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TRADE SECRET

Study Title

Ammonium Perfluorooctanoate: 28-Day Immunotoxicity Study in Male Mice

TEST GUIDELINES: U.S. EPA Health Effects Test Guidelines
OPPTS 870.7800 (1998)

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STUDY COMPLETED ON: February 1, 2007

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LABORATORY PROJECT ID: DuPont-18318

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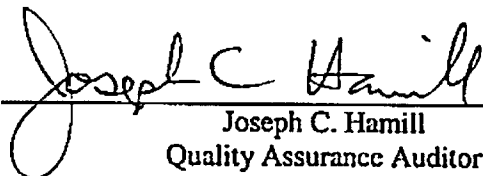
QUALITY ASSURANCE STATEMENT

Work Request Number: 16160
Study Code Number: 1546

<i>Phase Audited</i>	<i>Audit Dates</i>	<i>Date Reported to Study Director</i>	<i>Date Reported to Management</i>
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	November 28-29, 2006	November 29, 2006	January 8, 2007

* EPL QA Dates

Reported by:


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GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

This study was conducted in compliance with U.S. EPA FIFRA (40 CFR part 160) Good Laboratory Practice Standards, which are compatible with current OECD and MAFF (Japan) Good Laboratory Practices, except for the item documented below. The item listed does not impact the validity of the study.

A non-GLP characterization was performed prior to the initiation of this study. The accuracy of the composition at the concentrations documented in this report is considered sufficient for the purpose of this study and is based on the process chemistry provided by the sponsor. GLP characterization was performed concurrently during the course of the study.

Applicant / Sponsor: E.I. du Pont de Nemours and Company
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Date

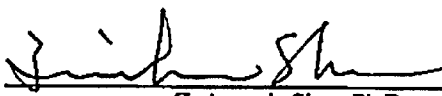
Applicant / Sponsor:

DuPont Representative

Date

CERTIFICATION

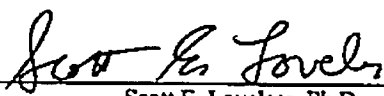
We, the undersigned, declare that this report provides an accurate evaluation of data obtained from this study.

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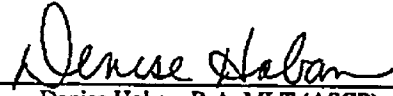
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STUDY INFORMATION

Substance Tested: • Ammonium Perfluorooctanoate [APFO (linear)]
• 3825-26-1 (CAS Number)

Haskell Number: 27308

Composition: Ammonium Perfluorooctanoate Solution 19.5% in water

Purity: 19.5%

Physical Characteristics: White to slightly opaque liquid

Stability: The test substance was stable under the conditions of the study based on analytical results.

Study Initiated/Completed: October 14, 2005 / (see report cover page)

Experimental Start/Termination: October 19, 2006 / February 1, 2007

SUMMARY

The purpose of this study was to evaluate the potential of ammonium perfluorooctanoate (APFO (linear)) to suppress the primary humoral immune response following exposure via oral gavage for up to 28 consecutive days. Groups of 20 male mice each were administered the test substance at daily levels of 0, 0.3, 1, 10, 30, and 30/0 mg/kg. The group designated 30/0 mg/kg day was included to assess potential reversibility/recovery and was therefore administered the test substance for 23 consecutive days followed by 6 consecutive days of vehicle (water) administration. Body weights, food consumption measurements, and clinical observations were recorded during the in-life period. Prior to sacrifice, the immune system was stimulated by injecting sheep red blood cells (SRBC) on test day 24 and blood samples were collected from each mouse on test day 29. The serum samples were assayed for their concentration of SRBC-specific IgM antibody to provide a quantitative assessment of humoral immune response. Serum from animals similarly challenged with cyclophosphamide, a positive control immunosuppressive agent, was analyzed concurrently to provide confirmation that the assay performance was acceptable for detection of immunosuppression. Clinical pathology data were collected at test day 29 and assessed effects on hematology and clinical chemistry. At sacrifice, each animal was examined grossly and selected organs were weighed (brain, spleen, and thymus); selected tissues (as outlined in the methods section) were retained and examined histologically. Thymus and spleen cells were manually counted from single-cell suspensions prepared from the collected tissue.

Samples of the dosing formulations were chemically analyzed and the results indicated that the test substance was at the targeted concentrations, homogeneously mixed, and stable under the conditions of the study.

Test substance-related toxicity was observed during the in-life portion of the study at 1 mg/kg and higher. Adverse reductions in body weights, weight changes, food consumption, and food efficiency occurred at 10 mg/kg and higher; at 30 and 30/0 mg/kg, these reductions were accompanied by low incidences of clinical observations indicative of toxicity. Effects on body weight and food consumption parameters were detected at 1 mg/kg, but these reductions were not considered adverse. There were no test substance-related effects observed at 0.3 mg/kg during the in-life portion of the study.

Mice dosed with ≥ 1 mg/kg had decreased serum HDL cholesterol, increased serum albumin, and variable changes in serum globulin. Mice dosed with ≥ 10 mg/kg had increased neutrophils and monocytes, decreased eosinophils, icteric serum, decreased serum total cholesterol, non-HDL cholesterol, and triglycerides, and increased serum corticosterone. Mice dosed with 30 mg/kg also had decreased red cell mass parameters (red blood cell count, hemoglobin, and hematocrit), increased reticulocytes, and decreased lymphocytes. The only parameter with complete recovery in the 30/0 mg/kg group was non-HDL cholesterol. Partial recovery was observed for icteric serum, total and HDL cholesterol, triglycerides, and serum corticosterone.

Test substance-related organ weight effects were observed in the liver, spleen, and thymus. Mean liver weight parameters were increased at ≥ 0.3 mg/kg, mean spleen weight parameters were decreased at ≥ 1 mg/kg, and mean thymus weight parameters were decreased at ≥ 10 mg/kg.

Test substance-related gross observations were observed at doses ≥ 10 mg/kg and included large and discolored livers, small spleens, and small thymuses.

Microscopic examination of the liver demonstrated mild hepatocellular hypertrophy at 0.3 mg/kg; moderate to severe hepatocellular hypertrophy with secondary individual cell necrosis and focal necrosis at doses ≥ 1 mg/kg; and increased hepatocellular mitotic figures, hepatocellular fatty change, and bile duct hyperplasia at doses ≥ 10 mg/kg.

Microscopic examination of lymphohematopoietic organs (spleen, thymus, bone marrow, lymph nodes) revealed increased granulocytic hematopoiesis in the bone marrow (≥ 10 mg/kg) and increased erythrocytic hematopoiesis in the bone marrow and spleen (30/0 mg/kg). Test substance-related lymphoid depletion/atrophy was present in the thymus (≥ 10 mg/kg) and spleen (30 mg/kg) of less than half of the mice at the respective dose levels. Mesenteric and popliteal lymph nodes had no test substance-related effects.

There was test substance-related evidence of immunosuppression in mice at 10, 30 and 30/0 mg/kg. The anti-SRBC titers for these groups were reduced 20, 28 and 30% when compared to the control group mean. There was no difference in mean primary humoral immune response between the 30 and 30/0 mg/kg, indicating that the shortened dosing period did not have an impact on this endpoint.

No significant changes in total thymus or spleen cell number were noted in animals dosed with 0.3 or 1 mg/kg. Significant decreases were noted in animals dosed with ≥ 10 mg/kg.

Under the conditions of this study, the no-observed-adverse-effect level (NOAEL) for APFO for systemic toxicity in male mice was 0.3 mg/kg and for immunosuppression was 1 mg/kg.

INTRODUCTION

The primary objective of this study was to evaluate the potential of ammonium perfluorooctanoate (APFO (linear)) to suppress the primary humoral immune response to sheep red blood cells (SRBC) when administered by oral gavage to male mice for up to 28 consecutive days. Additional endpoints of toxicity were also evaluated. The oral route of administration was selected because it is a potential route of human exposure.

Ammonium perfluorooctanoate (APFO; FC-143, C₈; C₇F₁₅COO⁻NH₄⁺; CAS Registry number 3825-26-1) is a surfactant used as a processing aid in the production of fluoropolymers. Perfluorooctanoate (PFOA; C₇F₁₅COO⁻), the dissociation product of APFO, is not metabolized⁽¹⁾ and has been identified in blood samples from exposed workers and the general population.^(2,3,4)

PFOA has been reported to inhibit the ability of mice to make antibodies to a T-cell dependent antigen.⁽⁵⁾ The reported study employed a single 0.02% APFO in chow (approximately 30 mg/kg) for 16 days. In order to better characterize the immune response following exposure to this material, APFO was administered by oral gavage using a broad range of doses.

Dosages for this study were selected based on the results of a 14-day oral gavage study in male rats and mice.⁽⁶⁾

STUDY DESIGN

A. Design Concentrations

Group	Number/ Group ^a	Daily Dosage (mg/kg) ^b	Dose Solution Concentration (mg/mL) ^c
I	20	0 (Control)	0
III	20	0.3	0.03
V	20	1	0.1
VII	20	10	1
IX	20	30	3
XI	20	30/0 ^d	3

- a Mice were divided into sub groups A and B (10/sub group) because of limited sample volume.
- b Weight of test substance/kg or animal body weight.
- c Solutions were adjusted for purity (19.5%).
- d This group (XI) was dosed with 30 mg/kg of test substance through test day 23. Following injection of SRBC on test day 24, group XI was dosed with NANOpure[®] water, at a volume of 10 mL/kg of body weight, until sacrifice.

B. Study Overview

Study Parameters	Frequency
Body Weight	Day 0, 3 (2 for subgroup B), and daily thereafter
Food Consumption	Weekly
Daily Animal Health Observation	Twice daily
General Clinical Observation ^a	Day 0 and weekly thereafter
Detailed Clinical Observation	At each weighing
SRBC Injection	Prior to dosing (test day 24)
Clinical Pathology Evaluation	Test day 29
Serum Collection for Antibody Determination	At sacrifice (test day 29)
Anatomic Pathology Evaluation	Test day 29

a A check for acute signs of toxicity was conducted approximately 2 hours post-dosing.

MATERIALS AND METHODS**A. Test Guidelines**

The study design complied with the following test guidelines:

- U.S. EPA, OPPTS 870.7800: Immunotoxicity, *Health Effects Test Guidelines* (1998)

B. Test Substance

(Appendix A)

APFO (linear), was supplied by the sponsor as a white to slightly opaque liquid in a 19.5% aqueous solution. The bulk test substance was used within the period of approved use as defined by the expiration date listed on the Certificate of Analysis (COA) that is provided in Appendix A. In addition, no evidence of instability, such as a change in color or physical state, was observed.

C. Test System

On October 6, 2005, 132 male Crl:CD(ICR) mice, with an assigned birth date of August 22, 2005, were received from Charles River Laboratories, Raleigh, North Carolina.

The Crl:CD(ICR) mouse was selected based on consistently acceptable health status and on extensive experience with this strain at Haskell Laboratory. By utilizing the Crl:CD(ICR) mouse, immunotoxicity studies can be conducted in the same strain that is used for other toxicology studies.

D. Animal Husbandry

1. Housing

All animals were housed singly in stainless steel, wire-mesh cages suspended above cage boards.

2. Environmental Conditions

Animal rooms were maintained at a temperature of 18-26°C and a relative humidity of 30-70%. Animal rooms were artificially illuminated (fluorescent light) on an approximate 12-hour light/dark cycle. Excursions outside of these ranges were of insufficient magnitude and/or duration to have adversely affected the validity of the study.

3. Feed and Water

All mice were provided tap water *ad libitum*. All mice were fed PMI[®] Nutrition International, LLC Certified Rodent LabDiet[®] 5002 *ad libitum*.

4. Animal Health and Environmental Monitoring Program

As specified in the Haskell Laboratory animal health and environmental monitoring program, the following procedures are performed periodically to ensure that contaminant levels are below those that would be expected to impact the scientific integrity of the study:

- Water samples are analyzed for total bacterial counts, and the presence of coliforms, lead, and other contaminants.
- Samples from freshly washed cages and cage racks are analyzed to ensure adequate sanitation by the cagewashers.

Certified animal feed is used, guaranteed by the manufacturer to meet specified nutritional requirements and not to exceed stated maximum concentrations of key contaminants, including specified heavy metals, aflatoxin, chlorinated hydrocarbons, and organophosphates. The presence of these contaminants below the maximum concentration stated by the manufacturer would not be expected to impact the integrity of the study.

The animal health and environmental monitoring program is administered by the attending laboratory animal veterinarian. Evaluation of these data did not indicate any conditions that affected the validity of the study.

E. Pretest Period

Upon arrival at Haskell Laboratory, all mice were housed in quarantine. The mice were:

- quarantined for 6 days.
- identified temporarily by cage identification.
- weighed at least 3 times during quarantine.

- observed with respect to weight gain and any gross signs of disease or injury.

The mice were released from quarantine by the laboratory animal veterinarian or designee on the bases of acceptable body weights and clinical signs of all mice.

F. Assignment to Groups

Mice, selected on the bases of adequate body weight gain and freedom from any clinical signs of disease or injury, were distributed by computerized, stratified randomization into study groups as designated in the Study Design, so that there were no statistically significant differences among group body weight means. The weight variation of selected mice did not exceed $\pm 20\%$ of the mean weight.

At grouping, each mouse was assigned an animal number/cage identification number. Dose groups were subdivided into groups A and B, with 10 animals per group. The animal number/cage identification number were tattooed on the tail of each mouse and included on the cage label.

At study start (test day 0) the mice were approximately 8 weeks of age.

G. Dose Formulation Preparation and Administration

The dosing solutions were prepared in NANOpure[®] water. The formulations were adjusted based on the percentage of APFO in the bulk test substance to achieve the desired concentrations. Dosing formulations were prepared on a daily basis.

To accommodate the schedule of the laboratory, the initiation of dosing for group A mice was started one day prior to group B mice.

Animals were dosed daily at approximately the same time (± 2 hours) by intragastric intubation at a dose volume of 10 mL/kg body weight for at least 28 consecutive days; individual dose volumes were calculated based on the most recently collected body weight data. Control mice were dosed with NANOpure[®] water at a volume of 10 mL/kg of body weight. The 30/0 mg/kg group (XI) was dosed with 30 mL/kg of test substance through test day 23. Following injection of SRBC on test day 24, group XI was dosed with NANOpure[®] water at a volume of 10 mL/kg of body weight until sacrifice.

In light of marked body weight losses in some of the mice, a decision was made to suspend dosing for a few days with the intention of resuming dosing if the animals were sufficiently recovered. The table below lists the specific mice for which dosing was suspended as well as the test days on which the animals were not dosed. This protocol deviation did not adversely impact the study for several reasons: first, the suspension of dosing was transient and affected some but not all of the animals dosed at 30 mg/kg/day. Second, the data collected from animals dosed on a daily basis combined with the data from the animals listed below are considered to provide sufficient data to meet the objectives of the current study. Third, if suspension of dosing had not been implemented, unscheduled mortalities may have precluded the collection of immune system data in these animals and, thus, reduced the amount of data available to assess potential immunotoxicity.

Group	Animal Number	Test Days Not Dosed
IX (30 mg/kg)	901	9 - 11
XI (30/0 mg/kg)	1108	9 - 11
XI (30/0 mg/kg)	1109	9 - 11
XI (30/0 mg/kg)	1117	8 - 10
XI (30/0 mg/kg)	1120	8 - 10

H. Dose Formulation Sampling and Analysis

1. Recovery Sample Analysis

Concurrent with dosing formulation analyses, recovery of APFO from spiked NANOpure® water was tested at the low level (approximately 0.03 mg/mL), the middle levels (approximately 0.1 and 1 mg/mL), and the high level (approximately 3 mg/mL) to confirm the analytical method. A stock solution of APFO was prepared in NANOpure® water. For all concentration levels, an appropriate aliquot of the stock solution was used to make the spiked solution upon further dilution with NANOpure® water. These spiked recovery samples were then processed and analyzed in the same manner as the dosing samples at similar concentrations.

2. Dosing Solution Treatment

Each dosing sample (1 mL) was initially diluted with NANOpure® water to a nominal concentration of 0.3, 1, 10, and 30 ppm APFO for the 0.03, 0.1, 1, and 3 mg/mL dosing samples, respectively. The samples were further diluted to a final expected concentration of 0.03 ppm with NANOpure® water for analysis. The 0 mg/mL sample followed the 0.03 mg/mL sample dilutions. Before the final dilution, the internal standard (1, 2-di-13C PFOA) was added to each sample to give an equivalent final concentration of the internal standard in all dosing samples; the 0.1, 1, and 3 mg/mL samples were matrix corrected with the initial diluted solution of the control sample.

3. Chromatographic Conditions

LC Parameters

Instrument: Agilent (Hewlett-Packard) 1100 liquid chromatograph
 Column: Zorbax® RX-C8, 2.1 x 150 mm, 5 µm
 Flow Rate: 0.4 mL/min
 Oven Temperature: 35°C
 Injection Volume: 20 µL
 Mobile Phase: A) 0.15% Acetic acid in NANOpure® water
 B) Acetonitrile

Gradient:	Time (min)	% Acetonitrile
	0	5
	0.9	5
	1.0	80
	5.0	80
	5.1	5
	7.0	5

MS Parameters

Instrument: Waters (Micromass) Quattro Micro
 Ionization Mode: Electrospray (ESI), negative ion
 Capillary Voltage: 2.7 kV
 Cone Voltage: 15 V
 Source Temperature: 120°C
 Desolvation Temperature: 350°C
 Scan Function: PFOA: 413 m/z (parent) to 369 m/z (daughter)
 1, 2-di-13C PFOA: 415 m/z (parent) to 370 m/z (daughter)

4. Calibration and Quantitation

The analytical reference of APFO (H-22703-376, 100%) was used for quantitation of this study. A stock solution was prepared in NANOpure[®] water. This stock solution was mixed to ensure that all material was dissolved in solution. Before analysis, appropriate aliquots of the stock solution were diluted with NANOpure[®] water to make calibration standards that bracketed the target concentration of the diluted dosing samples after matrix correction with the initial diluted solution of the control sample. Before these aliquots were brought to the final volume, an appropriate amount of 1, 2-di-13C PFOA internal standard was added to give an equivalent final concentration of the internal standard in all standard solutions.

The 369 m/z daughter ion of PFOA dissociated from APFO measured by LC/MS/MS was used against the 370 m/z daughter ion of 1, 2-di-13C PFOA internal standard to determine the concentrations of the dosing samples. Peak area ratios (369 m/z peak versus 370 m/z peak) of these standards were used to construct a calibration curve by least square regression (see Figure 1 for a representative calibration curve). Measured concentrations for dosing solutions were determined by applying the peak area ratios from replicate injections of each sample to the calibration curve.

Concentration verification of APFO in dosing samples was evaluated by the mean result of the duplicate analyses for each respective dosing level.

Uniformity of mixing of APFO in dosing samples was evaluated by calculating the coefficient of variation (C.V. = standard deviation/mean x 100) of the measured concentration in the duplicate analyses of the concentration verification samples. A coefficient of variation of less than or equal to 10% is the standard criterion at Haskell Laboratory for acceptable distribution of the test substance throughout the solution.

Stability of APFO in dosing samples was evaluated by using the mean result of the duplicate concentration verification analyses as the baseline for comparing the corresponding stability results.

I. Body Weights

During the test period, all mice were weighed on test days 0, 3 (2 for subgroup B), and daily thereafter.

J. Food Consumption and Food Efficiency

During the test period, the amount of food consumed by each mouse over the weighing interval was determined by weighing each feeder at the beginning and end of the interval and subtracting the final weight and the amount of spillage from the feeder during the interval from the initial weight. From these measurements, mean daily food consumption over the interval was determined. From the food consumption and body weight data, the mean daily food efficiency of test substance was calculated for each animal.

K. Clinical Observations

1. Daily Animal Health Observations

Cage-site examinations to detect moribund or dead mice and abnormal behavior and/or appearance among mice were conducted at least once daily throughout the study. Abnormal behavior/appearance was recorded by exception. Moribund mice were sacrificed, and a gross examination performed. Tissues and blood were not collected from moribund mice.

2. General Clinical Observations

An additional cage-site evaluation was conducted approximately 2 hours after dosing to detect acute clinical signs of systemic toxicity.

3. Detailed Clinical Observations

At every weighing, each mouse was individually handled and examined for abnormal behavior and appearance. Detailed clinical observations in a standardized arena were also evaluated on all mice. The detailed clinical observations included (but were not limited to) evaluation of fur, skin, eyes, mucous membranes, occurrence of secretions and excretions, autonomic nervous system activity (lacrimation, piloerection, and unusual respiratory pattern), changes in gait, posture, response to handling, presence of clonic, tonic, stereotypical, or bizarre behavior. Any abnormal clinical signs noted were recorded.

L. Clinical Pathology Evaluation

A clinical pathology evaluation was conducted on all surviving animals 29 days after initiation of the study. Animals from each dose group were divided into 2 groups, Group A and Group B with 10 animals in each (e.g., IA, IB, IIIA, IIIB). All animals were fasted for approximately 3 hours prior to the scheduled sacrifice. The fasting schedule was staggered so that the last animal

was fasted for approximately the same amount of time as the first animal. While the animals were under carbon dioxide anesthesia, the maximum amount of whole blood was collected from the abdominal *vena cava*. Samples were allocated as indicated below:

Group A	Group B
Hematology: 250 µL whole blood – EDTA	Not done
Clinical Chemistry: remaining blood in serum tube for: total protein, albumin, globulin (calculated)	Clinical Chemistry: all blood in serum tube for: Cholesterol, triglycerides, high-density lipoprotein cholesterol, non-high-density lipoprotein cholesterol (calculated)

In addition, for all animals, remaining sera were allocated for either humoral immune measurements or for serum corticosterone based on the optimal use of the serum volume remaining in the tube after the above tests were performed.

Bone marrow smears were prepared at sacrifice from all surviving animals. Bone marrow smears were stained with Wright-Giemsa stain, but analysis was not necessary to support experimental findings. All blood samples were evaluated for quality by visual examination. Results were maintained in the study records and reported only if the sample was analyzed. Unless otherwise indicated, any historical control clinical pathology data referenced in the text is maintained in Haskell Notebook Number E 98560-AN.

1. Hematology (Group A Only)

Complete blood counts, including reticulocytes, were determined on a Bayer® Advia 120 hematology analyzer or determined from microscopic evaluation of the blood smear. Wright-Giemsa-stained blood smears from all animals were examined microscopically for confirmation of automated results and evaluation of cellular morphology. Blood smears, stained with new methylene blue, were prepared from each animal undergoing a hematology evaluation, but were not needed for examination.

The following parameters were determined:

red blood cell count	red cell distribution width
hemoglobin	absolute reticulocyte count
hematocrit	platelet count
mean corpuscular (cell) volume	white blood cell count
mean corpuscular (cell) hemoglobin	differential white blood cell count
mean corpuscular (cell) hemoglobin concentration	microscopic blood smear examination

2. Clinical Chemistry

Routine serum clinical chemistry parameters were determined on an Olympus® AU640 clinical chemistry analyzer. Serum corticosterone was measured using a commercial RIA assay (Diagnostic Products Corporation, Los Angeles, CA; Catalog #TKRC1). Corticosterone concentrations were determined according to the manufacturer's recommended procedure

(aspirating aqueous contents of the assay tube rather than decanting). If necessary, the standard curve was extended at the low end of the range by including standards of 5 and 10 ng/mL.

The following parameters were determined:

cholesterol (group B)	globulin (calculated, group A)
triglycerides (group B)	high-density lipoprotein cholesterol (group B)
total protein (group A)	non-high-density lipoprotein cholesterol (calculated, group B)
albumin (group A)	serum corticosterone (groups A and B)

M. Humoral Immune Function

On test day 24, animals were injected intravenously in the lateral tail vein with 0.2 mL of 1×10^9 SRBC/mL (Covance, Denver, Pennsylvania, U.S.A.). One mouse (716 in the 10 mg/kg test substance group) was inadvertently not injected with the appropriate amount of SRBC and the immune response for this mouse could not be evaluated. On test day 29, serum was collected from each mouse and frozen (see L.2.Clinical Chemistry). Serum was not collected from 6 mice (117 in the 0 mg/kg test substance group, 306 in the 0.3 mg/kg test substance group, 903, 904, and 906 in the 30 mg/kg test substance group, and 1112 in the 30 mg/kg (recovery) test substance group) due to sacrifice *in extremis* prior to test day 29 (117, 906 and 1112), insufficient serum sample volume (306 and 904), or no serum sample taken (903); therefore, the immune response for these mice could not be evaluated. Serum volume was insufficient for 3 mice (703 in the 10 mg/kg test substance group, 907 in the 30 mg/kg test substance group, and 1116 in the 30 mg/kg (recovery) test substance group) and the immune response for these mice could not be evaluated.

Humoral immune function was evaluated by examining sera from individual animals for SRBC-specific IgM levels with an enzyme-linked immunosorbent assay (ELISA).⁽⁷⁾ The serum from each animal was assayed as 10 serial, 2-fold dilutions, with 1 replicate per dilution. The optical density (OD) of the contents of the reaction well was measured at the 405 nm wavelength with a MR 5000 Microplate Reader (Dynex Technologies). SRBC-specific serum IgM titer data were analyzed with Revelation Software Version 2.0 (Dynex Technologies). For each serum sample, a semi-log graph of the data was created and the linear portion of the curve was identified by using a log-log curve fit. A slope between -0.600 and -1.200 was obtained. The serum dilution expected to produce an OD of 0.5 was determined by regression analysis. The "titer" of each animal was defined as the reciprocal of the serum dilution that had an OD value of 0.5. If no points had an OD value of greater than or equal to 0.5, the reciprocal of the starting dilution closest to an OD value of 0.5 was used as the titer.

Sera previously collected from rats injected with SRBC and dosed for 5 days with 90 mg/kg of the known immunosuppressive agent cyclophosphamide monohydrate or vehicle were run concurrently with the study samples to demonstrate that the assay functioned properly. For any test samples that needed to be rerun due to a poor curve fit or slope, pooled male and/or female cyclophosphamide monohydrate or vehicle serum samples were concurrently run. The pooled samples consisted of equal aliquots of serum taken from either the male or female rats dosed with cyclophosphamide monohydrate or vehicle.

N. Anatomic Pathology Evaluation

After 29 days on study, the surviving mice from each dose group (0, 0.3, 1, 10, 30, and 30/0 mg/kg body weight) were sacrificed and necropsied for evaluation of subchronic toxicity. The order of sacrifice for scheduled deaths was stratified across groups. Mice were fasted for 3 hours before euthanasia.

All mice, including 3 mice (mice 117, 906, and 1112) that were sacrificed *in extremis* during the study (test days 5, 9, and 5, respectively), were euthanized by carbon dioxide anesthesia and exsanguination. Gross examinations were performed for all mice. Final body weights and organ weights were recorded for all mice sacrificed by design on test day 29.

The following tissues were collected from 120 mice (20/sex/group) on study.

<u>Digestive System</u>	<u>Nervous System</u>
liver ^a	brain ^{a,c} (3 sections)
<u>Hematopoietic System</u>	<u>Musculoskeletal System</u>
spleen ^a	femur/knee joint
thymus ^a	sternum
popliteal lymph node	
mesenteric lymph node	<u>Other</u>
bone marrow ^b	gross observations

a Organs were weighed at necropsy.

b Bone marrow was collected with the femur and sternum.

c Including cerebrum, cerebellum, medulla/pons.

Organ weight ratios (% final body weight, % brain weight) and group mean values from weighed organs were calculated.

All tissues were fixed in 10% neutral buffered formalin. Processed tissues were embedded in paraffin, sectioned approximately 5-6 microns thick, stained with hematoxylin and eosin (H&E), and examined microscopically by a veterinary pathologist. Microscopic findings were graded on a 4-point scale based on the severity or extent of the change (grade 1 = minimal; grade 2 = mild; grade 3 = moderate; grade 4 = severe).

For mice sacrificed by design (SD) on test day 29, all tissues collected from control (0 mg/kg) and high-dose (30 and 30/0 mg/kg) mice were processed to slides and examined microscopically. In addition, the following organs were examined from all SD mice in order to determine a no-observed-effect level for test substance-related microscopic findings: liver, thymus, spleen, and bone marrow.

For the 3 mice sacrificed *in-extremis* (SE) before the scheduled sacrifice, all tissues were processed to slides and examined microscopically.

Gross observations (recorded at necropsy) were examined microscopically for all animals.

O. Total Cell Counts

The following procedures were used for preparation of spleen and thymus single-cell suspensions for enumeration of total cell counts from each spleen or thymus:

- The weight of the halved spleen or thymus (tissue) was documented, the half was placed in a labeled 15 mL centrifuge tube containing 3 mL Hank's Balanced Salt Solution (HBSS/H) and put on ice.
- The halved tissue/HBSS/H was poured into a small petri dish and cut into small pieces.
- The centrifuge tube was inverted 2 or 3 times and left on ice for approximately 10 minutes to allow debris to settle to the bottom of the tube.
- The supernatant was transferred to a new centrifuge tube and the volume of the supernatant was documented.
- Total cell counts were determined from each tissue by hemacytometer.

P. Electron Microscopy Evaluation

A section of liver from 2 control mice (103 and 104) and 2 mice in the 1 mg/kg group (503 and 504) mice was placed in cassettes in a container of formalin, and shipped to Experimental Pathology Laboratories, Inc (EPL[®]) for evaluation by transmission electron microscopy. As a subcontractor to EPL[®], the Laboratory for Advanced Electron and Light Optical Methods, College of Veterinary Medicine, North Carolina State University processed the tissues for electron microscopy and prepared electron photomicrographic images under the direction of Dr. Michael Dykstra. The printed electron photomicrographic images were provided to EPL[®] for evaluation by an ACVP-certified veterinary pathologist who interpreted the images and prepared a final report of the electron microscopic evaluation. More details are provided in Appendix M.

Q. Statistical Analyses

For all statistical analyses, significance was judged at $p < 0.05$. Comparisons were made of the dosed groups to the control group (Group I). Comparisons were also made between Group IX and Group XI.

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DuPont-18318

Parameter	Preliminary Test	Method of Statistical Analysis	
		If preliminary test is not significant	If preliminary test is significant
Body Weight Body Weight Gain Food Consumption Food Efficiency Humoral Immune Function Data ^a Clinical Pathology Organ Weights Total Cell Counts	Levene's test for homogeneity ⁽⁸⁾ and Shapiro-Wilk test ⁽⁹⁾ for normality ^b	One-way analysis of variance ⁽¹⁰⁾ followed by Dunnett's test ^(11,12,13)	Kruskal-Wallis test ⁽¹⁴⁾ followed by Dunn's test ⁽¹⁵⁾

- a SRBC-specific serum IgM antibody titer data were transformed to Log₂ to obtain normality or homogenous variances.
- b If the Shapiro-Wilk test was not significant but Levene's test was significant, a robust version of Dunnett's test was used. If the Shapiro-Wilk test was significant, Kruskal-Wallis test was followed by Dunn's test.

RESULTS AND DISCUSSION

Analytical Evaluation

A. Chromatography

(Figures 1-2)

PFOA dissociated from APFO and 1, 2-di-¹³C PFOA eluted together from the HPLC column with a retention time of approximately 4.5 minutes. The mixture was separated into 2 resolved peaks at 369 m/z and 370 m/z, respectively, by MS/MS detection. Representative LC/MS/MS chromatograms are shown in Figures 2(a - e). Test substance was not detected in the 0 mg/mL samples.

B. Recovery Samples

(Table 1)

Detailed analytical results of recovery samples are summarized in Table 1. The variability of the analytical method was demonstrated by the coefficients of variation of the recovery results at each targeted dosing concentration (approximately 0.03, 0.1, 1, and 3 mg/mL) over the course of the study. The range of the measured concentrations of APFO for the 0.03 mg/mL level was 101.7% to 108.3% of nominal (mean percent recovery = 105.0% $\pm$ 5%, C.V. = 5%). The range of the measured concentrations of APFO for the 0.1 mg/mL level was 104.0% to 109.6% of nominal (mean percent recovery = 106.8% $\pm$ 4%, C.V. = 4%). The range of the measured concentrations of APFO for the 1 mg/mL level was 102.0% to 105.0% of nominal (mean percent recovery = 103.5 $\pm$ 2%, C.V. = 2%). The range of the measured concentrations of APFO for the 3 mg/mL level was 101.7% to 107.0% of nominal (mean percent recovery = 104.4 $\pm$ 4%, C.V. = 4%). Based on these data, the analytical method performed satisfactorily for the concentration range of the dosing samples in the study.

C. Concentration Verification, Uniformity of Mixing, and 5-Hour Room Temperature Stability Samples

(Table 2)

Dosing solutions prepared on October 17, 2005 were analyzed for concentration verification, uniformity of mixing, and 5-hour room temperature stability, and results are shown in Table 2.

The following table summarizes the results for concentration verification, uniformity of mixing, and 5-hour room temperature stability analyses.

Preparation Date	Nominal mg/mL	Measured ^a mg/mL	Average % Nominal	C.V. (%)	Stability ^b % Nominal
17-October-05	0	ND ^c	---	---	---
	0.03	0.0278, 0.0277	92.7	0.3	96.3
	0.1	0.0966, 0.0979	97.3	0.9	99.0
	1	0.979, 1.04, 1.03 ^d	102.0	3	96.9
	3	3.16, 3.06	103.7	2	102.0

a Duplicate samples analyzed.

b Stability samples held for 5 hours at room temperature.

c Denotes not detected.

d Data obtained from one of the duplicate initial analyses and 2 repeats from the re-diluted sample.

The data for samples submitted on October 17, 2005 show that the test substance was at the targeted levels ($\pm 7.3\%$ of nominal), uniformly mixed (CV's = 0.3%, 0.9%, 3%, and 2%, respectively), and stable when held for 5 hours at room temperature in the vehicle. Test substance was not detected in the 0 mg/mL sample.

D. Concentration Verification and Uniformity of Mixing Samples

(Table 3)

Dosing solutions prepared on November 15, 2005 were analyzed for concentration verification and uniformity of mixing, and results are shown in Table 3.

The following table summarizes the results for concentration verification and uniformity of mixing analyses.

Preparation Date	Nominal mg/mL	Measured ^a mg/mL	Average % Nominal	C.V. (%)
15-November-05	0	ND ^b	---	---
	0.03	0.0276, 0.0272	91.3	1
	0.1	0.0954, 0.0986	97.0	2
	1	1.02, 1.01	102.0	0.7
	3	3.21, 3.23	107.3	0.4

a Duplicate samples analyzed.

b Denotes not detected.

The data for samples submitted on November 15, 2005 show that the test substance was at the targeted levels ($\pm 8.7\%$ of nominal) and uniformly mixed (CV's = 1%, 2%, 0.7%, and 0.4%, respectively). Test substance was not detected in the 0 mg/mL sample.

E. Analytical Conclusions

Data from the analyses of the samples collected during the study indicate that the dosing formulations were at the targeted concentrations, mixed uniformly, and stable under the conditions of the study. Test substance was not found in the 0 mg/mL samples

In-Life Measurements

A. Mean Body Weights and Body Weight Gains

(Tables 4-5, Figure 3, Appendices B-C)

Test substance-related and adverse reductions in mean body weights and body weight gains were observed at 10, 30 and 30/0 mg/kg.

Mean final body weights were 14, 22, and 12% lower than the control group at 10, 30, and 30/0 mg/kg, respectively. Test substance-related increases in liver weights occurred and minimized the magnitude of the effects on body weight. In an attempt to quantitatively separate the increased liver weights (see Appendix C) from the decreased body weights, an adjusted body weight (see Appendix C) was calculated for each animal by subtracting the weight of the liver from the final body weight. The means for the adjusted body weights were 28, 35, and 23% lower than controls at 10, 30, and 30/0 mg/kg, respectively.

The reductions in mean body weight at 10 mg/kg and above resulted from overall body weight losses during the study; mice lost an average of 3.8, 6.6, and 3.3 g during days 0 to 28 at 10, 30, and 30/0 mg/kg, respectively, whereas control group mice gained an average of 0.9 g.

In general, the test substance-related effects on body weight parameters were dose-related relative to the magnitude of the change and the onset of the reductions; effects on mice dosed at 30 mg/kg were more pronounced and evident sooner than effects at 10 mg/kg.

The effects of cessation of dosing were evident in that the mean final body weights of mice at 30/0 mg/kg were 12% higher than those from the mice dosed at 30 mg/kg.

Body weight and weight gain data for animals dosed at 0.3 and 1 mg/kg were generally comparable to controls.

B. Food Consumption and Food Efficiency

(Tables 6-7, Appendix D)

Test substance-related effects on food consumption were evident at 10, 30, and 30/0 mg/kg. The food consumption data did not adhere to the hypothesis of a monotonic dose response. At 10 mg/kg, the mean food consumption was increased or significantly increased starting at the end of the first week and persisting until the end of the study. At 30 and 30/0 mg/kg, mean food consumed was usually lower or significantly lower than controls but for each group there was one interval with significantly increased food consumption. As a result of these somewhat erratic patterns of food consumption, overall food consumption during days 0 to 28 was generally comparable across the groups with the exception of the 10 mg/kg group for which mean food consumption was significantly increased.

C. Clinical Observations and Mortality

(Tables 8-9, Appendices E-F)

Test substance-related clinical signs observed at 1, 10, 30 and 30/0 mg/kg included: pallor, wet and stained fur, swollen penis, eye observations, prostrate, or yellow extremities.

Swollen left shoulder observed in one mouse dosed at 10 mg/kg was possibly due to a dosing incident.

Abnormal gait was observed in single animals dosed at 1 or 10 mg/kg. This observation was not considered test substance related because it was only observed in single animals and short in duration.

Three mice were sacrificed *in extremis* prior to test day 29. Two mice were sacrificed on test day 5 due to dosing incidents from the control and 30/0 mg/kg groups. One mouse dosed at 30 mg/kg was sacrificed on test day 9 possibly due to a dosing incident, however, gross and microscopic pathology were unable to determine the exact cause of death.

Clinical Pathology Evaluation

A. Hematology

(Table 10, Appendix G)

1. Red Blood Cells

Red cell mass parameters (red blood cell count, hemoglobin, and hematocrit) were minimally decreased in mice dosed with 30 mg/kg for 29 days. Mean values were 88-94% of the control group means (not statistically significant). In addition, mean cell hemoglobin and mean cell hemoglobin concentration were decreased in mice dosed with 10 or 30 mg/kg for 29 days. Means at 10 and 30 mg/kg were 94-96% and 95-97% of the respective control group means for these 2 parameters (variable statistical significance).

Some mice dosed with 1 or 10 mg/kg for 29 days had minimally lower reticulocyte counts compared to those dosed with 0 or 0.3 mg/kg. Mice dosed with 30 mg/kg either had higher (3/7) or lower (4/7) reticulocyte counts compared to control mice. Two of the 3 mice at 30 mg/kg with higher reticulocyte counts also had increased splenic extramedullary hematopoiesis. On an individual animal basis, there was no correlation between red cell mass and reticulocyte counts in this group.

Effects on red cell mass were more pronounced (mildly decreased) in mice dosed with 30/0 mg/kg compared to those dosed with 30 mg/kg for the entire 29 days. At recovery, mean red blood cell count, hemoglobin, and hematocrit ranged from 82-86% of the respective control group means for these 3 parameters (all statistically significant). Decreased red cell mass parameters following recovery could be due to one or more of the following processes: increased red cell destruction, red cell loss, or increased plasma volume. The mechanism for

decreased red cell mass parameters was not evident from in-life, clinical pathology, or anatomic pathology data. Therefore, the cause of the decreased red cell mass was not determined.

Reticulocytes were mildly increased in mice dosed with 30/0 mg/kg. Mean reticulocyte count was 148% of the control group mean (not statistically significant). Consistent with the increase in reticulocyte counts, red cell distribution width was increased (mean was 109% of the control group mean; not statistically significant), and mean cell hemoglobin concentration was decreased (97% of control group mean; statistically significant). Microscopically, this group had increased polychromasia (increased bluish staining of red blood cells), a characteristic finding in blood with increased reticulocyte counts. The increases in reticulocytes and related parameters were considered to be in response to the decreased red cell mass described above. These changes also correlated with histologic evidence of increased splenic extramedullary hematopoiesis, which was observed in 15 of 19 mice in the 30/0 mg/kg group.

2. White Blood Cells

Neutrophils were increased in mice dosed with 10 or 30 mg/kg. Means were 236 and 296% of the control group mean, respectively (statistically significant). While all neutrophil counts for mice dosed with ≤ 1 mg/kg were between 0.00 and $2.00 \times 10^3/\mu\text{L}$, mice dosed with 10 mg/kg had neutrophil counts between 1.00 and $3.00 \times 10^3/\mu\text{L}$, while 2 of 7 mice dosed with 30 mg/kg had neutrophil counts of greater than $3.50 \times 10^3/\mu\text{L}$ (animal 901 and 904). Histologically, 2 of 3 mice (mice 902 and 904) dosed with 30 mg/kg had minimal granulocytic hyperplasia of the bone marrow, corresponding to the observation of increased neutrophils in the peripheral blood of this group. The two 30 mg/kg mice with the highest neutrophil counts (901 and 904) also had higher lymphocyte and monocyte counts than other mice in this group, although the lymphocyte counts were similar to or lower than control values. Increased neutrophils may be due to stress (glucocorticoid-related; see corticosterone discussion below and anatomic pathology) or inflammation. The changes in neutrophils, in light of changes in other leukocyte types, are likely related to both of these processes.

Lymphocytes were generally decreased in mice dosed with 30 mg/kg (mean was 59% of the control group mean; not statistically significant). One mouse (animal 901) had increased neutrophil and unchanged lymphocyte counts compared to control mice. The decreases in lymphocyte counts in most mice dosed with 30 mg/kg were consistent with stress (see corticosterone discussion below and histology), and corresponded to increased serum corticosterone and lymphoid depletion/atrophy in the spleen, thymus, and lymph nodes in 30 mg/kg mice. The unchanged lymphocyte count in 1 mouse dosed with 30 mg/kg may have been due to a combination of stress and inflammation.

Monocytes were increased in mice dosed with 10 or 30 mg/kg. Means were 285 and 254% of the control group mean, respectively (variable statistical significance). In these 2 groups of mice, individual mice with increased monocytes tended to have increased neutrophil counts. Increased monocytes are observed with inflammation or stress. As discussed above, the combination of changes likely reflect both stress and inflammation.

Eosinophils were decreased in mice dosed with 10 or 30 mg/kg. Means were 57 and 64% of the control group mean, respectively (not statistically significant). A decrease in peripheral blood

eosinophils is consistently observed in response to stress. Therefore, this change was considered to be due to stress.

Large unstained cells (LUC) were increased in mice dosed with 10 or 30 mg/kg. LUCs are cells that cannot be identified as one of the 5 major leukocyte types by the Advia 120 automated hematology analyzer, and normally comprise a small percentage of the total leukocyte population. The LUC count normally includes mostly lymphocytes and monocytes. In this study, the mice with the highest LUC counts usually had the highest lymphocyte and/or monocyte counts. Therefore, in this study, changes in LUC counts paralleled changes in lymphocytes and/or monocytes.

In the 30/0 mg/kg group, neutrophil, lymphocyte, eosinophil, monocyte, and LUC counts were generally similar to those of mice dosed at 30 mg/kg for the full 29 days (variable statistical significance compared to controls; lymphocyte counts statistically different from that of mice dosed with 30 mg/kg for 29 days). Therefore, there was little or no recovery for changes in differential white blood cell counts.

The following statistically significant changes in mean hematology parameters were considered to be unrelated to treatment and non-adverse because they did not occur in a dose-related pattern:

- Decreased mean cell hemoglobin concentration in mice dosed with 10 mg/kg for 29 days
- Decreased red cell distribution width in mice dosed with 0.3 or 10 mg/kg for 29 days
- Increased total white blood cell count in mice dosed with 10 mg/kg for 29 days

B. Clinical Chemistry

(Table 11, Appendix G)

Icterus was evident in serum of mice dosed with 10 or 30 mg/kg for 29 days. The incidences of icteric serum were 0/19, 0/19, 0/20, 16/20, and 17/17 in mice dosed with 0, 0.3, 1, 10, or 30 mg/kg for 29 days. Icterus is graded as none, trace, small, moderate, or large and in this study, grades of trace, small and moderate were observed. The icterus grades were generally higher at 30 than at 10 mg/kg. Icterus is an indication of increased serum bilirubin and may result from either increased production of bilirubin from hemoglobin as a result of increased red blood cell destruction or decreased processing and excretion of bilirubin. There was no clinical or anatomic pathology evidence of increased red cell destruction in mice dosed for 29 days. Histologically, minimal to mild hyperplasia of the bile ducts were observed in mice dosed with 10 or 30 mg/kg, which, along with other hepatic changes, may have contributed to the presence of icterus. In mice dosed in the 30/0 mg/kg group, the incidence and grades of icterus were lower than after 29 days of treatment (trace to small icterus observed in 16/19 mice). Therefore, there was partial recovery from the finding of icteric serum.

Total cholesterol was moderately decreased in mice dosed with 10 or 30 mg/kg for 29 days. Means were 69 and 51% of the control group means (statistically significant). The decrease in cholesterol was due to decreases in HDL cholesterol at doses of 1, 10 and 30 mg/kg (means were 71, 61, and 44% of the control group mean, respectively, and were statistically significant), and

in non-HDL cholesterol at doses of 10 and 30 mg/kg (means were 85 and 65% of the control group mean, respectively; not statistically significant). Mean total and HDL cholesterol in the 30/0 mg/kg group were 80% and 69% of the control group mean (variable statistical significance compared to control but statistically different from mice dosed with 30 mg/kg for 29 days). Therefore, there was partial recovery of total and HDL cholesterol, and complete recovery for non-HDL cholesterol in mice dosed with 30/0 mg/kg.

Triglycerides were moderately decreased in mice dosed with 10 or 30 mg/kg for 29 days. Means were 47 and 32% of the control group mean, respectively (statistically significant). There was partial recovery of triglycerides, as the mean value in mice in the 30/0 mg/kg group was 57% of the control group mean (statistically different from control mice and mice dosed with 30 mg/kg for 29 days).

Albumin was moderately increased in mice dosed with 1, 10, or 30 mg/kg for 29 days (means were 110, 145, and 131% of the control group mean, respectively; variable statistical significance). Although albumin data were limited to 3 values at 30 mg/kg for 29 days, albumin concentrations for these 3 mice were greater than those of mice dosed with 0.3 or 1 mg/kg, suggesting a treatment-related increase. Increased albumin may result from dehydration (relative increase) or increased synthesis or decreased catabolism (absolute increase). There were no in-life or clinical pathology data to support dehydration; however, urine concentration, an important sign of dehydration, was not evaluated in this study. Some peroxisome proliferator-activated receptor (PPAR) agonists have been reported to cause increases in serum albumin concentration due to increased synthesis of albumin. Due to the lack of corroborative data, the cause of increased albumin in this study cannot be determined. In the 30/0 mg/kg group, albumin concentrations were similar to those of mice dosed for 10 or 30 mg/kg for 29 days and were increased compared to those of control mice. Therefore, there was no recovery in albumin concentrations.

Globulin concentrations were increased in the 30/0 mg/kg group compared to those of control mice and mice dosed with 30 mg/kg for 29 days (both statistically significant; mean was 119% of the control mean), suggesting a test substance-related effect.

Total protein measurements include albumin and globulin, so changes in total protein are a function of changes in these 2 components. Total protein concentration was increased at 10 mg/kg (due to increases in albumin) and similar to control values at 30 mg/kg (due to increases in albumin and decreases in globulin). Means for these 2 groups were 125 and 109% of the control group mean, respectively (variable statistical significance). In the 30/0 mg/kg group, total protein was 134% of the control group mean (due to increases in both albumin and globulin).

Serum corticosterone was moderately increased in several mice dosed with 10 or 30 mg/kg for 29 days (variable statistical significance). While serum corticosterone concentrations were between 0 and 400 ng/mL in all mice dosed with ≤ 1 mg/kg, concentrations greater than 400 ng/mL were observed in 7/10 and 6/10 mice dosed with 10 or 30 mg/kg, respectively, resulting in mean concentrations that were 229 and 231% of the control group mean for mice for these 2 groups. In the 30/0 mg/kg group, mouse serum corticosterone concentrations were still mildly increased (6/10 were greater than 400 ng/mL, and the mean was 137% of the control

group mean; not statistically significant). These changes are consistent with partial recovery from stress.

C. Clinical Pathology Conclusions

Mice dosed with ≥ 1 mg/kg had decreased serum HDL cholesterol, increased serum albumin, and variable changes in serum globulin. Mice dosed with ≥ 10 mg/kg had increased neutrophils and monocytes, decreased eosinophils, icteric serum, decreased serum total cholesterol, non-HDL cholesterol, and triglycerides, and increased serum corticosterone. Mice dosed with 30 mg/kg also had decreased red cell mass parameters (red blood cell count, hemoglobin, and hematocrit), increased reticulocytes, and decreased lymphocytes. The only parameter with complete recovery in the 30/0 mg/kg group was non-HDL cholesterol. Partial recovery was observed for icteric serum, total and HDL cholesterol, triglycerides, and serum corticosterone.

Immunotoxicity

A. Humoral Immune Function

(Tables 12-13, Appendices H-I)

There was test substance-related evidence of immunosuppression in mice at 10, 30 and 30/0 mg/kg. The anti-SRBC titers for these groups were reduced 20, 28 and 30% when compared to the control group mean.

There was no difference in mean primary humoral immune response between the 30 and 30/0 mg/kg, indicating that the shortened dosing period did not have an impact on this endpoint.

In contrast, mice injected for 5 days with 90 mg/kg of the immunosuppressive material, cyclophosphamide, demonstrated a 52% inhibition of the IgM antibody response to SRBC.

Anatomic Pathology Evaluation

A. Cause of Death

There were no test substance-related deaths. Only 3 of the 120 mice on study did not survive until the scheduled sacrifice on day 29. The 3 mice were sacrificed *in extremis* on test days 5 and 9.

Mouse 117 (control) and mouse 1112 (30/0 mg/kg) were sacrificed on test day 5 due to dosing incidents. Both mice had ruptured esophagi identified on gross examination. Mouse 906 (30 mg/kg) was sacrificed on test day 9 because the mouse was clinically lethargic and pale. Gross and microscopic pathology did not reveal a cause of death. It is likely that this death was also due to a dosing incident. However, since the esophagus, lungs, and mediastinal tissue were not saved for microscopic examination, the cause of death was undetermined.

B. Final Body and Organ Weight Data

(Table 14, Appendix J)

Following 28 days of daily gavage administration of the test substance, test substance-related organ weight effects were observed in the liver, spleen, and thymus. Relative to controls, mean liver weight parameters were increased at ≥ 0.3 mg/kg, mean spleen weight parameters were decreased ≥ 1 mg/kg, and mean thymus weight parameters were decreased at ≥ 10 mg/kg.

Text Table 1: Mean Absolute and Relative (% body weight) Organ Weights in Male Mice

Group:	I	III	V	VII	IX	XI
Dose (mg/kg):	0	0.3	1	10	30	30/0
Number of Mice/Sex:	19	20	20	20	19	19
Final Body Wt. (g)	33.0	33.4	33.8	<u>28.4*</u>	<u>26.0*</u>	<u>30.5*^</u>
Liver	(17)	(20)	(20)	(20)	(18)	(18)
absolute wt. (g)	1.782	<u>2.407</u>	<u>3.272**</u>	<u>6.061**</u>	<u>5.899**</u>	<u>6.391**</u>
% body wt.	5.421	<u>7.196</u>	<u>9.704**</u>	<u>21.232**</u>	<u>22.618**</u>	<u>21.209**</u>
Spleen	(19)	(20)	(20)	(20)	(19)	(19)
absolute wt. (g)	0.117	0.116	<u>0.104</u>	<u>0.066**</u>	<u>0.052**</u>	<u>0.076**</u>
% body wt.	0.355	0.346	<u>0.307*</u>	<u>0.232*</u>	<u>0.195*</u>	<u>0.249*</u>
Thymus	(19)	(20)	(20)	(20)	(19)	(19)
absolute wt. (g)	0.050	0.045	0.049	<u>0.025**</u>	<u>0.025**</u>	<u>0.027**</u>
% body wt.	0.153	0.137	0.144	<u>0.087**</u>	<u>0.094**</u>	<u>0.088**</u>

wt. = weight; () number in parenthesis is the number of organs weighed.

Underlined values were interpreted to be test-substance related effects, as compared to control values.

* = statistically significant (Dunnett/Tamhane-Dunnett parametric pairwise test), compared to control value.

** = statistically significant (Dunn's non-parametric pairwise test), compared to control value.

^ = statistically significant (Dunn's non-parametric pairwise test) change in Group XI value compared to Group IX value.

1. Final Body Weight

Mean final body weights were decreased 14%, 21%, and 8% in the 10, 30, and 30/0 mg/kg dose groups, respectively, as compared to the control value. All decreases were statistically significant. Mean final body weights in the 0.3 and 1 mg/kg dose groups were similar to the control values.

There was also a statistically significant increase in the mean final body weight of the 30/0 mg/kg dose group, as compared to the 30 mg/kg dose group. This increase demonstrates partial recovery from the test substance-related final body weight decrease in the 6 recovery days following the injection of sheep red blood cells.

2. Liver

Mean absolute liver weights were increased 35%, 84%, 240%, 231%, and 259% in the 0.3, 1, 10, 30, and 30/0 mg/kg dose groups, respectively, as compared to the control value. Mean relative (% body weight) liver weights were similarly increased (33%, 79%, 292%, 317%, and 291%, respectively). All increases were statistically significant, except for those in the 0.3 mg/kg dose group.

The increased liver weights, at all dose levels, correlated with the microscopic finding of mild to severe hepatocellular hypertrophy. It also correlated with the gross observation of large livers at doses ≥ 10 mg/kg.

3. Spleen

Mean absolute spleen weights were decreased 11%, 44%, 56%, and 35% in the 1, 10, 30, and 30/0 mg/kg dose groups, respectively, as compared to the control value. Mean relative (% body weight) spleen weights were similarly decreased (14%, 35%, 45%, and 30%, respectively). All decreases were statistically significant, except for the increase in the mean absolute spleen weight in the 1 mg/kg dose group. Mean spleen weight parameters in the 0.3 mg/kg dose group were similar to the control values.

The decreased spleen weights, at ≥ 1 mg/kg, correlated with the microscopic finding of minimal to mild lymphoid depletion/atrophy in this organ. It also correlated with the gross observation of small spleens at doses ≥ 10 mg/kg.

4. Thymus

Mean absolute thymus weights were decreased 50%, 50%, and 46% in the 10, 30, and 30/0 mg/kg dose groups, respectively, as compared to the control value. Mean relative (% body weight) thymus weights were similarly decreased (43%, 39%, and 42%, respectively). All decreases were statistically significant. Mean thymus weight parameters in the 0.3 and 1 mg/kg dose groups were similar to the control values.

The decreased thymus weights, at ≥ 10 mg/kg, correlated with the microscopic finding of minimal to severe lymphoid depletion/atrophy in this organ. It also correlated with the gross observation of small thymuses at doses ≥ 10 mg/kg.

5. Other

All other individual and mean organ weight differences were considered to be spurious or secondary to the decrease in final body weights. Mean absolute brain weights were decreased, while mean relative brain weights (% body weight) were increased only at doses (≥ 10 mg/kg) that produced significantly decreased body weights. The lack of any gross or microscopic effects on the brain also suggests that the brain weight differences were a function of body weight and not indicative of a test substance-related brain weight effect.

C. Gross Observations

(Table 15 Appendix K)

At the terminal sacrifice, test substance-related gross observations were observed at doses ≥ 10 mg/kg and included large and discolored livers, small spleens, and small thymuses.

Text Table 2: Incidences of Test Substance-Related Gross Observations in Male Mice

	Group:	I	III	V	VII	IX	XI
	Dose (mg/kg):	0	0.3	1	10	30	30/0*
	Number of Mice/Group:	19**	20	20	20	19**	19**
<u>Liver</u>							
	Large	1	0	0	<u>17</u>	<u>16</u>	<u>17</u>
	Discoloration	0	0	0	<u>1</u>	<u>5</u>	<u>1</u>
<u>Spleen</u>							
	Small	0	0	0	<u>8</u>	<u>8</u>	<u>2</u>
<u>Thymus</u>							
	Small	0	0	0	<u>3</u>	<u>2</u>	<u>2</u>

Underlined values were interpreted to be test-substance related increases, as compared to control values.

* Not dosed with test substance following immunology challenge.

** Table excludes 3 mice that were euthanized on days 5 (mice #s 117 and 1112) and 9 (mouse #906).

The observation of large livers in mice given ≥ 10 mg/kg correlated with the microscopic finding of severe hepatocellular hypertrophy in all mice at these dosages and greater than 200% increases in mean absolute liver weights, as compared to controls. Gross liver discoloration is also consistent with microscopic hepatocellular hypertrophy.

Small spleens, which were observed in almost half of the spleens from mice given 10 (8/20) and 30 (8/19) mg/kg of the test substance, correlated with decreased mean spleen weights at these same dose levels. Fewer small spleens (2/19) were observed in the recovery group (30/0 mg/kg), which was consistent with the partial recovery of spleen weights in this dose group. Test substance-related microscopic lymphoid depletion was observed only at 30 mg/kg.

Small thymuses were recorded in only a few thymuses at dose levels ≥ 10 mg/kg. These correlated with decreased mean thymus weights and microscopic lymphoid depletion at the same dose levels.

D. Microscopic Findings

(Table 16, Appendix K)

Microscopic examination of the liver demonstrated mild hepatocellular hypertrophy at 0.3 mg/kg; moderate to severe hepatocellular hypertrophy with secondary individual cell necrosis and focal necrosis at doses ≥ 1 mg/kg; and increased hepatocellular mitotic figures, hepatocellular fatty change, and bile duct hyperplasia at doses ≥ 10 mg/kg.

Microscopic examination of lymphohematopoietic organs (spleen, thymus, bone marrow, lymph nodes) revealed increased granulocytic hematopoiesis in the bone marrow (≥ 10 mg/kg) and increased erythrocytic hematopoiesis in the bone marrow and spleen (30/0 mg/kg). Test substance-related lymphoid depletion/atrophy was present in the thymus (≥ 10 mg/kg) and spleen (30 mg/kg) of less than half of the mice at the respective dose levels. Mesenteric and popliteal lymph nodes had no test substance-related effects.

Text Table 3: Incidences of Test Substance-Related Microscopic Findings in Male Mice

	Group:	I	III	V	VII	IX	XI
	Dose (mg/kg):	0	0.3	1	10	30	30/0*
	Number of Mice/Group:	19**	20	20	20	19**	19**
<u>Liver</u>		(19)	(20)	(20)	(20)	(19)	(19)
Hypertrophy, hepatocellular		0	<u>20</u> [2.0]	<u>20</u> [3.0]	<u>20</u> [4.0]	<u>19</u> [4.0]	<u>19</u> [4.0]
Necrosis, individual cell		0	0	<u>11</u> [1.1]	<u>20</u> [1.9]	<u>19</u> [2.0]	<u>19</u> [1.7]
Necrosis, focal		0	1 [1.0]	<u>3</u> [1.0]	4 [1.8]	<u>7</u> [1.9]	<u>3</u> [1.7]
Mitotic figures, increased		0	0	0	<u>10</u> [1.0]	<u>15</u> [1.0]	<u>19</u> [1.4]
Hyperplasia, bile duct		0	0	0	<u>6</u> [1.0]	<u>17</u> [1.2]	<u>12</u> [1.0]
Fatty change, nonzonal		0	0	0	<u>9</u> [1.0]	<u>14</u> [1.0]	<u>4</u> [1.0]
<u>Thymus</u>		(19)	(20)	(19)	(19)	(17)	(19)
Depl./Atr. Lymph. or NP.		0	0	0	<u>8</u> [1.6]	<u>12</u> [2.9]	<u>6</u> [2.8]
<u>Spleen</u>		(19)	(20)	(20)	(20)	(19)	(19)
Depletion/Atrophy, lymphoid		0	1 [1.0]	0	0	<u>8</u> [1.1]	<u>7</u> [1.1]
EMH, increased		6 [1.2]	4 [1.5]	1 [1.0]	3 [1.7]	5 [1.2]	<u>15</u> [1.8]
<u>Bone Marrow</u>		(19)	(20)	(20)	(20)	(19)	(19)
Hyperplasia, granulocytic		0	0	0	<u>3</u> [1.7]	<u>4</u> [1.0]	<u>3</u> [1.7]
Hyperplasia, erythrocytic		0	0	0	0	0	<u>3</u> [2.0]

[] = Number in brackets is the average grade (grades 1 – 4) when lesion is present (i.e., sum of grades ÷ # animals with lesion). Grading scale: 1 = minimal; 2 = mild; 3 = moderate; 4 = severe.

() number in parenthesis is the number of organs weighed; EMH = Extramedullary hematopoiesis.

Underlined values were interpreted to be test-substance related increases, as compared to control values.

* Not dosed with test substance following immunology challenge.

** Table excludes 3 mice that were euthanized on days 5 (mice #s 117 and 1112) and 9 (mouse #906).

. Includes lymphoid depletion/atrophy and thymus not present in mediastinal tissue (assumed grade 3 atrophy).

I. Liver

a. Hepatocellular Hypertrophy

Panlobular hepatocellular hypertrophy was observed in all surviving mice given the test substance and the severity was dose related. Hypertrophy was present in 0/19, 20/20, 20/20, 20/20, 19/19, and 19/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. The hypertrophy was graded as mild in all mice given 0.3 mg/kg, moderate in all mice given 1 mg/kg; and severe in all mice given ≥ 10 mg/kg.

The hepatocellular hypertrophy was characterized by an increase in the size of all hepatocytes due to an increase in cytoplasmic volume. The cytoplasm had a uniformly eosinophilic granular appearance consistent with peroxisome proliferation. At doses ≥ 1 mg/kg, the severity (moderate to severe) of the hepatocellular hypertrophy appeared to be responsible for increased individual cell necrosis and focal necrosis. At doses ≥ 10 mg/kg, the severity (severe) of the hepatocellular hypertrophy was associated with nonzonal fatty change and hepatocellular regeneration (increased mitotic figures).

Hepatocellular hypertrophy correlated with increased mean liver weight parameters at all doses and grossly large livers at doses ≥ 10 mg/kg.

b. Individual Cell Necrosis

Individual cell necrosis was observed in mice given ≥ 1 mg/kg of the test substance; the incidence and severity were dose related. Individual cell necrosis was present in 0/19, 0/20, 11/20, 20/20, 19/19, and 19/19 in mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively, and was graded minimal to mild. A slight decrease in severity was apparent in the 30/0 mg/kg group as compared to the 30 mg/kg group.

The individual cell necrosis was primarily due to the degeneration, necrosis, and lysis of enlarged hepatocytes in an individualized, non-zonal pattern. Although apoptotic cells were observed in most sections, the increased individual cell necrosis was usually not due to apoptosis. A slight secondary focal inflammatory cell infiltrate was often observed in association with necrotic hepatocytes.

c. Focal Necrosis

Test substance-related focal necrosis was also observed in mice given ≥ 1 mg/kg of the test substance. The incidence and severity were both mildly dose related. Focal necrosis was present in 0/19, 1/20, 3/20, 4/20, 7/19, and 3/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively, and was graded minimal to moderate. The single incidence of minimal focal necrosis in a 0.3 mg/kg mouse was considered incidental since this is sometimes a naturally occurring background lesion. A slight decrease in the incidence of focal necrosis was apparent in the 30/0 mg/kg group, as compared to the 30 mg/kg group.

Focal necrosis was characterized by the focal or multifocal coagulative necrosis of a cluster of hepatocytes. The distribution was usually subcapsular and the pattern was non-zonal. Focal coagulative necrosis of hepatocyte clusters is a common secondary effect of hepatocellular hypertrophy and is most likely the result of secondary focal ischemia.⁽¹⁶⁾

d. Increased Mitotic Figures

Increased mitotic figures were observed in mice given ≥ 10 mg/kg of the test substance; the incidence was dose related. Increased mitotic figures were present in 0/19, 0/20, 0/20, 10/20, 15/19, and 19/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively, and was graded minimal to mild. A slight increase in the incidence and severity was apparent in the 30/0 mg/kg group, as compared to the 30 mg/kg group.

Increased mitotic figures were an apparent indication of increased cell turnover in those mice with severe hepatocellular hypertrophy and subsequent individual cell necrosis.

e. Bile Duct Hyperplasia

Bile duct hyperplasia was observed in mice given ≥ 10 mg/kg and the incidence and severity were both dose related. Bile duct hyperplasia was observed in 0/19, 0/20, 0/20, 6/20, 17/19, and 12/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. The hyperplasia was graded as minimal in all mice except for three 30 mg/kg mice which were graded as mild. A slight decrease in the incidence of bile duct hyperplasia was apparent in the 30/0 mg/kg group, as compared to the 30 mg/kg group.

The bile duct hyperplasia was characterized by a minimal to mild increase in the number of profiles of normal bile ducts.

f. Fatty Change, Nonzonal

Nonzonal fatty change was also present in mice given ≥ 10 mg/kg. The incidence was dose related but all lesions were graded as minimal. Fatty change was observed in 0/19, 0/20, 0/20, 9/20, 14/19, and 4/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. A decrease in the incidence of fatty change was apparent in the 30/0 mg/kg group, as compared to the 30 mg/kg group.

The fatty change was characterized by a minimal increase in the number of hepatocytes with small to medium size cytoplasmic fatty globules. The distribution of the affected hepatocytes was nonzonal as the fatty change was scattered throughout the liver. The fatty change was only observed in livers with severe diffuse hepatocellular hypertrophy and was considered to be a degenerative change secondary to the hypertrophy.

2. Thymus

a. Lymphoid Depletion/Atrophy

Minimal to severe thymic lymphoid depletion/atrophy was only observed in mice given ≥ 10 mg/kg. The lesion was present in 0/19, 0/20, 0/19, 6/19, 7/17, and 4/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. In addition, thymic tissue was not present in the mediastinal tissue section of 9 other mice (given ≥ 10 mg/kg), suggesting that these animals also had moderate to severe thymic lymphoid depletion. Therefore, the combined incidence of lymphoid depletion and absent thymic tissue was 0/19, 0/20, 0/19, 8/19, 12/17, and 6/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. Both the incidence and severity were dose related. A slight decrease in the incidence and severity of thymic lymphoid depletion/atrophy was apparent in the 30/0 mg/kg group, as compared to the 30 mg/kg group.

Thymic lymphoid depletion/atrophy was characterized by decrease in the number of lymphocytes in the thymus in the absence of necrotic cells. As stated earlier, the absence of thymic tissue in the mediastinal tissue section was also interpreted to be indicative of thymic depletion/atrophy.

3. Spleen

a. Lymphoid Depletion/Atrophy

Minimal to mild splenic lymphoid depletion/atrophy was test substance related only at 30 mg/kg. The lesion was present in 0/19, 1/20, 0/20, 0/20, 8/19, and 7/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. The incidence and severity of this effect was similar in the 30 and 30/0 mg/kg groups.

As with the thymic lesion, splenic lymphoid depletion/atrophy was characterized by a decrease in the number of lymphocytes in the thymus in the absence of necrotic cells.

b. Increased Extramedullary Hematopoiesis

An increase in the incidence of splenic extramedullary hematopoiesis (EMH) was considered test substance related only in high-dose mice allowed a recovery period (30/0 mg/kg dose group). Minimal to moderate increased EMH was observed in 6/19, 4/20, 1/20, 3/20, 5/19, and 15/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively.

The increased splenic EMH was erythrocytic and correlated with both the bone marrow erythrocytic hyperplasia and the hematological finding of decreased red cell mass parameters and increased circulating reticulocytes (see Clinical Pathology) that were also observed only in the 30/0 mg/kg recovery mice.

4. Bone Marrow

a. Granulocytic Hyperplasia

A minimal to moderate increase in bone marrow granulocytic hyperplasia was observed in 0/19, 0/20, 0/20, 3/20, 4/19, and 3/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively. The incidence and severity were not dose related in groups given ≥ 10 mg/kg of the test substance.

The increase in bone marrow granulocytic hyperplasia (≥ 10 mg/kg) correlated with increases in the peripheral white blood cell and neutrophil counts (see Clinical Pathology). The granulocytic response was most likely secondary to the hepatocellular individual cell necrosis and focal necrosis observed in mice given ≥ 1 mg/kg of the test substance.

b. Erythrocytic Hyperplasia

A mild increase in bone marrow erythrocytic hyperplasia was observed only in high-dose mice allowed a recovery period (30/0 mg/kg dose group). Erythrocytic hyperplasia was observed in 0/19, 0/20, 0/20, 0/20, 0/19, and 3/19 mice given 0, 0.3, 1, 10, 30, and 30/0 mg/kg, respectively.

As discussed for the spleen, the increase in bone marrow erythrocytic hyperplasia in recovery mice correlated with both microscopic splenic EMH and hematology findings (decreased red cell mass parameters and increased circulating reticulocytes (see Clinical Pathology)).

5. Other

All other microscopic observations in this study were consistent with normal background lesions in mice of this age and strain.

E. Ultrastructural Findings

1. Electron Microscopy Evaluation

(Appendix M)

At the 1 mg/kg dose of APFO (linear), an increase in peroxisomes was not observed. However, many organelles could not be clearly identified due to poor ultrastructural detail, which was likely the result of formalin fixation. Therefore, definitive conclusions on peroxisomal numbers in treated groups relative to controls could not be drawn. More details are provided in Appendix M.

F. Anatomic Pathology Conclusions

There were no test substance-related deaths. Only 3 of the 120 mice on study did not survive until the scheduled sacrifice on day 29. The 3 mice were sacrificed *in extremis* on test days 5 and 9.

Following 28-days of daily gavage administration of the test substance, test substance-related organ weight effects were observed in the liver, spleen, and thymus. Mean liver weight parameters were increased, mean spleen weight parameters were decreased, and mean thymus weight parameters were decreased.

At the terminal sacrifice, test substance-related gross observations were observed at doses ≥ 10 mg/kg and included large and discolored livers, small spleens, and small thymuses.

Microscopic examination of the liver demonstrated mild hepatocellular hypertrophy at 0.3 mg/kg; moderate to severe hepatocellular hypertrophy with secondary individual cell necrosis and focal necrosis at doses ≥ 1 mg/kg; and increased hepatocellular mitotic figures, hepatocellular fatty change, and bile duct hyperplasia at doses ≥ 10 mg/kg.

Microscopic examination of lymphohematopoietic organs (spleen, thymus, bone marrow, lymph nodes) revealed increased granulocytic hematopoiesis in the bone marrow (≥ 10 mg/kg) and increased erythrocytic hematopoiesis in the bone marrow and spleen (30/0 mg/kg). Test substance-related lymphoid depletion/atrophy was present in the thymus (≥ 10 mg/kg) and spleen (30 mg/kg) of less than half of the mice at the respective dose levels. Mesenteric and popliteal lymph nodes had no test substance-related effects.

Total Cell Counts

A. Spleen Cell Number

(Table 17, Appendix L)

No significant changes in total spleen cell number were noted in animals dosed with 0.3 or 1 mg/kg. Significant decreases were noted in animals dosed with 10 mg/kg or greater, with the greatest suppression compared to vehicle-treated controls observed at 30 mg/kg (63% suppression). In the 30/0 mg/kg group, a rebound was seen (44% suppression), but this increase in cells compared to the 30 mg/kg was most likely due to the extramedullary hematopoiesis observed in 15 of 19 mice in this treatment group.

B. Thymus Cell Number

(Table 17, Appendix L)

No significant changes in total thymus cell number were noted in animals dosed with 0.3 or 1 mg/kg. Significant decreases were noted in animals dosed with 10 mg/kg or greater, with the greatest suppression observed at 30 mg/kg (82% suppression). In the 30/0 mg/kg group, a rebound was seen (51% suppression).

CONCLUSIONS

Under the conditions of this study, the no-observed-adverse-effect level (NOAEL) for APFO for systemic toxicity in male mice was 0.3 mg/kg and for immunosuppression was 1 mg/kg.

RECORDS AND SAMPLE STORAGE

Specimens (if applicable), raw data, the protocol, amendments (if any), and the final report will be retained at Haskell Laboratory, Newark, Delaware, or at Iron Mountain Records Management, Wilmington, Delaware.

Laboratory-specific raw data such as personnel files, instrument, equipment, refrigerator and/or freezer raw data will be retained at the facility where the work was done.

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TABLES

TABLES

EXPLANATORY NOTES

ABBREVIATIONS:**Summary of Hematology Values**

RBC	-	red blood cell count
HGB	-	hemoglobin
HCT	-	hematocrit
MCV	-	mean corpuscular (cell) volume
MCH	-	mean corpuscular (cell) hemoglobin
MCHC	-	mean corpuscular (cell) hemoglobin concentration
RDW	-	red cell distribution width
ARET	-	absolute reticulocyte count
PLT	-	platelet count
WBC	-	white blood cell count
ANEU	-	absolute neutrophil (all forms)
ALYM	-	absolute lymphocyte
AMON	-	absolute monocyte
AEOS	-	absolute eosinophil
ABAS	-	absolute basophil
ALUC	-	absolute large unstained cell
-	-	no data
NC	-	not calculated or not calculable

Summary of Clinical Chemistry Values

CHOL	-	cholesterol
TRIG	-	triglycerides
TP	-	total protein
ALB	-	albumin
GLOB	-	globulin
HDL	-	high-density lipoprotein cholesterol
NHDL	-	non-high-density lipoprotein cholesterol
SCORT	-	serum corticosterone

NOTES:**Summary of Hematology Values****Summary of Clinical Chemistry Values**

Groups with identical values may vary in statistical significance, because tabulated statistics are rounded to fewer decimal places than the values used for statistical determination.

TABLES

EXPLANATORY NOTES (Continued)NOTES: (Continued)**Summary of Total Cell Counts**

$$\text{Organ Weight as Percent of Body Weight} = \frac{\text{Organ Weight (g)}}{\text{Final Body Weight (g)}} \times 100$$

$$\text{Total Number of} \\ \text{of Organ Cells (x10}^8\text{)} = \frac{\text{Organ Weight (g)}}{\text{Half Organ Weight (g)}} \times \frac{\text{Organ Cell} \\ \text{Suspension} \\ \text{Volume} \\ \text{(mL)}}{\text{}} \times \frac{\text{Number of} \\ \text{Cells in Half} \\ \text{Organ} \\ \text{(x 10}^6\text{ cells/mL)}}{\text{}} \div 100$$

Table 1
Recovery of APFO Added to Dosing Vehicle

Sample Type	APFO (mg/mL)		Percent Nominal
	Nominal	Measured	
RECOVERY ^(A)	0.0302	0.0327	108.3
RECOVERY ^(B)	0.0300	0.0305	<u>101.7</u>
		Mean	105.0 ± 5, C.V. 5%
RECOVERY ^(A)	0.104	0.114	109.6
RECOVERY ^(B)	0.100	0.104	<u>104.0</u>
		Mean	106.8 ± 4, C.V. 4%
RECOVERY ^(A)	1.00	1.02	102.0
RECOVERY ^(B)	1.00	1.05	<u>105.0</u>
		Mean	103.5 ± 2, C.V. 2%
RECOVERY ^(A)	3.00	3.05	101.7
RECOVERY ^(B)	3.00	3.21	<u>107.0</u>
		Mean	104.4 ± 4, C.V. 4%

^(A) Processed with dosing samples submitted October 17, 2005 for concentration verification, uniformity of mixing, and 5-hour room temperature stability analyses.

^(B) Processed with dosing samples submitted November 15, 2005 for concentration verification and uniformity of mixing analyses.

Table 2
Concentration Verification, Uniformity of Mixing, and 5-Hour Room Temperature Stability of
APFO in Dosing Solutions

Sample Date Sample Type ^(A)	APFO (mg/mL)		Percent
	Nominal	Measured	Nominal
15-November-2005			
<u>Concentration Verification</u>			
Control	0	ND ^(B)	----
#1	0.03	0.0278	92.7
#2	0.03	<u>0.0277</u>	92.3
	Mean:	0.0278 ± 0.0001	(92.7)
		C.V. 0.3%	
#1	0.1	0.0966	96.6
#2	0.1	<u>0.0979</u>	97.9
	Mean:	0.0973 ± 0.0009	(97.3)
		C.V. 0.9%	
#1	1	0.979	97.9
#1 ^(C)	1	1.04	104.0
#2 ^(C)	1	<u>1.03</u>	103.0
	Mean:	1.02 ± 0.03	(102.0)
		C.V. 3%	
#1	3	3.16	105.3
#2	3	<u>3.06</u>	102.0
	Mean:	3.11 ± 0.07	(103.7)
		C.V. 2%	
<u>Stability^(D)</u>			
	0.03	0.0289	96.3
	0.1	0.0990	99.0
	1	0.969	96.9
	3	3.06	102.0

(A) Duplicate analyses per level performed for concentration verification. Mean, S.D. and C.V. calculated to verify uniformity of mixing.

(B) Denotes not detected.

(C) Duplicate analyses from the re-diluted sample.

(D) Samples held at room temperature for 5 hours.

Table 3
Concentration Verification and Uniformity of Mixing of APFO in Dosing Solutions

Sample Type ^(A)	APFO (mg/mL)		Percent
Sample Date	Nominal	Measured	Nominal
<u>Concentration</u>			
<u>Verification</u>			
11-October-2005			
Control	0	ND ^(B)	----
#1	0.03	0.0276	92.0
#2	0.03	<u>0.0272</u>	90.7
	<i>Mean:</i>	<i>0.0274 ± 0.0003</i>	<i>(91.3)</i>
		<i>C.V. 1%</i>	
#1	0.1	0.0954	95.4
#2	0.1	<u>0.0986</u>	98.6
	<i>Mean:</i>	<i>0.0970 ± 0.002</i>	<i>(97.0)</i>
		<i>C.V. 2%</i>	
#1	1	1.02	102.0
#2	1	<u>1.01</u>	101.0
	<i>Mean:</i>	<i>1.02 ± 0.008</i>	<i>(102.0)</i>
		<i>C.V. 0.7%</i>	
#1	3	3.21	107.0
#2	3	<u>3.23</u>	107.7
	<i>Mean:</i>	<i>3.22 ± 0.01</i>	<i>(107.3)</i>
		<i>C.V. 0.4%</i>	

(A) Duplicate analyses per level performed for concentration verification. Mean, S.D. and C.V. calculated to verify uniformity of mixing.

(B) Denotes not detected.

Table 4
Mean Body Weights of Male Mice

DAYS ON TEST	MEAN BODY WEIGHTS (g)					
	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
0	32.4 1.7(20)	32.4 1.8(20)	32.6 1.8(20)	32.3 1.7(20)	32.7 2.2(20)	32.7 1.6(20)
7	32.8 1.6(19)	32.6 1.8(20)	32.7 1.7(20)	31.8 2.3(20)	28.1* 3.1(20)	28.1* 3.1(19)
14	33.0 1.8(19)	33.0 1.9(20)	33.1 2.0(20)	29.7* 2.3(20)	28.6* 2.9(19)	28.0* 2.7(19)
21	33.7 1.5(19)	33.8 2.0(20)	34.2 1.8(20)	29.2* 2.0(20)	26.0* 3.1(19)	26.0* 2.8(19)
28	33.4 1.5(19)	33.9 2.5(20)	34.2 1.8(20)	28.6* 2.1(20)	26.2* 3.0(19)	29.5*† 3.4(19)

Data arranged as:

Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunnett test.† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 5
Mean Body Weight Gains of Male Mice

DAYS ON TEST	MEAN BODY WEIGHT GAINS (g)					
	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
0-7	0.2 0.7(19)	0.3 0.9(20)	0.0 1.0(20)	-0.5 1.6(20)	-4.6@ 3.0(20)	-4.7@ 2.7(19)
7-14	0.3 0.8(19)	0.3 0.5(20)	0.4 0.8(20)	-2.1@ 1.6(20)	0.2 3.0(19)	-0.0 2.9(19)
14-21	0.7 0.7(19)	0.8 0.4(20)	1.1 0.9(20)	-0.5@ 1.4(20)	-2.6@ 3.5(19)	-2.0@ 3.0(19)
21-28	-0.3 0.7(19)	0.1 0.8(20)	0.0 0.8(20)	-0.6 0.9(20)	0.3 1.7(19)	3.4@† 2.5(19)
OVERALL 0-28	0.9 1.4(19)	1.5 1.8(20)	1.5 1.9(20)	-3.8* 1.9(20)	-6.6* 3.5(19)	-3.3* 2.6(19)

Data arranged as:

Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunnnett test.@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 6
Mean Daily Food Consumption by Male Mice

DAYS ON TEST	MEAN DAILY FOOD CONSUMED PER ANIMAL (g)				
	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg
7	5.1 0.4(19)	5.1 0.4(20)	5.2 0.4(20)	5.0 0.6(20)	4.5* 0.7(19)
14	5.1 0.4(19)	5.2 0.4(20)	5.3 0.5(20)	5.8* 0.8(20)	5.5 1.0(19)
21	5.1 0.4(19)	5.1 0.4(20)	5.1 0.5(20)	5.3 0.9(20)	4.6† 0.9(19)
28	4.7 0.5(19)	4.9 0.4(20)	5.2 0.4(20)	5.5@ 0.8(20)	5.5@† 1.3(19)
OVERALL 0-28	5.0 0.3(19)	5.1 0.3(20)	5.2 0.3(20)	5.4@ 0.5(20)	5.0 0.7(19)

Data arranged as:

Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunnnett test.@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 7
Mean Daily Food Efficiency of Male Mice

DAYS ON TEST	MEAN DAILY FOOD EFFICIENCY (g weight gain/g food consumed)					
	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
0-7	0.005 0.020(19)	0.008 0.026(20)	0.001 0.028(20)	-0.020 0.053(20)	-0.161@ 0.122(20)	-0.165@ 0.116(19)
14	0.006 0.023(19)	0.009 0.015(20)	0.010 0.020(20)	-0.057@ 0.050(20)	0.004 0.082(19)	-0.003 0.071(19)
21	0.019 0.019(19)	0.023 0.011(20)	0.031 0.026(20)	-0.014@ 0.040(20)	-0.103@ 0.148(18)	-0.065@† 0.091(19)
28	-0.010 0.021(19)	0.001 0.023(20)	-0.000 0.022(20)	-0.017 0.023(20)	0.008 0.056(19)	0.087@ 0.056(19)
OVERALL 0-28	0.006 0.010(19)	0.010 0.012(20)	0.011 0.013(20)	-0.026* 0.015(20)	-0.053* 0.032(18)	-0.025* 0.021(19)

Data arranged as: Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunn test.@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 8
Summary of Daily Animal Health Observations in Male Mice

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group IX 30/0 mg/kg (Recovery)
ANIMAL COUNT:	20	20	20	20	20	20
Enophthalmus	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)
Abnormal Gait	1 (5%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)
Feces Absent	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)
Lethargic	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)
Not Eating	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)
Stained Cageboard	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (10%)
Swollen Shoulder	0 (0%)	0 (0%)	0 (0%)	1 (5%)	1 (5%)	0 (0%)
Swollen Penis	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)

Data arranged as: number of animals (percent of group) for which an observation was recorded

Table 9
Summary of Detailed Clinical Observations in Male Mice

	Group I 0 mg/kg		Group III 0.3 mg/kg		Group V 1 mg/kg		Group VII 10 mg/kg		Group IX 30 mg/kg		Group IX 30/0 mg/kg (Recovery)	
ANIMAL COUNT:	20		20		20		20		20		20	
Absent End of tail	0	(0%)	0	(0%)	0	(0%)	1	(5%)	0	(0%)	0	(0%)
Eye Dark	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)
Enophthalmus	1	(5%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	2	(10%)
Eye Partially Closed	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)	0	(0%)
Wet Fur	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)	0	(0%)
Prostrate	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)
Abnormal Gait	1	(5%)	0	(0%)	1	(5%)	1	(5%)	0	(0%)	0	(0%)
Pale	0	(0%)	0	(0%)	0	(0%)	1	(5%)	4	(20%)	0	(0%)
Feces Absent	1	(5%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)
Labored Breathing	1	(5%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Lethargic	1	(5%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)	1	(5%)
Not Eating	1	(5%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	1	(5%)

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Table 9
Summary of Detailed Clinical Observations in Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group IX 30/0 mg/kg (Recovery) 20
ANIMAL COUNT:	20	20	20	20	20	20
Misshapen Tail	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	0 (0%)
Stain Fur/Skin	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	1 (5%)
Stained Cageboard	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (10%)
Swollen Neck	1 (5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Swollen Face	1 (5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Swollen Shoulder	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)	1 (5%)
Swollen Penis	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)

Data arranged as: number of animals (percent of group) for which an observation was recorded

Table 10
Summary of Hematology Values for Male Mice

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
RBC ($\times 10^6/\mu\text{L}$) DAY 29	10.23 0.72(10)	10.15 0.38(10)	9.30 1.43(10)	10.04 0.97(8)	9.64 0.89(7)	8.82@ 0.77(9)
HGB (g/dL) DAY 29	16.0 1.1(10)	15.8 0.5(10)	14.3 2.2(10)	14.9 1.7(8)	14.1 1.9(7)	13.1@ 1.2(9)
HCT (%) DAY 29	53.0 3.3(10)	52.7 1.9(10)	48.0 7.4(10)	51.9 5.0(8)	48.3 6.1(7)	45.0@ 3.5(9)
MCV (fL) DAY 29	51.8 2.1(10)	51.9 1.4(10)	51.7 1.9(10)	51.7 2.6(8)	49.9 2.0(7)	51.1 2.2(9)
MCH (pg) DAY 29	15.6 0.5(10)	15.6 0.6(10)	15.4 0.7(10)	14.9 1.0(8)	14.6* 0.7(7)	14.8 0.6(9)
MCHC (g/dL) DAY 29	30.1 0.7(10)	30.1 1.1(10)	29.8 0.8(10)	28.7* 1.0(8)	29.1 0.7(7)	29.1* 1.0(9)

Table 10
Summary of Hematology Values for Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
RDW (%)						
DAY 29	12.9	12.3@	12.2	12.1@	13.1	14.0
	0.3(10)	0.3(10)	0.7(10)	0.5(8)	0.8(7)	2.2(9)
ARET (x10 ³ /μL)						
DAY 29	326.5	342.3	274.8	248.2	350.4	481.9
	27.9(10)	53.4(10)	65.3(10)	62.1(8)	160.1(7)	207.6(9)
PLT (x10 ³ /μL)						
DAY 29	1177	1402	1176	-	-	1501
	NC(1)	202(2)	315(5)			723(4)
WBC (x10 ³ /μL)						
DAY 29	7.55	9.57	8.90	11.14*	6.75	7.29
	2.39(10)	2.84(10)	2.62(10)	2.24(8)	2.61(7)	1.06(9)
ANEU (x10 ³ /μL)						
DAY 29	0.80	1.29	0.96	1.89*	2.37*	2.05*
	0.42(10)	0.46(10)	0.49(10)	0.60(8)	1.14(7)	0.57(9)
ALYM (x10 ³ /μL)						
DAY 29	6.43	7.82	7.60	8.67	3.81	4.78†
	1.92(10)	2.66(10)	2.57(10)	2.08(8)	1.39(7)	0.77(9)

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Table 10
Summary of Hematology Values for Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
AMON ($\times 10^3/\mu\text{L}$)						
DAY 29	0.13 0.09(10)	0.16 0.11(10)	0.11 0.07(10)	0.37@ 0.18(8)	0.33 0.23(7)	0.23 0.14(9)
AEOS ($\times 10^3/\mu\text{L}$)						
DAY 29	0.14 0.10(10)	0.18 0.07(10)	0.14 0.08(10)	0.08 0.04(8)	0.09 0.07(7)	0.09 0.08(9)
ABAS ($\times 10^3/\mu\text{L}$)						
DAY 29	0.01 0.02(10)	0.02 0.01(10)	0.02 0.01(10)	0.02 0.02(8)	0.02 0.02(7)	0.02 0.04(9)
ALUC ($\times 10^3/\mu\text{L}$)						
DAY 29	0.04 0.05(10)	0.09 0.05(10)	0.06 0.04(10)	0.10 0.11(8)	0.14 0.11(7)	0.11 0.12(9)

Data arranged as:

Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunn test.@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 11
Summary of Clinical Chemistry Values for Male Mice

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
CHOL (mg/dL) DAY 29	117 29(9)	128 38(10)	101 30(10)	81* 23(10)	60* 22(10)	94# 22(9)
TRIG (mg/dL) DAY 29	167 37(9)	148 41(10)	157 41(10)	78* 31(10)	53* 27(10)	96*# 23(9)
TP (g/dL) DAY 29	5.6 0.3(6)	5.2 0.5(7)	5.6 0.4(8)	7.0* 0.3(7)	6.1 0.8(3)	7.5*# 0.7(9)
ALB (g/dL) DAY 29	2.9 0.2(6)	2.8 0.3(7)	3.2 0.1(8)	4.2* 0.3(7)	3.8* 0.3(3)	4.3*# 0.4(9)
GLOB (g/dL) DAY 29	2.7 0.2(6)	2.4 0.3(7)	2.5 0.4(8)	2.8 0.1(7)	2.3 0.5(3)	3.2*# 0.4(9)
HDL (mg/dL) DAY 29	77 19(9)	77 13(10)	55* 15(10)	47* 11(10)	34* 11(10)	53*# 11(9)

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Table 11
Summary of Clinical Chemistry Values for Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
NHDL (mg/dL)						
DAY 29	40	51	46	34	26	41#
	10(9)	27(10)	18(10)	14(10)	13(10)	13(9)
SCORT (ng/mL)						
DAY 28-29	189	198	108	433*	437	259
	112(10)	86(10)	76(10)	156(10)	278(10)	168(10)

Data arranged as:

Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunnnett test.

Statistically significant difference from Group IX at $p < 0.05$ by t-test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

Table 12
Summary of Primary Humoral Immune Response to SRBC for Male Mice Dosed with APFO

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
LOG ₂ ^a	9.027 0.587(19) ^b	8.819 0.787(19) ^b	8.310 0.619(20)	7.185@ 1.351(18) ^{c,d}	6.513@ 1.037(16) ^{b,c}	6.277@ 0.680(18) ^{b,c}

Data arranged as: Mean

Standard deviation (Number of values included in calculation)

a Mean log₂ of the serum IgM titer data.

b Serum was not collected from one or more animals, therefore, immune response could not be evaluated for these animals.

c Serum volume was insufficient for one or more animals, therefore, immune response could not be evaluated for these animals.

d One or more animal was not injected with the appropriate amount of SRBC, therefore, immune response could not be evaluated for these animals.

@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.

Table 13
Summary of Primary Humoral Immune Response to SRBC for Male Mice Dosed With Positive Control

	Saline ^a	Cyclophosphamide 90 mg/kg ^a	Saline ^b	Cyclophosphamide 90 mg/kg ^b
LOG ₂	8.603 0.685(10)	4.515 0.843(10)	8.662	5.129

Data arranged as: Mean
 Standard deviation (Number of values included in calculation)

- a Mean log₂ of the SRBC-specific serum IgM titer data for individual samples.
b Log₂ of the SRBC-specific serum IgM titer data for pooled samples.

Table 14
Mean Final Body and Organ Weights from Male Mice

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
MEAN FINAL BODY AND ABSOLUTE ORGAN WEIGHTS (grams)						
LIVER	1.782 0.175(17) ^a	2.407 0.255(20)	3.272@ 0.231(20)	6.061@ 1.320(20)	5.899@ 0.850(18) ^b	6.391@ 1.505(18) ^b
SPLEEN	0.117 0.015(19)	0.116 0.032(20)	0.104 0.016(20)	0.066@ 0.019(20)	0.052@ 0.023(19)	0.076@ 0.022(19)
THYMUS	0.050 0.010(19)	0.045 0.010(20)	0.049 0.012(20)	0.025@ 0.009(20)	0.025@ 0.013(19)	0.027@ 0.010(19)
BRAIN	0.471 0.027(19)	0.478 0.029(20)	0.474 0.029(20)	0.446* 0.028(20)	0.440* 0.026(19)	0.442* 0.029(19)
FINAL BODY WEIGHT (grams)						
33.0	33.4	33.8	33.8	28.4*	26.0*	30.5*†
1.3(19)	2.5(20)	1.8(20)	1.8(20)	2.0(20)	2.8(19)	3.7(19)

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Table 14
Mean Final Body and Organ Weights from Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
MEAN RELATIVE ORGAN WEIGHTS (% of body weight)						
LIVER/ FINAL BODY * 100	5.421 0.466(17) ^a	7.196 0.418(20)	9.704@ 0.736(20)	21.232@ 3.715(20)	22.618@ 2.614(18) ^b	21.209@ 4.835(18) ^b
SPLEEN/ FINAL BODY * 100	0.355 0.045(19)	0.346 0.082(20)	0.307* 0.043(20)	0.232* 0.062(20)	0.195* 0.067(19)	0.249* 0.058(19)
THYMUS/ FINAL BODY * 100	0.153 0.034(19)	0.137 0.034(20)	0.144 0.035(20)	0.087@ 0.031(20)	0.094@ 0.048(19)	0.088@ 0.027(19)
BRAIN/ FINAL BODY * 100	1.427 0.080(19)	1.436 0.091(20)	1.408 0.103(20)	1.576* 0.111(20)	1.703* 0.132(19)	1.467† 0.189(19)

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Table 14
Mean Final Body and Organ Weights from Male Mice (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
MEAN RELATIVE ORGAN WEIGHTS (% of brain weight)						
LIVER/ BRAIN * 100	379.673 34.913(17) ^a	503.340 46.491(20)	691.370@ 55.479(20)	1357.057@ 275.001(20)	1336.969@ 167.426(18) ^b	1457.734@ 345.770(18) ^b
SPLEEN/ BRAIN * 100	24.915 2.950(19)	24.226 6.087(20)	21.872* 3.312(20)	14.822* 4.260(20)	11.756* 4.890(19)	17.267*† 4.669(19)
THYMUS/ BRAIN * 100	10.758 2.438(19)	9.533 2.207(20)	10.199 2.245(20)	5.592@ 2.072(20)	5.638@ 2.969(19)	6.164@ 2.278(19)

Data arranged as: Mean

Standard deviation (Number of values included in calculation)

a An error occurred while weighing livers for 2 animals in this group, and the liver weights were excluded from calculations.

b Liver inadvertently not weighed from one animal in this group.

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunn test.

@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.

† Statistically significant difference from Group IX at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; significant differences between IX and XI were detected.

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Table 15
Incidence of Gross Observations in Male Mice

LESIONS	TREATMENT per day	LESION INCIDENCE (Numeric)									
		0 mg/kg	I mg/kg	III mg/kg	V mg/kg	VII mg/kg	IX mg/kg	30 mg/kg	30/0 mg/kg	Recovery mg/kg	XI mg/kg
LIVER		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		19	20	20	20	3	3	3	3		
LARGE.		1				17	16	17	17		
DISCOLORATION						1	6	1	1		
SPLEEN		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		20	20	20	20	12	12	12	18		
SMALL.						8	8	2	2		
THYMUS		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		20	20	20	20	17	18	18	18		
SMALL.						3	2	2	2		
POPLITEAL LYMPH NODE		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		20	20	20	20	20	20	20	20		
MESENTERIC LYMPH NODE		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		20	20	20	20	20	19	20	20		
SMALL.							1				
BRAIN		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)		
NO ABNORMALITY DETECTED		20	20	20	20	20	20	20	20		

Figures in parentheses are the number of animals grossly examined for this tissue
The absence of a number indicates the finding specified was not identified

Table 15
Incidence of Gross Observations in Male Mice (Continued)

LESIONS	TREATMENT											LESION INCIDENCE (Numeric)				
	0	0.3	1	10	30	30/0	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	Recovery
	per day															XI
		I	III	V	VII	IX										
FEMUR/KNEE JOINT	(20)	(20)	(20)	(20)	(20)	(20)										
NO ABNORMALITY DETECTED	20	20	20	20	20	20										
STERNUM	(20)	(20)	(20)	(20)	(20)	(20)										
NO ABNORMALITY DETECTED	20	20	20	20	20	20										
PENIS																
PARAPHIMOSIS.						(1)										
SKIN	(1)															
MASS, GREEN, AXILLA, LEFT.						(1)										
OTHER, ABSCESS AXILLA RIGHT.						1										
OTHER, abscess subcutaneous axilla right,																
subcutaneous air pocket, dorsal neck,																
right axilla.																
ESOPHAGUS	(1)															
RUPTURE.	1															
TRACHEA	(1)															
RUPTURE.	1															

Figures in parentheses are the number of animals grossly examined for this tissue
The absence of a number indicates the finding specified was not identified

Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice

LESIONS	TREATMENT										
	0	0.3	1	10	30	30/0	mg/kg				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	Recovery				
	I	III	V	VII	IX	XI					
LIVER	(19)	(20)	(20)	(20)	(19)	(19)					
NO ABNORMALITY DETECTED	17										
NECROSIS, INDIVIDUAL CELL, INCREASED.											
minimal			10	3		6					
mild			1	17	19	13					
Total observations per lesion			11	20	19	19					
NECROSIS, FOCAL.											
minimal		1	3	2	4	2					
mild				1							
moderate				1	3	1					
Total observations per lesion		1	3	4	7	3					
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR.											
minimal				10	15	12					
mild						7					
Total observations per lesion				10	15	19					
INFLAMMATION, SUBACUTE/CHRONIC.											
minimal		1	1	4	1	5					
Total observations per lesion		1	1	4	1	5					

Figures in parentheses are the number of animals microscopically examined for this tissue
The absence of a number indicates the lesion specified was not identified
Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

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Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice (Continued)

LESIONS	LESION INCIDENCE (NUMERIC)										
	TREATMENT	0	0.3	1	10	30	30/0	Recovery			
	per day	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			
		I	III	V	VII	IX	XI				
LIVER		(19)	(20)	(20)	(20)	(19)	(19)				
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR.											
mild			20								
moderate				20							
severe					20	19	19				
Total observations per lesion			20	20	20	19	19				
HYPERPLASIA, BILE DUCT.											
minimal					6	14	12				
mild						3					
Total observations per lesion					6	17	12				
HEMATOPOIESIS, EXTRAMEDULLARY.											
minimal							1				
Total observations per lesion							1				
FATTY CHANGE, DIFFUSE.											
minimal		1									
mild		1									
Total observations per lesion		2									
FATTY CHANGE, NONZONAL.											
minimal					9	14	4				
Total observations per lesion					9	14	4				

Figures in parentheses are the number of animals microscopically examined for this tissue

The absence of a number indicates the lesion specified was not identified

Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice (Continued)

LESIONS	TREATMENT per day	LESION INCIDENCE (NUMERIC)						
		0 mg/kg	0.3 mg/kg	1 mg/kg	10 mg/kg	30 mg/kg	30/0 mg/kg	Recovery XI
	I	III	V	VII	IX			

SPLEEN								
NO ABNORMALITY DETECTED	(19)	(20)	(20)	(20)	(19)	(19)	(19)	
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY.	13	15	19	17	9	4		
minimal	5	2	1	1	4	4		
mild	1	2		2	1	10		
moderate						1		
Total observations per lesion	6	4	1	3	5	15		
DEPLETION/ATROPHY, LYMPHOID.								
minimal		1			7	6		
mild					1	1		
Total observations per lesion		1			8	7		

THYMUS								
NO ABNORMALITY DETECTED	(19)	(20)	(19)	(19)	(17)	(19)	(19)	
HYPERPLASIA, LYMPHOID, FOLLICULAR.	19	20	18	11	5	12		
mild			1					
Total observations per lesion			1					

Figures in parentheses are the number of animals microscopically examined for this tissue. The absence of a number indicates the lesion specified was not identified. Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice (Continued)

LESIONS	TREATMENT											LESION INCIDENCE (NUMERIC)				
	0	mg/kg	0.3	mg/kg	1	mg/kg	10	mg/kg	30	mg/kg	30/0					
	per day															
	I	III	V	VII	IX	XI										
THYMUS																
DEPLETION/ATROPHY, LYMPHOID.	(19)	(20)	(19)	(19)	(17)	(19)										
minimal							5		1		1					
mild							1		2		2					
moderate									1		2					
severe									3		1					
Total observations per lesion							6		7		4					
CYST, EPITHELIAL.																
minimal																
Total observations per lesion											2					
NOT PRESENT IN MEDIASTINAL TISSUE.																
ECTOPIC THYROID.	1						2		5		2					
LYMPH NODE - POPLITEAL	(10)								(18)		(19)					
NO ABNORMALITY DETECTED	6								14		5					
NOT PRESENT IN TISSUE SECTION.	4								4		14					
MESENTERIC LYMPH NODE	(19)	(20)	(19)	(20)	(19)	(19)										
NO ABNORMALITY DETECTED	19	20	19	19	16	18										
DEPLETION/ATROPHY, LYMPHOID.																
mild									1		1					
Total observations per lesion																

Figures in parentheses are the number of animals microscopically examined for this tissue
The absence of a number indicates the lesion specified was not identified
Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice (Continued)

LESIONS	TREATMENT											LESION INCIDENCE (NUMERIC)				
	0	mg/kg	0.3	mg/kg	1	mg/kg	10	mg/kg	30	mg/kg	30/0					
	per day										mg/kg					Recovery
		I	III	V	VII	IX	XI									
MESENTERIC LYMPH NODE NOT PRESENT IN TISSUE SECTION.	(19)	(20)	(19)	(19)	(20)	(19)	(19)	2	1	(19)						
BONE MARROW																
NO ABNORMALITY DETECTED	(19)	(20)	(20)	(20)	(20)	(19)	(19)	15	13	(19)						
HYPERPLASIA, GRANULOCYTIC.	19	20	20	20	17	15	13									
minimal					2	4	2									
moderate					1	1	1									
Total observations per lesion					3	4	3									
HYPERPLASIA, ERYTHROCYTIC.																
mild																
Total observations per lesion																
BRAIN																
NO ABNORMALITY DETECTED	(19)					(19)	(19)	19	19	(19)						
FEMUR/KNEE JOINT																
NO ABNORMALITY DETECTED	(19)					(19)	(19)	19	19	(19)						
STERNUM																
NO ABNORMALITY DETECTED	(19)					(19)	(19)	19	19	(19)						

Figures in parentheses are the number of animals microscopically examined for this tissue. The absence of a number indicates the lesion specified was not identified. Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

Table 16
Incidence and Lesion Grades of Microscopic Observations in Male Mice (Continued)

LESIONS	TREATMENT										LESION INCIDENCE (NUMERIC)			
	0	mg/kg	0.3	mg/kg	1	mg/kg	10	mg/kg	30	mg/kg	30/0	mg/kg	Recovery	XI
	per day													
		I	III	V	VII	IX								
PENIS														
EROSION/ULCER.									(1)					
moderate									1					
Total observations per lesion									1					
PREPUTIAL GLANDS														
ECTASIA.									(1)					
mild									1					
Total observations per lesion									1					
SKIN														
ABSCCESS.							(1)							
moderate							1							
Total observations per lesion							1							

Figures in parentheses are the number of animals microscopically examined for this tissue. The absence of a number indicates the lesion specified was not identified. Table excludes 3 mice that were euthanized on test days 5 (mice 117 or 1112) and 9 (mouse 906).

Table 17
Summary of Total Cell Counts

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
Final Body Weight (g)	33.02 1.33(19)	33.41 2.47(20)	33.77 1.81(20)	28.42 2.04(20)	25.99 2.84(19)	30.49 3.66(19)
<i>SPLEEN</i>						
Absolute Weight (g)	0.117 0.015(19)	0.116 0.032(20)	0.104 0.016(20)	0.066 0.019(20)	0.052 0.023(19)	0.076 0.022(19)
Weight Ratio (% Body Weight)	0.3553 0.0448(19)	0.3457 0.0824(20)	0.3066 0.0426(20)	0.2317 0.0623(20)	0.1949 0.0671(19)	0.2491 0.0578(19)
Half Weight (g)	0.058 0.008(19)	0.055 0.016(20)	0.051 0.009(20)	0.031 0.011(20)	0.026 0.010(19)	0.038 0.009(19)
Cell Suspension Volume (mL)	5.3 0.3(19)	5.5 0.3(20)	5.4 0.3(20)	5.4 0.2(20)	5.4 0.2(19)	5.5 0.2(19)
Number of Cells in Half (x 10 ⁶ cells/mL)	12.18 4.05(18)	11.27 4.79(20)	12.20 2.41(20)	5.92 2.35(20)	4.36 2.70(19)	6.45 2.88(18)
Total Number of Cells (x 10 ⁸)	1.29 0.34(18)	1.30 0.52(20)	1.34 0.25(20)	0.69* 0.25(20)	0.48* 0.35(19)	0.72* 0.34(18)

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Table 17
Summary of Total Cell Counts (Continued)

	Group I 0 mg/kg	Group III 0.3 mg/kg	Group V 1 mg/kg	Group VII 10 mg/kg	Group IX 30 mg/kg	Group XI 30/0 mg/kg (Recovery)
<i>THYMUS</i>						
Absolute Weight (g)	0.050 0.010(19)	0.045 0.010(20)	0.049 0.012(20)	0.025 0.009(20)	0.025 0.013(19)	0.027 0.010(19)
Weight Ratio (% Body Weight)	0.1532 0.0337(19)	0.1369 0.0339(20)	0.1439 0.0351(20)	0.0872 0.0309(20)	0.0942 0.0477(19)	0.0881 0.0266(19)
Half Weight (g)	0.025 0.006(19)	0.022 0.006(20)	0.024 0.008(20)	0.012 0.005(20)	0.010 0.005(19)	0.014 0.005(19)
Cell Suspension Volume (mL)	5.5 0.2(19)	5.4 0.2(20)	5.5 0.2(20)	5.5 0.2(20)	5.4 0.2(19)	5.4 0.2(19)
Number of Cells in Half (x 10 ⁶ cells/mL)	5.26 2.27(19)	5.36 2.14(20)	6.74 3.81(20)	2.18 2.36(20)	0.87 1.41(19)	1.05 1.37(18)
Total Number of Cells (x 10 ⁸)	0.57 0.22(19)	0.60 0.24(20)	0.75 0.38(20)	0.25@ 0.27(20)	0.10@ 0.16(19)	0.28@ 0.79(18)

Data arranged as: Mean

Standard deviation (Number of values included in calculation)

* Statistically significant difference from control at $p < 0.05$ by Dunnett/Tamhane-Dunn test.@ Statistically significant difference from control at $p < 0.05$ by Dunn's test.

NOTE: All data from groups III, V, VII, IX and XI were compared with the control (I) group data. In addition, data from group IX were compared with data from group XI; no significant differences between IX and XI were detected.

FIGURES

Figure 1
Representative Analytical Calibration Curve

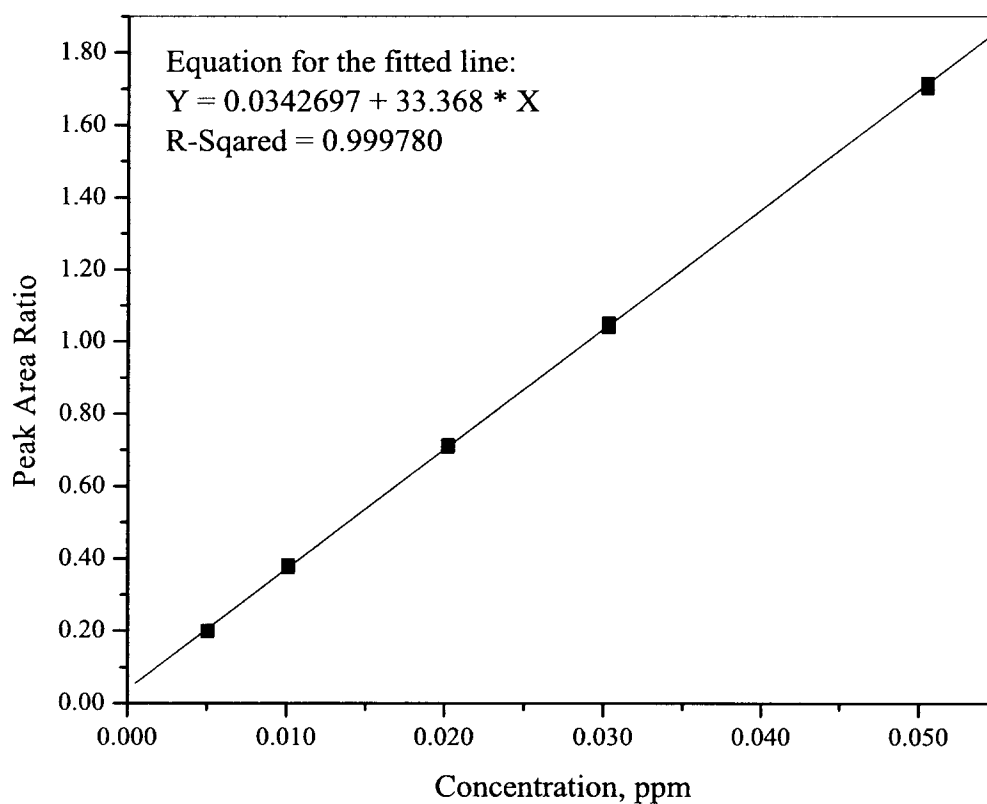


Figure 1: Calibration curve showing linear fit (line) to replicate peak area ratio measurements (squares) for matrix matched calibration solutions of APFO diluted over a concentration range of 0.00505 to 0.0505 ppm.

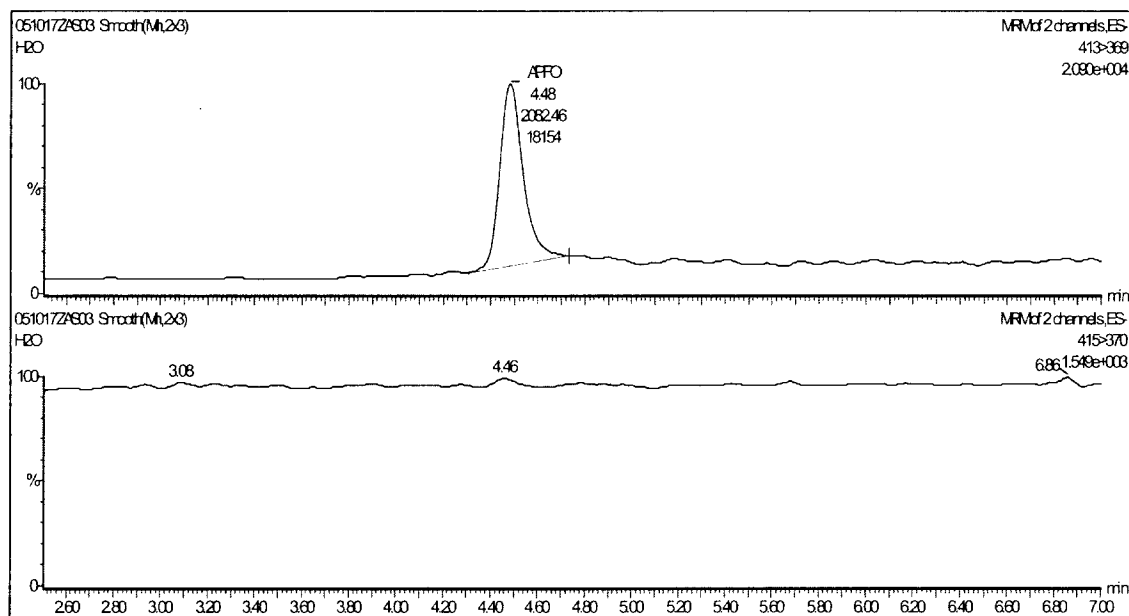
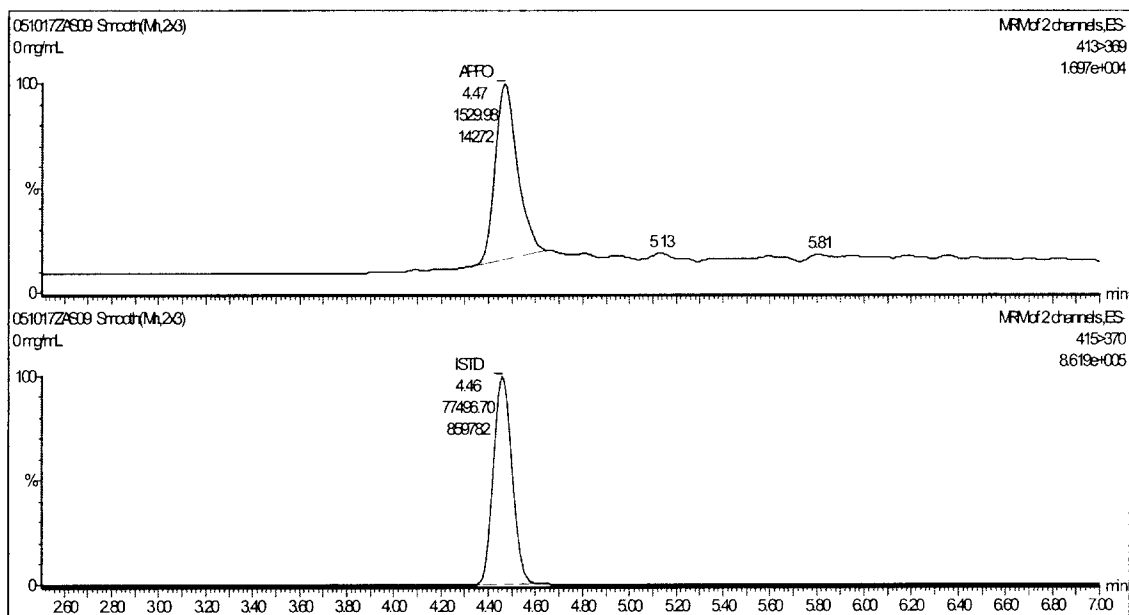
Figure 2
Representative LC/MS/MS ChromatogramsFigure 2a: Representative LC/MS/MS chromatogram of NANOpure[®] water used as the diluent in the study. Retention time for PFOA is approximately 4.5 minutes.

Figure 2b: Representative LC/MS/MS chromatogram of 0 mg/mL control sample. Retention time for PFOA is approximately 4.5 minutes.

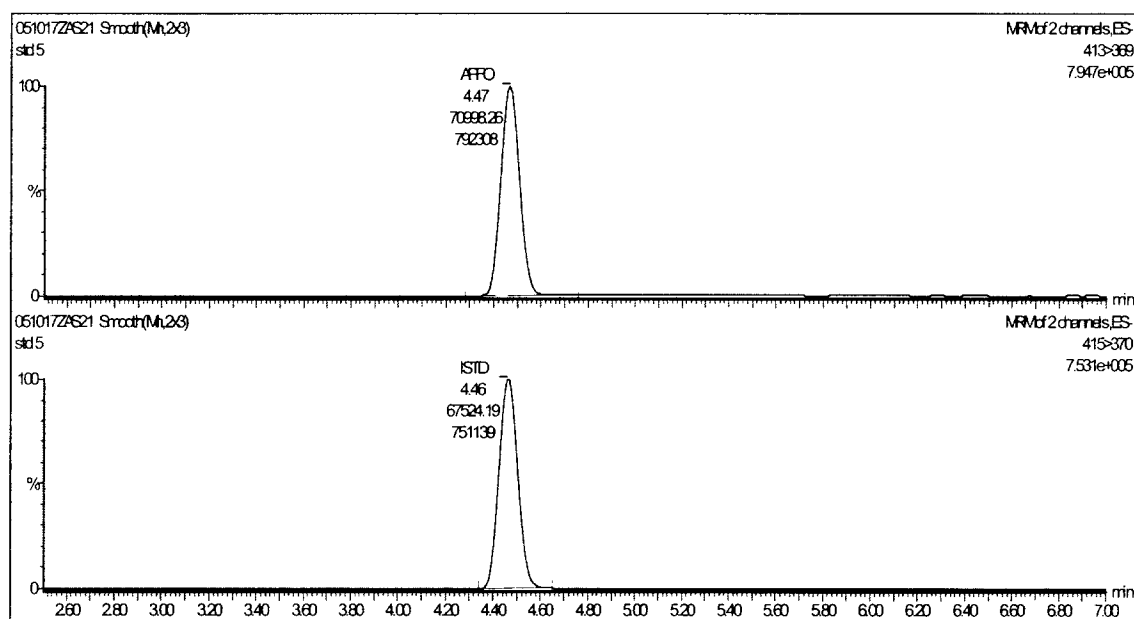
Figure 2
Representative LC/MS/MS Chromatograms (Continued)

Figure 2c: Representative LC/MS/MS chromatogram of 0.0303 ppm APFO analytical standard (H22703-376) diluted with NANOpure® water after matrix correction.

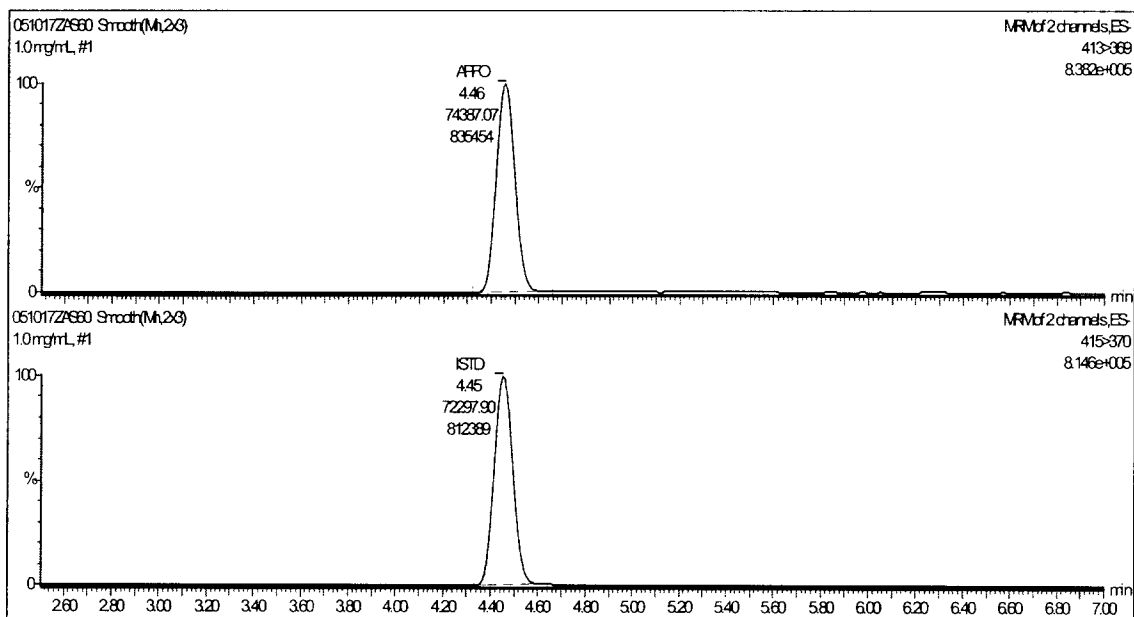


Figure 2d: Representative LC/MS/MS chromatogram of 1 mg/mL APFO dosing solution diluted to a nominal concentration of 0.03 mg/mL. The measured concentration of the representative solution is 0.979 mg/mL.

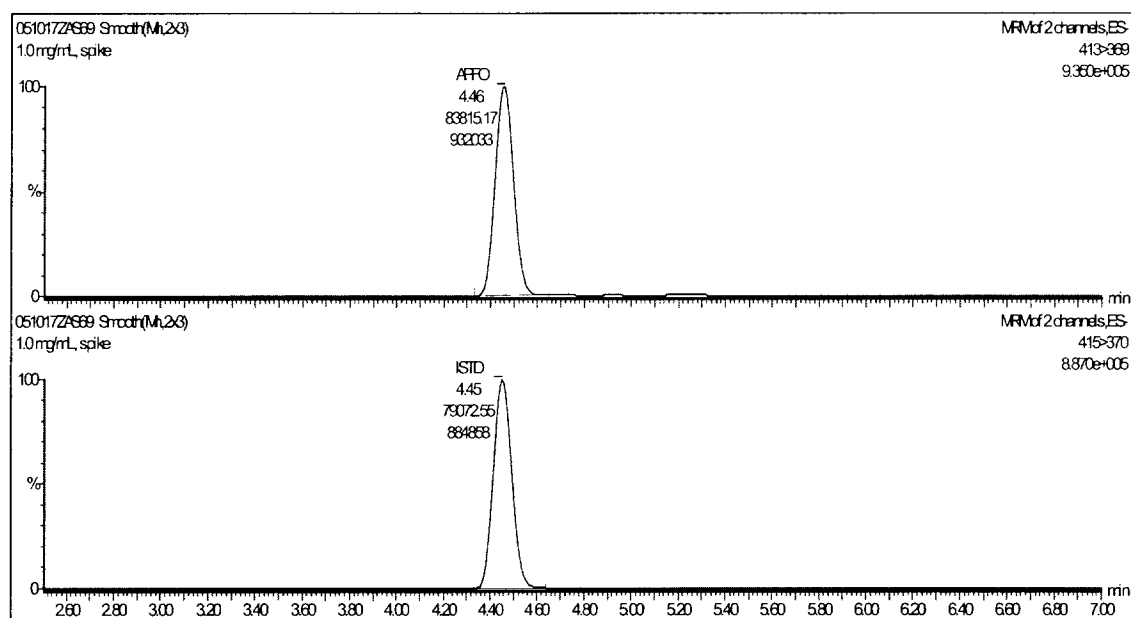
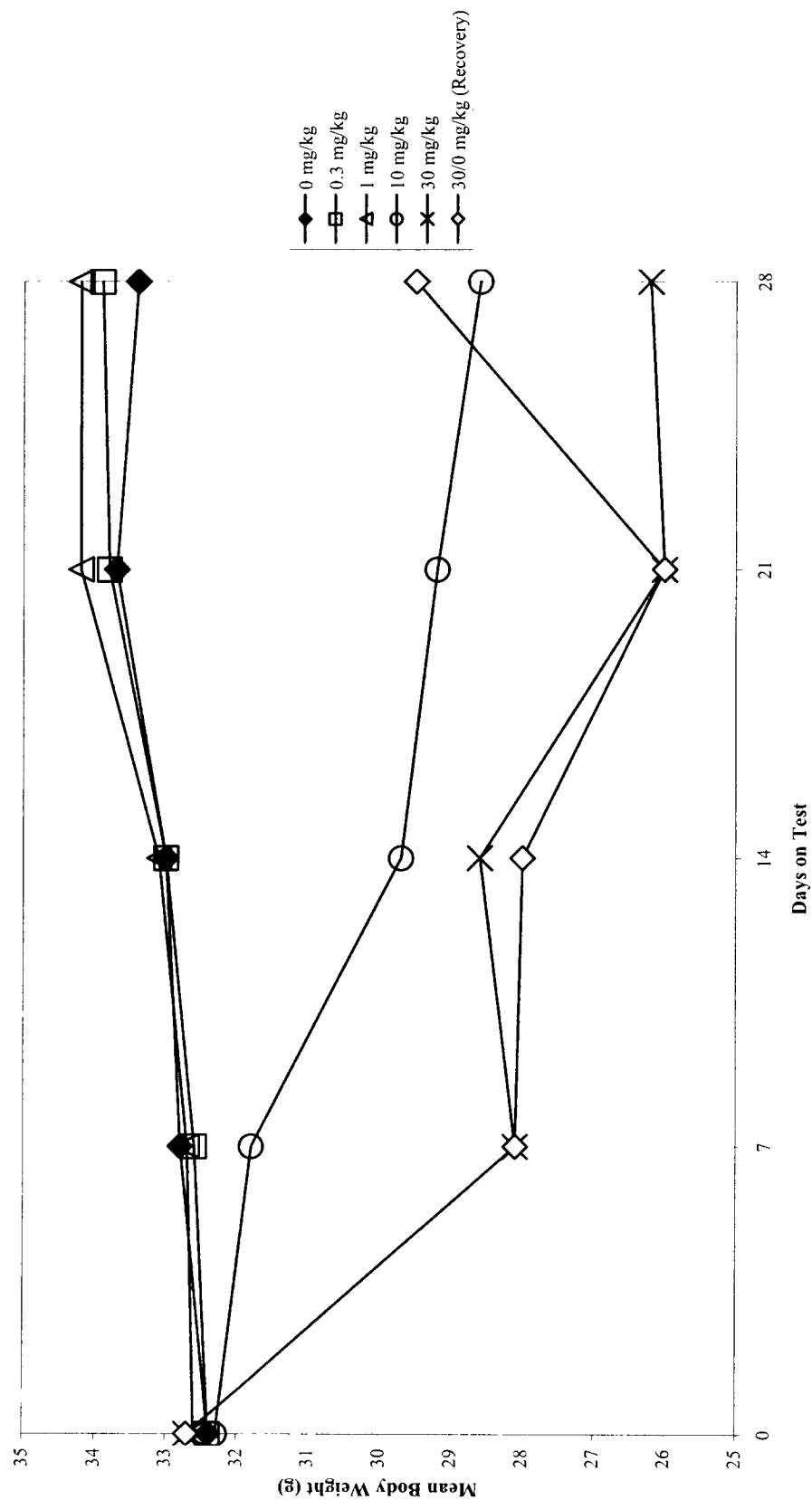
Figure 2
Representative LC/MS/MS Chromatograms (Continued)

Figure 2e: Representative LC/MS/MS chromatogram of the 1.00 mg/mL level recovery sample of APFO diluted with NANOpure[®] water after matrix correction to a nominal concentration of 0.0300 ppm. The measured concentration of the representative recovery sample is 1.02 mg/mL.

Figure 3
Mean Body Weights of Male Mice



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APPENDICES

Appendix A
Certificate of Analysis

3058 Research Drive
State College, PA 16801
T: 814.272.1039
exygen.com**CERTIFICATE OF ANALYSIS**

This Certificate of Analysis fulfills the requirement for characterization of a test substance prior to a study subject to the GLP regulations. It documents the purity of the test substance. This work was conducted under TSCA Good Laboratory Practice Standards (40 CFR 792) and FIFRA Good Laboratory Practice Standards (40 CFR 160).

Designation of the Certified Material:

Compound: APFO (Linear)
Haskell Number: H27308

Analytical Data:

The Purity of the Certified Material was Established by LC/MS/MS

Purity: 19.5%

Last Date of Analysis: 07-November-2005

Re-certification Date: 07-November-2006

Origin of Certified Material:

E.I. du Pont de Nemours and Company
Wilmington, DE 19898
USA

Testing Facility/Performing Laboratory:

Exygen Research
3058 Research Drive
State College, PA 16801

Prepared By:

Charles Simons
Study Director, Exygen Research

11/15/05
Date

Facility Management:

John Flaherty
Vice-President, Exygen Research

15-Nov-05
Date

Appendix B
Individual Body Weights

INDIVIDUAL BODY WEIGHTS

EXPLANATORY NOTES

ABBREVIATIONS:

g - grams

	Individual Body Weights								
	Body Weight g Day 0	Body Weight g Day 2	Body Weight g Day 3	Body Weight g Day 4	Body Weight g Day 5	Body Weight g Day 6	Body Weight g Day 7	Body Weight g Day 8	Body Weight g Day 9
Male, 10 mg/kg									
101	32.4		32.1	31.7	32.0	32.2	31.8	31.8	31.6
102	34.3		34.3	34.1	34.8	34.4	34.0	34.8	34.7
103	32.4		33.0	32.4	32.5	33.0	32.7	32.8	32.5
104	31.1		31.7	31.4	32.1	31.3	31.6	30.5	31.0
105	33.3		33.0	33.2	33.5	33.2	33.7	32.4	32.7
106	28.8		29.0	29.1	29.6	29.5	29.3	29.7	29.6
107	30.9		31.0	30.8	30.8	30.7	31.2	31.0	30.4
108	32.4		31.6	31.5	31.9	32.0	31.4	31.4	31.5
109	34.4		33.8	34.3	34.6	34.0	34.1	33.9	34.4
110	33.1		33.7	33.7	34.3	34.4	34.3	34.0	34.3
111	35.1	34.0	33.4	34.7	34.6	33.6	34.6	35.1	34.9
112	32.2	31.4	31.8	32.6	33.2	32.5	33.1	32.0	31.8
113	34.0	33.9	34.2	35.4	35.3	35.1	34.6	34.3	33.5
114	32.4	32.9	32.8	33.4	33.4	33.0	32.8	32.2	31.1
115	32.0	30.3	30.5	30.7	31.5	30.9	30.6	30.5	29.5
116	31.7	31.6	31.5	32.2	32.5	32.8	32.5	32.2	31.8
117	29.4	29.8	26.3	24.6	24.2				
118	33.3	33.4	33.4	34.4	35.0	34.3	34.0	33.1	33.5
119	30.8	30.5	30.5	31.6	32.0	32.1	31.6	31.8	31.8
120	34.2	34.1	34.2	35.6	35.5	35.9	34.8	35.3	34.5

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 0	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	
Male, III 0.3 mg/kg										
301	32.6		33.0	32.9	33.5	33.8	33.5	33.4	33.0	
302	34.8		34.7	34.7	35.6	35.1	34.4	34.2	34.6	
303	33.9		34.6	34.9	35.5	34.9	35.3	35.3	35.2	
304	32.4		33.5	33.6	34.0	34.2	34.0	33.9	33.7	
305	32.2		33.4	33.1	33.4	33.3	33.1	32.6	32.7	
306	30.9		31.2	30.8	31.5	32.0	31.6	32.2	31.6	
307	30.5		30.0	30.1	30.9	30.3	29.9	29.7	29.8	
308	31.6		32.1	32.7	33.3	33.0	31.8	32.0	32.2	
309	32.9		32.1	31.8	32.4	32.4	31.5	31.3	31.4	
310	33.4		33.8	33.5	34.4	34.1	33.5	32.9	32.9	
311	35.6	36.1	36.1	36.6	36.4	36.6	36.4	36.2	36.1	
312	30.7	31.2	31.5	31.9	32.3	31.8	31.9	31.7	31.5	
313	33.5	32.8	32.8	32.8	33.0	33.2	32.6	32.8	32.5	
314	30.8	31.1	31.2	31.7	31.7	31.2	32.1	30.7	31.0	
315	34.0	33.4	33.4	33.8	34.6	34.2	33.8	34.2	33.7	
316	32.7	32.3	32.1	32.8	33.2	33.3	32.9	32.6	33.2	
317	29.0	29.8	29.5	30.1	30.1	30.3	29.8	29.7	29.2	
318	32.2	31.2	31.0	31.2	31.1	31.0	30.4	30.3	30.2	
319	29.4	29.7	29.5	29.8	30.1	30.1	30.1	29.9	29.8	
320	34.1	33.4	33.7	34.8	34.4	34.7	34.4	34.1	33.8	

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	Individual Body Weights										
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g	g
Day 0	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9			
Male, V 1 mg/kg											
501	32.8	33.3	33.3	34.3	34.0	33.9	34.4	33.9	33.9		
502	34.6	34.6	34.6	35.9	35.0	35.1	34.3	34.4	33.8		
503	33.8	34.0	33.6	34.1	33.8	33.6	33.6	33.6	33.8		
504	31.4	31.1	31.3	31.8	31.5	31.4	31.9	31.7	30.8		
505	32.6	32.9	32.1	32.8	32.5	32.0	31.7	32.1	32.1		
506	28.6	29.5	29.7	30.2	30.4	30.5	30.5	30.4	30.4		
507	31.0	30.9	31.0	31.5	31.6	31.4	31.2	30.8	30.8		
508	32.5	33.1	32.8	33.7	33.6	33.5	33.6	33.5	33.5		
509	32.9	32.6	32.9	33.6	33.5	33.3	32.4	32.9	32.9		
510	32.9	32.1	32.3	33.3	32.2	31.6	31.4	31.1	31.1		
511	36.1	35.4	36.0	36.5	36.1	35.5	35.6	35.6	35.6		
512	32.5	31.4	32.5	32.4	32.4	31.9	31.2	31.9	31.9		
513	35.1	33.4	34.5	34.8	35.4	34.7	34.2	33.8	33.8		
514	31.8	31.6	32.1	32.2	31.9	31.6	31.6	31.3	31.3		
515	34.3	33.2	34.8	35.0	35.2	34.5	35.2	34.5	34.5		
516	31.6	30.9	31.1	32.3	32.8	32.1	32.1	31.6	31.6		
517	29.6	28.7	29.0	29.7	29.8	29.7	29.7	29.3	29.3		
518	31.8	31.2	31.9	32.8	33.2	33.0	32.5	32.4	32.4		
519	32.4	30.7	27.5	29.0	29.7	29.5	28.8	28.6	28.6		
520	34.1	33.6	33.6	34.9	35.0	34.3	34.0	34.4	34.4		

Ammonium Perfluorooctanoate:
 28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 0	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	
Male, VII 10 mg/kg										
701	33.7		34.3	34.6	34.2	33.4	33.6	33.0	33.0	33.0
702	34.5		35.5	35.2	35.6	34.6	33.3	32.7	31.9	31.9
703	31.9		32.0	32.9	32.2	31.6	32.0	32.0	31.0	31.0
704	32.2		32.9	33.2	34.5	33.7	34.4	32.9	31.9	31.9
705	32.7		32.5	33.3	33.3	33.1	33.4	32.9	32.5	32.5
706	29.2		29.9	30.7	31.0	30.8	30.3	29.9	29.1	29.1
707	31.2		31.5	31.1	31.0	30.2	28.6	28.7	26.8	26.8
708	32.8		33.1	33.2	33.7	32.8	33.0	31.7	32.3	32.3
709	34.2		35.0	35.2	35.4	35.1	34.7	33.5	32.9	32.9
710	30.8		32.1	32.3	32.7	31.8	31.2	31.2	30.4	30.4
711	35.0	33.7	33.8	34.4	34.0	32.8	32.1	31.4	31.0	31.0
712	31.5	30.5	30.4	31.2	30.7	30.3	29.7	29.2	29.6	29.6
713	35.7	35.1	36.3	37.4	37.8	37.2	36.8	36.2	36.4	36.4
714	32.1	31.3	31.5	28.9	28.7	27.4	27.4	27.3	27.8	27.8
715	32.1	32.3	32.3	33.2	33.0	32.1	31.9	31.9	30.1	30.1
716	31.5	31.2	31.2	32.7	32.0	29.9	30.4	30.4	28.2	28.2
717	29.5	29.2	29.1	30.3	30.2	29.5	28.9	28.4	27.7	27.7
718	31.8	31.8	32.9	33.4	33.0	32.7	31.6	31.6	31.6	31.6
719	31.3	31.2	31.5	32.8	32.1	30.5	30.4	30.2	29.8	29.8
720	33.0	32.9	33.1	34.5	33.7	33.0	32.3	30.6	31.5	31.5

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Ammonium Perfluorooctanoate:

28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 0	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	
Male, IX 30 mg/kg										
901	33.7		33.5	31.4	30.5	28.4	25.5	23.0	23.6	
902	35.9		36.3	33.8	32.3	30.1	27.4	26.1	25.0	
903	32.3		32.1	30.8	29.8	28.8	28.4	27.7	27.2	
904	31.2		30.1	27.6	28.6	24.4	22.6	24.1	25.3	
905	33.4		34.5	32.5	29.3	26.5	24.2	23.7	24.7	
906	29.4		30.1	29.1	28.8	26.1	24.6	23.4	21.9	
907	30.4		30.1	29.0	27.7	26.3	24.4	23.0	22.4	
908	31.2		32.6	30.6	30.0	27.3	25.7	25.9	26.4	
909	34.2		34.9	33.6	32.5	30.7	28.5	26.5	26.4	
910	33.7		34.4	33.4	32.0	28.4	26.2	24.8	24.8	
911	37.5	38.9	38.6	37.9	35.5	33.5	30.2	30.0	30.1	
912	33.1	33.0	31.6	32.6	31.0	30.3	29.5	28.6	27.8	
913	33.4	33.2	33.3	33.3	33.1	31.7	31.5	31.5	30.7	
914	31.3	31.2	32.1	33.1	32.5	31.1	30.9	29.9	29.3	
915	34.7	35.8	36.0	35.9	35.1	34.5	32.9	33.6	32.4	
916	31.2	31.6	31.8	30.7	29.9	29.2	27.8	29.8	28.3	
917	28.7	29.8	29.3	29.4	30.0	30.1	28.9	29.5	29.2	
918	32.4	32.8	33.3	32.8	32.3	31.2	29.9	29.8	29.9	
919	31.1	31.7	31.8	31.5	30.9	30.2	29.0	29.1	29.0	
920	35.1	35.2	35.9	36.5	35.7	35.0	34.3	35.1	34.0	

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	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 0	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	
Male, XI 30/0 mg/kg (Recovery)										
1101	32.4		33.1	32.0	32.5	30.0	30.2	30.2	29.4	
1102	36.0		36.9	35.8	35.9	35.6	34.5	35.8	35.4	
1103	32.7		34.7	33.9	33.9	33.0	33.6	33.5	33.5	
1104	33.1		33.6	33.3	32.6	30.8	29.6	29.5	29.2	
1105	33.0		34.6	32.8	31.6	28.6	27.6	27.3	29.7	
1106	30.1		31.4	29.7	28.1	26.2	24.8	26.7	27.1	
1107	30.4		31.1	29.8	29.9	26.9	25.5	25.8	25.7	
1108	32.6		33.7	32.0	31.8	29.3	26.8	24.7	22.6	
1109	34.4		36.1	33.3	32.2	29.7	27.3	27.1	25.8	
1110	31.4		33.2	31.9	30.9	30.9	29.9	31.9	31.9	
1111	36.6	35.6	35.5	36.0	34.3	32.9	30.6	30.5	30.3	
1112	31.4	31.7	29.8	28.4	27.5					
1113	33.3	33.5	34.4	33.1	32.7	30.8	30.2	32.8	32.3	
1114	31.7	32.4	32.1	32.2	31.9	30.8	28.6	28.5	26.5	
1115	32.3	32.1	31.5	31.4	30.6	30.7	29.4	30.4	29.5	
1116	32.5	31.8	31.2	30.6	28.0	25.0	23.4	24.6	24.9	
1117	32.2	31.6	30.9	30.7	29.0	25.9	23.4	21.3	20.8	
1118	32.5	32.8	32.4	31.6	31.4	29.0	28.1	29.0	29.3	
1119	31.6	32.1	29.8	28.1	26.3	24.1	24.7	25.4	24.3	
1120	33.4	33.2	33.6	33.9	29.4	27.9	25.2	23.9	24.8	

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	Individual Body Weights																	
	Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight			
	g	Day 10	g	Day 11	g	Day 12	g	Day 13	g	Day 14	g	Day 15	g	Day 16	g	Day 17	g	Day 18
Male, I 0 mg/kg																		
101	31.4		30.8		30.8		30.3		30.9		30.7		30.1		30.7		31.1	
102	34.5		34.6		34.7		34.6		35.0		34.2		34.4		34.7		34.6	
103	32.5		32.3		32.5		32.7		33.0		33.5		32.9		33.1		33.9	
104	31.0		31.2		31.7		32.0		32.6		31.8		32.0		32.8		33.2	
105	32.8		33.4		33.7		34.2		34.0		34.2		33.1		34.1		34.1	
106	29.7		29.6		29.2		30.0		29.9		29.8		29.7		30.2		30.4	
107	30.5		30.9		31.1		31.0		31.3		31.4		30.7		31.6		31.6	
108	31.6		31.9		31.1		31.3		31.3		31.7		31.0		31.9		31.4	
109	34.1		34.0		34.7		34.3		34.0		34.2		33.4		34.4		34.4	
110	34.4		33.8		34.0		33.7		33.9		34.1		33.8		34.4		34.4	
111	34.3		35.6		35.8		36.1		37.0		34.7		35.7		36.4		36.0	
112	32.2		32.5		32.5		32.6		32.7		32.3		32.3		33.1		33.4	
113	34.1		34.1		33.7		33.6		34.1		33.5		34.1		33.9		34.4	
114	31.2		31.9		31.7		32.2		32.0		32.2		32.4		32.2		32.7	
115	30.1		30.3		30.6		30.5		30.8		30.3		30.8		31.0		32.1	
116	31.8		32.2		32.4		32.2		32.6		32.8		32.9		33.2		33.5	
117																		
118	33.6		33.8		33.5		33.6		34.4		34.3		34.7		34.6		35.2	
119	31.8		32.5		32.6		32.5		33.1		32.4		32.8		32.9		33.2	
120	35.1		36.0		35.6		34.3		34.9		35.2		35.4		35.7		35.7	

Ammonium Perfluorooctanoate:

28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	
Male, III 0.3 mg/kg										
301	33.2	33.3	33.6	33.7	33.8	33.8	34.0	34.3	34.3	34.3
302	34.5	34.6	34.5	35.2	35.0	35.0	34.1	35.1	35.1	35.3
303	35.6	35.7	35.4	35.9	35.8	35.7	36.1	36.7	36.7	36.7
304	34.1	34.0	34.8	34.6	34.6	34.8	34.2	34.9	34.9	35.1
305	32.9	32.8	33.3	33.4	33.2	33.5	32.9	34.0	34.0	33.9
306	31.8	31.8	32.0	32.6	32.6	32.5	32.3	33.0	33.0	33.0
307	29.9	30.3	30.2	30.1	30.5	30.5	29.8	30.7	30.7	30.5
308	32.8	32.2	33.0	32.2	33.0	33.7	32.6	33.8	33.8	33.1
309	31.5	31.8	31.8	31.5	31.0	31.6	30.8	31.6	31.6	31.7
310	33.5	33.3	33.8	34.0	33.9	34.3	34.0	34.4	34.1	34.1
311	35.9	36.1	36.0	35.9	36.0	35.9	36.6	37.1	36.8	36.8
312	31.6	31.8	32.0	31.9	31.9	31.6	32.7	32.6	32.8	32.8
313	33.2	33.6	34.1	33.4	33.6	33.3	33.5	33.4	33.7	33.7
314	31.5	32.2	32.0	31.8	32.9	32.2	32.8	32.4	33.1	33.1
315	33.6	34.1	33.6	33.7	34.0	33.4	33.7	33.9	34.2	34.2
316	32.7	33.4	33.0	32.9	32.3	31.7	32.1	32.3	32.0	32.0
317	30.1	30.5	30.2	30.2	29.9	30.2	30.3	30.3	30.7	30.7
318	30.3	30.5	30.3	30.7	30.1	29.6	30.4	30.0	29.8	29.8
319	29.8	30.2	30.5	30.0	30.3	29.7	30.4	29.7	30.7	30.7
320	33.4	34.5	34.7	35.0	35.3	35.4	36.4	36.4	36.5	36.5

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Male, V 1 mg/kg	Individual Body Weights										
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g	g
	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18		
501	33.8	34.1	34.3	33.8	34.5	34.7	34.2	34.8	34.8	34.8	
502	33.6	33.7	33.4	33.8	34.4	34.1	33.5	33.9	34.0	34.0	
503	34.3	34.4	34.2	34.6	34.9	35.0	34.4	35.1	34.7	34.7	
504	31.1	31.4	31.2	31.6	31.3	31.9	31.2	32.4	32.7	32.7	
505	31.9	32.5	32.3	32.7	32.5	32.4	32.3	32.9	33.2	33.2	
506	30.8	31.4	31.7	31.5	31.9	32.6	32.5	33.3	33.7	33.7	
507	31.0	31.0	31.1	30.8	30.7	31.2	30.9	31.4	31.3	31.3	
508	33.6	33.9	33.4	34.0	34.2	34.5	33.9	34.6	34.8	34.8	
509	32.6	33.0	33.2	33.3	33.2	33.8	33.6	34.0	34.8	34.8	
510	30.6	30.2	30.5	30.4	30.6	31.1	31.0	31.9	31.8	31.8	
511	35.2	35.5	35.4	35.4	35.3	34.7	35.4	35.7	35.5	35.5	
512	32.0	32.1	32.3	32.5	32.9	32.8	33.2	33.4	33.9	33.9	
513	34.4	35.2	34.7	35.0	35.4	34.6	34.7	35.6	35.9	35.9	
514	31.5	31.7	32.2	31.7	32.0	31.3	32.0	32.2	32.4	32.4	
515	34.8	35.3	35.1	35.0	35.9	35.2	35.9	36.5	36.8	36.8	
516	31.6	31.9	32.1	32.2	32.2	31.7	32.3	33.5	33.5	33.5	
517	29.6	30.0	30.2	30.0	30.3	30.7	30.9	31.3	31.4	31.4	
518	33.0	33.3	33.3	33.3	33.4	33.2	34.0	34.2	35.2	35.2	
519	28.5	28.5	29.1	29.3	29.3	28.6	29.3	29.5	30.2	30.2	
520	34.5	34.8	35.2	35.5	36.1	34.9	35.6	35.8	36.3	36.3	

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	
Male, VII 10 mg/kg										
701	32.4	32.7	31.1	31.2	32.0	31.8	31.6	31.9	32.1	
702	32.8	31.8	32.5	32.4	32.2	32.5	31.7	32.8	32.3	
703	30.9	31.4	30.9	31.4	30.2	31.1	29.7	29.8	30.3	
704	31.4	31.2	31.0	29.6	29.1	28.6	28.3	29.4	29.0	
705	32.4	30.5	30.7	32.1	30.7	31.2	31.3	30.3	30.8	
706	28.9	27.2	27.0	28.3	28.3	28.2	28.1	27.9	27.8	
707	26.1	25.4	24.8	25.1	24.1	24.9	25.4	25.1	25.0	
708	33.7	31.7	31.6	32.0	31.4	31.1	30.7	30.8	30.6	
709	32.8	31.7	31.3	31.9	32.6	32.3	30.5	30.4	30.7	
710	30.0	29.6	30.2	29.4	29.5	30.2	29.6	29.1	29.3	
711	30.2	29.5	29.1	28.7	28.8	28.5	27.6	27.3	27.1	
712	29.6	30.0	29.0	29.8	29.3	29.1	29.4	29.3	29.9	
713	35.7	35.6	34.4	34.6	34.4	33.4	33.2	33.2	32.2	
714	28.0	28.9	29.0	30.1	29.0	29.5	29.8	30.0	29.1	
715	30.4	29.9	29.1	28.9	28.8	29.4	29.4	28.9	29.4	
716	28.2	29.8	28.5	27.5	26.9	28.1	26.3	26.9	29.1	
717	27.2	27.1	27.9	27.1	26.8	26.8	26.9	26.9	26.8	
718	32.1	32.1	30.7	31.1	31.1	30.5	30.8	30.6	33.5	
719	30.0	29.5	29.2	30.2	29.9	29.1	29.5	30.9	30.3	
720	30.0	31.3	29.3	29.0	28.2	27.9	28.1	27.0	27.8	

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Ammonium Perfluorooctanoate:

28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g
	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	
Male, IX 30 mg/kg										
901	25.4	29.8	31.8	32.4	32.5	31.3	29.8	28.9	26.7	
902	25.8	28.5	30.5	31.4	31.9	30.5	27.8	26.5	24.8	
903	26.9	26.5	25.9	25.2	25.2	24.7	25.4	25.1	24.9	
904	26.5	26.5	26.4	26.1	25.8	26.4	25.1	25.4	24.9	
905	27.5	28.1	28.9	29.3	29.3	28.1	26.8	28.0	25.8	
906										
907	21.9	21.2	21.6	22.3	23.0	22.9	23.4	23.5	23.5	
908	27.2	26.0	26.2	26.4	25.5	26.5	25.2	26.0	25.9	
909	28.1	28.9	29.1	29.3	29.1	28.2	26.9	25.6	25.0	
910	25.2	25.0	28.1	29.6	29.4	30.1	28.9	28.4	26.2	
911	29.8	29.8	29.3	28.6	27.8	28.1	28.1	28.4	27.1	
912	27.1	26.5	25.5	25.3	25.0	24.8	24.6	24.3	24.0	
913	30.7	30.6	30.9	29.5	29.2	28.9	29.0	28.8	28.8	
914	29.6	30.2	30.1	29.8	29.6	29.6	29.4	28.8	29.2	
915	31.7	32.3	31.9	32.1	32.4	32.6	33.2	32.5	33.0	
916	27.5	28.0	27.9	27.0	25.9	26.6	26.5	25.9	25.2	
917	29.3	29.4	28.6	28.7	29.4	29.0	29.9	29.7	30.3	
918	29.2	29.5	29.1	28.9	28.8	28.2	28.2	28.5	28.8	
919	29.4	29.3	29.9	28.9	29.3	28.5	28.7	28.2	28.0	
920	32.6	33.2	34.1	34.1	33.4	33.5	33.1	32.3	31.5	

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Ammonium Perfluorooctanoate:

28-Day Immunotoxicity Study in Male Mice

DuPont-18318

	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	
Male, XI 30/0 mg/kg (Recovery)										
1101	30.1	28.8	28.4	28.5	28.1	29.0	27.2	27.6	27.1	
1102	35.1	33.4	33.0	31.7	30.9	32.6	31.2	32.1	31.6	
1103	32.2	31.7	31.2	29.9	29.3	29.6	28.4	27.7	27.3	
1104	28.7	29.1	29.6	29.5	29.0	29.4	27.8	27.9	27.9	
1105	31.1	31.1	31.7	32.4	32.0	30.8	30.4	29.5	29.9	
1106	27.4	24.9	26.0	26.8	26.0	26.3	25.9	27.5	27.6	
1107	24.4	25.2	24.6	24.3	23.9	24.8	24.2	23.6	23.0	
1108	22.0	22.3	24.8	27.4	28.8	30.4	28.7	28.6	26.4	
1109	25.9	27.0	33.2	33.9	34.2	33.2	29.2	26.6	24.2	
1110	30.8	31.3	28.6	27.2	27.6	28.0	27.0	29.1	30.2	
1111	30.4	30.5	30.3	29.7	29.4	29.7	29.5	29.4	29.4	
1112										
1113	31.8	31.4	31.4	30.0	29.4	28.7	28.9	29.5	30.3	
1114	28.3	27.9	27.1	27.0	27.4	26.8	27.7	26.8	26.5	
1115	28.8	29.0	28.9	28.9	28.4	28.2	28.5	29.6	29.3	
1116	24.0	24.9	24.6	24.0	23.2	24.6	23.8	23.5	23.4	
1117	21.6	23.8	25.7	27.3	28.0	25.4	26.5	24.8	25.0	
1118	28.1	28.1	27.2	26.9	25.8	25.3	25.7	24.9	24.8	
1119	24.7	25.8	24.1	23.9	25.2	23.8	21.9	22.7	23.2	
1120	26.8	28.7	28.8	26.5	26.2	25.5	25.1	25.3	24.6	

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	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	
Male, III 0.3 mg/kg										
301	34.8	34.8	35.0	35.2	35.0	35.4	36.3	36.0	36.4	
302	36.2	35.6	35.8	36.3	36.3	36.4	36.9	35.9	36.7	
303	37.0	36.4	36.6	36.7	36.6	36.3	37.3	37.2	37.6	
304	35.8	35.6	35.7	36.1	36.3	36.4	37.1	37.5	37.7	
305	34.6	34.3	34.6	34.1	35.4	35.0	35.1	35.6	36.0	
306	33.7	33.3	33.2	33.5	33.8	33.2	33.9	33.7	33.4	
307	30.8	30.7	31.1	31.3	31.4	31.1	31.5	31.4	31.5	
308	34.0	34.3	33.9	34.1	34.0	34.7	35.1	34.7	35.1	
309	31.8	31.5	32.2	31.7	31.7	31.6	31.5	31.6	31.6	
310	34.4	34.2	34.5	33.7	34.4	34.8	34.9	35.1	35.1	
311	36.6	37.0	37.5	36.9	37.2	36.7	37.2	37.3	37.5	
312	32.4	33.1	33.3	32.7	33.2	33.3	33.8	33.5	33.8	
313	33.3	33.3	33.8	33.9	33.8	34.0	32.9	32.7	32.9	
314	32.7	32.9	32.9	32.6	32.4	32.5	33.1	33.1	32.9	
315	33.6	34.0	34.5	33.7	34.3	34.5	35.1	34.1	34.9	
316	31.4	32.0	32.4	31.5	32.2	32.5	32.7	32.2	31.9	
317	30.3	30.9	31.1	30.3	30.3	29.9	30.1	30.1	30.3	
318	29.9	30.0	30.8	30.2	30.8	30.9	31.3	31.1	31.2	
319	30.2	30.8	31.0	30.9	31.1	30.8	31.5	31.2	31.4	
320	35.8	36.5	36.4	37.1	36.8	37.0	37.5	37.2	36.8	

Ammonium Perfluorooctanoate:
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Individual Body Weights																																				
Body Weight g		Day 19		Body Weight g		Day 20		Body Weight g		Day 21		Body Weight g		Day 22		Body Weight g		Day 23		Body Weight g		Day 24		Body Weight g		Day 25		Body Weight g		Day 26		Body Weight g		Day 27		
Male, I 0 mg/kg																																				
101		31.0		31.2		31.2		31.1		31.5		31.1		31.2		31.4		31.1		31.2		31.4		31.4		31.2		31.4		31.4		31.4		31.4		31.4
102		35.1		34.9		35.2		35.0		35.1		34.9		35.6		35.8		34.9		35.6		35.8		36.4		35.6		35.8		35.8		35.8		35.8		36.4
103		34.4		34.3		34.1		33.7		33.4		33.7		34.5		33.8		34.0		34.5		33.8		33.9		34.5		33.8		33.8		33.8		33.8		33.9
104		33.3		33.4		33.4		33.4		32.0		32.5		32.7		32.4		32.5		32.7		32.4		33.3		32.7		32.4		32.4		32.4		32.4		33.3
105		34.4		34.0		34.4		33.6		33.6		34.5		34.2		33.5		34.5		34.2		33.5		33.8		34.2		33.5		33.5		33.5		33.5		33.8
106		31.0		30.8		30.7		31.2		31.5		31.0		31.4		31.4		31.0		31.4		31.4		31.1		31.1		31.4		31.4		31.4		31.4		31.1
107		32.2		31.7		32.1		32.4		31.7		32.4		32.4		32.7		32.3		32.4		32.7		33.4		32.4		32.7		32.7		32.7		33.4		33.4
108		32.1		31.9		31.8		32.2		31.8		32.2		31.8		31.5		31.5		31.5		31.1		31.2		31.2		31.1		31.1		31.1		31.2		31.2
109		35.3		34.8		34.3		34.3		34.2		34.3		34.5		34.3		33.9		33.9		34.3		33.8		34.5		34.3		34.3		34.3		33.8		33.8
110		35.0		34.7		34.7		34.9		34.5		34.4		34.6		34.6		34.4		34.6		34.6		35.2		34.6		34.6		34.6		34.6		35.2		35.2
111		36.5		36.4		35.7		35.6		35.4		35.6		35.4		35.6		34.5		35.5		35.6		34.5		34.5		34.5		34.5		34.5		34.5		34.5
112		32.9		33.6		33.7		33.4		33.5		33.7		33.4		33.7		33.7		33.9		34.2		34.2		34.4		34.2		34.2		34.2		34.4		34.4
113		33.9		34.2		34.4		33.6		34.5		33.6		33.6		34.5		34.5		34.4		34.5		34.2		34.4		34.5		34.5		34.5		34.2		34.2
114		32.1		32.9		33.7		33.4		33.6		33.4		33.4		33.7		33.7		34.2		33.6		33.7		34.2		33.6		33.6		33.6		33.7		33.7
115		31.2		32.0		32.0		32.1		31.9		32.1		32.1		32.1		31.7		32.6		32.4		31.3		32.6		32.4		32.4		32.4		31.3		31.3
116		33.5		34.0		34.3		33.9		34.1		33.9		33.9		33.4		33.7		33.8		33.4		33.7		33.8		33.4		33.4		33.4		33.7		33.7
117																																				
118		35.0		35.7		35.2		35.2		35.8		35.4		35.8		35.4		35.4		35.8		35.4		34.4		35.8		35.4		35.4		35.4		34.4		34.4
119		33.3		33.9		33.9		33.4		33.8		33.8		34.2		34.4		33.8		34.2		34.4		34.7		34.2		34.4		34.4		34.4		34.7		34.7
120		35.4		35.7		35.5		34.9		35.4		35.0		35.1		35.3		35.0		35.1		35.3		34.6		35.1		35.3		35.3		35.3		34.6		34.6

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	Individual Body Weights																	
	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g	Body Weight g
	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30	Day 31	Day 32	Day 33	Day 34	Day 35	Day 36
Male, V 1 mg/kg																		
501	34.7	34.5	35.1	34.2	34.3	34.7	34.4	34.2										
502	34.1	33.7	33.9	33.5	33.2	33.5	33.8	33.6										
503	35.1	35.0	34.8	34.2	34.5	34.5	34.7	34.3										
504	32.7	32.9	33.3	32.9	33.2	33.6	33.7	33.9										
505	32.9	33.2	33.0	32.7	33.0	33.2	33.8	33.9										
506	34.3	34.6	34.4	35.0	35.1	35.3	35.9	35.3										
507	31.2	31.3	31.0	30.7	31.0	31.4	31.6	31.6										
508	34.6	34.6	34.6	34.6	34.9	34.7	35.2	34.8										
509	34.4	34.9	35.0	34.7	34.9	35.5	35.5	35.0										
510	32.8	32.7	32.8	33.0	33.3	32.9	33.2	32.5										
511	35.4	36.1	36.0	35.6	36.6	37.0	37.4	37.5										
512	33.6	33.7	34.2	34.1	34.6	34.6	35.7	35.3										
513	35.2	35.4	36.1	35.3	36.5	36.2	36.5	36.8										
514	32.1	32.3	32.2	32.6	32.5	32.8	32.8	32.0										
515	35.3	36.2	37.0	36.9	35.8	36.0	36.5	36.4										
516	32.7	32.8	33.4	32.3	32.6	32.7	32.8	32.8										
517	31.1	31.4	32.3	32.0	32.3	32.1	32.7	32.5										
518	34.5	34.9	36.2	36.0	36.2	35.6	36.2	36.7										
519	29.5	30.5	31.0	30.9	31.1	31.2	31.3	31.6										
520	35.4	35.7	36.9	35.7	35.8	36.7	37.1	36.4										

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	Individual Body Weights									
	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight	Body Weight
	g	g	g	g	g	g	g	g	g	g
	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	
Male, IX 30 mg/kg										
901	25.2	23.3	21.5	23.8	24.8	24.4	24.9	25.9	26.7	
902	23.5	22.9	22.8	24.0	23.3	24.0	24.0	25.0	24.6	
903	25.6	25.0	24.7	25.1	24.9	24.9	24.7	24.8	24.4	
904	23.6	26.3	23.7	24.6	24.1	24.8	24.0	24.6	24.4	
905	24.7	24.0	22.2	21.6	23.4	22.5	23.7	24.3	24.3	
906										
907	23.7	23.7	23.6	23.6	23.5	23.4	23.1	22.4	21.9	
908	25.6	25.5	25.7	26.6	26.3	26.3	26.3	26.5	25.7	
909	25.2	24.4	24.0	25.2	26.7	26.3	26.1	25.6	25.3	
910	25.8	26.0	24.7	25.1	25.9	26.4	26.9	28.1	28.4	
911	27.0	27.7	27.8	29.5	29.8	29.5	28.4	27.8	26.4	
912	23.8	23.6	22.7	23.2	23.6	22.6	22.3	22.1	22.0	
913	28.6	28.6	28.5	29.4	29.3	28.9	28.6	28.4	28.2	
914	30.0	28.8	28.2	29.9	29.3	29.1	28.2	28.7	27.8	
915	32.1	32.5	33.0	33.4	32.9	32.6	32.5	33.1	32.5	
916	24.9	24.8	25.0	25.6	25.5	25.3	24.7	24.8	24.0	
917	29.8	29.8	30.1	30.3	29.9	29.7	29.4	29.8	30.4	
918	27.9	28.1	28.5	28.4	27.9	28.1	28.1	28.0	28.5	
919	27.8	28.1	28.2	27.5	27.3	27.0	26.9	26.6	26.9	
920	30.3	29.5	28.7	28.4	28.2	28.9	29.3	29.0	28.9	

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

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	Individual Body Weights																	
	Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight		Body Weight	
	g	Day 19	g	Day 20	g	Day 21	g	Day 22	g	Day 23	g	Day 24	g	Day 25	g	Day 26	g	Day 27
Male, X1 30/0 mg/kg (Recovery)																		
1101	27.9		28.1		27.4		29.1		29.4		29.0		29.3		30.1		30.2	
1102	32.6		32.9		32.6		33.1		33.8		32.7		34.0		34.2		36.8	
1103	27.0		25.9		26.1		28.6		28.7		28.5		28.9		30.2		31.4	
1104	27.1		27.7		26.0		26.4		28.1		27.6		27.3		27.9		28.7	
1105	28.1		29.2		27.4		30.7		33.2		31.4		32.5		32.6		31.8	
1106	27.5		27.0		25.9		25.7		26.2		25.4		25.6		25.5		25.7	
1107	22.9		23.1		23.3		25.0		24.8		23.9		23.6		23.6		24.3	
1108	24.8		24.2		23.6		23.4		23.3		23.6		25.2		26.0		28.4	
1109	22.5		22.9		22.7		24.5		25.5		27.3		29.7		32.6		34.3	
1110	29.8		28.4		26.0		23.4		22.3		22.3		22.6		23.4		24.6	
1111	28.4		28.8		28.5		28.5		28.3		28.5		28.5		29.2		29.4	
1112																		
1113	31.1		30.8		30.7		31.3		31.1		30.4		30.3		31.2		32.2	
1114	26.6		25.8		25.5		26.9		28.2		27.6		26.5		28.2		29.5	
1115	28.9		28.9		29.2		29.2		29.3		29.3		29.1		29.9		29.7	
1116	22.8		23.7		22.9		23.2		24.3		23.9		23.6		23.8		24.1	
1117	24.0		23.9		23.6		23.8		23.6		25.0		23.6		26.0		25.4	
1118	25.0		26.0		26.4		26.4		27.8		26.6		26.9		27.0		27.7	
1119	21.4		22.8		22.4		23.2		23.6		23.3		24.5		24.2		23.9	
1120	25.1		24.4		24.2		25.0		25.5		25.7		26.6		27.6		27.9	

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Individual Body Weights

Body Weight	
g	
Day 28	
Male, I	0 mg/kg
101	31.3
102	35.8
103	34.4
104	33.6
105	33.7
106	30.9
107	32.3
108	30.7
109	33.1
110	34.4
111	34.0
112	34.0
113	34.5
114	33.6
115	31.2
116	33.4
117	
118	34.8
119	34.3
120	35.0

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Individual Body Weights

	Body Weight	
	g	Day 28
Male, III 0.3 mg/kg		
301	35.7	
302	36.0	
303	37.6	
304	38.0	
305	35.2	
306	33.1	
307	31.1	
308	33.8	
309	31.4	
310	34.7	
311	37.5	
312	34.0	
313	32.5	
314	32.4	
315	34.6	
316	31.8	
317	30.0	
318	31.0	
319	31.0	
320	36.7	

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Individual Body Weights

	Body Weight	
	g	
	Day 28	
Male, V	1	mg/kg
501	33.8	
502	34.0	
503	33.8	
504	33.5	
505	33.1	
506	35.5	
507	31.9	
508	34.5	
509	35.0	
510	32.6	
511	37.0	
512	35.8	
513	36.8	
514	32.2	
515	36.3	
516	32.2	
517	32.7	
518	35.7	
519	30.7	
520	36.2	

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Individual Body Weights

Body Weight	
g	
Day 28	
Male, VII 10 mg/kg	
701	32.5
702	31.4
703	28.4
704	28.2
705	28.7
706	27.2
707	24.4
708	31.1
709	27.4
710	27.2
711	26.9
712	29.6
713	31.9
714	29.4
715	27.1
716	27.5
717	26.1
718	30.2
719	29.2
720	26.9

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Individual Body Weights

Body Weight g	
Day 28	
Male, XI 30/0 mg/kg (Recovery)	
1101	30.3
1102	36.9
1103	31.5
1104	29.3
1105	33.0
1106	26.2
1107	25.2
1108	29.9
1109	33.4
1110	26.0
1111	30.3
1112	
1113	33.8
1114	30.5
1115	30.7
1116	25.3
1117	26.7
1118	28.2
1119	24.8
1120	27.9

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Individual Body Weights

Body Weight	
g	
Day 28	
Male, IX 30 mg/kg	
901	26.2
902	24.1
903	24.1
904	23.6
905	24.1
906	
907	21.5
908	25.0
909	24.5
910	28.9
911	26.2
912	22.1
913	28.2
914	27.9
915	33.2
916	23.5
917	29.7
918	28.9
919	27.9
920	29.0

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Appendix C
Individual Final Body and Liver Weights

INDIVIDUAL FINAL BODY AND LIVER WEIGHTS

EXPLANATORY NOTES

ABBREVIATIONS:

FBW - final body weight
na - not applicable
NW - not weighed
S.D. - standard deviation
WE - weighing error

FOOTNOTES:

a Animal was sacrificed *in extremis* prior to this analysis.

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28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Final Body and Liver Weights

Animal	FBW (g)	Liver (g)	FBW - Liver (g)
101	31.0	1.623	29.4
102	34.7	2.017	32.7
103	33.4	1.736	31.7
104	32.5	1.768	30.7
105	33.0	1.459	31.5
106	31.2	1.717	29.5
107	31.9	1.861	30.0
108	30.3	1.727	28.6
109	32.7	1.711	31.0
110	33.9	1.634	32.3
111	32.6	1.801	30.8
112	33.9	WE	na
113	34.6	WE	na
114	33.7	2.064	31.6
115	31.5	1.718	29.8
116	34.2	1.795	32.4
117	^a	na	na
118	34.5	2.172	32.3
119	34.3	1.859	32.4
120	33.5	1.639	31.9
MEAN	33.0	1.782	31.1
S.D.	1.33	0.18	1.26
301	35.1	2.609	32.5
302	36.1	2.405	33.7
303	37.4	2.512	34.9
304	37.2	2.758	34.4
305	34.5	2.520	32.0
306	33.1	2.539	30.6
307	31.3	2.036	29.3
308	33.7	2.372	31.3
309	29.9	1.988	27.9
310	32.8	2.492	30.3
311	36.6	2.896	33.7
312	33.4	2.529	30.9
313	31.5	2.445	29.1
314	32.2	2.206	30.0
315	33.8	2.514	31.3
316	31.6	2.294	29.3
317	30.2	2.053	28.1
318	30.1	2.054	28.0
319	30.9	2.199	28.7
320	36.7	2.715	34.0
MEAN	33.4	2.407	31.0
S.D.	2.47	0.25	2.26

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Final Body and Liver Weights

Animal	FBW (g)	Liver (g)	FBW - Liver (g)
501	33.3	3.274	30.0
502	34.0	3.381	30.6
503	33.5	2.978	30.5
504	33.3	3.647	29.7
505	33.0	3.095	29.9
506	35.1	3.042	32.1
507	31.3	2.992	28.3
508	33.9	2.898	31.0
509	33.5	3.490	30.0
510	32.3	3.017	29.3
511	36.8	3.191	33.6
512	36.0	3.397	32.6
513	35.9	3.539	32.4
514	31.4	3.544	27.9
515	35.7	3.535	32.2
516	32.1	3.317	28.8
517	32.2	3.300	28.9
518	35.0	3.484	31.5
519	30.7	2.996	27.7
520	36.4	3.314	33.1
MEAN	33.8	3.272	30.5
S.D.	1.81	0.23	1.76
701	31.8	7.969	23.8
702	30.9	7.155	23.7
703	29.1	8.574	20.5
704	28.2	6.519	21.7
705	28.4	4.627	23.8
706	27.3	4.783	22.5
707	24.7	5.517	19.2
708	29.7	5.939	23.8
709	26.6	6.075	20.5
710	27.2	5.137	22.1
711	26.8	4.228	22.6
712	28.9	5.438	23.5
713	31.6	8.346	23.3
714	29.6	5.068	24.5
715	27.4	6.320	21.1
716	27.0	4.902	22.1
717	25.2	5.396	19.8
718	31.0	8.136	22.9
719	30.0	5.884	24.1
720	26.9	5.205	21.7
MEAN	28.4	6.061	22.4
S.D.	2.04	1.32	1.53

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Final Body and Liver Weights

Animal	FBW (g)	Liver (g)	FBW - Liver (g)
901	26.2	5.786	20.4
902	24.3	5.752	18.5
903	23.7	5.441	18.3
904	24.2	5.335	18.9
905	24.1	4.810	19.3
906	^a	na	na
907	21.8	5.128	16.7
908	25.4	5.628	19.8
909	23.5	5.189	18.3
910	27.0	7.923	19.1
911	25.3	5.957	19.3
912	22.0	5.463	16.5
913	28.3	7.657	20.6
914	28.4	5.089	23.3
915	32.4	6.732	25.7
916	23.3	NW	na
917	29.4	6.316	23.1
918	28.0	5.574	22.4
919	27.1	5.895	21.2
920	29.5	6.499	23.0
MEAN	26.0	5.899	20.2
S.D.	2.84	0.85	2.46
1101	31.3	8.009	23.3
1102	39.5	8.361	31.1
1103	32.2	5.329	26.9
1104	30.4	6.914	23.5
1105	34.4	7.432	27.0
1106	27.2	6.657	20.5
1107	27.1	6.001	21.1
1108	32.3	7.295	25.0
1109	34.7	6.493	28.2
1110	24.9	5.491	19.4
1111	30.8	6.983	23.8
1112	^a	na	na
1113	34.7	1.670	33.0
1114	30.4	6.359	24.0
1115	31.6	NW	na
1116	26.9	6.006	20.9
1117	27.5	6.827	20.7
1118	28.6	7.310	21.3
1119	26.2	4.637	21.6
1120	28.7	7.271	21.4
MEAN	30.5	6.391	24.0
S.D.	3.66	1.51	3.84

Appendix D
Individual Food Consumption

INDIVIDUAL FOOD CONSUMPTION

EXPLANATORY NOTES

ABBREVIATIONS:

Cons. - consumption
g/anm/day - grams of food consumed per animal per day

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Food Consumption

	Food Cons. g/anm/day Day 7	Food Cons. g/anm/day Day 14	Food Cons. g/anm/day Day 21	Food Cons. g/anm/day Day 28
Male, I 0 mg/kg				
101	4.9	4.7	4.7	4.5
102	5.6	5.6	5.9	5.8
103	5.2	5.4	5.2	4.5
104	4.5	4.7	4.9	4.2
105	5.3	4.9	5.4	4.5
106	4.5	5.4	5.3	5.1
107	4.3	5.0	5.1	4.9
108	4.7	4.6	4.7	4.1
109	5.1	5.0	4.8	3.9
110	5.5	5.5	5.2	4.6
111	4.9	5.0	4.8	4.3
112	5.3	4.7	5.0	4.4
113	5.6	4.9	4.8	4.3
114	5.1	4.5	4.7	4.8
115	4.5	4.9	4.9	4.8
116	4.8	5.2	5.2	5.0
118	5.0	5.3	5.6	5.3
119	5.4	5.7	5.6	5.1
120	5.9	5.3	5.4	5.1

Male, III 0.3 mg/kg

301	5.3	5.5	5.5	5.4
302	5.3	5.6	5.3	4.9
303	5.1	6.0	5.3	5.2
304	5.6	5.7	5.6	5.4
305	5.1	5.4	5.6	5.3
306	4.5	4.9	5.1	4.6
307	4.6	4.8	4.9	4.9
308	4.7	4.6	4.7	4.5
309	5.2	5.2	5.0	4.3
310	5.9	5.6	5.3	5.4
311	5.7	5.4	5.5	5.2
312	5.2	5.4	5.2	5.1
313	5.5	5.8	5.3	4.9
314	4.9	5.2	5.1	4.7
315	5.1	5.2	4.8	4.9
316	4.7	4.5	3.9	4.3
317	4.9	5.0	4.8	4.4
318	4.6	5.0	4.6	5.1
319	5.1	4.9	4.9	4.8
320	5.5	5.0	5.2	5.4

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Food Consumption

	Food Cons. g/anm/day Day 7	Food Cons. g/anm/day Day 14	Food Cons. g/anm/day Day 21	Food Cons. g/anm/day Day 28
Male, V 1 mg/kg				
501	5.9	5.8	6.2	5.0
502	6.2	4.8	5.0	4.6
503	5.0	5.6	5.0	4.5
504	4.6	4.5	4.9	4.9
505	5.4	5.3	5.4	5.2
506	5.1	5.3	5.6	5.4
507	5.1	4.7	5.2	4.7
508	5.4	5.7	5.5	5.4
509	4.6	6.5	3.8	5.0
510	4.9	5.0	5.3	5.4
511	5.8	5.3	5.1	5.7
512	5.2	5.1	4.7	5.4
513	5.6	5.4	5.3	5.5
514	5.3	5.6	4.9	4.8
515	5.6	5.8	5.8	5.8
516	5.1	4.9	5.2	5.0
517	4.6	4.7	4.9	4.9
518	5.0	5.3	5.3	5.6
519	5.0	5.6	5.1	5.5
520	5.2	5.7	4.9	5.0

Male, VII 10 mg/kg

701	5.2	6.7	6.9	6.4
702	5.9	6.2	6.4	5.0
703	5.0	5.9	5.1	4.5
704	5.8	6.0	6.1	6.1
705	5.1	6.6	5.7	5.1
706	5.0	5.4	5.2	5.2
707	4.4	3.4	4.4	4.3
708	4.7	6.9	6.1	6.1
709	5.7	6.9	6.5	5.7
710	5.3	5.7	5.4	4.5
711	3.9	5.3	4.4	5.8
712	4.4	6.5	5.9	5.4
713	5.4	6.3	4.5	4.1
714	3.8	5.9	5.5	6.7
715	5.0	5.4	5.0	6.2
716	4.8	5.2	5.5	5.5
717	4.7	5.0	4.7	4.7
718	5.5	6.2	4.0	5.9
719	5.0	6.5	4.1	5.9
720	5.6	4.9	4.2	6.9

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Food Consumption

	Food Cons. g/anm/day Day 7	Food Cons. g/anm/day Day 14	Food Cons. g/anm/day Day 21	Food Cons. g/anm/day Day 28
Male, IX 30 mg/kg				
901	3.7	5.7	4.5	4.8
902	3.7	5.4	2.5	3.7
903	4.7	4.5	4.0	4.4
904	3.3	5.7	NM	3.5
905	3.3	5.5	3.8	4.0
906	3.9			
907	3.2	3.7	3.5	3.2
908	4.7	6.1	4.2	5.6
909	4.8	5.9	3.8	4.1
910	5.0	5.2	4.5	4.7
911	5.1	5.8	4.4	5.7
912	5.3	4.7	3.1	3.7
913	4.8	4.9	4.1	3.9
914	5.1	5.7	4.7	5.1
915	5.7	6.7	7.2	7.3
916	3.9	6.1	4.2	4.6
917	5.9	7.0	7.1	7.3
918	4.9	6.0	5.1	4.9
919	4.3	5.6	4.5	4.6
920	5.3	6.4	3.9	5.2

Male, XI 30/0 mg/kg (Recovery)

1101	5.2	6.4	6.1	6.1
1102	5.6	5.7	5.1	5.4
1103	5.6	5.4	3.9	5.7
1104	4.7	5.3	4.6	4.0
1105	5.1	7.7	6.2	6.0
1106	3.9	5.1	5.5	4.2
1107	4.4	4.4	3.6	4.3
1108	4.1	4.8	5.2	4.4
1109	4.3	7.8	4.9	7.5
1110	5.1	5.8	4.8	3.3
1111	4.1	4.4	3.9	4.5
1113	4.3	5.4	4.7	5.1
1114	5.0	5.9	5.5	6.7
1115	4.1	5.3	5.2	5.5
1116	3.0	4.2	3.8	5.0
1117	3.4	4.1	3.9	5.2
1118	4.4	5.8	4.1	6.8
1119	4.6	6.3	3.0	8.8
1120	3.9	5.1	3.4	5.9

Key: NM = Not Measurable

Appendix E
Individual Daily Animal Health Observations

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Daily Animal Health Observations

Sex	Group	Animal	Observation	Days
M	I	101	General observation, No Abnormality Detected	0-28
M	I	102	General observation, No Abnormality Detected	0-28
M	I	103	General observation, No Abnormality Detected	0-28
M	I	104	General observation, No Abnormality Detected	0-28
M	I	105	General observation, No Abnormality Detected	0-28
M	I	106	General observation, No Abnormality Detected	0-28
M	I	107	General observation, No Abnormality Detected	0-28
M	I	108	General observation, No Abnormality Detected	0-28
M	I	109	General observation, No Abnormality Detected	0-28
M	I	110	General observation, No Abnormality Detected	0-28
M	I	111	General observation, No Abnormality Detected	0-28
M	I	112	General observation, No Abnormality Detected	0-28
M	I	113	General observation, No Abnormality Detected	0-28
M	I	114	General observation, No Abnormality Detected	0-28
M	I	115	General observation, No Abnormality Detected	0-2, 7-28
			Abnormal Gait, Hindlimb, Right, Severe	3-6
M	I	116	General observation, No Abnormality Detected	0-28
M	I	117	General observation, No Abnormality Detected	0-5
			Sacrificed in extremis	5
M	I	118	General observation, No Abnormality Detected	0-28
M	I	119	General observation, No Abnormality Detected	0-28
M	I	120	General observation, No Abnormality Detected	0-28
M	III	301	General observation, No Abnormality Detected	0-28
M	III	302	General observation, No Abnormality Detected	0-28
M	III	303	General observation, No Abnormality Detected	0-28
M	III	304	General observation, No Abnormality Detected	0-28
M	III	305	General observation, No Abnormality Detected	0-28
M	III	306	General observation, No Abnormality Detected	0-28
M	III	307	General observation, No Abnormality Detected	0-28
M	III	308	General observation, No Abnormality Detected	0-28
M	III	309	General observation, No Abnormality Detected	0-28
M	III	310	General observation, No Abnormality Detected	0-28
M	III	311	General observation, No Abnormality Detected	0-28
M	III	312	General observation, No Abnormality Detected	0-28
M	III	313	General observation, No Abnormality Detected	0-28
M	III	314	General observation, No Abnormality Detected	0-28
M	III	315	General observation, No Abnormality Detected	0-28
M	III	316	General observation, No Abnormality Detected	0-28
M	III	317	General observation, No Abnormality Detected	0-28
M	III	318	General observation, No Abnormality Detected	0-28
M	III	319	General observation, No Abnormality Detected	0-28
M	III	320	General observation, No Abnormality Detected	0-28

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Daily Animal Health Observations

Sex	Group	Animal	Observation	Days
M	V	501	General observation, No Abnormality Detected	0-28
M	V	502	General observation, No Abnormality Detected	0-28
M	V	503	General observation, No Abnormality Detected	0-28
M	V	504	General observation, No Abnormality Detected	0-28
M	V	505	General observation, No Abnormality Detected	0-28
M	V	506	General observation, No Abnormality Detected	0-28
M	V	507	General observation, No Abnormality Detected	0-28
M	V	508	General observation, No Abnormality Detected	0-28
M	V	509	General observation, No Abnormality Detected	0-28
M	V	510	General observation, No Abnormality Detected	0-28
M	V	511	General observation, No Abnormality Detected	0-28
M	V	512	General observation, No Abnormality Detected	0-28
M	V	513	General observation, No Abnormality Detected	0-28
M	V	514	General observation, No Abnormality Detected	0-28
M	V	515	General observation, No Abnormality Detected	0-28
M	V	516	General observation, No Abnormality Detected	0-28
M	V	517	General observation, No Abnormality Detected	0-28
M	V	518	General observation, No Abnormality Detected	0-28
M	V	519	General observation, No Abnormality Detected	0-28
M	V	520	General observation, No Abnormality Detected	0-28
M	VII	701	General observation, No Abnormality Detected	0-28
M	VII	702	General observation, No Abnormality Detected	0-28
M	VII	703	General observation, No Abnormality Detected	0-28
M	VII	704	General observation, No Abnormality Detected	0-28
M	VII	705	General observation, No Abnormality Detected	0-28
M	VII	706	General observation, No Abnormality Detected	0-28
M	VII	707	General observation, No Abnormality Detected	0-28
M	VII	708	General observation, No Abnormality Detected	0-28
M	VII	709	General observation, No Abnormality Detected	0-28
M	VII	710	General observation, No Abnormality Detected	0-28
M	VII	711	General observation, No Abnormality Detected	0-28
M	VII	712	General observation, No Abnormality Detected	0-28
M	VII	713	General observation, No Abnormality Detected	0-28
M	VII	714	General observation, No Abnormality Detected	0-4
			Swollen Observations, Shoulder, Left	5-28
M	VII	715	General observation, No Abnormality Detected	0-28
M	VII	716	General observation, No Abnormality Detected	0-28
M	VII	717	General observation, No Abnormality Detected	0-28
M	VII	718	General observation, No Abnormality Detected	0-28
M	VII	719	General observation, No Abnormality Detected	0-28
M	VII	720	General observation, No Abnormality Detected	0-28

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Daily Animal Health Observations

M	IX	901	General observation, No Abnormality Detected Comments, animal not dosed, pd obs not done	0-8,12-28 9-11
M	IX	902	General observation, No Abnormality Detected Comments, both ears, hindpaws/forepaws yellow Comments, animal not dosed, pd obs not done	0-8,12-22,28 23-27 9-11
M	IX	903	General observation, No Abnormality Detected	0-28
M	IX	904	General observation, No Abnormality Detected	0-28
M	IX	905	General observation, No Abnormality Detected	0-28
M	IX	906	General observation, No Abnormality Detected Swollen Observations, Shoulder, Left Sacrificed in extremis	0-6 7-8 9
M	IX	907	General observation, No Abnormality Detected	0-28
M	IX	908	General observation, No Abnormality Detected Comments, both ears/forepaws/hindpaws yellow Swollen Observations, Penis	0-21 22-27 22-28
M	IX	909	General observation, No Abnormality Detected Abnormal Gait, Hindlimb, Right, Moderate	0-16,19-28 17-18
M	IX	910	General observation, No Abnormality Detected	0-28
M	IX	911	General observation, No Abnormality Detected Comments, both ears/hindpaws/forepaws yellow	0-27 28
M	IX	912	General observation, No Abnormality Detected	0-28
M	IX	913	General observation, No Abnormality Detected	0-28
M	IX	914	General observation, No Abnormality Detected	0-28
M	IX	915	General observation, No Abnormality Detected	0-28
M	IX	916	General observation, No Abnormality Detected	0-28
M	IX	917	General observation, No Abnormality Detected	0-28
M	IX	918	General observation, No Abnormality Detected	0-28
M	IX	919	General observation, No Abnormality Detected	0-28
M	IX	920	General observation, No Abnormality Detected	0-28
M	XI	1101	General observation, No Abnormality Detected	0-28
M	XI	1102	General observation, No Abnormality Detected	0-28
M	XI	1103	General observation, No Abnormality Detected	0-28
M	XI	1104	General observation, No Abnormality Detected	0-28
M	XI	1105	General observation, No Abnormality Detected	0-28
M	XI	1106	General observation, No Abnormality Detected	0-28
M	XI	1107	General observation, No Abnormality Detected	0-28
M	XI	1108	General observation, No Abnormality Detected Comments, both ears/forepaws/hindpaws yellow Comments, animal not dosed, pd obs not done Stained Cageboard, Yellow	0-8,12-21,28 22-27 9-11 22-27
M	XI	1109	General observation, No Abnormality Detected Feces, Absent Comments, both ears/forepaws/hindpaws yellow Comments, animal not dosed, pd obs not done Stained Cageboard, Yellow Not Eating	0-8, 12-17, 19-21,28 18 22-27 9-11 22-27 18
M	XI	1110	General observation, No Abnormality Detected	0-28
M	XI	1111	General observation, No Abnormality Detected	0-28
M	XI	1112	General observation, No Abnormality Detected Eye Observations, Enophthalmus, Bilateral Lethargic Sacrificed in extremis	0-2 3-5 3-5 5
M	XI	1113	General observation, No Abnormality Detected	0-28
M	XI	1114	General observation, No Abnormality Detected	0-28
M	XI	1115	General observation, No Abnormality Detected	0-28
M	XI	1116	General observation, No Abnormality Detected	0-28
M	XI	1117	General observation, No Abnormality Detected Comments, animal not dosed, pd obs not done	0-7,11-28 8-10
M	XI	1118	General observation, No Abnormality Detected	0-28
M	XI	1119	General observation, No Abnormality Detected	0-28
M	XI	1120	General observation, No Abnormality Detected Comments, animal not dosed, pd obs not done	0-7,11-28 8-10

Appendix F
Individual Detailed Clinical Observations and Mortality Records

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	I	101	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	102	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	103	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	104	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	105	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	106	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	107	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	108	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	109	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	110	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	111	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	112	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	113	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	114	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	115	General observation, No Abnormality Detected	0,7-29
			Abnormal Gait, Hindlimb, Right, Severe	3
			Sacrificed by design	29
M	I	116	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	117	General observation, No Abnormality Detected	0
			Eye Observations, Enophthalmus, Bilateral	5
			Lethargic	5
			Breathing Observations, Labored	5
			Feces, Absent	5
			Comments, swollen thoracic ventral	5
			Swollen Observations, Face	5
			Swollen Observations, Neck	5
			Not Eating	5
			Sacrificed in extremis	5
M	I	118	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	119	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	I	120	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	III	301	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	302	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	303	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	304	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	305	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	306	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	307	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	308	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	309	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	310	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	311	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	312	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	313	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	314	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	315	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	316	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	317	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	318	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	319	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	III	320	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	V	501	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	502	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	503	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	504	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	505	General observation, No Abnormality Detected	0,14-29
			Abnormal Gait, Hindlimb, Left, Severe	7
			Sacrificed by design	29
M	V	506	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	507	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	508	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	509	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	510	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	511	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	512	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	513	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	514	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	515	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	516	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	517	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	518	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	519	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	V	520	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	VII	701	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	702	General observation, No Abnormality Detected Abnormal Gait, Hindlimb, Right, Moderate Sacrificed by design	0,14-29 7 29
M	VII	703	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	704	General observation, No Abnormality Detected Pale Sacrificed by design	0-7,28-29 14-21 29
M	VII	705	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	706	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	707	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	708	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	709	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	710	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	711	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	712	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	713	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	714	Absent, End of tail Swollen Observations, Shoulder, Left Sacrificed by design	0-29 7-29 29
M	VII	715	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	716	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	717	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	718	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	VII	719	General observation, No Abnormality Detected Misshapen Observations, Tail Sacrificed by design	0 7-29 29
M	VII	720	General observation, No Abnormality Detected Sacrificed by design	0-29 29

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

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Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	IX	901	General observation, No Abnormality Detected Pale Sacrificed by design	0-14, 28-29 21 29
M	IX	902	General observation, No Abnormality Detected Pale Stain Fur/Skin, Perineum, Yellow Wet Fur, Perineum Sacrificed by design	0-14 21-28 21-29 21-28 29
M	IX	903	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	904	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	905	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	906	General observation, No Abnormality Detected Eye Observations, Partially Closed, Bilateral Lethargic Pale Sacrificed in extremis	0-7 9 9 9 9
M	IX	907	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	908	General observation, No Abnormality Detected Comments, both ears/hindpaws/forepaws yellow Swollen Observations, Penis Sacrificed by design	0-21 28 28-29 29
M	IX	909	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	910	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	911	General observation, No Abnormality Detected Comments, both ears/forepaws/hindpaws yellow Sacrificed by design	0-21 28-29 29
M	IX	912	General observation, No Abnormality Detected Pale Sacrificed by design	0-14 21-29 29
M	IX	913	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	914	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	915	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	916	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	917	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	918	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	919	General observation, No Abnormality Detected Sacrificed by design	0-29 29
M	IX	920	General observation, No Abnormality Detected Sacrificed by design	0-29 29

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

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Individual Detailed Clinical Observations and Mortality Records

Sex	Group	Animal	Observation	Days
M	XI	1101	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1102	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1103	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1104	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1105	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1106	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1107	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1108	General observation, No Abnormality Detected	0-21
			Comments, both ears yellow	28
			Stained Cageboard, Yellow	28-29
			Sacrificed by design	29
M	XI	1109	General observation, No Abnormality Detected	0-14
			Eye Observations, Enophthalmus, Bilateral	21
			Prostrate	21
			Comments, ears/extremities yellow	21
			Stained Cageboard, Yellow	28-29
			Sacrificed by design	29
M	XI	1110	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1111	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1112	General observation, No Abnormality Detected	0
			Eye Observations, Enophthalmus, Left	5
			Eye Observations, Dark, Bilateral	5
			Lethargic	5
			Feces, Absent	5
			Stain Fur/Skin, Perineum, Yellow	5
			Swollen Observations, Shoulder, Left	5
			Not Eating	5
			Sacrificed in extremis	5
M	XI	1113	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1114	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1115	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1116	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1117	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1118	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1119	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29
M	XI	1120	General observation, No Abnormality Detected	0-29
			Sacrificed by design	29

Appendix G
Individual Animal Clinical Pathology Data

INDIVIDUAL ANIMAL CLINICAL PATHOLOGY DATA

EXPLANATORY NOTES

ABBREVIATIONS:**General:**

Adeq - adequate
 CLOT or Clot - sample clotted
 Decr - decreased
 Mod - moderate
 NSR - no sample received for testing
 NP - not taken, not performed, or results not valid
 OK - sample condition OK for testing
 QNS - sample quantity not sufficient for testing
 UTD - unable to determine

Individual Hematology Values:

COND - sample condition
 RBC - red blood cell count
 HGB - hemoglobin
 HCT - hematocrit
 MCV - mean corpuscular (cell) volume
 MCH - mean corpuscular (cell) hemoglobin
 MCHC - mean corpuscular (cell) hemoglobin concentration
 RDW - red cell distribution width
 ARET - absolute reticulocyte count
 PLT - platelet count
 WBC - white blood cell count
 ANEU - absolute neutrophil (all forms)
 ALYM - absolute lymphocyte
 AMON - absolute monocyte
 AEOS - absolute eosinophil
 ABAS - absolute basophil
 ALUC - absolute large unstained cell

Individual Red Blood Cell Morphology Values:

ANIS - anisocytosis
 MIC - microcytes
 MAC - macrocytes
 POLY - polychromasia
 HYPO - hypochromasia
 ECHI - echinocytes
 ACAN - acanthocytes
 TARG - target cells
 RX - rouleaux
 HJB - Howell-Jolly body
 - - not observed

Individual White Blood Cell / Platelet Morphology Values:

SM - smudge white blood cells
 TOX - toxic neutrophils
 DB - Döhle bodies
 VC - vacuolated cytoplasm
 BC - basophilic cytoplasm
 PCE - platelet clumps / estimate
 GP - giant platelets
 BP - bizarre platelets
 - - not observed

INDIVIDUAL ANIMAL CLINICAL PATHOLOGY DATA

EXPLANATORY NOTES (Continued)

ABBREVIATIONS: (Continued)**Individual Clinical Chemistry Values:**

HEM	-	hemolysis
LIP	-	lipemia
ICT	-	icterus
CHOL	-	cholesterol
TRIG	-	triglycerides
TP	-	total protein
ALB	-	albumin
GLOB	-	globulin
HDL	-	high-density lipoprotein cholesterol
NHDL	-	non-high-density lipoprotein cholesterol
SCORT	-	serum corticosterone

NOTES:

When individual animal data are not reported, it may be due to one of the following reasons or other reasons, all of which are explained in the study records:

the sample was clotted (CLOT)
there was insufficient sample for testing (QNS)
a valid result could not be obtained (RNV)
the sample was not suitable for testing
the animal died prior to sample collection
no sample was available for testing (NSR)

Only positive findings were recorded for special observations (e.g., additional cell types) or observations marked other.

Male,	Group	I	0	mg/kg	Day	29	MCH	MCHC	RDW	ARET	PLT
Animal	COND	RBC x10 ⁶ /μL	HGB g/dL	HCT %	MCV fL	pg		g/dL	%	x10 ³ /μL	x10 ³ /μL
101	OK	10.83	16.8	55.2	50.9	15.5		30.4	12.8	318.0	NP
102	OK	10.45	16.4	55.8	53.4	15.6		29.3	13.7	315.4	NP
103	OK	9.23	14.3	46.8	50.7	15.4		30.5	13.1	275.1	NP
104	OK	9.99	16.0	52.3	52.4	16.0		30.5	12.9	333.4	NP
105	OK	11.04	16.2	53.5	48.4	14.7		30.3	12.9	320.8	NP
106	OK	10.68	17.0	56.7	53.1	15.9		30.0	12.7	369.1	NP
107	OK	8.80	13.8	48.4	54.9	15.7		28.6	12.4	330.3	NP
108	OK	10.60	17.3	55.6	52.5	16.3		31.0	12.9	367.1	NP
109	OK	10.14	16.3	54.2	53.4	16.1		30.2	12.7	333.5	NP
110	OK	10.57	15.7	51.5	48.7	14.9		30.5	12.6	302.5	1177

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Individual Animal Clinical Pathology Data

Male,	Group	VII	10	mg/kg	Day	29				
Animal	COND	RBC x10 ⁶ /μL	HGB g/dL	HCT %	MCV fL	MCH pg	MCHC g/dL	RDW %	ARET x10 ³ /μL	PLT x10 ³ /μL
701	OK	10.49	16.3	57.6	54.9	15.5	28.2	11.9	338.1	NP
702	OK	9.83	14.9	51.7	52.6	15.2	28.8	11.4	302.9	NP
703	OK	9.92	16.7	55.2	55.7	16.8	30.1	11.9	248.3	NP
704	OK	8.09	11.9	41.7	51.5	14.7	28.4	12.2	162.0	NP
705	OK	10.47	14.7	52.8	50.5	14.0	27.8	12.7	171.9	NP
706	CLOT	NP	NP	NP	NP	NP	NP	NP	NP	NP
707	OK	11.34	16.3	54.7	48.2	14.3	29.7	11.6	278.5	NP
708	OK	10.69	15.7	53.4	50.0	14.7	29.4	12.7	271.3	NP
709	QMS	NP	NP	NP	NP	NP	NP	NP	NP	NP
710	OK	9.51	13.0	47.8	50.2	13.6	27.1	12.6	212.9	NP

Individual Animal Clinical Pathology Data

Male, Animal	Group	IX	30	mg/kg	Day	29	HCT %	MCV fL	MCH pg	MCHC g/dL	RDW %	ARET $\times 10^3/\mu\text{L}$	PLT $\times 10^3/\mu\text{L}$
	COND	RBC $\times 10^6/\mu\text{L}$	HGB g/dL										
901	OK	9.65	13.8	48.7	50.4	14.3	48.7	50.4	14.3	28.3	14.5	521.1	NP
902	OK	8.12	10.9	38.2	47.0	13.4	38.2	47.0	13.4	28.5	13.7	228.4	NP
903	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
904	OK	9.57	14.0	47.7	49.9	14.6	47.7	49.9	14.6	29.3	12.3	181.0	NP
905	OK	9.61	13.4	46.0	47.8	13.9	46.0	47.8	13.9	29.1	12.7	245.7	NP
906	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
907	OK	10.72	16.4	54.7	51.1	15.3	54.7	51.1	15.3	30.0	12.2	246.7	NP
908	OK	10.68	16.3	56.8	53.1	15.3	56.8	53.1	15.3	28.8	13.6	566.0	NP
909	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
910	OK	9.15	13.8	46.0	50.3	15.1	46.0	50.3	15.1	30.0	12.9	463.7	NP
Male,	Group	XI	30/0	mg/kg	(Recovery)	Day	29						
	COND	RBC $\times 10^6/\mu\text{L}$	HGB g/dL	HCT %	MCV fL	MCH pg	MCHC g/dL	RDW %	ARET $\times 10^3/\mu\text{L}$	PLT $\times 10^3/\mu\text{L}$			
1101	OK	9.58	13.8	48.4	50.5	14.4	48.4	50.5	14.4	28.5	12.6	268.2	NP
1102	OK	8.13	12.6	43.3	53.3	15.5	43.3	53.3	15.5	29.0	13.6	374.0	NP
1103	OK	9.57	13.7	47.1	49.2	14.3	47.1	49.2	14.3	29.0	12.4	377.1	1530
1104	OK	8.37	13.3	45.2	54.0	15.9	45.2	54.0	15.9	29.5	12.7	703.1	1360
1105	OK	9.68	14.5	49.1	50.7	15.0	49.1	50.7	15.0	29.5	13.4	503.4	NP
1106	CLOT	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
1107	OK	9.64	14.5	48.0	49.8	15.0	48.0	49.8	15.0	30.2	12.8	347.0	NP
1108	OK	8.34	12.4	43.2	51.8	14.9	43.2	51.8	14.9	28.8	13.3	625.5	NP
1109	OK	7.92	11.3	42.1	53.1	14.3	42.1	53.1	14.3	27.0	18.7	863.3	2434
1110	OK	8.15	11.5	38.4	47.1	14.1	38.4	47.1	14.1	30.1	16.7	275.3	679

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	I	0	mg/kg	Day	29	ALUC x10 ³ /μL
	WBC x10 ³ /μL	ANEU x10 ³ /μL	ALYM x10 ³ /μL	AMON x10 ³ /μL	AEOS x10 ³ /μL	ABAS x10 ³ /μL	
101	6.96	0.84	5.84	0.21	0.07	0.00	0.00
102	4.12	0.48	3.47	0.04	0.07	0.02	0.04
103	5.04	0.50	4.54	0.00	0.00	0.00	0.00
104	10.08	1.75	7.79	0.16	0.26	0.04	0.09
105	6.20	0.69	5.26	0.06	0.11	0.01	0.06
106	12.10	1.32	10.17	0.20	0.25	0.05	0.11
107	7.98	0.71	6.94	0.09	0.11	0.02	0.10
108	6.21	0.43	5.53	0.19	0.06	0.00	0.00
109	9.05	0.72	7.79	0.27	0.27	0.00	0.00
110	7.75	0.54	6.98	0.08	0.16	0.00	0.00

Male, Animal	Group	III	0.3	mg/kg	Day	29	ALUC x10 ³ /μL
	WBC x10 ³ /μL	ANEU x10 ³ /μL	ALYM x10 ³ /μL	AMON x10 ³ /μL	AEOS x10 ³ /μL	ABAS x10 ³ /μL	
301	10.07	1.63	7.90	0.23	0.18	0.03	0.10
302	11.77	1.72	9.45	0.17	0.31	0.04	0.09
303	3.45	1.15	3.98	0.10	0.19	0.01	0.02
304	5.80	0.83	4.49	0.11	0.21	0.02	0.14
305	11.77	1.16	10.27	0.14	0.06	0.02	0.12
306	10.72	1.92	8.34	0.19	0.13	0.03	0.10
307	9.50	0.99	8.05	0.07	0.25	0.03	0.10
308	10.05	1.92	7.59	0.15	0.21	0.03	0.14
309	6.48	0.77	5.49	0.05	0.11	0.01	0.05
310	14.07	0.84	12.67	0.42	0.14	0.00	0.00

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

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Individual Animal Clinical Pathology Data

Male, Animal	Group	V	1	mg/kg	Day	29	ALUC
	WBC	ANEU	ALYM	AMON	AEOS	ABAS	x10 ³ /pL
	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL
501	10.54	1.61	8.38	0.15	0.28	0.03	0.07
502	9.59	0.83	8.22	0.18	0.24	0.03	0.08
503	6.94	1.59	5.09	0.08	0.09	0.03	0.06
504	12.33	0.25	11.71	0.25	0.12	0.00	0.00
505	6.87	0.52	6.08	0.11	0.07	0.02	0.08
506	12.44	1.24	11.08	0.00	0.12	0.00	0.00
507	7.76	0.64	6.80	0.08	0.12	0.02	0.10
508	6.63	1.04	5.10	0.15	0.23	0.02	0.10
509	10.99	1.41	9.27	0.11	0.09	0.02	0.09
510	4.93	0.49	4.26	0.03	0.07	0.01	0.06

Male, Animal	Group	VII	10	mg/kg	Day	29	ALUC
	WBC	ANEU	ALYM	AMON	AEOS	ABAS	x10 ³ /pL
	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL	x10 ³ /pL
701	12.71	2.29	9.69	0.34	0.08	0.06	0.25
702	8.33	2.67	5.00	0.58	0.08	0.00	0.00
703	11.31	1.81	8.71	0.68	0.11	0.00	0.00
704	9.79	1.20	8.12	0.19	0.05	0.03	0.20
705	15.71	2.57	12.52	0.23	0.13	0.05	0.21
706	NP	NP	NP	NP	NP	NP	NP
707	9.97	1.89	7.88	0.20	0.00	0.00	0.00
708	10.71	1.71	8.46	0.43	0.11	0.00	0.00
709	NP	NP	NP	NP	NP	NP	NP
710	10.55	1.00	8.94	0.30	0.10	0.03	0.17

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	IX	30	mg/kg	Day	29	ALUC
	WBC x10 ³ /μL	ANEU x10 ³ /μL	ALYM x10 ³ /μL	AMON x10 ³ /μL	AEOS x10 ³ /μL	ABAS x10 ³ /μL	x10 ³ /μL
901	11.69	3.99	6.83	0.50	0.09	0.07	0.21
902	6.02	2.82	2.83	0.18	0.05	0.01	0.12
903	NP	NP	NP	NP	NP	NP	NP
904	8.98	3.70	4.04	0.75	0.16	0.03	0.30
905	4.68	1.02	3.20	0.25	0.03	0.02	0.17
906	NP	NP	NP	NP	NP	NP	NP
907	5.31	1.70	3.18	0.32	0.11	0.00	0.00
908	5.05	1.67	3.13	0.25	0.00	0.00	0.00
909	NP	NP	NP	NP	NP	NP	NP
910	5.50	1.66	3.43	0.04	0.18	0.02	0.17

Male, Animal	Group	XI	30/0	mg/kg	(Recovery)	Day	29
	WBC x10 ³ /μL	ANEU x10 ³ /μL	ALYM x10 ³ /μL	AMON x10 ³ /μL	AEOS x10 ³ /μL	ABAS x10 ³ /μL	ALUC x10 ³ /μL
1101	7.78	1.40	6.22	0.16	0.00	0.00	0.00
1102	7.28	1.72	5.03	0.28	0.08	0.01	0.15
1103	5.38	1.26	3.74	0.14	0.12	0.01	0.11
1104	7.55	2.34	4.71	0.09	0.09	0.05	0.27
1105	8.32	2.50	5.32	0.50	0.00	0.00	0.00
1106	NP	NP	NP	NP	NP	NP	NP
1107	8.24	2.60	4.85	0.13	0.27	0.11	0.29
1108	7.50	2.10	4.87	0.38	0.15	0.00	0.00
1109	5.67	1.66	3.71	0.09	0.06	0.03	0.13
1110	7.86	2.91	4.56	0.31	0.08	0.00	0.00

Individual Animal Clinical Pathology Data

Male, Animal	Group	I	0	mg/kg	Day	29				
	ANIS	MIC	MAC	POLY	HYPO	ECHI	ACAN	TARG	RX	HJB
101	-	-	-	Few	-	-	-	-	-	-
102	-	-	-	Few	-	Trace	-	-	-	-
103	-	-	-	Few	-	-	-	-	-	-
104	-	-	-	Few	-	-	-	-	-	-
105	-	-	-	Few	-	-	-	-	-	-
106	-	-	-	Few	-	-	-	-	-	-
107	-	-	-	Few	-	-	-	-	-	-
108	-	-	-	Few	-	-	-	-	-	-
109	-	-	-	Few	-	-	-	-	-	-
110	-	-	-	Trace	-	-	-	-	-	-
Male, Animal	Group	III	0.3	mg/kg	Day	29				
	ANIS	MIC	MAC	POLY	HYPO	ECHI	ACAN	TARG	RX	HJB
301	-	-	-	Few	-	-	-	-	-	-
302	-	-	-	Few	-	-	-	-	-	-
303	-	-	-	Few	-	-	-	-	-	-
304	-	-	-	Few	-	-	-	-	-	-
305	-	-	-	Trace	-	-	-	-	-	-
306	-	-	-	Few	-	-	-	-	-	-
307	-	-	-	Few	-	-	-	-	-	-
308	-	-	-	Trace	-	-	-	-	-	-
309	-	-	-	Few	-	-	-	-	-	-
310	-	-	-	Few	-	-	-	-	-	-

Individual Animal Clinical Pathology Data

Male, Animal	Group	V	1	mg/kg	Day	29	ACAN	TARG	RX	HJB
	ANIS	MIC	MAC	POLY	HYPO	ECHI				
501	Trace	-	Trace	Trace	-	-	-	-	-	-
502	-	-	-	Few	-	-	-	-	-	-
503	-	-	-	Few	-	-	-	-	-	-
504	-	-	-	Few	-	-	-	-	-	-
505	-	-	-	-	-	-	-	-	-	-
506	-	-	-	Few	-	-	-	-	-	-
507	-	-	-	Trace	-	-	-	-	-	-
508	-	-	-	Trace	-	-	-	-	-	-
509	-	-	-	Few	-	-	-	-	-	-
510	-	-	-	Few	-	-	-	-	-	-
Male, Animal	Group	VII	10	mg/kg	Day	29	ACAN	TARG	RX	HJB
	ANIS	MIC	MAC	POLY	HYPO	ECHI				
701	-	-	-	Few	-	-	-	-	-	-
702	-	-	-	Few	-	-	-	-	-	-
703	-	-	-	Trace	-	-	-	-	-	-
704	-	-	-	-	-	-	-	-	-	-
705	-	-	-	-	-	-	-	-	-	-
706	CLOT	NP	NP	NP	NP	NP	NP	NP	NP	NP
707	-	-	-	Trace	-	-	-	-	-	-
708	-	-	-	Trace	-	-	-	-	-	-
709	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP
710	-	-	-	-	-	-	-	-	-	-

Individual Animal Clinical Pathology Data

Male,	Group	IX	30	mg/kg	Day	29				
Animal	ANIS	MIC	MAC	POLY	HYPO	ECHI	ACAN	TARG	RX	HJB
901	-	-	-	Mod	-	-	-	-	-	-
902	Trace	-	Trace	Trace	-	-	-	-	-	-
903	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP
904	-	-	-	-	-	-	-	-	-	-
905	-	-	-	Trace	-	-	-	-	-	-
906	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP
907	-	-	-	-	-	-	-	-	-	-
908	-	-	-	Mod	-	-	-	-	-	-
909	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP
910	-	-	-	Few	-	-	-	-	-	-
Male,	Group	XI	30/0	mg/kg	(Recovery)	Day	29			
Animal	ANIS	MIC	MAC	POLY	HYPO	ECHI	ACAN	TARG	RX	HJB
1101	-	-	-	Mod	-	-	-	-	-	-
1102	Trace	Trace	Trace	Mod	-	-	-	-	-	-
1103	-	-	-	Few	-	-	-	-	-	-
1104	-	-	-	Mod	-	-	-	-	-	-
1105	-	-	-	Mod	-	-	-	-	-	-
1106	CLOT	NP	NP	NP	NP	NP	NP	NP	NP	NP
1107	Trace	Trace	Trace	Mod	-	-	-	-	-	-
1108	-	-	-	Many	-	-	-	-	-	-
1109	Trace	Trace	Trace	Many	-	-	-	-	-	-
1110	-	-	-	Few	-	-	-	-	-	-

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Individual Animal Clinical Pathology Data

Male, Animal	Group	I	0	mg/kg	Day	29	GP	BP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
101	-	-	-	-	-	Adeq	-	-
102	-	-	-	-	-	Adeq	-	-
103	-	-	-	-	-	Adeq	-	-
104	-	-	-	-	-	Adeq	-	-
105	-	-	-	-	-	Adeq	-	-
106	-	-	-	-	-	Adeq	-	-
107	-	-	-	-	-	Adeq	-	-
108	-	-	-	-	-	Decr	-	-
109	-	-	-	-	-	Adeq	-	-
110	-	-	-	-	-	-	-	-
Male, Animal	Group	III	0.3	mg/kg	Day	29	GP	BP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
301	-	-	-	-	-	Adeq	-	-
302	-	-	-	-	-	Adeq	-	-
303	-	-	-	-	-	Adeq	-	-
304	-	-	-	-	-	-	-	-
305	-	-	-	-	-	Adeq	-	-
306	-	-	-	-	-	Adeq	-	-
307	-	-	-	-	-	Adeq	-	-
308	-	-	-	-	-	UTD	-	-
309	-	-	-	-	-	Adeq	-	-
310	-	-	-	-	-	-	-	-

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	V	1	mg/kg	Day	29	GP	BP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
501	-	-	-	-	-	Adeq	-	-
502	-	-	-	-	-	Adeq	-	-
503	-	-	-	-	-	-	-	-
504	-	-	-	-	-	Decr	-	-
505	-	-	-	-	-	Adeq	-	-
506	-	-	-	-	-	Adeq	-	-
507	-	-	-	-	-	-	-	-
508	-	-	-	-	-	-	-	-
509	-	-	-	-	-	-	-	-
510	-	-	-	-	-	-	-	-

Male, Animal	Group	VII	10	mg/kg	Day	29	GP	BP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
701	-	-	-	-	-	Adeq	-	-
702	-	-	-	-	-	Decr	-	-
703	-	-	-	-	-	Decr	-	-
704	-	-	-	-	-	Adeq	-	-
705	-	-	-	-	-	Adeq	-	-
706	CLOT	NP	NP	NP	NP	NP	NP	NP
707	-	-	-	-	-	Decr	-	-
708	-	-	-	-	-	Decr	-	-
709	QNS	NP	NP	NP	NP	NP	NP	NP
710	-	-	-	-	-	Decr	-	-

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	IX	30	mg/kg	Day	29	GP	BP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
901	-	-	-	-	-	Adeq	-	-
902	-	-	-	-	-	Adeq	-	-
903	QNS	NP	NP	NP	NP	NP	NP	NP
904	-	-	-	-	-	Adeq	-	-
905	-	-	-	-	-	Adeq	-	-
906	NSR	NP	NP	NP	NP	NP	NP	NP
907	-	-	-	-	-	Adeq	-	-
908	-	-	-	-	-	Decr	-	-
909	QNS	NP	NP	NP	NP	NP	NP	NP
910	-	-	-	-	-	Adeq	-	-
Male, Animal	Group	XI	30/0	mg/kg	(Recovery)	Day	29	GP
Animal	SM	TOX	DB	VC	BC	PCE	GP	BP
1101	-	-	-	-	-	Adeq	-	-
1102	-	-	-	-	-	Adeq	-	-
1103	-	-	-	-	-	-	-	-
1104	-	-	-	-	-	-	-	-
1105	-	-	-	-	-	UTD	-	-
1106	CLOT	NP	NP	NP	NP	NP	NP	NP
1107	-	-	-	-	-	Adeq	-	-
1108	-	-	-	-	-	Adeq	-	-
1109	-	-	-	-	-	-	-	-
1110	-	-	-	-	-	-	-	-

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Individual Animal Clinical Pathology Data

Male, Animal	Group	I	0	mg/kg	Day	TP	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	mg/dL	TRIG	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
101	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
102	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
103	None	None	None	NP	NP	5.8	3.0	2.8	NP	NP	204
104	Trace	None	None	NP	NP	5.6	3.0	2.6	NP	NP	NP
105	Small	None	None	NP	NP	5.5	3.0	2.5	NP	NP	NP
106	None	None	None	NP	NP	5.1	2.6	2.5	NP	NP	NP
107	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
108	None	None	None	NP	NP	5.9	3.0	2.9	NP	NP	NP
109	None	None	None	NP	NP	5.7	3.0	2.7	NP	NP	NP
110	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
111	None	None	None	161	178	NP	NP	NP	106	55	391
112	None	None	None	128	156	NP	NP	NP	83	45	282
113	None	None	None	110	170	NP	NP	NP	78	32	214
114	None	None	None	142	214	NP	NP	NP	91	51	99
115	None	None	None	98	133	NP	NP	NP	64	34	64
116	None	None	None	121	234	NP	NP	NP	80	41	120
117	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
118	None	None	None	131	162	NP	NP	NP	87	44	92
119	None	None	None	101	141	NP	NP	NP	68	33	110
120	None	None	None	62	118	NP	NP	NP	37	25	323

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	III	0.3	mg/kg	Day	29	TP	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	CHOL	TRIG	g/dL	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
301	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP	NP
302	None	None	None	NP	NP	4.4	4.4	2.6	1.8	NP	NP	NP
303	None	None	None	NP	NP	5.5	5.5	3.0	2.5	NP	NP	NP
304	None	None	None	NP	NP	5.8	5.8	3.1	2.7	NP	NP	NP
305	None	None	None	NP	NP	5.4	5.4	2.8	2.6	NP	NP	NP
306	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
307	Small	None	None	NP	NP	5.6	5.6	3.0	2.6	NP	NP	NP
308	None	None	None	NP	NP	5.1	5.1	2.7	2.4	NP	NP	NP
309	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP	NP
310	None	None	None	NP	NP	4.7	4.7	2.4	2.3	NP	NP	NP
311	Small	None	None	132	190	NP	NP	NP	NP	89	43	170
312	None	None	None	121	164	NP	NP	NP	NP	72	49	212
313	None	None	None	101	112	NP	NP	NP	NP	68	33	262
314	None	None	None	72	121	NP	NP	NP	NP	52	20	236
315	None	None	None	140	187	NP	NP	NP	NP	77	63	78
316	None	None	None	148	116	NP	NP	NP	NP	87	61	231
317	None	None	None	122	141	NP	NP	NP	NP	78	44	220
318	None	None	None	123	92	NP	NP	NP	NP	80	43	360
319	None	None	None	104	136	NP	NP	NP	NP	69	35	139
320	None	None	None	215	219	NP	NP	NP	NP	96	119	76

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Individual Animal Clinical Pathology Data

Male, Animal	Group	V	1	mg/kg	Day	TP	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	CHOL	TRIG	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
501	None	None	None	NP	NP	5.4	3.2	2.2	NP	NP	NP
502	None	None	None	NP	NP	5.4	3.3	2.1	NP	NP	NP
503	None	None	None	NP	NP	6.6	3.3	3.3	NP	NP	NP
504	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
505	None	None	None	NP	NP	5.7	3.2	2.5	NP	NP	NP
506	None	None	None	NP	NP	5.4	3.1	2.3	NP	NP	NP
507	None	None	None	NP	NP	5.3	3.1	2.2	NP	NP	NP
508	None	None	None	NP	NP	5.3	2.9	2.4	NP	NP	NP
509	None	None	None	NP	NP	5.8	3.2	2.6	NP	NP	NP
510	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
511	Trace	None	None	138	151	NP	NP	NP	83	55	197
512	None	None	None	108	219	NP	NP	NP	59	49	127
513	None	None	None	86	103	NP	NP	NP	52	34	170
514	None	None	None	144	140	NP	NP	NP	68	76	32
515	None	None	None	57	118	NP	NP	NP	40	17	42
516	None	None	None	123	154	NP	NP	NP	63	60	247
517	None	None	None	91	207	NP	NP	NP	44	47	115
518	None	None	None	117	205	NP	NP	NP	57	60	48
519	None	None	None	88	152	NP	NP	NP	46	42	60
520	None	None	None	58	118	NP	NP	NP	34	24	43

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	Vil	10	mg/kg	Day	29	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	mg/dL	TRIG	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
701	None	None	Trace	NP	NP	7.1	4.5	2.6	NP	NP	NP
702	None	None	Moderate	NP	NP	7.2	4.4	2.8	NP	NP	NP
703	Small	None	None	NP	NP	7.3	4.3	3.0	NP	NP	NP
704	None	None	Trace	NP	NP	7.0	4.2	2.8	NP	NP	NP
705	None	None	None	NP	NP	NP	NP	NP	NP	NP	NP
706	None	None	Trace	NP	NP	6.7	3.9	2.8	NP	NP	NP
707	None	None	Small	NP	NP	NP	NP	NP	NP	NP	NP
708	None	None	Trace	NP	NP	NP	NP	NP	NP	NP	NP
709	None	None	Small	NP	NP	7.0	4.2	2.8	NP	NP	NP
710	None	None	Trace	NP	NP	6.4	3.7	2.7	NP	NP	NP
711	None	None	Trace	63	60	NP	NP	NP	44	19	516
712	None	None	Trace	60	99	NP	NP	NP	38	22	471
713	None	None	Moderate	77	63	NP	NP	NP	50	27	605
714	None	None	None	113	65	NP	NP	NP	63	50	183
715	None	None	Trace	87	35	NP	NP	NP	55	32	259
716	None	None	None	66	131	NP	NP	NP	39	27	476
717	None	None	Small	96	103	NP	NP	NP	44	52	464
718	None	None	Trace	100	110	NP	NP	NP	53	47	578
719	None	None	Small	44	47	NP	NP	NP	28	16	216
720	None	None	Trace	106	64	NP	NP	NP	58	48	564

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Individual Animal Clinical Pathology Data

Male, Animal	Group	IX	30	mg/kg	Day	TP	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	CHOL	TRIG	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
901	None	None	Small	NP	NP	NP	NP	NP	NP	NP	NP
902	None	None	Moderate	NP	NP	6.1	4.0	2.1	NP	NP	NP
903	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
904	QNS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
905	None	None	Moderate	NP	NP	NP	NP	NP	NP	NP	NP
906	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
907	None	None	Small	NP	NP	NP	NP	NP	NP	NP	NP
908	None	None	Moderate	NP	NP	5.4	3.4	2.0	NP	NP	NP
909	None	None	Moderate	NP	NP	NP	NP	NP	NP	NP	NP
910	None	None	Moderate	NP	NP	6.9	4.0	2.9	NP	NP	NP
911	None	None	Moderate	31	15	NP	NP	NP	26	5	912
912	None	None	Moderate	44	46	NP	NP	NP	22	22	597
913	None	None	Moderate	46	36	NP	NP	NP	23	23	503
914	None	None	Moderate	48	18	NP	NP	NP	33	15	141
915	None	None	Small	71	80	NP	NP	NP	38	33	264
916	None	None	Moderate	57	54	NP	NP	NP	27	30	821
917	None	None	Small	57	60	NP	NP	NP	37	20	434
918	None	None	Small	70	88	NP	NP	NP	38	32	414
919	None	None	Moderate	113	89	NP	NP	NP	59	54	130
920	None	None	Moderate	65	45	NP	NP	NP	40	25	158

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Clinical Pathology Data

Male, Animal	Group	XI	30/0	mg/kg	(Recovery)	Day	29	ALB	GLOB	HDL	NHDL	SCORT
	HEM	LIP	ICT	mg/dL	TRIG	TP	g/dL	g/dL	g/dL	mg/dL	mg/dL	ng/mL
1101	None	None	Small	NP	NP	7.2	4.5	2.7	NP	NP	NP	240
1102	None	None	None	NP	NP	7.3	4.2	3.1	NP	NP	NP	25
1103	None	None	None	NP	NP	6.4	3.8	2.6	NP	NP	NP	NP
1104	None	None	Trace	NP	NP	8.4	4.8	3.6	NP	NP	NP	NP
1105	None	None	Small	NP	NP	7.9	4.6	3.3	NP	NP	NP	NP
1106	Small	None	Trace	NP	NP	8.6	4.9	3.7	NP	NP	NP	NP
1107	None	None	Small	NP	NP	NP	NP	NP	NP	NP	NP	NP
1108	None	None	Small	NP	NP	7.8	4.3	3.5	NP	NP	NP	NP
1109	None	None	Small	NP	NP	6.9	4.1	2.8	NP	NP	NP	NP
1110	None	None	None	NP	NP	7.0	3.6	3.4	NP	NP	NP	NP
1111	None	None	Trace	117	127	NP	NP	64	53	78	NP	NP
1112	NSR	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
1113	None	None	Trace	93	111	NP	NP	NP	36	136	NP	NP
1114	None	None	Trace	121	110	NP	NP	NP	55	325	NP	NP
1115	None	None	Trace	121	115	NP	NP	NP	61	433	NP	NP
1116	Trace	None	Small	91	64	NP	NP	NP	36	NP	NP	NP
1117	None	None	Small	77	77	NP	NP	NP	30	194	NP	NP
1118	None	None	Trace	66	108	NP	NP	NP	28	183	NP	NP
1119	None	None	Trace	96	76	NP	NP	NP	39	476	NP	NP
1120	None	None	Trace	63	74	NP	NP	NP	27	501	NP	NP

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Appendix H
Individual Primary Humoral Immune Response Data

INDIVIDUAL PRIMARY HUMORAL IMMUNE RESPONSE DATA

EXPLANATORY NOTES

FOOTNOTES:

- b Serum was not collected from this animal, therefore, immune response could not be evaluated.
- c Serum volume was insufficient for this animal, therefore, immune response could not be evaluated.
- d This animal was not injected with the appropriate amount of SRBC, therefore, immune response could not be evaluated.

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Primary Humoral Immune Response Data

Animal Number	SLOPE	X	Log ₂
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Male, Group I - 0 mg/kg

101	-1.0034	874	9.771
102	-0.9958	292	8.190
103	-0.9796	540	9.077
104	-0.8528	353	8.464
105	-0.9942	737	9.526
106	-0.8607	487	8.928
107	-0.8226	727	9.506
108	-0.9649	1018	9.992
109	-0.9366	417	8.704
110	-0.9625	777	9.602
111	-1.0109	340	8.409
112	-0.9652	784	9.615
113	-0.9896	537	9.069
114	-0.9866	497	8.957
115	-0.9834	384	8.585
116	-0.9607	689	9.428
117	^a		
118	-0.9716	215	7.748
119	-0.8730	457	8.836
120	-0.8733	549	9.101

Male, Group III - 0.3 mg/kg

301	-1.0351	681	9.412
302	-0.9020	235	7.877
303	-0.9403	405	8.662
304	-0.9653	445	8.798
305	-0.9268	258	8.011
306	^a		
307	-1.0131	511	8.997
308	-0.9142	269	8.071
309	-0.9091	830	9.697
310	-0.9551	573	9.162
311	-0.9906	1205	10.235
312	-0.9573	645	9.333
313	-0.9484	417	8.704
314	-0.9460	793	9.631
315	-1.0128	401	8.647
316	-0.9552	552	9.109
317	-0.9239	132	7.044
318	-0.9189	579	9.177
319	-0.9709	211	7.721
320	-0.9938	622	9.281

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Primary Humoral Immune Response Data

Animal Number	SLOPE	X	Log ₂
Male, Group V - 1 mg/kg			
501	-1.0294	324	8.340
502	-1.0045	562	9.134
503	-0.9279	428	8.741
504	-0.9200	353	8.464
505	-1.0255	343	8.422
506	-1.0013	161	7.331
507	-0.9730	284	8.150
508	-0.9931	444	8.794
509	-0.9765	223	7.801
510	-0.9230	331	8.371
511	-0.8852	673	9.394
512	-1.0076	222	7.794
513	-0.9627	317	8.308
514	-0.9910	363	8.504
515	-0.9622	734	9.520
516	-1.0029	351	8.455
517	-0.9352	205	7.679
518	-0.9065	151	7.238
519	-0.8622	253	7.983
520	-0.9383	220	7.781

Male, Group VII - 10 mg/kg

701	-0.8465	285	8.155
702	-0.9652	95	6.570
703	^b		
704	-0.9617	134	7.066
705	-1.0045	187	7.547
706	-0.9582	311	8.281
707	-1.0358	97	6.600
708	-1.0128	144	7.170
709	-1.0214	73	6.190
710	-0.9532	148	7.209
711	-0.7979	243	7.925
712	-0.9974	180	7.492
713	-1.0116	140	7.129
714	-0.9470	817	9.674
715	-0.8674	134	7.066
716	^c		
717	-1.0155	226	7.820
718	-1.0207	110	6.781
719	-0.9787	7	2.807
720	-0.7775	230	7.845

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Primary Humoral Immune Response Data

Animal Number	SLOPE	X	Log ₂
Male, Group IX - 30 mg/kg			
901	-0.9613	164	7.358
902	-0.9724	26	4.700
903	a		
904	a		
905	-1.0229	65	6.022
906	a		
907	b		
908	-1.0094	89	6.476
909	-0.9950	141	7.140
910	-1.0106	44	5.459
911	-0.9730	84	6.392
912	-1.0333	62	5.954
913	-0.8405	530	9.050
914	-0.9848	193	7.592
915	-0.9891	58	5.858
916	-1.0002	90	6.492
917	-0.9981	120	6.907
918	-1.0207	55	5.781
919	-0.9989	161	7.331
920	-0.9884	52	5.700

Male, Group IX - 30/0 mg/kg (Recovery)

1101	-0.9921	89	6.476
1102	-1.0202	45	5.492
1103	-0.9938	114	6.833
1104	-1.0130	78	6.285
1105	-0.9951	96	6.585
1106	-0.9785	35	5.129
1107	-0.9904	88	6.459
1108	-0.9412	78	6.285
1109	-0.9771	47	5.555
1110	-0.8757	169	7.401
1111	-1.0060	43	5.426
1112	a		
1113	-0.9806	151	7.238
1114	-0.9696	74	6.209
1115	-0.9458	74	6.209
1116	b		
1117	-0.9999	167	7.384
1118	-0.9994	98	6.615
1119	-0.9866	52	5.700
1120	-0.9927	52	5.700

Appendix I
Individual Primary Humoral Immune Response Positive Control Data

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Primary Humoral Immune Response Positive Control Data

Animal Number	SLOPE	X	Log ₂
Male, Group CI - Saline			
C101	-0.9624	578	9.175
C102	-0.9535	747	9.545
C103	-0.9312	417	8.704
C104	-0.9892	505	8.980
C105	-1.0066	268	8.066
C106	-0.8598	410	8.679
C107	-0.8395	140	7.129
C108	-0.9841	485	8.922
C109	-1.0023	429	8.745
C110	-0.9946	271	8.082

Male, Group CIII - 90 mg/kg Cyclophosphamide

C301	-0.9579	25	4.644
C302	-0.9965	19	4.248
C303	-1.0234	25	4.644
C304	-0.8989	14	3.807
C305	-1.0583	14	3.807
C306	-0.9927	25	4.644
C307	-1.0321	33	5.044
C308	-0.9777	43	5.426
C309	-0.8206	8	3.000
C310	-1.0512	59	5.883

Male, Pooled Samples - Saline

-1.0107	405	8.662
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Male, Pooled Samples - 90 mg/kg Cyclophosphamide

-0.9846	35	5.129
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Appendix J
Individual Animal Final Body and Organ Weights

INDIVIDUAL ANIMAL FINAL BODY AND ORGAN WEIGHTS

EXPLANATORY NOTES

FOOTNOTES:

- a An error occurred while weighing livers for this animal, and the liver weight was excluded from calculations.
- b Liver inadvertently not weighed.

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Final Body and Organ Weights

Group:	IA	Treatment: 0 mg/kg				Sex: MALES								
	ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	BRAIN (Gms)	%BRAIN	SPLEEN (Gms)	%FBW	BRAIN (Gms)	THYMUS (Gms)	%FBW	%BRAIN
	101	31.00	0.409	1.3194	1.623	5.2355	396.82	0.106	0.3419	25.917	0.071	0.2290	17.359	
	102	34.70	0.460	1.3256	2.017	5.8127	438.48	0.110	0.3170	23.913	0.052	0.1499	11.304	
	103	33.40	0.480	1.4371	1.736	5.1976	361.67	0.124	0.3713	25.833	0.037	0.1108	7.7083	
	104	32.50	0.453	1.3938	1.768	5.4400	390.29	0.111	0.3415	24.503	0.058	0.1785	12.804	
	105	33.00	0.460	1.3939	1.459	4.4212	317.17	0.091	0.2758	19.783	0.047	0.1424	10.217	
	106	31.20	0.425	1.3622	1.717	5.5032	404.00	0.114	0.3654	26.824	0.051	0.1635	12.000	
	107	31.90	0.454	1.4232	1.861	5.8339	409.91	0.128	0.4013	28.194	0.041	0.1285	9.0308	
	108	30.30	0.462	1.5248	1.727	5.6997	373.81	0.107	0.3531	23.160	0.043	0.1419	9.3074	
	109	32.70	0.495	1.5138	1.711	5.2324	345.66	0.112	0.3425	22.626	0.057	0.1743	11.515	
	110	33.90	0.465	1.3717	1.634	4.8201	351.40	0.119	0.3510	25.591	0.050	0.1475	10.753	
	Mean	32.46	0.456	1.4065	1.725	5.3196	378.92	0.112	0.3461	24.634	0.051	0.1566	11.200	
	S.D.	1.38	0.025	0.0702	0.147	0.4455	35.880	0.010	0.0333	2.3978	0.010	0.0325	2.6437	

Group:	IB	Treatment: 0 mg/kg				Sex: MALES							
	ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	%BRAIN	SPLEEN (Gms)	%FBW	%BRAIN	THYMUS (Gms)	%FBW	%BRAIN
	111	32.60	0.505	1.5491	1.801	5.5245	356.63	0.145	0.4448	28.713	0.052	0.1595	10.297
	112	33.90	0.497	1.4661	a			0.122	0.3599	24.547	0.074	0.2183	14.889
	113	34.60	0.461	1.3324	a			0.117	0.3382	25.380	0.043	0.1243	9.3275
	114	33.70	0.498	1.4777	2.064	6.1246	414.46	0.115	0.3412	23.092	0.035	0.1039	7.0281
	115	31.50	0.496	1.5746	1.718	5.4540	346.37	0.107	0.3397	21.573	0.061	0.1937	12.298
	116	34.20	0.447	1.3070	1.795	5.2485	401.57	0.111	0.3246	24.832	0.044	0.1287	9.8434
	118	34.50	0.503	1.4580	2.172	6.2957	431.81	0.099	0.2870	19.682	0.053	0.1536	10.537
	119	34.30	0.492	1.4344	1.859	5.4198	377.85	0.152	0.4431	30.894	0.044	0.1283	8.9431
	120	33.50	0.487	1.4537	1.639	4.8925	336.55	0.138	0.4119	28.337	0.045	0.1343	9.2402
	Mean	33.64	0.487	1.4503	1.864	5.5657	380.75	0.123	0.3656	25.228	0.050	0.1494	10.267
	S.D.	1.01	0.020	0.0873	0.190	0.4889	36.291	0.018	0.0552	3.5924	0.012	0.0365	2.2340

FBW - Final Body Weight

Individual Animal Final Body and Organ Weights

Group: IIIA		Treatment: 0.3 mg/kg				Sex: MALES			
ANIMAL	FBW	BRAIN	LIVER	SPLEEN	THYMUS				
	(Gms)	(Gms)	%FBW	(Gms)	%FBW				
301	35.10	0.516	1.4701	2.609	7.4330				
302	36.10	0.489	1.3546	2.405	6.6620				
303	37.40	0.486	1.2995	2.512	6.7166				
304	37.20	0.526	1.4140	2.758	7.4140				
305	34.50	0.516	1.4957	2.520	7.3043				
306	33.10	0.525	1.5861	2.539	7.6707				
307	31.30	0.473	1.5112	2.036	6.5048				
308	33.70	0.436	1.2938	2.372	7.0386				
309	29.90	0.441	1.4749	1.988	6.6488				
310	32.80	0.455	1.3872	2.492	7.5976				
Mean	34.11	0.486	1.4287	2.423	7.0990				
S.D.	2.45	0.034	0.0956	0.241	0.4378				

Group: IIIB		Treatment: 0.3 mg/kg				Sex: MALES								
ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	%BRAIN	(Gms)	SPLEEN (Gms)	%FBW	%BRAIN	(Gms)	THYMUS (Gms)	%FBW	%BRAIN
311	36.60	0.452	1.2350	2.896	7.9126	640.71	0.114	0.3115	25.221	0.033	0.0902	7.3009		
312	33.40	0.478	1.4311	2.529	7.5719	529.08	0.136	0.4072	28.452	0.040	0.1198	8.3682		
313	31.50	0.477	1.5143	2.445	7.7619	512.58	0.076	0.2413	15.933	0.022	0.0698	4.6122		
314	32.20	0.471	1.4627	2.206	6.8509	468.37	0.135	0.4193	28.662	0.045	0.1398	9.5541		
315	33.80	0.505	1.4941	2.514	7.4379	497.82	0.152	0.4497	30.099	0.049	0.1450	9.7030		
316	31.60	0.479	1.5158	2.294	7.2595	478.91	0.099	0.3133	20.668	0.054	0.1709	11.273		
317	30.20	0.458	1.5166	2.053	6.7980	448.25	0.060	0.1987	13.100	0.057	0.1887	12.445		
318	30.10	0.430	1.4286	2.054	6.8239	477.67	0.106	0.3522	24.651	0.031	0.1030	7.2093		
319	30.90	0.459	1.4854	2.199	7.1165	479.08	0.060	0.1942	13.072	0.051	0.1650	11.111		
320	36.70	0.493	1.3433	2.715	7.3978	550.71	0.151	0.4114	30.629	0.048	0.1308	9.7363		
Mean	32.70	0.470	1.4427	2.391	7.2931	508.32	0.109	0.3299	23.049	0.043	0.1323	9.1314		
S.D.	2.41	0.021	0.0908	0.280	0.3953	55.523	0.035	0.0940	6.9119	0.011	0.0375	2.3193		

FBW - Final Body Weight

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Final Body and Organ Weights

Group:	VA	Treatment:	1 mg/kg	Sex:	MALES										
	ANIMAL	FBW	BRAIN	LIVER	SPLEEN	THYMUS									
	(Gms)	(Gms)	%FBW	(Gms)	%FBW	%BRAIN	(Gms)	%BRAIN	(Gms)	%FBW	%BRAIN	(Gms)	%FBW	%BRAIN	
	501	33.30	0.441	1.3243	3.274	9.8318	742.40	0.088	0.2643	19.955	0.037	0.1111	8.3900		
	502	34.00	0.522	1.5353	3.381	9.9441	647.70	0.135	0.3971	25.862	0.074	0.2176	14.176		
	503	33.50	0.479	1.4299	2.978	8.8836	621.71	0.090	0.2687	18.789	0.045	0.1343	9.3946		
	504	33.30	0.502	1.5075	3.647	10.952	726.49	0.108	0.3243	21.514	0.059	0.2072	13.745		
	505	33.00	0.444	1.3455	3.095	9.3788	697.07	0.092	0.2788	20.721	0.036	0.1091	8.1081		
	506	35.10	0.451	1.2849	3.042	8.6667	674.50	0.115	0.3276	25.499	0.062	0.1766	13.747		
	507	31.30	0.491	1.5687	2.992	9.5591	609.37	0.107	0.3419	21.792	0.056	0.1789	11.405		
	508	33.90	0.509	1.5015	2.898	8.5487	569.35	0.103	0.3038	20.236	0.054	0.1593	10.609		
	509	33.50	0.447	1.3343	3.490	10.418	780.76	0.112	0.3343	25.056	0.032	0.0955	7.1588		
	510	32.30	0.441	1.3653	3.017	9.3406	684.13	0.078	0.2415	17.687	0.040	0.1238	9.0703		
	Mean	33.32	0.473	1.4197	3.181	9.5529	675.35	0.103	0.3082	21.711	0.051	0.1514	10.580		
	S.D.	1.01	0.032	0.1017	0.252	0.7635	64.982	0.016	0.0462	2.8633	0.015	0.0429	2.5811		

Group:	VB	Treatment:	1 mg/kg	Sex:	MALES										
	ANIMAL	FBW	BRAIN	LIVER	SPLEEN	THYMUS									
	(Gms)	(Gms)	%FBW	(Gms)	%FBW	%BRAIN	(Gms)	%BRAIN	(Gms)	%FBW	%BRAIN	(Gms)	%FBW	%BRAIN	
	511	36.80	0.497	1.3505	3.191	8.6712	642.05	0.081	0.2201	16.298	0.047	0.1277	9.4567		
	512	36.00	0.465	1.2917	3.397	9.4361	730.54	0.118	0.3278	25.376	0.049	0.1361	10.538		
	513	35.90	0.480	1.3370	3.539	9.8579	737.29	0.106	0.2953	22.083	0.045	0.1253	9.3750		
	514	31.40	0.508	1.6178	3.544	11.287	697.64	0.088	0.2803	17.323	0.037	0.1178	7.2835		
	515	35.70	0.459	1.2857	3.535	9.9020	770.15	0.124	0.3473	27.015	0.032	0.0896	6.9717		
	516	32.10	0.502	1.5639	3.317	10.333	660.76	0.088	0.2741	17.530	0.046	0.1433	9.1633		
	517	32.20	0.443	1.3758	3.300	10.248	744.92	0.093	0.2888	20.993	0.055	0.1708	12.415		
	518	35.00	0.484	1.3829	3.484	9.9543	719.83	0.114	0.3257	23.554	0.059	0.1686	12.190		
	519	30.70	0.424	1.3811	2.996	9.7590	706.60	0.109	0.3550	25.708	0.038	0.1238	8.9623		
	520	36.40	0.499	1.3709	3.314	9.1044	664.13	0.122	0.3352	24.449	0.059	0.1621	11.824		
	Mean	34.22	0.476	1.3957	3.362	9.8553	707.39	0.104	0.3050	22.033	0.047	0.1365	9.8179		
	S.D.	2.34	0.028	0.1092	0.177	0.7145	41.290	0.016	0.0412	3.8599	0.009	0.0254	1.9127		

FBW - Final Body Weight

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Final Body and Organ Weights

Group: VIIA		Treatment: 10 mg/kg				Sex: MALES								
ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	%BRAIN	(Gms)	SPLEEN (Gms)	%FBW	%BRAIN	(Gms)	THYMUS (Gms)	%FBW	%BRAIN
701	31.80	0.471	1.4811	7.969	25.060	1691.9	0.078	0.2453	16.561	0.029	0.0912	6.1571		
702	30.90	0.477	1.5437	7.155	23.155	1500.0	0.081	0.2621	16.981	0.039	0.1262	8.1761		
703	29.10	0.485	1.6667	8.574	29.464	1767.8	0.042	0.1443	8.6598	0.016	0.0550	3.2990		
704	28.20	0.388	1.3759	6.519	23.117	1680.2	0.053	0.1879	13.660	0.035	0.1241	9.0206		
705	28.40	0.439	1.5458	4.627	16.292	1054.0	0.058	0.2042	13.212	0.021	0.0739	4.7836		
706	27.30	0.454	1.6630	4.783	17.520	1053.5	0.072	0.2637	15.859	0.035	0.1282	7.7093		
707	24.70	0.414	1.6761	5.517	22.336	1332.6	0.054	0.2186	13.043	0.013	0.0526	3.1401		
708	29.70	0.458	1.5421	5.939	19.997	1296.7	0.069	0.2323	15.066	0.030	0.1010	6.5502		
709	26.60	0.465	1.7481	6.075	22.838	1306.5	0.045	0.1692	9.6774	0.010	0.0376	2.1505		
710	27.20	0.389	1.4301	5.137	18.886	1320.6	0.076	0.2794	19.537	0.026	0.0956	6.6838		
Mean	28.39	0.444	1.5673	6.230	21.867	1400.4	0.063	0.2207	14.226	0.025	0.0885	5.7670		
S.D.	2.10	0.035	0.1193	1.331	3.8680	253.65	0.014	0.0442	3.3173	0.010	0.0328	2.3287		

Group: VIIB		Treatment: 10 mg/kg				Sex: MALES						
ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	%BRAIN	SPLEEN (Gms)	%FBW	%BRAIN	THYMUS (Gms)	%FBW	%BRAIN
711	26.80	0.427	1.5933	4.228	15.776	990.16	0.066	0.2463	15.457	0.014	0.0522	3.2787
712	28.90	0.478	1.6540	5.438	18.817	1137.7	0.082	0.2837	17.155	0.037	0.1280	7.7406
713	31.60	0.466	1.4747	8.346	26.411	1791.0	0.083	0.2627	17.811	0.017	0.0538	3.6481
714	29.60	0.455	1.5372	5.068	17.122	1113.8	0.128	0.4324	28.132	0.042	0.1419	9.2308
715	27.40	0.431	1.5730	6.320	23.066	1466.4	0.053	0.1934	12.297	0.020	0.0730	4.6404
716	27.00	0.436	1.6148	4.902	18.156	1124.3	0.052	0.1926	11.927	0.023	0.0852	5.2752
717	25.20	0.428	1.6984	5.396	21.413	1260.7	0.065	0.2579	15.187	0.026	0.1032	6.0748
718	31.00	0.436	1.4065	8.136	26.245	1866.1	0.064	0.2065	14.679	0.019	0.0613	4.3578
719	30.00	0.454	1.5133	5.884	19.613	1296.0	0.054	0.1800	11.894	0.027	0.0900	5.9471
720	26.90	0.477	1.7732	5.205	19.349	1091.2	0.046	0.1710	9.6436	0.019	0.0706	3.9832
Mean	28.44	0.449	1.5838	5.892	20.597	1313.7	0.069	0.2427	15.418	0.024	0.0859	5.4177
S.D.	2.09	0.020	0.1083	1.358	3.6430	301.90	0.024	0.0772	5.1497	0.009	0.0305	1.8903

FBW - Final Body Weight

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Final Body and Organ Weights

Group:	IXA	Treatment: 30 mg/kg				Sex: MALES						
	ANIMAL	FBW	BRAIN	LIVER	SPLEEN	THYMUS						
		(Gms)	(Gms)	%FBW	%BRAIN	(Gms)	%FBW	%BRAIN	(Gms)	%FBW	%BRAIN	
	901	26.20	0.469	1.7901	5.786	22.084	1233.7	0.066	0.2519	14.072	0.009	0.0344
	902	24.30	0.414	1.7037	5.752	23.671	1389.4	0.034	0.1399	8.2126	0.022	0.0905
	903	23.70	0.448	1.8903	5.441	22.958	1214.5	0.021	0.0886	4.6875	0.017	0.0717
	904	24.20	0.420	1.7355	5.335	22.045	1270.2	0.031	0.1281	7.3810	0.028	0.1157
	905	24.10	0.415	1.7220	4.810	19.959	1159.0	0.037	0.1535	8.9157	0.023	0.0954
	907	21.80	0.401	1.8394	5.128	23.523	1278.8	0.026	0.1193	6.4838	0.015	0.0688
	908	25.40	0.435	1.7126	5.628	22.157	1293.8	0.037	0.1457	8.5057	0.065	0.2559
	909	23.50	0.416	1.7702	5.189	22.081	1247.4	0.038	0.1617	9.1346	0.009	0.0383
	910	27.00	0.461	1.7074	7.923	29.344	1718.7	0.065	0.2407	14.100	0.027	0.1000
	Mean	24.47	0.431	1.7635	5.666	23.091	1311.7	0.039	0.1588	9.0548	0.024	0.0968
	S.D.	1.55	0.024	0.0656	0.903	2.5850	164.98	0.016	0.0541	3.1653	0.017	0.0656

Group:	IXB	Treatment: 30 mg/kg				Sex: MALES							
	ANIMAL	FBW (Gms)	BRAIN (Gms)	%FBW	LIVER (Gms)	%FBW	%BRAIN	SPLEEN (Gms)	%FBW	%BRAIN	THYMUS (Gms)	%FBW	%BRAIN
	911	25.30	0.466	1.8419	5.957	23.545	1278.3	0.042	0.1660	9.0129	0.016	0.0632	3.4335
	912	22.00	0.406	1.8455	5.463	24.832	1345.6	0.020	0.0909	4.9261	0.014	0.0636	3.4483
	913	28.30	0.435	1.5371	7.657	27.057	1760.2	0.072	0.2544	16.552	0.025	0.0883	5.7471
	914	28.40	0.431	1.5176	5.089	17.919	1180.7	0.082	0.2887	19.026	0.030	0.1056	6.9606
	915	32.40	0.445	1.3735	6.732	20.778	1512.8	0.102	0.3148	22.921	0.039	0.1204	8.7640
	916	23.30	0.419	1.7983	b			0.049	0.2103	11.695	0.023	0.0987	5.4893
	917	29.40	0.462	1.5714	6.316	21.483	1367.1	0.068	0.2313	14.719	0.039	0.1327	8.4416
	918	28.00	0.449	1.6036	5.574	19.907	1241.4	0.067	0.2393	14.922	0.029	0.1036	6.4588
	919	27.10	0.459	1.6937	5.895	21.753	1284.3	0.067	0.2472	14.597	0.026	0.0959	5.6545
	920	29.50	0.504	1.7085	6.499	22.031	1289.5	0.068	0.2305	13.492	0.014	0.0475	2.7778
	Mean	27.37	0.448	1.6491	6.131	22.145	1362.2	0.064	0.2274	14.186	0.026	0.0920	5.7185
	S.D.	3.09	0.028	0.1554	0.774	2.7075	175.82	0.022	0.0627	5.0057	0.009	0.0268	2.0510

FBW - Final Body Weight

Appendix K
Individual Animal Pathology Data

INDIVIDUAL ANIMAL PATHOLOGY DATA

KEY TO APPENDIX

LESION GRADING:

Histopathology changes are described according to their morphologic character, distribution and severity. The distribution (extent of tissue involvement) is indicated, where appropriate, by modifiers such as focal, multifocal, diffuse, unilateral, bilateral, etc. A severity score, if appropriate, is also assigned as follows:

- MINIMAL: The amount of change present barely exceeds that which is considered to be within normal limits.
- MILD: In general, the lesion is easily identified but of limited severity. The lesion probably does not produce any functional impairment.
- MODERATE: The lesion is prominent but there is significant potential for increased severity. Limited tissue or organ dysfunction is possible.
- SEVERE: The degree of change is either as complete as considered possible or great enough in intensity or extent to expect significant tissue or organ dysfunction.

COMMENT:

Grades minimal through severe represent progressive involvement/severity along a continuum with minimal lesions being the least severe and severe lesions being the most severe. While the grades refer to the morphologic characteristics of lesions, they also indicate their relative biologic significance.

Gross observations listing multiple masses for a tissue are distinguished with letters (i.e., a, b, c, d, etc.).

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

101 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
FATTY CHANGE, DIFFUSE, mild.

THYMUS :
ECTOPIC THYROID.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

102 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

103 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

104 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

104 Continued from previous page

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW, LYMPH NODE -
POPLITEAL

105 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW, LYMPH NODE -
POPLITEAL

106 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

106 Continued from previous page

Histopathology :

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW

107

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW

108

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW, LYMPH NODE -
POPLITEAL

109 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
FATTY CHANGE, DIFFUSE, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

110 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IA Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW, LYMPH NODE -
POPLITEAL

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

111 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

112 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

113 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW

114 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

115 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

116 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW

117 Unscheduled Sacrifice
Duration of dosing-days: 5
Exposure Group : Early Deaths
Animal is signed off from necropsy

Gross Pathology :

TRACHEA :
RUPTURE.
ESOPHAGUS :
RUPTURE.
SKIN :
OTHER, abscess subcutaneous axilla right, subcutaneous air
pocket, dorsal neck, right axilla.

No Macroscopic Abnormality Observed :
LIVER

Histopathology :

MESENTERIC LYMPH NODE :
DEPLETION/ATROPHY, LYMPHOID, minimal, (outer cortex and
follicles).
THYMUS :
DEPLETION/ATROPHY, LYMPHOID, mild.
ESOPHAGUS :
INFLAMMATION, MYOFIBER, mild, (due to esophageal rupture).
SKIN :
Moderate, ABSCESS.
BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, moderate.

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Ammonium Perfluorooctanoate:
 28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :

DOSING ACCIDENT.

MEDIASTINUM :

INFLAMMATION, CHRONIC, (due to esophageal rupture).

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, TRACHEA, FEMUR/KNEE JOINT, STERNUM

118

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
 FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
 FEMUR/KNEE JOINT, STERNUM, BONE MARROW

119

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
 FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Individual Animal Pathology Data

Group: IB Treatment: 0 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, BONE MARROW120 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
LIVER, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

301 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

302 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW303 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW304 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

305 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

306 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

307

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

308 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

309 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIA Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

309 Continued from previous page

Histopathology :

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

310 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

311 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

312 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW313 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW314 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

315 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

316 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

317 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

SPLEEN :
DEPLETION/ATROPHY, LYMPHOID, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

317 Continued from previous page

Histopathology :

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

318 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

319 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IIIB Treatment: 0.3 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

320

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, mild, with
cytoplasmic eosinophilic stippling.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

501 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

502 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

502 Continued from previous page

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

503 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

504 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

504 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

THYMUS :

HYPERPLASIA, LYMPHOID, FOLLICULAR, mild.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

505

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

506 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

507 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

508 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, minimal.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

509 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VA Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

510

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

511 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

512 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

NECROSIS, FOCAL, minimal.

NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

MESENTERIC LYMPH NODE :
NOT PRESENT.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, THYMUS, BONE MARROW

513 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

514 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
NECROSIS, FOCAL, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

515 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

516 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

THYMUS :
NOT PRESENT.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

517 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

517 Continued from previous page

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW518 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW519 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VB Treatment: 1 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

519 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

520

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

701 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
Minimal, FATTY CHANGE, NONZONAL.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

702 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

INFLAMMATION, SUBACUTE/CHRONIC, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

703

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

SPLEEN :

SMALL.

No Macroscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

INFLAMMATION, SUBACUTE/CHRONIC, minimal.
NECROSIS, FOCAL, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERPLASIA, BILE DUCT, minimal.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

704 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

705 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

706 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

707

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

SPLEEN :

SMALL.

THYMUS :

SMALL.

No Macroscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

THYMUS :
ECTOPIC THYROID.
DEPLETION/ATROPHY, LYMPHOID, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

708 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

709 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.
THYMUS :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
Minimal, FATTY CHANGE, NONZONAL.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, mild.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

710 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIA Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

HYPERPLASIA, BILE DUCT, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

711 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
Minimal, FATTY CHANGE, NONZONAL.
THYMUS :
NOT PRESENT.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

712 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

713

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.
DISCOLORATION, TAN, 1CM DIA.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, moderate.
HYPERPLASIA, BILE DUCT, minimal.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, minimal.
BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE

714 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SKIN :
MASS, GREEN, AXILLA, LEFT, 1.5CM DIA.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
SKIN :
Moderate, ABSCESS.
BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, moderate.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, THYMUS

715 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

716 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

717 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.
THYMUS :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

MESENTERIC LYMPH NODE :

NOT PRESENT IN TISSUE SECTION.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, THYMUS, BONE MARROW

718 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

SPLEEN :

SMALL.

No Macroscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

718 Continued from previous page

Histopathology :

LIVER :
Minimal, FATTY CHANGE, NONZONAL.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
MESENTERIC LYMPH NODE, BONE MARROW

719 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE, THYMUS, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: VIIB Treatment: 10 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

720 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, mild.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.
THYMUS :
DEPLETION/ATROPHY, LYMPHOID, minimal.
BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
SPLEEN, MESENTERIC LYMPH NODE

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

901 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, mild.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

902 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

902 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.
THYMUS :
NOT PRESENT.
BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, minimal.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.
LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM

903 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.
THYMUS :
SMALL.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

903 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

904 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

904 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

MESENTERIC LYMPH NODE :

NOT PRESENT IN TISSUE SECTION.

THYMUS :

NOT PRESENT IN MEDIASTINAL TISSUE.

BONE MARROW :

HYPERPLASIA, GRANULOCYTIC, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

BRAIN, FEMUR/KNEE JOINT, STERNUM, LYMPH NODE - POPLITEAL

905

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

905 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

905 Continued from previous page

Gross Pathology :

SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

MESENTERIC LYMPH NODE :
NOT PRESENT IN TISSUE SECTION.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, severe.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, FEMUR/KNEE JOINT, STERNUM, BONE MARROW, LYMPH NODE -
POPLITEAL

906 Unscheduled Sacrifice
Duration of dosing-days: 9
Exposure Group : Early Deaths
Animal is signed off from necropsy

Gross Pathology :

LIVER :
DISCOLORATION, PALE, MOTTLED, DIFFUSE.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref	Microscopic & Macroscopic Findings
906	Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, moderate, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
FATTY CHANGE, PERIportal, minimal.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, moderate, (periarteriolar
lymphoid sheath).

MESENTERIC LYMPH NODE :

DEPLETION/ATROPHY, LYMPHOID, moderate, (inner cortex and
outer cortex).

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, severe.

BONE MARROW :

HYPERPLASIA, GRANULOCYTIC, moderate, with left shift
(immature).

CAUSE OF DEATH :

UNDETERMINED.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, FEMUR/KNEE JOINT, STERNUM

907

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

SPLEEN :

SMALL.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

907 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

MESENTERIC LYMPH NODE :

DEPLETION/ATROPHY, LYMPHOID, mild, (inner cortex, outer
cortex, and follicles).

THYMUS :

NOT PRESENT IN MEDIASTINAL TISSUE.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT.

No Microscopic Abnormality Observed :
BRAIN, FEMUR/KNEE JOINT, STERNUM, BONE MARROW

908 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

908 Continued from previous page

Gross Pathology :

LIVER :
DISCOLORATION, TAN, MOTTLED.SPLEEN :
SMALL.PENIS :
PARAPHIMOSIS.No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, moderate, coagulative, subcapsular.
HYPERPLASIA, BILE DUCT, mild.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
Minimal, FATTY CHANGE, NONZONAL.SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, minimal.CAUSE OF DEATH :
SACRIFICE BY DESIGN.PENIS :
EROSION/ULCER, moderate.PREPUTIAL GLANDS :
ECTASIA, mild.LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

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Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

908 Continued from previous page

Histopathology :

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM909 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.
THYMUS :
SMALL.No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
THYMUS :
DEPLETION/ATROPHY, LYMPHOID, severe.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXA Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

910 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
DISCOLORATION, TAN, MOTTLED, LEFT.
SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
DEPLETION/ATROPHY, LYMPHOID, mild, (periarteriolar lymphoid
sheath).
THYMUS :
NOT PRESENT.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref	Microscopic & Macroscopic Findings
911	Terminal Sacrifice Killed on Day : 29 Exposure Group : SD Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, severe.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings
-----912 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.
THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL913 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
DISCOLORATION, TAN, RIGHT, ACCESSORY.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

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Gross Pathology :

MESENTERIC LYMPH NODE :
SMALL.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, THYMUS, FEMUR/KNEE JOINT, STERNUM, POPLITEAL
LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
NECROSIS, FOCAL, moderate, coagulative, subcapsular.
HYPERPLASIA, BILE DUCT, mild.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, moderate.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

914 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
. Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

914 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

HYPERPLASIA, BILE DUCT, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

915

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

DISCOLORATION, LEFT, 1MM DIA.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

HYPERPLASIA, BILE DUCT, minimal.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

915 Continued from previous page

Histopathology :

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

916 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
DISCOLORATION, TAN, CAUDATE, 0.3 CM DIA.
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
NECROSIS, FOCAL, moderate, coagulative, subcapsular.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

THYMUS :
DEPLETION/ATROPHY, LYMPHOID, mild.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

916 Continued on the next page

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

916 Continued from previous page

Histopathology :

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL917 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
HYPERPLASIA, BILE DUCT, minimal.CAUSE OF DEATH :
SACRIFICE BY DESIGN.No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

918 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
HYPERPLASIA, BILE DUCT, minimal.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

SPLEEN :
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

919 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

919 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

919 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.

BONE MARROW :

HYPERPLASIA, GRANULOCYTIC, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, LYMPH NODE - POPLITEAL

920

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERPLASIA, BILE DUCT, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

920 Continued on the next page

Individual Animal Pathology Data

Group: IXB Treatment: 30 mg/kg Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

920 Continued from previous page

Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings
-----1101 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.
HYPERPLASIA, BILE DUCT, minimal.
Minimal, FATTY CHANGE, NONZONAL.SPLEEN :
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.CAUSE OF DEATH :
SACRIFICE BY DESIGN.LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1102 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
INFLAMMATION, SUBACUTE/CHRONIC, minimal.
HYPERPLASIA, BILE DUCT, minimal.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

MESENTERIC LYMPH NODE :
NOT PRESENT IN TISSUE SECTION.

BONE MARROW :
HYPERPLASIA, GRANULOCYTIC, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
BRAIN, THYMUS, FEMUR/KNEE JOINT, STERNUM

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref	Microscopic & Macroscopic Findings
1103	Terminal Sacrifice Killed on Day : 29 Exposure Group : SD Animal is signed off from necropsy
Gross Pathology :	
LIVER : LARGE.	
No Macroscopic Abnormality Observed : SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE	
Histopathology :	
LIVER : HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with cytoplasmic eosinophilic stippling. NECROSIS, INDIVIDUAL CELL, INCREASED, mild. MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.	
BONE MARROW : HYPERPLASIA, GRANULOCYTIC, minimal.	
CAUSE OF DEATH : SACRIFICE BY DESIGN.	
LYMPH NODE - POPLITEAL : NOT PRESENT IN TISSUE SECTION.	
No Microscopic Abnormality Observed : SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT, STERNUM	
1104	Terminal Sacrifice Killed on Day : 29 Exposure Group : SD Animal is signed off from necropsy
Gross Pathology :	
LIVER : LARGE.	

1104 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1104 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).
THYMUS :
CYST, EPITHELIAL, minimal.
BONE MARROW :
HYPERPLASIA, ERYTHROCYTIC, mild.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
LYMPH NODE - POPLITEAL

1105 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
SPLEEN :
SMALL.

1105 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1105 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
BONE MARROW :
HYPERPLASIA, ERYTHROCYTIC, mild.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.
LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM

1106 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

1106 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1106 Continued from previous page

Histopathology :

LIVER :

MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
HYPERPLASIA, BILE DUCT, minimal.

THYMUS :

CYST, EPITHELIAL, minimal.
DEPLETION/ATROPHY, LYMPHOID, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

1107 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

THYMUS :

SMALL.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

1107 Continued on the next page

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1107 Continued from previous page

Histopathology :

LIVER :
HYPERPLASIA, BILE DUCT, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
NECROSIS, FOCAL, minimal, coagulative, subcapsular.
Minimal, FATTY CHANGE, NONZONAL.
SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
THYMUS :
NOT PRESENT IN MEDIASTINAL TISSUE.
CAUSE OF DEATH :
SACRIFICE BY DESIGN.
LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW

1108 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.
THYMUS :
SMALL.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

1108 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1108 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

1109 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

1109 Continued on the next page

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1109 Continued from previous page

Histopathology :

LIVER :

HYPERPLASIA, BILE DUCT, minimal.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HEMATOPOIESIS, EXTRAMEDULLARY, minimal.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, moderate.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

BONE MARROW :

HYPERPLASIA, ERYTHROCYTIC, mild.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM

1110

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.
DISCOLORATION, TAN, LEFT, NECROTIC 6MM DIAM.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

1110 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIA Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1110 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, FOCAL, moderate, coagulative, subcapsular.
HYPERPLASIA, BILE DUCT, minimal.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, mild, (periarteriolar lymphoid
sheath).
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, moderate.

BONE MARROW :

HYPERPLASIA, GRANULOCYTIC, moderate.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1111 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :
BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW, LYMPH NODE - POPLITEAL

1112 Unscheduled Sacrifice
Duration of dosing-days: 5
Exposure Group : Early Deaths
Animal is signed off from necropsy

Gross Pathology :

ESOPHAGUS :
RUPTURE.

SKIN :
OTHER, ABSCESS AXILLA RIGHT.

1112 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1112 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :
LIVER

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, minimal, with
cytoplasmic eosinophilic stippling.
FATTY CHANGE, DIFFUSE, minimal.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, moderate, (periarteriolar
lymphoid sheath).

MESENTERIC LYMPH NODE :

DEPLETION/ATROPHY, LYMPHOID, mild.

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, severe.

BONE MARROW :

HYPERPLASIA, GRANULOCYTIC, moderate, with left shift
(immature).

CAUSE OF DEATH :

DOSING ACCIDENT.

No Microscopic Abnormality Observed :

BRAIN, FEMUR/KNEE JOINT, STERNUM, LYMPH NODE - POPLITEAL

1113

Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

1113 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1113 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

1114 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

SPLEEN :

SMALL.

No Macroscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
HYPERPLASIA, BILE DUCT, minimal.

1114 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1114 Continued from previous page

Histopathology :

LIVER :

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

1115 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
INFLAMMATION, SUBACUTE/CHRONIC, minimal.

SPLEEN :

DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).
HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

1115 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1115 Continued from previous page

Histopathology :

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

1116

Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

No Macroscopic Abnormality Observed :

LIVER, SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS,
FEMUR/KNEE JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

INFLAMMATION, SUBACUTE/CHRONIC, minimal.

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.

HYPERPLASIA, BILE DUCT, minimal.

NECROSIS, FOCAL, minimal, coagulative, subcapsular.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, mild.

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, severe.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

1116 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1116 Continued from previous page

Histopathology :

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW

1117 Terminal Sacrifice

Killed on Day : 29

Exposure Group : SD

Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.

NECROSIS, INDIVIDUAL CELL, INCREASED, mild.

MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.

HYPERPLASIA, BILE DUCT, minimal.

INFLAMMATION, SUBACUTE/CHRONIC, minimal.

Minimal, FATTY CHANGE, NONZONAL.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :

NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE JOINT,
STERNUM, BONE MARROW

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1118 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

No Macroscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :
HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.

CAUSE OF DEATH :
SACRIFICE BY DESIGN.

LYMPH NODE - POPLITEAL :
NOT PRESENT IN TISSUE SECTION.

No Microscopic Abnormality Observed :
SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, BONE MARROW

1119 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :
LARGE.

1119 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1119 Continued from previous page

Gross Pathology :

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, mild.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.
DEPLETION/ATROPHY, LYMPHOID, minimal, (periarteriolar
lymphoid sheath).

THYMUS :

NOT PRESENT IN MEDIASTINAL TISSUE.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

1120 Terminal Sacrifice
Killed on Day : 29
Exposure Group : SD
Animal is signed off from necropsy

Gross Pathology :

LIVER :

LARGE.

No Macroscopic Abnormality Observed :

SPLEEN, BRAIN, MESENTERIC LYMPH NODE, THYMUS, FEMUR/KNEE
JOINT, STERNUM, POPLITEAL LYMPH NODE

1120 Continued on the next page

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Animal Pathology Data

Group: XIB Treatment: 30/0 mg/kg (Recovery) Sex: MALES

Animal Ref Microscopic & Macroscopic Findings

1120 Continued from previous page

Histopathology :

LIVER :

HYPERTROPHY, PANLOBULAR, HEPATOCELLULAR, severe, with
cytoplasmic eosinophilic stippling.
NECROSIS, INDIVIDUAL CELL, INCREASED, minimal.
MITOTIC FIGURES, INCREASED, HEPATOCELLULAR, minimal.
HYPERPLASIA, BILE DUCT, minimal.

SPLEEN :

HEMATOPOIESIS, INCREASED, EXTRAMEDULLARY, minimal.

THYMUS :

DEPLETION/ATROPHY, LYMPHOID, moderate.

CAUSE OF DEATH :

SACRIFICE BY DESIGN.

No Microscopic Abnormality Observed :

BRAIN, MESENTERIC LYMPH NODE, FEMUR/KNEE JOINT, STERNUM,
BONE MARROW, LYMPH NODE - POPLITEAL

Appendix L
Individual Total Cell Counts

INDIVIDUAL TOTAL CELL COUNTS

EXPLANATORY NOTES

ABBREVIATIONS:

NP - not taken or not performed

FOOTNOTES:

- c Animal was sacrificed *in extremis* prior to this evaluation and tissue was not analyzed.
 d Count inadvertently not performed.
 e Unable to confirm results.

NOTES:

$$\text{Organ Weight as Percent of Body Weight} = \frac{\text{Organ Weight (g)}}{\text{Final Body Weight (g)}} \times 100$$

$$\begin{array}{l} \text{Total Number of} \\ \text{Organ Cells} \\ (\times 10^3) \end{array} = \frac{\text{Organ Weight (g)}}{\text{Half Organ Weight (g)}} \times \frac{\text{Organ Cell} \\ \text{Suspension Volume} \\ (\text{mL})} \times \frac{\text{Number of} \\ \text{Cells in Half} \\ \text{Organ} \\ (\times 10^6 \text{ cells/mL})}{- 100}$$

Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Total Cell Counts							
Animal Number	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)	Total Number of Spleen Cells (x10 ⁶)
Male, Group I - 0 mg/kg							
101	31.00	0.106	0.3419	0.046	5.5	10.06	1.27
102	34.70	0.110	0.3170	0.052	5.5	7.54	0.88
103	33.40	0.124	0.3713	0.060	5.3	12.04	1.32
104	32.50	0.111	0.3415	0.056	5.2	16.00	1.65
105	33.00	0.091	0.2758	0.050	5.5	10.89	1.09
106	31.20	0.114	0.3654	0.058	5.3	8.86	0.92
107	31.90	0.128	0.4013	0.065	5.4	10.94	1.16
108	30.30	0.107	0.3531	0.056	5.4	8.80	0.91
109	32.70	0.112	0.3425	0.048	5.4	7.37	0.93
110	33.90	0.119	0.3510	0.061	5.5	13.97	1.50
111	32.60	0.145	0.4448	0.077	4.4	25.08	2.08
112	33.90	0.122	0.3599	0.054	5.5	13.42	1.67
113	34.60	0.117	0.3382	0.059	5.0	14.14	1.40
114	33.70	0.115	0.3412	0.061	5.5	13.86	1.44
115	31.50	0.107	0.3397	0.051	5.5	10.78	1.24
116	34.20	0.111	0.3246	0.059	4.5	9.40	0.80
117 ^a	NP	NP	NP	NP	NP	NP	NP
118	34.50	0.099	0.2870	0.051	5.4	^b	^b
119	34.30	0.152	0.4431	0.076	5.4	13.53	1.46
120	33.50	0.138	0.4119	0.061	5.4	12.60	1.54

439

Animal Number	Individual Total Cell Counts						
	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)	Total Number of Spleen Cells (x10 ⁸)
Male, Group III - 0.3 mg/kg							
301	35.10	0.150	0.4274	0.070	5.5	14.74	1.74
302	36.10	0.108	0.2992	0.059	5.5	10.94	1.10
303	37.40	0.104	0.2781	0.047	5.5	11.88	1.45
304	37.20	0.188	0.5054	0.085	5.5	14.46	1.76
305	34.50	0.117	0.3391	0.051	5.5	10.18	1.28
306	33.10	0.102	0.3082	0.046	5.3	10.12	1.19
307	31.30	0.095	0.3035	0.049	5.5	11.33	1.21
308	33.70	0.129	0.3828	0.059	5.5	9.62	1.16
309	29.90	0.112	0.3746	0.047	5.3	8.20	1.04
310	32.80	0.130	0.3963	0.063	5.4	6.88	0.77
311	36.60	0.114	0.3115	0.057	5.4	16.34	1.76
312	33.40	0.136	0.4072	0.065	5.5	18.20	2.09
313	31.50	0.076	0.2413	0.043	5.7	6.16	0.62
314	32.20	0.135	0.4193	0.075	5.7	21.84	2.24
315	33.80	0.152	0.4497	0.075	5.6	17.32	1.97
316	31.60	0.099	0.3133	0.045	5.5	7.10	0.86
317	30.20	0.060	0.1987	0.022	5.4	3.02	0.44
318	30.10	0.106	0.3522	0.046	5.5	8.25	1.05
319	30.90	0.060	0.1942	0.023	4.5	5.56	0.65
320	36.70	0.151	0.4114	0.071	6.0	13.20	1.68

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Animal Number	Individual Total Cell Counts						
	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)	Total Number of Spleen Cells (x10 ⁵)
Male, Group V - 1 mg/kg							
501	33.30	0.088	0.2643	0.050	5.0	16.50	1.45
502	34.00	0.135	0.3971	0.068	5.5	16.66	1.82
503	33.50	0.090	0.2687	0.048	5.6	7.42	0.78
504	33.30	0.108	0.3243	0.054	5.5	13.26	1.46
505	33.00	0.092	0.2788	0.048	5.4	11.55	1.20
506	35.10	0.115	0.3276	0.058	5.5	12.60	1.37
507	31.30	0.107	0.3419	0.056	5.3	14.08	1.43
508	33.90	0.103	0.3038	0.054	5.3	12.43	1.26
509	33.50	0.112	0.3343	0.049	5.2	13.42	1.60
510	32.30	0.078	0.2415	0.031	5.0	9.02	1.13
511	36.80	0.081	0.2201	0.037	5.0	13.80	1.51
512	36.00	0.118	0.3278	0.055	5.6	10.06	1.21
513	35.90	0.106	0.2953	0.062	5.7	12.16	1.19
514	31.40	0.088	0.2803	0.041	5.7	11.72	1.43
515	35.70	0.124	0.3473	0.059	5.7	11.22	1.34
516	32.10	0.088	0.2741	0.041	5.5	8.08	0.95
517	32.20	0.093	0.2888	0.048	5.6	11.06	1.20
518	35.00	0.114	0.3257	0.054	5.7	13.04	1.57
519	30.70	0.109	0.3550	0.050	5.0	11.55	1.26
520	36.40	0.122	0.3352	0.060	5.8	14.36	1.69

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Animal Number	Individual Total Cell Counts							Total Number of Spleen Cells (x10 ⁵)
	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)		
Male, Group VII - 10 mg/kg								
701	31.80	0.078	0.2453	0.040	5.5	11.72	1.26	
702	30.90	0.081	0.2621	0.043	5.3	9.18	0.92	
703	29.10	0.042	0.1443	0.014	5.0	2.86	0.43	
704	28.20	0.053	0.1879	0.027	5.2	5.61	0.57	
705	28.40	0.058	0.2042	0.031	5.4	5.17	0.52	
706	27.30	0.072	0.2637	0.032	5.5	4.51	0.56	
707	24.70	0.054	0.2186	0.023	5.5	3.90	0.50	
708	29.70	0.069	0.2323	0.031	5.4	5.39	0.65	
709	26.60	0.045	0.1692	0.020	5.1	2.97	0.34	
710	27.20	0.076	0.2794	0.034	5.4	5.88	0.71	
711	26.80	0.066	0.2463	0.032	5.4	7.15	0.80	
712	28.90	0.082	0.2837	0.030	5.0	6.93	0.95	
713	31.60	0.083	0.2627	0.040	5.6	8.69	1.01	
714	29.60	0.128	0.4324	0.066	6.0	9.79	1.14	
715	27.40	0.053	0.1934	0.026	5.4	5.66	0.62	
716	27.00	0.052	0.1926	0.024	5.7	4.18	0.52	
717	25.20	0.065	0.2579	0.029	5.4	5.78	0.70	
718	31.00	0.064	0.2065	0.025	5.5	4.46	0.63	
719	30.00	0.054	0.1800	0.028	5.7	4.29	0.47	
720	26.90	0.046	0.1710	0.023	5.4	4.29	0.46	

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Animal Number	Individual Total Cell Counts							Total Number of Spleen Cells (x10 ⁶)
	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)		
Male, Group IX - 30 mg/kg								
901	26.20	0.066	0.2519	0.035	5.0	4.78	0.45	
902	24.30	0.034	0.1399	0.014	5.5	1.43	0.19	
903	23.70	0.021	0.0886	0.016	5.7	3.14	0.23	
904	24.20	0.031	0.1281	0.016	5.5	0.82	0.09	
905	24.10	0.037	0.1535	0.017	5.5	1.04	0.12	
906 ^a	NP	NP	NP	NP	NP	NP	NP	
907	21.80	0.026	0.1193	0.013	5.5	1.48	0.16	
908	25.40	0.037	0.1457	0.034	5.5	3.85	0.23	
909	23.50	0.038	0.1617	0.015	5.5	2.36	0.33	
910	27.00	0.065	0.2407	0.036	5.5	4.73	0.47	
911	25.30	0.042	0.1660	0.020	5.3	1.87	0.21	
912	22.00	0.020	0.0909	0.013	5.5	1.92	0.16	
913	28.30	0.072	0.2544	0.038	5.7	6.44	0.70	
914	28.40	0.082	0.2887	0.036	5.5	9.84	1.23	
915	32.40	0.102	0.3148	0.041	5.8	7.04	1.02	
916	23.30	0.049	0.2103	0.026	5.5	4.18	0.43	
917	29.40	0.068	0.2313	0.032	5.4	5.72	0.66	
918	28.00	0.067	0.2393	0.029	5.3	8.08	0.99	
919	27.10	0.067	0.2472	0.031	5.2	7.15	0.80	
920	29.50	0.068	0.2305	0.033	5.0	7.04	0.73	

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Total Cell Counts							
Animal Number	Final Body Weight (g)	Spleen Weight (g)	Spleen Weight (% Body Weight)	Half Spleen Weight (g)	Spleen Cell Suspension Volume (mL)	Number of Cells in Half Spleen (x 10 ⁶ cells/mL)	Total Number of Spleen Cells (x10 ³)
Male, Group XI - 30/0 mg/kg (Recovery)							
1101	31.30	0.091	0.2907	0.046	5.5	7.04	0.77
1102	39.50	0.107	0.2709	0.053	5.5	10.84	1.20
1103	32.20	0.069	0.2143	0.038	5.5	5.56	0.56
1104	30.40	0.086	0.2829	0.044	5.5	10.84	1.17
1105	34.40	0.081	0.2355	0.044	5.5	9.13	0.92
1106	27.20	0.058	0.2132	0.030	5.5	4.02	0.43
1107	27.10	0.060	0.2214	0.028	5.6	5.06	0.61
1108	32.30	0.067	0.2074	0.030	5.5	4.29	0.53
1109	34.70	0.104	0.2997	0.049	5.5	11.33	1.32
1110	24.90	0.091	0.3655	0.044	5.0	8.36	0.86
1111	30.80	0.064	0.2078	0.033	5.5	5.06	0.54
1112 ^a	NP	NP	NP	NP	NP	NP	NP
1113	34.70	0.133	0.3833	0.053	5.4	8.96	1.21
1114	30.40	0.048	0.1579	0.026	5.7	2.42	0.25
1115	31.60	0.086	0.2722	0.043	5.5	7.37	0.81
1116	26.90	0.062	0.2305	0.030	5.6	3.63	0.42
1117	27.50	0.072	0.2618	0.039	5.4	4.95	0.49
1118	28.60	0.065	0.2273	0.031	6.0	4.90	0.62
1119	26.20	0.052	0.1985	0.029	5.5	2.36	0.23
1120	28.70	0.055	0.1916	0.024	6.0	^b	^b

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Total Cell Counts						
Animal Number	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus (x 10 ⁶ cells/mL)	Total Number of Thymus Cells (x10 ⁶)
Male, Group I - 0 mg/kg						
101	0.071	0.2290	0.035	5.5	2.48	0.28
102	0.052	0.1499	0.023	6.0	3.80	0.52
103	0.037	0.1108	0.020	5.5	3.80	0.39
104	0.058	0.1785	0.032	5.5	11.00	1.10
105	0.047	0.1424	0.024	5.5	4.29	0.46
106	0.051	0.1635	0.026	5.5	5.61	0.61
107	0.041	0.1285	0.021	5.5	3.19	0.34
108	0.043	0.1419	0.024	5.5	5.88	0.58
109	0.057	0.1743	0.028	5.5	7.86	0.88
110	0.050	0.1475	0.028	5.8	4.34	0.45
111	0.052	0.1595	0.017	5.5	3.30	0.56
112	0.074	0.2183	0.036	5.7	6.66	0.78
113	0.043	0.1243	0.019	5.0	2.42	0.27
114	0.035	0.1039	0.019	5.4	4.68	0.47
115	0.061	0.1937	0.032	6.0	7.42	0.85
116	0.044	0.1287	0.020	5.4	4.02	0.48
117 ^a	NP	NP	NP	NP	NP	NP
118	0.053	0.1536	0.029	5.4	8.36	0.83
119	0.044	0.1283	0.024	5.5	3.85	0.39
120	0.045	0.1343	0.026	5.5	6.93	0.66

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Animal Number	Individual Total Cell Counts					
	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus ($\times 10^6$ cells/mL)	Total Number of Thymus Cells ($\times 10^6$)
Male, Group III - 0.3 mg/kg						
301	0.052	0.1481	0.022	5.5	1.10	0.14
302	0.043	0.1191	0.017	5.5	1.21	0.17
303	0.047	0.1257	0.024	5.5	7.54	0.81
304	0.048	0.1290	0.020	5.5	4.12	0.54
305	0.038	0.1101	0.017	5.5	3.58	0.44
306	0.034	0.1027	0.020	5.5	7.48	0.70
307	0.060	0.1917	0.028	5.5	8.36	0.99
308	0.049	0.1454	0.019	5.4	7.42	1.03
309	0.058	0.1940	0.030	5.5	5.88	0.63
310	0.049	0.1494	0.025	5.5	8.58	0.92
311	0.033	0.0902	0.016	5.0	5.06	0.52
312	0.040	0.1198	0.022	5.5	6.98	0.70
313	0.022	0.0698	0.011	5.4	3.14	0.34
314	0.045	0.1398	0.024	6.0	5.34	0.60
315	0.049	0.1450	0.020	5.5	3.08	0.42
316	0.054	0.1709	0.035	5.3	5.50	0.45
317	0.057	0.1887	0.025	5.5	5.50	0.69
318	0.031	0.1030	0.012	5.0	6.32	0.82
319	0.051	0.1650	0.025	5.4	5.88	0.65
320	0.048	0.1308	0.027	5.0	5.12	0.46

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Total Cell Counts						
Animal Number	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus ($\times 10^6$ cells/mL)	Total Number of Thymus Cells ($\times 10^6$)
Male, Group V - 1 mg/kg						
501	0.037	0.1111	0.018	5.5	2.58	0.29
502	0.074	0.2176	0.039	5.3	10.67	1.07
503	0.045	0.1343	0.022	5.5	6.00	0.68
504	0.069	0.2072	0.041	5.5	16.00	1.48
505	0.036	0.1091	0.016	5.5	5.34	0.66
506	0.062	0.1766	0.035	5.5	7.59	0.74
507	0.056	0.1789	0.027	5.5	11.44	1.31
508	0.054	0.1593	0.026	5.4	7.81	0.88
509	0.032	0.0955	0.009	5.5	3.02	0.59
510	0.040	0.1238	0.020	5.2	5.17	0.54
511	0.047	0.1277	0.017	5.0	5.83	0.81
512	0.049	0.1361	0.025	5.5	5.34	0.58
513	0.045	0.1253	0.024	5.8	9.74	1.06
514	0.037	0.1178	0.019	5.8	4.84	0.55
515	0.032	0.0896	0.016	5.4	4.90	0.53
516	0.046	0.1433	0.029	5.7	0.38	0.03
517	0.055	0.1708	0.027	5.5	9.35	1.05
518	0.059	0.1686	0.032	6.0	11.22	1.24
519	0.038	0.1238	0.020	5.0	1.38	0.13
520	0.059	0.1621	0.026	5.3	6.16	0.74

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Individual Total Cell Counts

Animal Number	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus ($\times 10^6$ cells/mL)	Total Number of Thymus Cells ($\times 10^6$)
Male, Group VII - 10 mg/kg						
701	0.029	0.0912	0.014	5.5	2.80	0.32
702	0.039	0.1262	0.021	5.5	0.72	0.07
703	0.016	0.0550	0.009	5.5	2.48	0.24
704	0.035	0.1241	0.019	5.5	5.06	0.51
705	0.021	0.0739	0.012	5.3	0.55	0.05
706	0.035	0.1282	0.015	5.4	4.51	0.57
707	0.013	0.0526	0.006	5.4	0.11	0.01
708	0.030	0.1010	0.009	5.7	0.82	0.16
709	0.010	0.0376	0.005	5.4	0.16	0.02
710	0.026	0.0956	0.009	5.3	1.54	0.24
711	0.014	0.0522	0.007	5.5	2.20	0.24
712	0.037	0.1280	0.019	5.8	6.71	0.76
713	0.017	0.0538	0.012	5.5	1.26	0.10
714	0.042	0.1419	0.020	5.5	8.08	0.93
715	0.020	0.0730	0.009	5.7	0.00	0.00
716	0.023	0.0852	0.011	5.2	4.24	0.46
717	0.026	0.1032	0.012	5.5	0.94	0.11
718	0.019	0.0613	0.005	5.8	0.22	0.05
719	0.027	0.0900	0.014	5.2	1.21	0.12
720	0.019	0.0706	0.011	5.5	0.06	0.01

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Ammonium Perfluorooctanoate:
28-Day Immunotoxicity Study in Male Mice

DuPont-18318

Individual Total Cell Counts						
Animal Number	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus (x 10 ⁶ cells/mL)	Total Number of Thymus Cells (x10 ⁵)
Male, Group IX - 30 mg/kg						
901	0.009	0.0344	0.006	5.5	0.06	0.00
902	0.022	0.0905	0.009	5.5	0.06	0.01
903	0.017	0.0717	0.002	5.3	0.00	0.00
904	0.028	0.1157	0.010	5.0	0.06	0.01
905	0.023	0.0954	0.008	5.5	0.00	0.00
906 ^a	NP	NP	NP	NP	NP	NP
907	0.015	0.0688	0.006	5.5	0.11	0.02
908	0.065	0.2559	0.013	5.5	0.55	0.15
909	0.009	0.0383	0.003	5.5	0.16	0.03
910	0.027	0.1000	0.009	5.3	0.33	0.05
911	0.016	0.0632	0.008	5.3	0.00	0.00
912	0.014	0.0636	0.009	5.5	0.00	0.00
913	0.025	0.0883	0.016	5.5	0.16	0.01
914	0.030	0.1056	0.018	5.7	3.08	0.29
915	0.039	0.1204	0.019	5.5	3.52	0.40
916	0.023	0.0987	0.011	5.0	0.00	0.00
917	0.039	0.1327	0.019	5.8	4.56	0.54
918	0.029	0.1036	0.014	5.4	1.82	0.20
919	0.026	0.0959	0.013	5.7	1.87	0.21
920	0.014	0.0475	0.006	5.5	0.16	0.02

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Individual Total Cell Counts

Animal Number	Thymus Weight (g)	Thymus Weight (% Body Weight)	Half Thymus Weight (g)	Thymus Cell Suspension Volume (mL)	Number of Cells in Half Thymus ($\times 10^6$ cells/mL)	Total Number of Thymus Cells ($\times 10^6$)
Male, Group XI - 30/0 mg/kg (Recovery)						
1101	0.027	0.0863	0.012	5.5	0.99	0.12
1102	0.048	0.1215	0.019	5.5	2.75	0.38
1103	0.031	0.0963	0.018	5.5	3.63	0.34
1104	0.028	0.0921	0.016	5.5	0.00	0.00
1105	0.020	0.0581	0.010	5.5	0.82	0.09
1106	0.026	0.0956	0.014	5.5	0.16	0.02
1107	0.018	0.0664	0.012	5.5	0.06	0.00
1108	0.013	0.0402	0.007	5.4	0.00	0.00
1109	0.032	0.0922	0.012	5.0	0.00	0.00
1110	0.014	0.0562	0.006	5.5	0.06	0.01
1111	0.032	0.1039	0.016	5.3	2.42	0.26
1112 ^a	NP	NP	NP	NP	NP	NP
1113	0.037	0.1066	0.023	5.5	3.19	0.28
1114	0.045	0.1480	0.023	5.5	0.00	0.00
1115	0.025	0.0791	0.013	5.0	3.52	0.34
1116	0.034	0.1264	0.021	5.0	0.06	0.00
1117	0.023	0.0836	0.014	5.5	0.77	0.07
1118	0.026	0.0909	0.015	5.3	0.50	0.05
1119	0.016	0.0611	0.009	5.2	0.00	0.00
1120	0.020	0.0697	0.011	5.3	0.00 _c	0.00 _c

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Appendix M
Electron Microscopy Report from Experimental Pathology Laboratories, Inc.



Experimental Pathology Laboratories, Inc.

DUPONT/HASKELL LABORATORY

DUPONT STUDY NUMBER: 18318
WORK REQUEST NUMBER: 16160
SERVICE CODE: 1546

AMMONIUM PERFLUOROOCTANOATE: 28-DAY
IMMUNOTOXICITY STUDY IN MALE MICE

ELECTRON MICROSCOPY

PATHOLOGY REPORT
EPL PROJECT NO. 129-080

Submitted to:

DuPont/Haskell Laboratory for Health
and Environmental Science
Stine Haskell Research Center
1090 Elkton Road
Newark, DE 19711

Submitted by:

Experimental Pathology Laboratories, Inc.
P.O. Box 12766
Research Triangle Park, NC 27709

October 25, 2006



Experimental Pathology Laboratories, Inc.

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Experimental Pathology Laboratories, Inc.

DuPont-18318

DUPONT/HASKELL LABORATORY

DUPONT STUDY NUMBER: 18318
 WORK REQUEST NUMBER: 16160
 SERVICE CODE: 1546

EPL PROJECT NUMBER 129-080

AMMONIUM PERFLUOROOCTANOATE: 28-DAY
 IMMUNOTOXICITY STUDY IN MALE MICE

ELECTRON MICROSCOPY

PATHOLOGY SUMMARY

The in-life phase of this study was conducted at Haskell Laboratory for Health and Environmental Sciences, E.I. duPont de Nemours and Company, Newark, Delaware. The objective of this study is to evaluate the potential of ammonium perfluorooctanoate to suppress the primary humoral immune response to sheep red blood cells (SRBC) when administered by oral gavage to male mice for at least 28 days. The table below summarizes the experimental design:

Experimental Design

Group	Number/Group	Daily Dosage (mg/kg) ^a	Dose Solution Concentration (mg/mL) ^b
I	20	0 (Control)	0
III	20	0.3	0.03
V	20	1	0.1
VII	20	10	1
IX	20	30	3
XI	20	30 (Recovery) ^c	3

^a Weight of test substance/kg of animal body weight.
^b Solutions will be adjusted for purity (20%)
^c The recovery group (XI) will be dosed with 30 mg/kg of test substance through test day 23. Following injection of SRBC on test day 24, group XI will be dosed with NANOpure® water, at a volume of 10 mL/kg of body weight, until sacrifice.



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Electron microscopic evaluation of samples of liver from designated animals was added to clarify light microscopic histopathological findings in the liver. Samples of liver from two male mice in Group I (Control) and two male mice in Group V (1mg/kg) that were fixed in formalin were submitted for transmission electron microscopy. The samples that were processed and evaluated are listed in the following table:

TEM Number	Tissue	Animal ID	Group	TEM Negative Number (evaluated)
G06-403	Liver	103	I (Control)	06-1906 to 06-1908
G06-404	Liver	104	I (Control)	06-1909 to 06-1911
G06-405	Liver	503	V (1mg/kg)	06-1912 to 06-1914
G06-406	Liver	504	V (1 mg/kg)	06-1915 to 06-1917

Samples, cut into small cubes, were preserved in formalin and shipped to Experimental Pathology Laboratories, Inc (EPL®), Research Triangle Park, NC. The samples were transferred to the Laboratory for Advanced Electron and Light Optical Methods (LAELOM) at the College of Veterinary Medicine, North Carolina State University, Raleigh, NC for further processing and examination by transmission electron microscopy.

The samples were washed in buffer, post-fixed in 1% osmium tetroxide in the phosphate buffer, dehydrated in an ethanolic series culminating in acetone, and infiltrated with Spurr epoxide resin. The resulting blocks were trimmed and semithin sections (approximately 0.5 µm thick) were cut, mounted on glass slides, and stained with 1% toluidine blue O in 1% sodium borate prior to being examined with a light microscope. The slides of semithin sections were sent to Experimental Pathology Laboratories for evaluation by the Pathologist, Dr. Henry Wall. When the slides were returned to the LAELOM, areas of interest for ultrathin sectioning were trimmed in the corresponding tissue blocks.

Ultrathin (80-90 nm thick) sections were cut from the selected trimmed blocks and placed on 200 mesh copper grids before being stained with uranyl acetate and lead citrate. For each sample, two survey photographs (final print magnification 5,600x) were taken. One higher magnification (final print magnification 22,400x) was taken of each sample to show more cellular detail.



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RESULTS**TEM #G06-403 (Animal 103, Control, Liver, TEM Neg # 06-1906 to 06-1908)**

Two low magnification images (06-1906 and 06-1907; 5,600X) show portions of adjacent hepatocytes as the primary cell type in the image. Electron-dense areas that are predominantly mitochondria and rough endoplasmic reticulum are separated by intervening areas that contain clustered electron-dense granules against an electron-lucent background. The electron-dense granules are glycogen deposits. A few fat vacuoles that appear as partially electron-lucent smooth contoured vacuoles, are scattered in the cytoplasm of a few hepatocytes. The higher magnification image (06-1908; 22,400X) shows greater detail of mitochondria, rough endoplasmic reticulum, glycogen deposits, and a few membranous cytoplasmic profiles.

TEM #G06-404 (Animal 104, Control, Liver, TEM Neg # 06-1909 to 06-1911)

The low magnification images (06-1909 and 06-1910; 5,600X) show similar adjacent hepatocytes with electron-dense areas that are primarily mitochondria and endoplasmic reticulum and lighter (less electron-dense) areas with electron-dense granularity. The high magnification image (06-1911; 22,400X) shows the electron-dense granularity to be glycogen deposits. This image also shows greater detail of the mitochondria and rough endoplasmic reticulum that are relatively electron-dense as compared to the glycogen filled areas. All images also show a few smooth contoured lipid vacuoles within hepatocytic cytoplasm. Two deeply electron-dense membrane-bound bodies in the lower right quadrant are considered lysosomes. The core of these bodies have uniform electron-dense granularity compared to the prominent foldings of the cristae in mitochondria.

TEM #G06-405 (Animal 503, Group V/1mg/kg, Liver, TEM Neg # 06-1912 to 06-1914)

Both low magnification images (06-1912 and 06-1913; 5,600X) contain adjacent hepatocytes that have numerous mitochondria rather uniformly distributed in the cytoplasm. Pale granular areas surrounding mitochondria contain glycogen deposits. The glycogen deposits are best detailed in the portion of a hepatocyte in the lower portion of image 06-1913. The higher magnification image (06-1914; 22,400X) shows more detail of mitochondria, lipid vacuoles, glycogen and endoplasmic reticulum. No peroxisomes are clearly defined in the hepatocyte images from this animal.



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TEM #G06-406 (Animal 504, Group V/1mg/kg, Liver, TEM Neg # 06-1915 to 06-1917)

Electron-dense areas that are primarily mitochondria are the predominant feature other than the nucleus in the low magnification images (06-1915 and 06-1916; 5,600X). The paler and granular background is glycogen. A few small smooth-contoured lipid vacuoles are also scattered in a few hepatocytes. The high magnification image (06-1917; 22,400X) shows the detail of mitochondria, rough endoplasmic reticulum, and part of a nucleus. A few lipid vacuoles are also present. No structures that can be clearly defined as peroxisomes are noted.

CONCLUSIONS

At the 1 mg/kg dose of ammonium pefluorooctanoate an increase in peroxisomes was not observed. However, many organelles could not be clearly identified due to poor ultrastructural detail, which was likely the result of formalin fixation. Therefore, definitive conclusions on peroxisomal numbers in treated groups relative to controls could not be drawn.

A handwritten signature in cursive script that reads 'Henry G. Wall'.

HENRY G. WALL, DVM, PhD
Diplomate, ACVP
Veterinary Pathologist

25 October 2006

Date

HGW/dc



Experimental Pathology Laboratories, Inc.

QUALITY ASSURANCE FINAL CERTIFICATION

Study Title: Ammonium Perfluorooctanoate: 28-Day Immunotoxicity Study in Male Mice

Client Study: DuPont-18318; Service Code 1546; EPL Project Coordinator: Dr. Henry Wall
Work Request 16160

EPL Project Number: 129-080

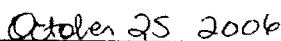
EPL Pathologist: Dr. Henry Wall

The following aspects of this study were inspected by the Quality Assurance Unit of Experimental Pathology Laboratories, Inc. Dates inspections were performed and findings reported to the EPL Project Coordinator and Management are indicated below.

Area Inspected	Dates	
	Inspection	Reporting
EPL Project Sheets	May 30, 2006	May 30, 2006
Data Review	June 14, 2006	June 14, 2006
Draft Pathology Report	June 27, 2006; July 24, 2006	June 27, 2006; July 24, 2006
Final Pathology Report	October 25, 2006	October 25, 2006

Date reported to Study Director/Management: October 25, 2006

Date of last quarterly facility inspection: October 2006


EPL Quality Assurance Unit
Date

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