F	0.00	<MDL		
	I05531F	0.00	<MDL		
	I05535F	0.00	<MDL		
	I05544F	0.00	<MDL		
	I05549F	0.00	<MDL	<MDL	<MDL
	I05514M	495	0.990		
	I05515M	383	0.957		
Group 2 Low-Dose 0.02 mg/kg/day 0.03	I05516M	519	1.04		16.9
	I05521M	677	1.35	1.08	0.183
	I05537F	684	1.37		
	I05541F	464	1.16		11.6
	I05547F	581	1.16		
	I05550F	519	1.04	1.18	0.137
Group 3 Mid-Dose 0.05 mg/kg/day 0.15	I05505M	287	5.74		
	I05510M	209	5.23		
	I05518M	342	6.84		
	I05523M	221	4.41		
	I05524M	318	5.30		17.0
	I05528M	413	6.89	5.74	0.976
	I05532F	161	5.38		
	I05538F	257	5.15		
	I05539F	248	4.13		
	I05545F	184	4.61		
	I05548F	232	4.65		12.3
	I05552F	195	3.90	4.63	0.57
Group 4 High-Dose 0.20 mg/kg/day 0.75	I05506M	665	26.6		
	I05507M	411	27.4		
	I05509M	351	23.4		
	I05511M	482	24.1		
	I05512M	711	28.5		7.49
	I05522M	539	26.9	26.2	1.96
	I05533F	564	28.2		
	I05534F	451	22.6		
	I05536F	393	26.2		
	I05540F	419	20.9		
	I05542F	749	29.9		13.3
	I05551F	377	25.1	25.5	3.38

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL

Date Entered/By: 02/10/99, 03/02/99 LAC
Date Verified/By: 03/23/99 GML

PFOS = Perfluorooctanesulfonate

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	FACT-M-3.1 & FACT-M-4.1
Analytical Equipment System Number:	Madeline 041098 & Amelia 062498
Instrument Software/Version:	MassLynx 3.1
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	02/09/99 JCP
Date of Analysis/Analyst:	02/15/99, 02/22/99 HOJ
Date of Data Reduction/Analyst:	02/19/99, 02/25/99 HOJ

Sample Data

WEEK 2 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	<MDL	<MDL	<MDL	<MDL
Method Blk	H2O Blk-2	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	<MDL	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-2	<MDL	<MDL	<MDL	<MDL
QC - 250 ppb	MKS02059-MS	293	118%	120%	2%
	MKS02059-MSD	300	121%		
Group 1 Control 0.0 mg/kg/day	I05508M	4.09	<MDL		
	I05517M	3.07	<MDL		
	I05519M	4.53	<MDL		
	I05520M	2.08	<MDL		
	I05526M	2.02	<MDL		
	I05527M	1.89	<MDL	<MDL	<MDL
	I05529F	0.520	<MDL		
	I05530F	1.02	<MDL		
	I05531F	1.90	<MDL		
	I05535F	3.12	<MDL		
Group 2 Low-Dose 0.02 mg/kg/day	I05544F	0.380	<MDL		
	I05549F	0.810	<MDL	<MDL	<MDL
	I05514M	575	1.28		
	I05515M	513	1.28		
	I05516M	492	1.49		7.63
	I05521M	425	1.42	1.37	0.104
	I05537F	446	1.49		
	I05541F	722	1.44		
Group 3 Mid-Dose 0.5 mg/kg/day	I05547F	527	1.32		8.79
	I05547F	527	1.32		0.120
	I05550F	550	1.22	1.37	
	I05505M	227	7.58		
	I05510M	301	6.01		
	I05518M	350	8.75		
	I05523M	285	5.69		
	I05524M	195	7.78		16.1
	I05528M	384	7.68	7.25	1.16
	I05532F	173	5.75		
Group 4 High-Dose 2.0 mg/kg/day	I05538F	416	8.33		
	I05539F	232	5.80		
	I05545F	329	6.59		
	I05548F	320	8.01		17.2
	I05552F	295	5.90	6.73	1.16
	I05506M	747	37.3		
	I05507M	626	31.3		
	I05509M	746	29.9		
	I05511M	706	28.2		
	I05512M	976	39.1		13.1
	I05522M	899	35.9	33.6	4.41
	I05533F	778	31.1		
	I05534F	650	32.5		
	I05536F	588	29.4		
	I05540F	546	24.3		
	I05542F	372	24.8		14.8
	I05551F	568	22.7	27.5	4.05

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL

Date Entered/By: 02/22/99, 03/02/99 LAC
Date Verified/ By: 03/23/99 GML

PFOS = Perfluorooctanesulfonate

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Madeline 041098, Amelia 062498, & Soup 020199
Instrument Software/Version:	MassLynx 3.1 and 3.2
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	03/02/99 SAH/RWW
Date of Analysis/Analyst:	03/05/99, 03/08/99, 03/25/99 HOJ/MEE/DRB
Date of Data Reduction/Analyst:	03/08/99, 03/26/99 KJH/DRB

Sample Data

WEEK 4 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0	<MDL		
Method Blk	H2O Blk-2	0	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	7.21	<LOQ		
Matrix Blk	Monkey Sera Blk-2	7.17	<LOQ	<LOQ	<LOQ
Matrix Blk	Monkey Sera Blk-3	7.26	<LOQ		
Matrix Blk	Monkey Sera Blk-4	6.32	<LOQ	<LOQ	<LOQ
QC - 250 ppb	MKS03029-MS-1	253	102%		
	MKS03029-MSD-1	250	101%	101%	1%
	MKS03029-MS-2	242	98%		
	MKS03029-MSD-2	235	95%	96%	3%
Group 1 Control 0.0 mg/kg/day	I05508M	5.43	<LOQ		
	I05517M	6.76	<LOQ		
	I05519M	7.91	<LOQ		
	I05520M	6.11	<LOQ		
	I05526M	6.73	<LOQ		
	I05527M	1.98	<LOQ	<LOQ	<LOQ
	I05529F	6.63	<LOQ		
	I05530F	6.11	<LOQ		
	I05531F	9.19	<LOQ		
	I05535F	8.17	<LOQ		
	I05544F	9.96	<LOQ		
	I05549F	8.74	<LOQ	<LOQ	<LOQ
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	108	3.58		
	I05515M	172	3.43		
	I05516M	196	3.91		18.1
	I05521M	101	5.03	3.99	0.720
	I05537F	186	4.65		
	I05541F	153	3.83		
	I05547F	221	4.43		8.53
	I05550F	163	4.08	4.25	0.363
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	63.7	21.2		
	I05510M	64.6	21.5		
	I05518M	101	25.2		
	I05523M	110	22.0		
	I05524M	96.3	19.3		9.47
	I05528M	95.7	23.9	22.2	2.10
	I05532F	41.4	20.7		
	I05538F	117	23.3		
	I05539F	35.8	17.9		
	I05545F	46.7	23.4		
	I05548F	78.3	19.6		11.4
	I05552F	55.9	18.6	20.6	2.34
Group 4 High-Dose 2.0 mg/kg/day	I05506M	118	295		
	I05507M	27.2	90.6		
	I05509M	27.3	68.4		
	I05511M	24.2	60.5		
	I05512M	29.0	96.6		73.8
	I05522M	30.8	103	119	87.8
	I05533F	35.2	176		
	I05534F	36.3	181		
	I05536F	24.0	80.0		
	I05540F	834	83.4		
	I05542F	29.4	97.8		42.7
	I05551F	15.0	75.2	116	49.4

Limit of Quantitation (LOQ): PFOS = 15.2 ng/mL
Method Detection Limit (MDL): PFOS = 4.76 ng/mL

Date Entered/By: 03/08/99, 03/26/99 LAC
Date Verified/ By: 03/23/99 GML

PFOS = Perfluorooctanesulfonate

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Madeline 041098, Amelia 062498, & Soup 020199
Instrument Software/Version:	MassLynx 3.1 and 3.2
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	03/10/99 SAH
Date of Analysis/Analyst:	03/12/99, 03821/99 MEE/DRB
Date of Data Reduction/Analyst:	03/18/99, 03/24/99 LAC/DRB

Sample Data

WEEK 6 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<10 ppb		
Method Blk	H2O Blk-2	7.74	<10 ppb	<10 ppb	<10 ppb
Matrix Blk	Rabbit Sera Blk-1	0.00	<10 ppb		
Matrix Blk	Rabbit Sera Blk-2	4.19	<10 ppb	<10 ppb	<10 ppb
Matrix Blk	Monkey Sera Blk-1	2.56	<10 ppb		
	Monkey Sera Blk-2	2.55	<10 ppb		
	Monkey Sera Blk-3	1.93	<10 ppb		
	Monkey Sera Blk-4	0.5	<10 ppb	<10 ppb	<10 ppb
QC - 250 ppb	MKS03109-MS-1	264	106%		
	MKS03109-MSD-1	253	101%	103%	4%
QC - 250 ppb	MKS03109-MS-2	243	97%		
	MKS03109-MSD-2	249	100%	98%	2%
Group 1 Control 0.0 mg/kg/day	I05508M	0.00	<MDL		
	I05517M	0.00	<MDL		
	I05519M	0.00	<MDL		
	I05520M	1.60	<MDL		
	I05526M	0.61	<MDL		
	I05527M	9.49	<MDL	<MDL	<MDL
	I05529F	1.56	<MDL		
	I05530F	3.38	<MDL		
	I05531F	4.24	<MDL		
	I05535F	0.00	<MDL		
	I05544F	0.00	<MDL		
	I05549F	3.54	<MDL	<MDL	<MDL
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	36.6	4.58		
	I05515M	33.1	4.13		
	I05516M	32.5	4.06		11.9
	I05521M	41.8	5.23	4.50	0.537
	I05537F	42.7	5.34		
	I05541F	45.7	4.57		
	I05547F	36.4	4.55		11.2
	I05550F	32.7	4.08	4.63	0.520
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	87.4	26.2		
	I05510M	56.1	28.1		
	I05518M	66.9	25.1		
	I05523M	61.9	23.2		
	I05524M	72.7	27.2		8.09
	I05528M	61.6	23.1	25.5	2.06
	I05532F	61.2	23.0		
	I05538F	94.5	23.6		
	I05539F	61.4	23.0		
	I05545F	94.5	28.4		
	I05548F	61.3	23.0		11.4
	I05552F	67.0	20.1	23.5	2.68
Group 4 High-Dose 2.0 mg/kg/day	I05506M	182	114		
	I05507M	165	103		
	I05509M	230	115		
	I05511M	234	117		
	I05512M	211	132		8.54
	I05522M	203	127	118	10.1
	I05533F	232	116		
	I05534F	166	104		
	I05536F	179	112		
	I05540F	227	113		
	I05542F	203	127		7.90
	I05551F	205	102	112	8.88

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL
PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/19/99, 03/24/99 LAC
Date Verified/ By: 0

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Soup 020199
Instrument Software/Version:	MassLynx 3.1 and 3.2
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	03/03/99 RWW/JCP
Date of Analysis/Analyst:	03/05/99, 03/09/99, 03/25/99 HOJ/MEE/DRB
Date of Data Reduction/Analyst:	03/08/99, 03/15/99, 03/26/99 DRB

Sample Data

WEEK 8 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL		
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	0.00	<MDL		
Matrix Blk	Monkey Sera Blk-2	0.00	<MDL	<MDL	<MDL
QC - 250 ppb	MKS03039-MS-1	174	70%		
	MKS03039-MSD-1	191	77%	73%	9%
	MKS03039-MS-2	205	83%		
	MKS03039-MSD-2	185	75%	79%	10%
QC - 250 ppb	MKS03039-MS-3	181	73%		
	MKS03039-MSD-3	203	82%	77%	11%
Group 1 Control 0.0 mg/kg/day	I05508M	9.43	<MDL		
	I05517M	7.68	<MDL		
	I05519M	12.0	<MDL		
	I05520M	9.03	<MDL		
	I05526M	11.0	<MDL		
	I05527M	28.8	0.0480	<MDL	<MDL
	I05529F	16.0	<LOQ		
	I05530F	18.3	<LOQ		
	I05531F	18.0	<LOQ		
	I05535F	14.5	<LOQ		
Group 2 Low-Dose 0.02 mg/kg/day	I05544F	9.46	<MDL		
	I05549F	15.0	<LOQ	<LOQ	<LOQ
	I05514M	37.2	6.20		
	I05515M	33.8	5.63		
	I05516M	47.1	6.73		8.88
	I05521M	34.4	6.88	6.36	0.565
	I05537F	49.2	7.03		
	I05541F	39.0	6.51		
	I05547F	40.1	6.68		11.8
	I05550F	37.1	5.30	6.38	0.752
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	122	34.8		
	I05510M	82.9	27.6		
	I05518M	94.1	31.4		
	I05523M	91.6	30.5		
	I05524M	118	39.4		12.7
	I05528M	107	30.7	32.4	4.12
	I05532F	86.1	34.5		
	I05538F	106	30.3		
	I05539F	82.6	33.1		
	I05545F	122	30.5		
Group 4 High-Dose 2.0 mg/kg/day	I05548F	69.4	27.8		12.7
	I05552F	59.5	23.8	30.0	3.82
	I05506M	122	157		
	I05507M	83.8	107		
	I05509M	117	128		
	I05511M	89.8	115		
	I05512M	115	147		16.7
	I05522M	127	163	136	22.8
	I05533F	107	138		
	I05534F	98.1	151		
	I05536F	100	128		
	I05540F	102	131		
	I05542F	113	145		11.1
	I05551F	99.2	109	133	14.8

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL
PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/08/99, 03/24/99, 03/26/99 LAC
Date Verified/ By: 0

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Soup 020199
Instrument Software/Version:	MassLynx 3.2
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	03/03/99 RW/W/JCP
Date of Analysis/Analyst:	3/09/99, 03/10/99, 03/25/99 DRB
Date of Data Reduction/Analyst:	03/15/99, 03/24/99, 03/26/99 DRB

Sample Data

WEEK 12 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL		
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	0.00	<MDL		
Matrix Blk	Monkey Sera Blk-2	0.00	<MDL	<MDL	<MDL
QC - 250 ppb	MKS03039-MS-1	174	70%		
	MKS03039-MSD-1	191	77%	73%	9%
	MKS03039-MS-2	205	83%		
	MKS03039-MSD-2	185	75%	79%	10%
QC - 250 ppb	MKS03039-MS-3	181	73%		
	MKS03039-MSD-3	203	82%	77%	11%
Group 1 Control 0.0 mg/kg/day	I05508M	30.9	0.0476		
	I05517M	26.9	0.0537		
	I05519M	32.8	0.0547		
	I05520M	12.7	<LOQ		
	I05526M	21.3	<LOQ		
	I05527M	32.6	0.0572	0.0533	7.67 0.00409
	I05529F	13.2	<LOQ		
	I05530F	18.4	<LOQ		
	I05531F	21.1	<LOQ		
	I05535F	11.2	<MDL		
	I05544F	20.2	<LOQ		
	I05549F	25.6	0.0433	<LOQ	<LOQ
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	44.7	8.278		
	I05515M	47.5	8.636		
	I05516M	50.6	8.72		8.59
	I05521M	48.1	10.0	8.92	0.766
	I05537F	61.3	9.02		
	I05541F	37.5	7.49		
	I05547F	39.6	9.43		11.2
	I05550F	52.0	7.76	8.42	0.945
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	143	50.0		
	I05510M	135	49.0		
	I05518M	133	42.1		
	I05523M	88.0	44.0		
	I05524M	118	47.1		15.3
	I05528M	79.2	31.7	44.0	6.73
	I05532F	86.9	32.2		
	I05538F	94.2	41.0		
	I05539F	101	34.7		
	I05545F	109	40.2		
	I05548F	79.6	28.9		14.3
	I05552F	77.4	30.9	34.7	4.97
Group 4 High-Dose 2.0 mg/kg/day	I05506M	103	144		
	I05507M	86.4	133		
	I05509M	116	154		
	I05511M	83.9	124		
	I05512M	149	209		19.6
	I05522M	88.0	150	152	29.9
	I05533F	109	158		
	I05534F	100	143		
	I05536F	63.6	122		
	I05540F	80.0	140		
	I05542F	128	164		10.0
	I05551F	114	146	145	14.6

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL
PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/08/99, 03/24/99, 03/26/99 LAC
Date Verified/ By: 0

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Soup 020199
Instrument Software/Version:	MassLynx 3.2
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	3/12/99 SAH/RWW
Date of Analysis/Analyst:	03/15/99, 03/19/99 DRB
Date of Data Reduction/Analyst:	03/16/99, 03/24/99 DRB

Sample Data

WEEK 16 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL		
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	36.21	0.03621		
Matrix Blk	Monkey Sera Blk-2	21.43	0.02143	0.0288	0
QC - 250 ppb	MKS03129-MS-1	280	101%		
	MKS03129-MSD-1	269	97%	99%	4%
QC - 250 ppb	MKS03129-MS-2	269	97%		
	MKS03129-MSD-2	316	116%	106%	16%
Group 1 Control 0.0 mg/kg/day	I05508M	21.5	<LOQ		
	I05517M	20.4	<LOQ		
	I05519M	21.1	<LOQ		
	I05520M	20.7	<LOQ		
	I05526M	19.9	<LOQ		
	I05527M	38.4	0.0767	<LOQ	<LOQ
	I05529F	35.5	0.0546		
	I05530F	25.7	<LOQ		
	I05531F	21.5	<LOQ		
	I05535F	9.57	<LOQ		
	I05544F	11.6	<LOQ		
	I05549F	28.9	0.0577	<LOQ	<LOQ
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	77.7	13.0		
	I05515M	47.3	11.8		
	I05516M	81.7	12.6		21.9
	I05521M	83.1	18.5	14.0	3.05
	I05537F	76.4	13.9		
	I05541F	69.2	15.4		
	I05547F	66.8	13.4		18.1
	I05550F	53.9	9.80	13.1	2.37
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	222	74.1		
	I05510M	330	66.1		
	I05518M	379	75.7		
	I05523M	326	65.2		
	I05524M	475	79.2		10.4
	I05528M	362	60.3	70.1	7.29
	I05532F	252	50.4		
	I05538F	279	46.5		
	I05539F	347	57.8		
	I05545F	323	53.8		
	I05548F	323	58.7		9.59
	I05552F	241	48.2	52.6	5.04
Group 4 High-Dose 2.0 mg/kg/day	I05506M	273	228		
	I05507M	257	214		
	I05509M	296	246		
	I05511M	268	223		
	I05512M	296	270		8.42
	I05522M	254	231	235	19.8
	I05533F	245	204		
	I05534F	196	196		
	I05536F	184	229		
	I05540F	258	215		
	I05542F	231	210		11.9
	I05551F	191	159	202	24.1

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL
PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/08/99, 03/17/99, 03/24/99 LAC
Date Verified/ By: 0

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number/Test Substance:	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Soup 020199
Instrument Software/Version:	MassLynx 3.1
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	3/15/99 JCP/SAH
Date of Analysis/Analyst:	03/16/99 DRB
Date of Data Reduction/Analyst:	03/17/99 DRB

Sample Data

WEEK 20 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL		
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	0.00	NA		
Matrix Blk	Monkey Sera Blk-2	0.00	NA	NA	NA
QC - 250 ppb	RBS03159-MS-1	232	94%	89%	11%
	RBS03159-MSD-1	208	84%		
QC - 250 ppb	RBS03159-MS-2	191	77%		
	RBS03159-MSD-2	195	79%	78%	2%
Group 1 Control 0.0 mg/kg/day	I05508M	30.4	0.0434		
	I05517M	31.4	0.0523		
	I05519M	19.3	<LOQ		
	I05520M	23.2	<LOQ		
	I05526M	30.0	0.0461		29.4
	I05527M	31.5	0.0788	0.0551	0.0162
	I05529F	51.6	0.0770		
	I05530F	38.3	0.0722		
	I05531F	28.3	0.0615		
	I05535F	19.4	<LOQ		
	I05544F	29.6	0.0630		9.5
	I05549F	39.1	0.0711	0.0690	0.0065
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	88.6	15.5		
	I05515M	86.7	13.3		
	I05516M	101	14.9		11.4
	I05521M	98.3	17.6	15.3	1.74
	I05537F	70.2	13.8		14.6
	I05541F	73.2	14.4	15.3	2.23
	I05547F	96.6	17.9		74.4
	I05550F	359	51.3	24.3	18.1
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	237	77.8		
	I05510M	253	79.0		
	I05518M	248	78.8		
	I05523M	319	93.8		
	I05524M	220	79.9		10.5
	I05528M	223	67.6	79.5	8.37
	I05532F	255	86.4		
	I05538F	201	59.1		
	I05539F	210	97.6		
	I05545F	171	57.0		
	I05548F	204	81.5		25.4
	I05552F	154	53.3	72.5	18.4
Group 4 High-Dose 2.0 mg/kg/day	I05506M	381	197		
	I05507M	282	173		
	I05509M	315	189		
	I05511M	352	158		
	I05512M	309	178		7.62
	I05522M	302	181	179	13.7
	I05533F	393	210		
	I05534F	303	178		
	I05536F	274	182		
	I05540F	441	241		
	I05542F	302	189		14.0
	I05551F	330	165	194	27.2

Limit of Quantitation (LOQ): 25 ng/mL
 Method Detection Limit (MDL): 12 ng/mL
 PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/08/99, 03/17/99 LAC
 Date Verified/ By: 0
 * Calculated without sample I05550F.

FACT TOX-030
Covance# 6329-223

Study:	26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
Product Number(Test Substance):	T-6295 (PFOS)
Matrix:	Monkey Sera
Method/Revision:	ETS-8-4.0 and ETS-8-5.0
Analytical Equipment System Number:	Amelia 062498 & Soup 020199
Instrument Software/Version:	MassLynx 3.1
Filename:	See Attachments
R-Squared Value:	See Attachments
Slope:	See Attachments
Y-Intercept:	See Attachments
Date of Extraction/Analyst:	3/16/99 RWW/SAH
Date of Analysis/Analyst:	03/17/99, 03/23/99 DRB
Date of Data Reduction/Analyst:	03/23/99, 03/24/99 DRB

Sample Data

WEEK 24 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL	<MDL	<MDL
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	0.00	NA	NA	NA
Matrix Blk	Monkey Sera Blk-2	0.00	NA	NA	NA
QC - 250 ppb	RBS03169-MS-1	218	88%	92%	8%
	RBS03169-MSD-1	236	95%		
	RBS03169-MS-2	231	93%		
QC - 250 ppb	RBS03169-MSD-2	213	86%	89%	8%
	RBS03169-MS-3	224	90%		
	RBS03169-MSD-3	220	89%	90%	2%
Group 1 Control 0.0 mg/kg/day	I05508M	36.4	0.0560		
	I05517M	30.3	0.0606		
	I05519M	25.8	0.0517		
	I05520M	19.4	<LOQ		17.7
	I05526M	24.8	<LOQ	0.0612	0.0109
	I05527M	36.7	0.0765		
	I05529F	40.4	0.06		
	I05530F	24.2	<LOQ		
	I05531F	25.9	0.05		
	I05535F	8.36	<LOQ		15.4
Group 2 Low-Dose 0.02 mg/kg/day	I05544F	16.2	<LOQ	0.0544	0.0084
	I05549F	33.4	0.06		
	I05514M	115	18.3		
	I05515M	85	13.6		21
	I05516M	132	17.6	18.12	3.815
	I05521M	141	22.9		
	I05537F	134	16.7		
	I05541F	133	17.1		5
	I05547F	85	15.9	16.25	0.842
	I05550F	108	15.2		
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	251	96.6		
	I05510M	186	81.4		
	I05518M	191	73.4		
	I05523M	164	74.4		10
	I05524M	201	86.8	82.26	8.58
	I05528M	155	80.9		
	I05532F	145	78.7		
	I05538F	153	60.6		
	I05539F	142	86.8		
	I05545F	168	79.3		12
Group 4 High-Dose 2.0 mg/kg/day	I05548F	196	70.0	75.41	9.04
	I05552F	139	77.1		
	I05506M	287	247.1		
	I05507M	234	234.4		
	I05509M	M	M		
	I05511M	258	257.9		11.61
	I05512M	309	308.6	267.86	31.1
	I05522M	233	291.4		
	I05533F	280	237.6		
	I05534F	225	250.1		
	I05536F	207	210.8		
	I05540F	218	187.8		
	I05542F	240	226.5		12.0
	I05551F	131	187.1	216.64	26.0

Limit of Quantitation (LOQ): 25 ng/mL
Method Detection Limit (MDL): 12 ng/mL
PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/24/99 LAC
Date Verified/ By: 0

FACT TOX-030
Covance# 6329-223

Study:
 Product Number(Test Substance):
 Matrix:
 Method/Revision:
 Analytical Equipment System Number:
 Instrument Software/Version:
 Filename:
 R-Squared Value:
 Slope:
 Y-Intercept:
 Date of Extraction/Analyst:
 Date of Analysis/Analyst:
 Date of Data Reduction/Analyst:

26 Week Capsule Toxicity Study with PFOS in Cynomolgus Monkeys
 T-6295 (PFOS)
 Monkey Sera
 ETS-8-4.0 and ETS-8-5.0
 Amelia 062498, Soup 020199
 MassLynx 3.1
 See Attachments
 See Attachments
 See Attachments
 See Attachments
 3/16/99 RWW/SAH
 03/17/99,03/21/99 DRB/MEE
 03/23/99, 03/22/99 DRB/MEE

Sample Data

WEEK 26 MONKEY SERA

Group Dose	Sample #	PFOS Conc. ng/mL	PFOS Reported ug/mL	Average PFOS ug/mL	RSD Std. Dev.
Method Blk	H2O Blk-1	0.00	<MDL		
Method Blk	H2O Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Rabbit Sera Blk-1	0.00	<MDL		
Matrix Blk	Rabbit Sera Blk-2	0.00	<MDL	<MDL	<MDL
Matrix Blk	Monkey Sera Blk-1	0.00	<MDL		
Matrix Blk	Monkey Sera Blk-2	0.00	<MDL	<MDL	<MDL
QC - 250 ppb	RBS03169-MS-1	210	85%		
	RBS03169-MSD-1	232	94%	89%	10%
QC - 250 ppb	RBS03169-MS-2	229	92%		
	RBS03169-MSD-2	193	78%	85%	17%
QC - 250 ppb	RBS03169-MS-3	211	85%		
	RBS03169-MSD-3	213	86%	86%	1%
Group 1 Control 0.0 mg/kg/day	I05508M	30.9	0.0619		
	I05517M	31.0	0.0673		
	I05519M	27.1	0.0521		
	I05520M	16.8	<LOQ		
	I05526M	26.7	0.0469		22.9
	I05527M	41.7	0.0835	0.0623	0.0143
	I05529F	48.22	0.0765		
	I05530F	59.68	0.0918		
	I05531F	30.12	0.0538		
	I05535F	16.61	<LOQ		
	I05544F	21.61	<LOQ		21.7
	I05549F	34.69	0.0694	0.0729	0.0158
Group 2 Low-Dose 0.02 mg/kg/day	I05514M	151	20.2		
	I05515M	143	20.6		
	I05516M	131	17.2		8.91
	I05521M	112	21.1	19.8	1.76
	I05537F	101	16.8		
	I05541F	113	18.5		
	I05547F	140	16.2		10.8
	I05550F	85	14.2	16.4	1.77
Group 3 Mid-Dose 0.5 mg/kg/day	I05505M	255	116		
	I05510M	149	162		
	I05518M	142	86.7		
	I05523M	176	89.9		
	I05524M	160	86.7		30.4
	I05528M	156	77.8	103	31.4
	I05532F	209	79.2		
	I05538F	150	73.6		
	I05539F	216	90.1		
	I05545F	269	107		
	I05548F	145	80.6		16.3
	I05552F	142	69.4	83.3	13.5
Group 4 High-Dose 2.0 mg/kg/day	I05506M	M	M		
	I05507M	213	227		
	I05509M	M	M		
	I05511M	248	177		
	I05512M	285	185		21.0
	I05522M	298	276	216	45.5
	I05533F	340	253		
	I05534F	308	233		
	I05536F	155	193		
	I05540F	278	221		
	I05542F	206	206		13.0
	I05551F	163	177	214	27.7

Limit of Quantitation (LOQ): 25 ng/mL
 Method Detection Limit (MDL): 12 ng/mL
 PFOS = Perfluorooctanesulfonate

Date Entered/By: 03/23/99 LAC
 Date Verified/ By: 0

M = Moribund