GLP REPORT

TEST FACILITY

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CONFIDENTIAL

STUDY TITLE

Two Week Toxicity Study in the Rat, Parenteral Administration of Two Extracts

TEST ARTICLE NAME

Occlusin® 500 Artificial Embolization Device

TEST ARTICLE IDENTIFICATION

Batch: FL288

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Summary

The test article, Occlusin® 500 Artificial Embolization Device, Batch: FL288, was extracted in 0.9% sodium chloride USP solution (SC) and sesame oil, NF (SO). These extracts were evaluated for subchronic toxicity in the rat. A separate group of animals was similarly prepared, without test article, to serve as vehicle controls.

Animals were identified, weighed and randomly assigned to a treatment group such that 7 male and 7 female rats were assigned to either the test or control group. The animals received daily intravenous injections of the SC test extract at 10.0 ml/kg body weight for 14 consecutive days. The same animals received intraperitoneal injections of the SO test extract at 5.0 ml/kg body weight on days 1, 4, 8 and 12. Animals were observed immediately after injection for signs of behavioral change or toxicity. General health observations were conducted daily. Detailed health examinations were conducted weekly. Body weights were recorded prior to the first dose, and on days 8, 14 (pre-fasted weight) and 15 (fasted weight). At termination, blood specimens were collected for hematology and clinical chemistry analysis. A necropsy was conducted and selected organs were excised, weighed, and processed histologically. Body weights, hematology values, clinical chemistry values, organ weights and organ/body weight ratios were analyzed statistically.

Under the conditions of this study, there was no significant evidence of systemic toxicity from the test extract injected intravenously into rats. Daily clinical observations, body weights, necropsy findings, organ weights and organ/body weight ratios were judged to be within acceptable limits and were similar between and within test and control treatment groups. There were no changes in histopathology, hematology values or clinical chemistry values in either male or female rats that were considered to be related to treatment with the test article extract.

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10-29-07
Date Completed

Statement of GLP Compliance

This study was conducted in accordance with the provisions of the FDA Good Laboratory Practice (GLP) Regulations (21 CFR, Part 58).

There were no deviations from the protocol, standard operating procedures or the GLP Regulations which were judged to have had any significant impact on the validity or interpretation of the data.

All laboratory data has been accurately recorded and verified, as indicated by the signature below.

Study Director: Michelle E. Longstreet — 10-29-07

Michelle E. Longstreet, B.S. — Date

1. Introduction

Purpose
The purpose of the study was to evaluate the potential for an extract of the test article to cause systemic toxicity following repeated intravenous injections in rats.

Dates
The test article was received on May 30, 2007 and June 27, 2007. The animals were first dosed on August 2, 2007, and the terminal procedures were performed on August 16, 2007.

GLP Compliance
The study initiated by protocol signature on June 11, 2007, was conducted in accordance with the provisions of the FDA Good Laboratory Practice (GLP) Regulations, 21 CFR 58. A Statement of Quality Assurance Activities was issued with this report.

Duplication of Experimental Work
By signature on the protocol, the sponsor confirmed that the conduct of this study did not unnecessarily duplicate previous experiments.

2. Materials

The test article provided by the sponsor was identified and handled as follows:

Test Article Name:	Occlusin® 500 Artificial Embolization Device
Test Article Identification:	Batch: FL288
Stability Testing:	In progress (per sponsor)
Expiration Date:	Stable for duration of intended testing (per sponsor)
Strength, Purity and Composition:	The sponsor elects not to provide this information to NAMSA and takes full responsibility for this data and can supply this information if requested to do so.
Physical Description of the Test Article:	White beads
Storage Conditions:	Refrigerate
Vehicle:	0.9% sodium chloride USP solution (SC) Sesame oil, NF (SO)

Preparation: The test article was prepared based on the sponsor supplied surface area of 44 cm^2 per sample. Based on a ratio of 120 cm^2:20 ml (mass of test article to volume of vehicle), a 484.0 cm^2 portion of the test article was covered with 81 ml of the SC. A 264 cm2 portion of the test article was covered with 44 ml of the SO. A 7.3 ml portion of extract was added to each vial in order to remove the test article from the original container. The test article was extracted with agitation at 37°C for 72 hours. The vehicle without test article was similarly prepared to serve as the control. Fresh test and control preparations were prepared for each day of dosing. Prior to each dose, the appropriate vials were removed from the freezer and thawed at room temperature.

Condition of Extract:

SC Test: clear with particulates	SC Control: clear
SO Test: clear with particulates	SO Control: clear

3. Test System

Test System

Species:	Rat (*Rattus norvegicus*)
Strain:	Hla®:(SD)CVF®
Source:	Hilltop Lab Animals, Inc.
Sex:	14 male, 14 female
Body Weight Range:	148 grams to 234 grams at first treatment
Age:	6 weeks at first treatment
Acclimation Period:	6 days
Number of Animals:	Twenty-eight
Identification Method:	Ear tag

Justification of Test System

Preparation and testing of extracts is recognized as an acceptable method for evaluating potential leachables from solid materials. The laboratory rat is suggested in various regulatory guidelines as an acceptable model for evaluating the intravenous toxicity of various materials.

4. Animal Management

Husbandry:	Conditions conformed to Standard Operating Procedures that are based on the "Guide for the Care and Use of Laboratory Animals."
Food:	A commercially available rodent feed was provided daily.
Water:	Potable water was provided *ad libitum* through species appropriate water containers or delivered through an automatic watering system.
Contaminants:	Reasonably expected contaminants in feed or water supplies did not have the potential to influence the outcome of this test.
Housing:	Animals were group housed in stainless steel suspended cages identified by a card indicating the lab number, animal number, test code, sex, animal code and first treatment date.
Environment:	The room temperature was monitored daily. The temperature range for the room was within a range of 64-79°F.
	The room humidity was monitored daily. The humidity range for the room was 30-70%.
	The light cycle was controlled using an automatic timer (12 hours light, 12 hours dark).
Accreditation:	NAMSA is an AAALAC International accredited facility and is registered with the United States Department of Agriculture. Additionally, NAMSA maintains an approved Animal Welfare Assurance on file with the National Institutes of Health, Office for Laboratory Animal Welfare.
Personnel:	Associates involved were appropriately qualified and trained.
Selection:	Only healthy, previously unused animals were selected.

Sedation, Analgesia or Anesthesia:	Sedation, analgesia or anesthesia was necessary during the routine course of this procedure.
Veterinary Care:	In the unlikely event that an animal became injured, ill, or moribund, care was conducted in accordance with current veterinary medical practice. If warranted for humane reasons, euthanasia was conducted in accordance with the current report of the American Veterinary Medical Association's Panel on Euthanasia. The objective of the study will be given due consideration in any decision and the study sponsor will be advised.
IACUC:	This procedure has been approved by NAMSA Institutional Animal Care and Use Committees (IACUC), and is reviewed at least annually by the same committees. Any significant changes to this procedure were approved by the IACUC prior to conduct.

5. Method

Prior to the first dose, each rat was weighed, identified and randomly assigned to each treatment group (test, control) as shown below:

Number of Animals Injected			
Test		Control	
Male	Female	Male	Female
7	7	7	7

Individual pretreatment body weights were within 20% of the group mean for each sex.

The test animals received an intravenous injection of the SC test article extract once each day for 14 consecutive days. The SC test extract was injected via the lateral tail vein at a dose of 10.0 ml/kg. The same animals received an intraperitoneal injection of the SO test extract at a dose of 5.0 ml/kg body weight on days 1, 4, 8 and 12. The individual daily dose was based on the weight of each animal at the beginning of each dose week. Dose volumes were calculated to the nearest 0.1 ml. A 23-26 gauge needle attached to a disposable 3 ml or 5 ml syringe was used to deliver the injections. The injection rate was approximately 1.0 ml/10 seconds. The control animals were similarly injected with the control vehicle. The first day of dosing was designated as day 1.

Laboratory Observations

1. Animals were observed daily for general health. Rats were observed for any adverse reactions immediately after injection.
2. Detailed examinations for clinical signs of disease or abnormality were conducted prior to the first dose, and on day 8 and 15.
3. Body weights were recorded to the nearest whole gram prior to the first dose, and on day 8, 14 (pre-fasted weight) and 15 (fasted weight).

Terminal Procedures

At the end of the workday on day 14, the animals were weighed and food was withheld for a maximum of 20 hours. On day 15, the animals were weighed and then anesthetized by an intraperitoneal injection of ketamine hydrochloride and xylazine (88 mg/kg + 12 mg/kg) dosed at 3.0 ml/kg. The abdomen was opened and a blood specimen was collected from the posterior vena cava. The blood specimens were forwarded to Pathology Laboratories for a complete blood cell count with differential and clinical chemistry analyses. Rats were euthanized by exsanguination while anesthetized.

Following exsanguination, a macroscopic observation of the viscera was conducted. The following organs were removed: heart, lungs, liver, spleen, thymus, kidneys, adrenal glands, mesenteric lymph nodes, submandibular lymph nodes, gonads and tissue with visible gross lesions. The liver, spleen, thymus, kidneys, adrenal glands and gonads were weighed. Paired organs were weighed together. The tissues were preserved in 10% neutral buffered formalin (NBF) until further processing.

After fixation, the tissues were processed using standard histological techniques, sectioned and stained with hematoxylin and eosin. Microscopic tissue evaluation was conducted by a qualified pathologist.

6. Evaluation and Statistical Analysis

The test and control treatment groups were considered the variables for comparison. Data from male and female rats were analyzed separately. The body weight, organ weight data, organ/body weight ratios, hematology data and clinical chemistry

values were analyzed statistically. Pre-fasted body weights were used to determine weight gain and the fasted body weights were used to determine anesthetic dosages at termination and organ/body weight ratios. Descriptive statistics and group comparisons of data were accomplished using a validated statistical software package. After screening the data for normality and equal variance, the appropriate parametric or nonparametric tests were performed. Normally distributed data with equal variance was considered parametric and evaluated using an "unpaired t-test". If data was nonparametric, a two sample t-test unequal variance (Welch Test) was used for two group comparisons. Calculations resulting in probability (p) values less than 0.05 were considered statistically significant. 99~Due to statistical significance for a hematology parameter, a reference range was used as an aid in determining biological significance of the finding. A review of all hematological and clinical chemistry parameters was performed by the attending veterinarian.

7. Results

Body Weight
Individual weight gain and group mean body weights for both male and female rats were considered to be clinically acceptable following treatment. A summary of body weight data appear in Appendix 2, and individual body weights appear in Appendix 10.

Organ Weight/Organ to Body Weight Ratio
Absolute organ weights and organ to body weight ratios were similar between and within test and control groups. There was no difference between the two groups that was considered to be related to treatment. A summary of organ weight data appear in Appendices 3 and 4. Individual organ weights appear in Appendices 11 and 12.

Clinical Hematology
The hematology values showed no evidence of treatment induced effects and were comparable between test and control groups. A summary of hematology data is shown in Appendices 5 and 6. Individual values are shown in Appendices 13 and 15. Absolute differential values are shown in Appendix 14.

Clinical Observations
No behavioral changes or signs of toxicity were observed in any rat. Detailed examinations for individual rats appear in Appendix 7.

Necropsy
There were no macroscopic changes in the viscera at necropsy that could be attributed to the test article extract. Necropsy observations appear in Appendix 7.

Clinical Pathology
There were no changes in clinical pathology parameters in either sex that were considered to be related to treatment with the test article extract. Details of the clinical pathology findings appear in the Clinical Pathology Report (Appendix 8).

Microscopic Evaluation
Tissues examined were within normal histomorphological limits and essentially comparable between test and control animals. The postmortem evaluation of the tissues appears in the microscopic evaluation report (Appendix 9).

8. Conclusion

Under the conditions of this study, there was no significant evidence of systemic toxicity from the extract of the test article injected intravenously into rats.

Results and conclusions apply only to the test article tested. Any extrapolation of these data to other samples is the sponsor's responsibility. All procedures were conducted in conformance with good manufacturing practices, certified to ISO 13485:2003 and accredited to ISO 17025:2005.

9. Quality Assurance

Inspections were conducted at intervals adequate to assure the integrity of the study in conformance with 21 CFR 58.35(b)(3). The final report was reviewed for conformance to Section 58.185, Subpart J, of the GLP Regulations. A Statement of Quality Assurance Activities was issued with the report.

10. Proposed Dates

The study dates were finalized by the study director following receipt of the sponsor approved protocol and appropriate material for the study. Initiation of the study was the date on which the study director signed the GLP protocol. Projected dates for

starting the study (first treatment) and for the completion of the study (final report release) were provided to the sponsor (or representative of the sponsor).

11. Records

All raw data, paraffin blocks and tissue slides pertaining to this study and a copy of the final report are to be retained in designated NAMSA archive files.

12. References

21 CFR 58 (GLP Regulations).

Guide for the Care and Use of Laboratory Animals, Institute for Laboratory Animal Research, National Academy of Sciences (Washington: National Academy Press, 1996).

ISO 10993-11 (2006) Biological evaluation of medical devices - Part 11: Tests for systemic toxicity.

OECD Guideline for Testing of Chemicals, *Repeated Dose Oral Toxicity - Rodent: 28-day or 14-day Study*, Document Number 407.

OLAW, Public Health Service Policy on Humane Care and use of Laboratory Animals (NIH Publication).

13. Protocol Changes

Any necessary changes to the protocol after sponsor approval or study initiation were documented and approved by the study director as protocol amendments. Copies were distributed to the sponsor, the raw data file, and the NAMSA Quality Assurance department.

Appendix 1 - Routine Hematology and Clinical Chemistry Parameters

Routine Hematology
(CBC with differential)

*Bands

*Basophils (BASO)

*Eosinophils (EOS)

Hematocrit (HCT)

Hemoglobin (HGB)

*Lymphocytes (LYMPH)

Mean Corpuscular Hemoglobin (MCH)

Mean Corpuscular Hemoglobin Concentration (MCHC)

Mean Cell Volume (MCV)

*Monocytes (MONO)

*Neutrophils (NEUTRO)

Red Blood Cell count (RBC)

White Blood Cell count (WBC)

Clinical Chemistry
(Diagnostic - Multi Chem)

Albumin/Globulin Ratio (ALB/GLOB)

Albumin (ALB)

Alkaline Phosphatase (ALP)

Amylase, serum (AMY)

Bilirubin, total (TOT BIL)

Blood Urea Nitrogen (BUN)

BUN/Creatinine Ratio (BUN/CR)

Calcium (Ca)

Chloride (Cl)

Cholesterol (CHOL)

Creatinine, serum (CR)

γ-Glutamyl transferase (GGT)

Globulin, total (TOT GLOB)

Glucose, serum (GLU)

Lactate dehydrogenase (LDH)

Phosphorus (P)

Potassium (K)

Aspartate aminotransferase (AST)

Alanine aminotransferase (ALT)

Sodium (Na)

Total protein (TOT PRO)

Triglycerides (TRI)

*Presented as relative percentages and absolute values

Appendix 2 - Summary of Body Weight Data (g)

Gender	Interval	Control			Test		
		Mean ± SD			Mean ± SD		
Male	Pretreatment	224	±	6	223	±	7
	Day 8	273	±	14	273	±	13
	Day 14	295	±	22	298	±	18
	Termination	280	±	20	281	±	18
Female	Pretreatment	163	±	12	161	±	8
	Day 8	186	±	13	184	±	10
	Day 14	201	±	16	199	±	8
	Termination	190	±	14	186	±	7

SD = Standard Deviation
There were no statistically significant differences between control and test groups

Appendix 3 - Summary of Organ Weight Data (g)

Gender	Organ	Control			Test		
		Mean ± SD			Mean ± SD		
Male	Liver*	9.21	±	0.63	8.33	±	0.87
	Spleen	0.88	±	0.15	0.91	±	0.11
	Thymus	0.70	±	0.13	0.65	±	0.18
	Kidneys (2)	2.41	±	0.28	2.48	±	0.21
	Adrenal glands (2)	0.07	±	0.02	0.08	±	0.05
	Testes (2)	3.75	±	0.39	3.45	±	0.29
Female	Liver	6.42	±	0.75	6.26	±	0.39
	Spleen*	0.71	±	0.08	0.60	±	0.09
	Thymus	0.57	±	0.07	0.47	±	0.13
	Kidneys (2)	1.87	±	0.21	1.71	±	0.20
	Adrenal glands (2)	0.09	±	0.03	0.09	±	0.03
	Ovaries (2)	0.25	±	0.04	0.20	±	0.06

SD = Standard Deviation

* = Data showed a statistically significant difference between control and test groups ($p < 0.05$)

Appendix 4 - Summary of Organ/Body Weight Ratios (%)

Gender	Organ	Control			Test		
		Mean ± SD			Mean ± SD		
Male	Liver*	3.31	±	0.29	2.96	±	0.16
	Spleen	0.32	±	0.05	0.32	±	0.03
	Thymus	0.25	±	0.05	0.23	±	0.06
	Kidneys (2)	0.87	±	0.11	0.88	±	0.03
	Adrenal glands (2)	0.02	±	0.01	0.03	±	0.01
	Testes (2)	1.35	±	0.17	1.23	±	0.09
Female	Liver	3.38	±	0.17	3.37	±	0.16
	Spleen	0.37	±	0.05	0.32	±	0.05
	Thymus	0.30	±	0.04	0.25	±	0.06
	Kidneys (2)	0.99	±	0.10	0.92	±	0.08
	Adrenal glands (2)	0.05	±	0.02	0.05	±	0.02
	Ovaries (2)	0.13	±	0.02	0.11	±	0.03

SD = Standard Deviation

* = Data showed a statistically significant difference between control and test groups ($p < 0.05$)

Appendix 5 - Summary of Hematology Data

Gender	Parameter	Control			Test		
		Mean ± SD			Mean ± SD		
Male	WBC (th/mm^3)	8.7	±	1.5	7.9	±	1.3
	RBC (mi/mm^3)	7.71	±	0.53	7.88	±	0.40
	HGB (g/dL)	15.5	±	0.9	15.5	±	0.5
	HCT (%)	48.7	±	4.8	48.4	±	2.2
	MCV (μ^3)	63.0	±	2.6	61.4	±	1.5
	MCH (pg)	20.1	±	0.7	19.6	±	1.0
	MCHC (g/dL)	31.9	±	1.5	32.0	±	1.4
	NEUTRO (%)	10	±	3	13	±	3
	BANDS (%)		∫			∫	
	LYMPH (%)	87	±	3	85	±	4
	MONO (%)	2	±	2	2	±	1
	EOS (%)	0	±	1	0	±	1
	BASO (%)		∫			∫	
Female	WBC (th/mm^3)	5.6	±	0.7	5.8	±	1.5
	RBC (mi/mm^3)*	6.90	±	0.49	7.56	±	0.35
	HGB (g/dL)*	14.6	±	0.3	15.2	±	0.5
	HCT (%)*	42.1	±	2.1	45.6	±	1.0
	MCV (μ^3)	61.1	±	1.5	60.5	±	2.1
	MCH (pg)	21.2	±	1.3	20.1	±	0.5
	MCHC (g/dL)*	34.7	±	1.4	33.2	±	0.6
	NEUTRO (%)	11	±	4	10	±	3
	BANDS (%)		∫			∫	
	LYMPH (%)	87	±	5	88	±	3
	MONO (%)	1	±	1	1	±	2
	EOS (%)	1	±	1	1	±	1
	BASO (%)		∫			∫	

SD = Standard Deviation
* = Data showed a statistically significant difference between control and test groups ($p < 0.05$)
∫ = All values zero, no analysis

Appendix 6 - Summary of Clinical Chemistry Data

Parameter	Males						Females					
	Control			Test			Control			Test		
	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD
GLU (mg/dL)	161	±	85	123	±	15	136	±	23	137	±	29
BUN (mg/dL)	12	±	2	12	±	3	14	±	1	14	±	2
CR (mg/dL)	0.4	±	0.1	0.4	±	0.1	0.5	±	0.1	0.4	±	0.1
BUN/CR	32.6	±	6.5	32.8	±	6.6	31.8	±	3.0	36.6	±	11.5
Ca (mg/dL)	9.5	±	0.2	9.7	±	0.2	9.4	±	0.3	9.7	±	0.4
P (mg/dL)	10.0	±	0.8	9.5	±	0.4	10.1	±	1.7	9.5	±	0.5
Na (mmol/L)	141	±	3	142	±	2	144	±	1	142	±	3
K (mmol/L)	4.8	±	0.6	4.5	±	0.2	5.2	±	1.0	4.7	±	0.2
Cl (mmol/L)	107	±	2	106	±	2	109	±	3	110	±	4
TOT BIL (mg/dL)	0.5	±	0.1	0.5	±	0.1	0.4	±	0.1	0.4	±	0.2
ALP (IU/L)	161	±	34	155	±	22	93	±	16	110	±	24
LDH (IU/L)	853	±	440	837	±	227	329	±	235	524	±	203
AST-SGOT (IU/L)	86	±	11	95	±	14	67	±	9	87*	±	10
ALT-SGPT (IU/L)	33	±	4	33	±	8	21	±	3	23	±	2
GGT (IU/L)	<5			<5			<5			<5		
TOT PRO (g/dL)	4.8	±	0.1	4.9	±	0.3	4.6	±	0.3	5.1*	±	0.4
ALB (g/dL)	1.4	±	0.1	1.5	±	0.2	1.5	±	0.1	1.6	±	0.2
TOT GLOB (g/dL)	3.4	±	0.1	3.4	±	0.3	3.2	±	0.2	3.5*	±	0.3
ALB/GLOB	0.4	±	0.0	0.4	±	0.0	0.5	±	0.0	0.4	±	0.1
AMY (IU/L)	1366	±	310	1310	±	214	605	±	107	591	±	44
CHOL (mg/dL)	42	±	4	44	±	10	30	±	5	35	±	7
TRI (mg/dL)	33	±	6	36	±	11	29	±	8	28	±	4

SD = Standard Deviation
* = Data showed a statistically significant difference between control and test groups ($p < 0.05$)
< = Below detection limit

Appendix 7 - Summary of Clinical Observations and Necropsy Findings

Group	Gender	Animal Number	Clinical Observations (Days 0-15)	Necropsy (Day 15)
Control	Male	2297	Appeared normal	Macroscopically normal.
		2289	Appeared normal	Macroscopically normal.
		2292	Appeared normal	Macroscopically normal.
		2295	Appeared normal	Macroscopically normal.
		2298	Appeared normal	Macroscopically normal.
		2301	Appeared normal	Macroscopically normal.
		2291	Appeared normal	Macroscopically normal.
	Female	2308	Appeared normal	Macroscopically normal.
		2306	Appeared normal	Macroscopically normal.
		2314	Appeared normal	Macroscopically normal.
		2307	Appeared normal	Macroscopically normal.
		2305	Appeared normal	Macroscopically normal.
		2311	Appeared normal	Macroscopically normal.
		2317	Appeared normal	Macroscopically normal.
Test	Male	2290	Appeared normal	Macroscopically normal.
		2288	Appeared normal	The bilateral submandibular lymph node appeared dark red in color. Otherwise, macroscopically normal.
		2296	Appeared normal	Both submandibular lymph nodes were darker than normal. Otherwise, macroscopically normal.
		2299	Appeared normal	Macroscopically normal.
		2300	Appeared normal	Both submandibular lymph nodes were darker than normal. Otherwise, macroscopically normal.
		2302	Appeared normal	Macroscopically normal.
		2294	Appeared normal	Macroscopically normal.
	Female	2304	Appeared normal	Macroscopically normal.
		2316	Appeared normal	Macroscopically normal.
		2303	Appeared normal	Macroscopically normal.
		2310	Appeared normal	Macroscopically normal.
		2309	Appeared normal	Macroscopically normal.
		2312	Appeared normal	Macroscopically normal.
		2315	Appeared normal	Macroscopically normal.

Appendix 8 - Clinical Pathology Report

Introduction and Methods: Twenty-eight rats were utilized in the aforementioned study. Seven males and seven females were dosed with the test saline and sesame oil extract. An additional seven males and seven females served as controls and were dosed with the extract vehicle. At the end of the 2-week test period, animals were anesthetized and blood samples collected for hematologic and clinical chemistry analysis.

Hematology: A review of all hematologic parameters revealed no biologically significant differences between any of the test and control groups and all mean values were within a normal expected range. Parameters showing significant differences and/or statistical significance are discussed below:

- Statistical analysis indicated a difference between test and control females for the parameters Red Blood Cell (RBC) count and Hemoglobin (HGB). The values for these parameters were well within a normal expected range and there were no similar differences between the male groups. As a result, these minor differences were considered biologically insignificant and related to random biologic variation.

Clinical Chemistries: A review of all clinical chemistry parameters revealed no biologically significant differences between the test and control groups, and all mean values were within a normal expected range. Parameters showing significant differences and/or statistical significance are discussed below:

- Statistical analysis indicated a difference between test and control females for the parameters of Aspartate aminotransferase (AST), Total Protein (TOT PRO), and Total Globulin (TOT GLOB). The values for these parameters were within a normal expected range and there were no similar differences between the male groups. The difference between test and control groups reflected no evidence of hepatotoxicity, altered protein metabolism, or other systemic toxicity. Consequently, these minor differences were considered biologically insignificant and related to random biologic variation.

Individual Finding: Rat # 2306, a female control, was noted to have elevations in Phosphorus (P) and Potassium (K). While the blood sample was not noted to have evidence of hemolyisis, this pattern of elevation in these parameters was consistent with some degree of hemolysis in the sample. Collection of blood from small rodents can sometimes be difficult, resulting in hemolysis and release of these components into the serum. As a result, these elevations were considered artifactual in nature and not as a result of the control treatment.

Conclusions: Under the conditions of this test, it was concluded that neither test extract nor extract vehicle caused an effect on hematologic and clinical chemistry parameters.

Kelli R. Young, D.V.M. Date 10-29-07

Kelli R. Young, D.V.M.
Veterinarian

Appendix 9 - Microscopic Evaluation

Introduction and Methods: This report discusses the macroscopic and microscopic findings in 28 animals assigned to the 2 week toxicity study for Lab No. 07T-37252-06. Seven male and seven female rats received an extract derived from the submitted test article intravenously at the rate of 10 ml/kg once daily for 14 consecutive days. An additional seven male and seven female rats received the control article intravenously at the rate of 10 ml/kg once daily for 14 consecutive days. Complete necropsies were performed on all animals and macroscopic alterations were recorded. The heart, lungs, liver, spleen, thymus, both kidneys, both adrenal glands, mesenteric lymph nodes (MLN), submandibular lymph nodes (SLN), gonads, and, if present, all noted macroscopic alterations were collected from each rat and fixed in 10% neutral buffered formalin (NBF). The tissues were processed using standard histological techniques, sectioned at approximately 5 µm and stained with hematoxylin and eosin. The tissue sections were evaluated for treatment-related toxicity, for treatment-related changes in the severity and incidence rate of background lesions commonly found in rats, and for gender-based treatment effects. The severity of a microscopic finding(s), when present, was scored for severity using the following scale: 1= minimal, 2 = mild, 3 = moderate and 4 = severe (coded in parentheses after finding). A few tissues were missing from this study and thus could not be evaluated microscopically. The absence of these tissues was not considered to affect interpretation of this study.

Results and Discussion:
A few macroscopic alterations were noted in this study. The SLN of test male 2288 appeared dark red which corresponded microscopically to acute hemorrhage. This macroscopic finding was suspected to be attributable to perimortem/post-mortem hemorrhage associated with the termination procedure and not considered test article related. The SLN of test male 2296 appeared darker than normal which corresponded microscopically to acute hemorrhage. Hemorrhage was suspected attributable to perimortem/post-mortem hemorrhage associated with the termination procedure and not considered test article related. The SLN of test male 2300 appeared darker than normal which corresponded microscopically to acute hemorrhage. Hemorrhage was suspected attributable to perimortem/post-mortem hemorrhage associated with the termination procedure and not considered test article related. One kidney from control female 2307 exhibited a hollow area (at trim) which corresponded microscopically to hydronephrosis. Hydronephrosis is considered a spontaneous (background) finding in rats. The low incidence of hydronephrosis in the test group is not considered related to the test article.

The microscopic tissue alterations observed for the test and control groups are reported in Table I. Table II contains the microscopic findings according to treatment group and the gender of the rat. Individual microscopic findings are located in Table III.

Microscopic tissue alterations indicative of a systemic toxicity were not observed in any of the tissue sections evaluated in this study. The incidence rate and the severity of the spontaneous lesions (see Table III, Individual Microscopic Findings) commonly observed in rats used for intravenous studies were within the expected range. A biologically significant difference in the incidence and severity of the spontaneous lesions between the test and control groups was not identified. No gender-based treatment effects were identified.

Conclusions:
No evidence of systemic toxicity was observed in this study. No treatment-effects or gender-based treatment-effects were evident in this study.

References
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Pathologist Anthony J. Skowronek Date 10/24/2007
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Study Pathologist

TABLE I

SUMMARY OF MICROSCOPIC FINDINGS BY TREATMENT GROUP

Organ/Tissue	CONTROL	
	MALE	FEMALE
Heart		
Normal	100%	100%
Lung		
Normal	100%	100%
Liver		
Normal	100%	100%
Spleen		
Normal	100%	100%
Thymus		
Normal	100%	100%
Kidneys		
Normal (bilateral)	79%	86%
Hydronephrosis	7%	7%
Progressive nephropathy	14%	7%
Adrenal glands		
Normal	100%	100%
Mesenteric lymph nodes		
Normal	100%	100%
Submandibular lymph nodes		
Normal	100%	100%
Hemorrhage, acute	0%	14%
Gonad		
Normal	100%	93%
Cyst	0%	7%

TABLE II

SUMMARY OF MICROSCOPIC FINDINGS BY TREATMENT GROUP AND GENDER

Organ/Tissue	CONTROL		TEST	
	MALE	FEMALE	MALE	FEMALE
Heart				
Normal	100%	100%	100%	100%
Lung				
Normal	100%	100%	100%	100%
Liver				
Normal	100%	100%	100%	100%
Spleen				
Normal	100%	100%	100%	100%
Thymus				
Normal	100%	100%	100%	100%
Kidneys				
Normal (bilateral)	100%	57%	100%	100%
Hydronephrosis	0%	14%	14%	0%
Progressive nephropathy	0%	29%	0%	14%
Adrenal glands				
Normal	100%	100%	100%	100%
Mesenteric lymph nodes				
Normal	100%	100%	100%	100%
Submandibular lymph nodes				
Normal	100%	100%	71%	100%
Hemorrhage, acute	0%	0%	29%	0%
Gonad				
Normal	100%	100%	86%	100%
Cyst	0%	0%	14%	0%

TABLE III

INDIVIDUAL MICROSCOPIC FINDINGS

Group	Gender	Animal Number	Macroscopic alterations	Heart	Lungs	Liver	Spleen
CONTROL	MALE	2297	None	N	N	N	N
		2289	None	N	N	N	N
		2292	None	N	N	N	N
		2295	None	N	N	N	N
		2298	None	N	N	N	N
		2301	None	N	N	N	N
		2291	None	N	N	N	N
	FEMALE	2308	None	N	N	N	N
		2306	None	N	N	N	N
		2314	None	N	N	N	N
		2307	Yes	N	N	N	N
		2305	None	N	N	N	N
		2311	None	N	N	N	N
		2317	None	N	N	N	N
TEST	MALE	2290	None	N	N	N	N
		2288	Yes	N	N	N	N
		2296	None	N	N	N	N
		2299	None	N	N	N	N
		2300	Yes	N	N	N	N
		2302	None	N	N	N	N
		2294	None	N	N	N	N
	FEMALE	2304	None	N	N	N	N
		2316	None	N	N	N	N
		2303	None	N	N	N	N
		2310	None	N	N	N	N
		2309	None	N	N	N	N
		2312	None	N	N	N	N
		2315	None	N	N	N	N

TABLE III (continued)

INDIVIDUAL MICROSCOPIC FINDINGS

Group	Gender	Animal Number	Kidney	Adrenal Glands	Thymus	Mesenteric Lymph Node	Submandibular Lymph Node	Gonads
CONTROL	MALE	2297	N	N	N	N	N	N
		2289	N	N	N	N	N	N
		2292	N	N	N	N	N	N
		2295	N	N	N	N	N	N
		2298	N	N	N	N	N	N
		2301	N	N	N	N	N	N
		2291	N	N	N	N	N	N
	FEMALE	2308	NP (1)	missing	N	missing	missing	missing
		2306	NP (1)	N	N	N	N	N
		2314	N	N	N	N	N	N
		2307	HN (2)	one missing	N	N	N	N
		2305	N	N	N	N	N	N
		2311	N	N	N	N	N	N
		2317	N	one missing	N	N	N	N
TEST	MALE	2290	N	N	N	N	N	N
		2288	N	N	N	N	Hm (1)	N
		2296	N	N	N	N	N	N
		2299	N	N	N	N	N	N
		2300	HN (2)	N	N	N	Hm (2)	Cy (1)
		2302	N	N	N	N	N	N
		2294	N	N	N	N	N	N
	FEMALE	2304	N	N	N	N	N	N
		2316	N	N	N	N	N	N
		2303	N	N	N	N	N	N
		2310	NP (1)	N	N	N	N	N
		2309	N	N	N	N	N	N
		2312	N	N	N	N	N	N
		2315	N	N	N	N	N	N

N = normal (within normal limits)
HN = hydronephrosis
NP = progressive nephropathy
Hm = acute hemorrhage
Cy = cyst(s)

Appendix 10 - Body Weights For Individual Rats

Group	Gender	Animal Number	Body Weight (g)			
			Day 0	Day 8	Day 14	Day 15
Control	Male	2297	234	289	317	297
		2289	226	279	293	280
		2292	226	278	310	294
		2295	224	276	307	292
		2298	223	275	300	284
		2301	218	272	290	273
		2291	216	245	251	238
	Female	2308	187	212	228	213
		2306	165	185	193	184
		2314	163	188	207	192
		2307	162	186	205	193
		2305	158	184	208	196
		2311	155	175	190	181
		2317	149	170	177	168
Test	Male	2290	231	280	301	287
		2288	227	283	318	300
		2296	226	276	303	287
		2299	225	281	307	292
		2300	221	256	273	257
		2302	220	283	310	290
		2294	209	253	272	254
	Female	2304	173	193	209	194
		2316	167	191	209	194
		2303	163	181	195	182
		2310	163	192	203	190
		2309	158	190	199	185
		2312	158	177	191	180
		2315	148	166	189	175

AN = Appeared Normal

Appendix 11 - Organ Weight Data For Individual Rats (g)

Group	Gender	Animal Number	Liver	Spleen	Thymus	Kidneys	Adrenal Glands	Gonads
Control	Male	2297	8.56	0.76	0.56	*	0.09	4.28
		2289	10.12	0.84	0.73	2.64	0.05	3.23
		2292	9.56	1.05	0.58	2.35	0.09	3.79
		2295	9.71	0.82	0.84	2.61	0.06	3.84
		2298	8.51	1.11	0.89	1.92	0.04	3.96
		2301	9.32	0.90	0.72	2.60	0.08	3.21
		2291	8.72	0.70	0.57	2.31	0.05	3.93
	Female	2308	7.62	0.79	0.48	2.09	0.08	0.21
		2306	5.84	0.57	0.61	1.78	0.09	0.23
		2314	6.29	0.74	0.67	1.81	0.09	0.21
		2307	6.49	0.70	0.54	1.58	0.02	0.27
		2305	7.09	0.65	0.58	2.13	0.13	0.29
		2311	6.21	0.69	0.61	2.01	0.11	0.30
		2317	5.38	0.81	0.47	1.72	0.09	0.25
Test	Male	2290	8.16	1.12	0.95	2.43	0.08	3.13
		2288	8.91	0.91	0.56	2.73	0.17	3.57
		2296	8.49	0.86	0.73	2.47	0.08	3.50
		2299	8.92	0.96	0.54	2.67	0.06	3.52
		2300	7.42	0.82	0.41	2.25	0.03	3.34
		2302	9.40	0.91	0.78	2.63	0.09	3.95
		2294	6.99	0.77	0.61	2.18	0.04	3.12
	Female	2304	6.28	0.60	0.43	1.80	0.10	0.18
		2316	6.89	0.70	0.72	1.98	0.12	0.26
		2303	6.49	0.71	0.48	1.70	0.09	0.24
		2310	6.43	0.58	0.34	1.75	0.08	0.19
		2309	5.81	0.63	0.52	1.73	0.14	0.29
		2312	6.15	0.58	0.45	1.73	0.05	0.15
		2315	5.78	0.43	0.37	1.31	0.08	0.12

*Weight not recorded at time of termination. The kidney weights from the remaining animals are sufficient for statistical analysis.

Appendix 12 - Organ/Body Weight Ratios For Individual Rats (%)

Group	Gender	Animal Number	Liver	Spleen	Thymus	Kidneys	Adrenal Glands	Gonads
Control	Male	2297	2.88	0.26	0.19	*	0.03	1.44
		2289	3.61	0.30	0.26	0.94	0.02	1.15
		2292	3.25	0.36	0.20	0.80	0.03	1.29
		2295	3.33	0.28	0.29	0.89	0.02	1.32
		2298	3.00	0.39	0.31	0.68	0.01	1.39
		2301	3.41	0.33	0.26	0.95	0.03	1.18
		2291	3.66	0.29	0.24	0.97	0.02	1.65
	Female	2308	3.58	0.37	0.23	0.98	0.04	0.10
		2306	3.17	0.31	0.33	0.97	0.05	0.13
		2314	3.28	0.39	0.35	0.94	0.05	0.11
		2307	3.36	0.36	0.28	0.82	0.01	0.14
		2305	3.62	0.33	0.30	1.09	0.07	0.15
		2311	3.43	0.38	0.34	1.11	0.06	0.17
		2317	3.20	0.48	0.28	1.02	0.05	0.15
Test	Male	2290	2.84	0.39	0.33	0.85	0.03	1.09
		2288	2.97	0.30	0.19	0.91	0.06	1.19
		2296	2.96	0.30	0.25	0.86	0.03	1.22
		2299	3.05	0.33	0.18	0.91	0.02	1.21
		2300	2.89	0.32	0.16	0.88	0.01	1.30
		2302	3.24	0.31	0.27	0.91	0.03	1.36
		2294	2.75	0.30	0.24	0.86	0.02	1.23
	Female	2304	3.24	0.31	0.22	0.93	0.05	0.09
		2316	3.55	0.36	0.37	1.02	0.06	0.13
		2303	3.57	0.39	0.26	0.93	0.05	0.13
		2310	3.38	0.31	0.18	0.92	0.04	0.10
		2309	3.14	0.34	0.28	0.94	0.08	0.16
		2312	3.42	0.32	0.25	0.96	0.03	0.08
		2315	3.30	0.25	0.21	0.75	0.05	0.07

*Data not supplied.

Appendix 13 - Hematology Values For Individual Rats

Group	Gender	Animal Number	WBC (th/mm^3)	RBC (mi/mm^3)	HGB (g/dL)	HCT (%)	MCV (μ^3)	MCH (pg)
Control	Male	2297	7.7	7.56	15.1	48.5	64.2	20.0
		2289	7.8	7.14	15.3	45.2	63.3	21.4
		2292	9.8	8.68	17.0	58.5	67.4	19.6
		2295	11.4	7.36	14.1	44.3	60.2	19.2
		2298	7.5	7.66	15.4	46.1	60.2	20.1
		2301	9.1	7.44	15.3	47.8	64.2	20.6
		2291	7.4	8.14	16.1	50.2	61.7	19.8
	Female	2308	5.0	6.20	14.2	39.0	62.9	22.9
		2306	5.3	7.18	14.8	43.1	60.0	20.6
		2314	5.4	7.14	14.7	42.8	60.0	20.6
		2307	5.7	6.42	14.5	39.8	62.0	22.6
		2305	5.3	7.14	14.3	43.7	61.2	20.0
		2311	5.8	6.64	14.7	41.8	62.9	22.1
		2317	7.0	7.56	15.0	44.6	59.0	19.8
Test	Male	2290	7.8	7.70	16.2	47.3	61.4	21.0
		2288	8.0	7.30	14.8	46.1	63.2	20.3
		2296	8.4	8.22	15.9	51.9	63.1	19.3
		2299	5.6	7.62	15.4	46.2	60.6	20.2
		2300	7.4	8.48	15.3	50.0	58.8	18.0
		2302	8.2	7.76	15.0	47.3	61.0	19.3
		2294	9.8	8.10	15.7	50.1	61.8	19.4
	Female	2304	3.8	7.28	14.6	43.9	60.3	20.1
		2316	7.1	7.56	15.0	45.4	60.1	19.8
		2303	7.7	7.28	14.8	45.5	62.5	20.3
		2310	4.1	7.52	14.9	45.3	60.2	19.8
		2309	6.2	7.44	15.2	46.2	62.1	20.4
		2312	5.5	8.32	16.0	46.8	56.2	19.2
		2315	6.4	7.50	15.7	46.4	61.9	20.9

Appendix 13 (continued) - Hematology Values For Individual Rats

Group	Gender	Animal Number	MCHC (g/dL)	NEUTRO (%)	BANDS (%)	LYMPH (%)	MONO (%)	EOS (%)	BASO (%)
Control	Male	2297	31.1	10	0	90	0	0	0
		2289	33.8	15	0	84	1	0	0
		2292	29.1	14	0	85	0	1	0
		2295	31.8	5	0	92	2	1	0
		2298	33.4	9	0	86	5	0	0
		2301	32.0	9	0	85	5	1	0
		2291	32.1	9	0	87	4	0	0
	Female	2308	36.4	13	0	83	3	1	0
		2306	34.3	12	0	85	1	2	0
		2314	34.3	12	0	86	0	2	0
		2307	36.4	8	0	91	1	0	0
		2305	32.7	8	0	90	0	2	0
		2311	35.2	18	0	79	2	1	0
		2317	33.6	5	0	94	0	1	0
Test	Male	2290	34.2	13	0	84	3	0	0
		2288	32.1	12	0	86	2	0	0
		2296	30.6	9	0	90	1	0	0
		2299	33.3	17	0	81	1	1	0
		2300	30.6	11	0	86	3	0	0
		2302	31.7	17	0	78	3	2	0
		2294	31.3	10	0	90	0	0	0
	Female	2304	33.3	9	0	90	0	1	0
		2316	33.0	10	0	89	0	1	0
		2303	32.5	16	0	83	0	1	0
		2310	32.9	7	0	86	6	1	0
		2309	32.9	9	0	90	0	0	1
		2312	34.2	12	0	85	0	3	0
		2315	33.8	8	0	90	2	0	0

Appendix 14 - Absolute Differential Values For Individual Rats (th/mm^3)

Group	Gender	Animal Number	WBC	NEUTRO	BANDS	LYMPH	MONO	EOS	BASO
Control	Male	2297	7.7	0.8	0.0	6.9	0.0	0.0	0.0
		2289	7.8	1.2	0.0	6.6	0.1	0.0	0.0
		2292	9.8	1.4	0.0	8.3	0.0	0.1	0.0
		2295	11.4	0.6	0.0	10.5	0.2	0.1	0.0
		2298	7.5	0.7	0.0	6.5	0.4	0.0	0.0
		2301	9.1	0.8	0.0	7.7	0.5	0.1	0.0
		2291	7.4	0.7	0.0	6.4	0.3	0.0	0.0
	Female	2308	5.0	0.7	0.0	4.2	0.2	0.1	0.0
		2306	5.3	0.6	0.0	4.5	0.1	0.1	0.0
		2314	5.4	0.6	0.0	4.6	0.0	0.1	0.0
		2307	5.7	0.5	0.0	5.2	0.1	0.0	0.0
		2305	5.3	0.4	0.0	4.8	0.0	0.1	0.0
		2311	5.8	1.0	0.0	4.6	0.1	0.1	0.0
		2317	7.0	0.4	0.0	6.6	0.0	0.1	0.0
Test	Male	2290	7.8	1.0	0.0	6.6	0.2	0.0	0.0
		2288	8.0	1.0	0.0	6.9	0.2	0.0	0.0
		2296	8.4	0.8	0.0	7.6	0.1	0.0	0.0
		2299	5.6	1.0	0.0	4.5	0.1	0.1	0.0
		2300	7.4	0.8	0.0	6.4	0.2	0.0	0.0
		2302	8.2	1.4	0.0	6.4	0.2	0.2	0.0
		2294	9.8	1.0	0.0	8.8	0.0	0.0	0.0
	Female	2304	3.8	0.3	0.0	3.4	0.0	0.0	0.0
		2316	7.1	0.7	0.0	6.3	0.0	0.1	0.0
		2303	7.7	1.2	0.0	6.4	0.0	0.1	0.0
		2310	4.1	0.3	0.0	3.5	0.2	0.0	0.0
		2309	6.2	0.6	0.0	5.6	0.0	0.0	0.1
		2312	5.5	0.7	0.0	4.7	0.0	0.2	0.0
		2315	6.4	0.5	0.0	5.8	0.1	0.0	0.0

Appendix 15 - Clinical Chemistry Values For Individual Rats

Group	Gender	Animal Number	GLU (mg/dL)	BUN (mg/dL)	CR (mg/dL)	BUN/CR	Ca (mg/dL)	P (mg/dL)	Na (mmol/L)
Control	Male	2297	93	12	0.4	30.0	9.6	11.4	144
		2289	304	14	0.4	35.0	9.4	9.2	142
		2292	*	*	*	*	*	*	*
		2295	122	12	0.5	24.0	9.6	9.8	137
		2298	107	9	0.3	30.0	9.1	10.1	141
		2301	112	10	0.3	33.3	9.7	9.8	144
		2291	228	13	0.3	43.3	9.7	9.6	140
	Female	2308	117	13	0.4	32.5	9.4	9.1	143
		2306	129	15	0.4	37.5	9.6	13.8	144
		2314	136	14	0.5	28.0	9.1	9.5	144
		2307	113	15	0.5	30.0	9.9	9.6	144
		2305	134	16	0.5	32.0	9.6	10.7	145
		2311	182	13	0.4	32.5	9.2	9.1	145
		2317	141	15	0.5	30.0	9.2	8.8	144
Test	Male	2290	142	12	0.4	30.0	10.1	10.0	140
		2288	134	8	0.4	20.0	9.3	9.4	141
		2296	128	10	0.3	33.3	9.7	10.1	141
		2299	119	12	0.3	40.0	9.6	9.2	142
		2300	127	11	0.3	36.7	9.6	9.3	140
		2302	94	15	0.4	37.5	9.7	9.1	143
		2294	119	16	0.5	32.0	9.6	9.6	144
	Female	2304	126	12	0.2	60.0	9.2	9.8	147
		2316	106	15	0.4	37.5	9.9	10.0	144
		2303	175	15	0.5	30.0	*	*	*
		2310	180	13	0.4	32.5	10.1	8.8	139
		2309	124	12	0.5	24.0	9.5	9.8	144
		2312	127	16	0.5	32.0	9.5	9.1	140
		2315	118	12	0.3	40.0	10.0	9.7	140

*Insufficient quantity.

Appendix 15 (continued) - Clinical Chemistry Values For Individual Rats

Group	Gender	Animal Number	K (mmol/L)	Cl (mmol/L)	TOT BIL (mg/dL)	ALP (IU/L)	LDH (IU/L)	AST-SGOT (IU/L)	ALT-SGPT (IU/L)	GGT (IU/L)
Control	Male	2297	5.6	110	0.3	188	372	77	34	<5
		2289	4.5	104	0.3	219	733	79	31	<5
		2292	*	*	*	142	*	86	40	*
		2295	5.5	106	0.6	156	945	91	34	<5
		2298	4.4	107	0.6	168	1445	103	28	<5
		2301	4.3	110	0.5	129	1235	92	32	<5
		2291	4.4	106	0.4	126	389	72	29	<5
	Female	2308	4.6	110	0.4	95	94	53	19	<5
		2306	7.1	112	0.5	82	81	59	17	<5
		2314	4.9	108	0.3	86	186	73	24	<5
		2307	4.9	109	0.4	106	305	62	21	<5
		2305	6.1	105	0.3	79	378	67	22	<5
		2311	4.2	114	0.4	82	702	77	18	<5
		2317	4.6	108	0.4	121	556	75	25	<5
Test	Male	2290	4.7	105	0.4	173	722	121	50	<5
		2288	4.2	105	0.4	144	653	88	32	<5
		2296	4.6	103	0.6	190	1188	101	26	<5
		2299	4.4	107	0.5	143	1037	100	29	<5
		2300	4.3	108	0.5	146	617	83	26	<5
		2302	4.6	105	0.5	166	978	88	34	<5
		2294	4.6	106	0.6	124	665	82	33	<5
	Female	2304	4.4	116	0.5	111	176	73	23	<5
		2316	4.8	109	0.4	93	764	81	22	<5
		2303	*	*	0.3	134	338	87	22	<5
		2310	4.7	107	0.5	89	619	83	21	<5
		2309	4.6	109	0.2	148	496	90	21	<5
		2312	5.0	105	0.4	107	646	104	27	<5
		2315	4.9	111	0.7	86	626	89	22	<5

< = Below detection limit
*Insufficient quantity.

Appendix 15 (continued) - Clinical Chemistry Values For Individual Rats

Group	Gender	Animal Number	TOT PRO (g/dL)	ALB (g/dL)	TOT GLOB (g/dL)	ALB/GLOB	AMY (IU/L)	CHOL (mg/dL)	TRI (mg/dL)
Control	Male	2297	4.8	1.3	3.5	0.4	1233	41	24
		2289	4.8	1.4	3.4	0.4	1176	42	30
		2292	*	*	*	*	*	48	*
		2295	4.7	1.4	3.3	0.4	1755	36	43
		2298	4.9	1.3	3.6	0.4	990	40	29
		2301	4.8	1.5	3.3	0.5	1313	40	35
		2291	4.6	1.2	3.4	0.4	1730	44	34
	Female	2308	4.4	1.4	3.4	0.4	584	26	33
		2306	4.6	1.5	3.1	0.5	535	31	29
		2314	4.7	1.6	3.1	0.5	595	29	27
		2307	5.0	1.5	3.5	0.4	756	31	41
		2305	5.0	1.6	3.4	0.5	711	40	34
		2311	4.4	1.4	3.0	0.5	602	26	24
		2317	4.4	1.4	3.0	0.5	443	24	15
Test	Male	2290	5.2	1.5	3.7	0.4	1612	41	37
		2288	4.5	1.3	3.2	0.4	1567	37	30
		2296	5.0	1.7	3.3	0.5	1362	61	47
		2299	4.7	1.5	3.2	0.5	1193	30	23
		2300	4.4	1.2	3.2	0.4	1085	41	23
		2302	5.2	1.5	3.7	0.4	1262	49	43
		2294	5.2	1.5	3.7	0.4	1088	50	50
	Female	2304	4.4	1.2	3.2	0.4	524	26	23
		2316	4.9	1.5	3.4	0.4	640	40	34
		2303	5.5	1.6	3.9	0.4	*	41	28
		2310	5.2	1.8	3.4	0.5	572	43	28
		2309	5.4	1.7	3.7	0.5	625	26	23
		2312	5.2	1.5	3.7	0.4	568	34	32
		2315	5.0	1.7	3.3	0.5	616	34	30

*Insufficient quantity.

Statement of Quality Assurance Activities

Phase Inspected	Auditor	Date
Dosing	L. M. Byrd	August 13, 2007
Study Data Approval	D. S. Dunn	September 14, 2007
Final Report Review	K. J. Evener	October 19, 2007

Reports to Management and Study Director(s)	Date
Periodic Status Report Periodic Status Report Periodic Status Report Periodic Status Report	July 10, 2007 August 10, 2007 September 10, 2007 October 10, 2007

This study will be included in the next periodic status report as completed.

Based on a review of this study, it has been concluded that this report accurately describes the methods and standard operating procedures, and that the reported results accurately reflect the raw data of the study. This study has been reviewed in accordance with the provisions of the FDA Good Laboratory Practice Regulations (21 CFR, Part 58).

QA Representative: Karen J. Evener — Oct. 24, 2007

Karen J. Evener, B.E.
Auditor, Quality Assurance

Date

STORE IN REFRIGERATOR (+4°C)
CALIBRATION #: 7420
TECH/DATE: VS 5-30-07

GLP SAMPLE S[illegible]SION FORM

07T_37252
25447_001 25447

USA Corporate Headquarters
6750 Wales Rd
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C[illegible]
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*Required field

SPONSOR FINAL REPORT WILL BE ADDRESSED AND MAILED TO

ViRexx Medical Corp	Paul Tiege
COMPANY NAME*	**ATTN***
8223 Roper Road	
ADDRESS*	
Edmonton	Alberta T6E 6S4
CITY*	**STATE*** **ZIP***
Canada	
COUNTRY*	
780 989 6715	
PHONE*	
780 436 0068	
FAX*	
ptiege@virexx.com	
E-MAIL*	

INVOICE INFORMATION
same, Attn. Erin Horwitz
BILLING ADDRESS (include Company Name if different from mailed to)*

V0725-186PT
PURCHASE ORDER NUMBER*
T07 2708
COST ESTIMATE AND PROPOSAL NUMBER
☐ VISA ☐ MasterCard ☐ American Exp.
CARD HOLDER NAME
CREDIT CARD NUMBER **EXPIRATION DATE**
ACCOUNTS PAYABLE PHONE* **ACCOUNTS PAYABLE FAX***

Occlusin® 500 Artificial Embolization Device
TEST ARTICLE NAME *USE EXACT WORDING DESIRED ON FINAL REPORT* * +

Embolotherapy
INTENDED CLINICAL USE OF TEST ARTICLE:*

X **BATCH** ☐ **CODE** ☐ **LOT** FL288
CHECK ONE **IDENTIFICATION NUMBER***

CONTROL ARTICLE NAME*

☑ **BATCH** ☐ **CODE** ☐ **LOT**
CHECK ONE **IDENTIFICATION NUMBER***
NAMSA recommends only one lot, batch, or code per test article submission.

QUANTITY SUBMITTED:* 38 vials Occlusin® 500 Artificial Embolization Device , Batch FL288
(please specify quantities for each lot/batch/code provided)
PHYSICAL DESCRIPTION OF TEST ARTICLE (Chemical/Material type/Color)*
glass vials containing white beads

TEST ARTICLE IS CATEGORIZED AS BEING A (check all that apply):* +
MEDICAL DEVICE ☐ BIOLOGIC ☐ TISSUE
☐ PHARMACEUTICAL ☐ CHEMICAL ☐ OTHER

+ A detailed composition list and current MSDS sheet must accompany any chemical or biologic test article. A certificate of testing or reprocessing must be submitted for any human tissue derived sample or clinically used medical device

TEST ARTICLE BEING SUBMITTED IS:*
STERILIZED ☐ NOT STERILIZED
☐ **NAMSA TO STERILIZE BY:** ☐ EO (additional charge) ☐ STEAM

Mixtures of test or control articles with carriers require analysis to demonstrate proper concentration, homogeneity, and stability.*
☐ Sponsor will provide analytical methods; or
☐ Sponsor will perform analysis on representative aliquots provided by NAMSA.

STORAGE CONDITIONS*
☐ ROOM TEMPERATURE X REFRIGERATION ☐ FREEZER
☐ OTHER:

TEST AND CONTROL ARTICLE CHARACTERIZATION: The sponsor assures the above test article has been characterized for identity, strength, purity, and composition as required by FDA Good Laboratory Practice Regulations of 21 CFR Part 58.105. Stability testing is the responsibility of the sponsor and is subject to FDA audit. Characterization and stability information are also required for control articles. Please check the statement(s) applicable to the test and control articles for both Stability and Strength, Purity and Composition sections below.

Test Article	Control Article	Stability (Choose One)
X	☐	Stability testing is in progress; article is stable for duration of intended testing.
☐	☐	Stability testing is complete and on file with sponsor. Expiration date (test): Expiration date (control):
☐	☐	Marketed product stability characterized by its labeling.

Test Article	Control Article	Strength, Purity, and Composition (Choose One)
☐	☐	Sponsor provided data in a Certificate of Analysis or other appropriate documentation and results will be reflected in the final report.
X	☐	Sponsor elects not to provide this information to NAMSA and takes full responsibility for this data and can supply this information if requested to do so.

If requesting to return sample, please check the courier and include your:
☐ UPS ☐ Federal Express ☐ Other: Account Number:

T053007_017
FEDEX VIREXX VS 5-30-07 Requested Ice Packs

AUTHORIZED BY SPONSOR Michelle E. Longstreet DATE 28 MAY 07
NAMSA STUDY DIRECTOR DATE 6-11-07

REV040207

NAMSA

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June 12, 2007

Paul Tiege
ViRexx Medical Corporation
8223 Roper Road NW
Edmonton, Alberta, T6E 6S4 Canada

PROTOCOL AMENDMENT I

Test Article: Occlusin® 500 Artificial Embolization Device

Identification: Batch: FL288

NAMSA Submission ID.: 07T_37252

We have received appropriate test article and approved protocol(s) for the program to be conducted in accordance with the Good Laboratory Practice (GLP) Regulations on the material described above. Below is a projected schedule for the work to be performed.

NAMSA Code	NAMSA Lab Number	Study	Estimated Start Date:	Estimated Report Release Date:
TI261_300	07T_37252_02	ISO Maximization Sensitization Study - Extract - 0.9% SC Extract	June 25, 2007	August 24, 2007
TI261_300	07T_37252_03	ISO Maximization Sensitization Study - Extract - SO Extract	June 25, 2007	August 24, 2007
TI251_800	07T_37252_04	ISO Intracutaneous Study - Extract - 0.9% SC Extract	June 18, 2007	July 12, 2007
TI251_800	07T_37252_05	ISO Intracutaneous Study - Extract - SO Extract	June 18, 2007	July 12, 2007
TS200_901	07T_37252_06	Two Week Rat Study, Repeated Parenteral Administration of Two Extracts - 0.9% SC Extract	June 25, 2007	September 21, 2007
TS200_901	07T_37252_07	Two Week Rat Study, Repeated Parenteral Administration of Two Extracts - SO Extract	June 25, 2007	September 21, 2007

Michelle E. Longstreet

Michelle E. Longstreet, B.S.
Study Director

6-12-07
Date

cc: QA (NAMSA)
GLP study file

NAMSA

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October 3, 2007

Paul Tiege
ViRexx Medical Corporation
8223 Roper Road NW
Edmonton, Alberta, T6E 6S4 Canada

REVISED*
PROTOCOL AMENDMENT I

Test Article: Occlusin® 500 Artificial Embolization Device

Identification: Batch: FL288

NAMSA Submission ID.: 07T_37252

We have received appropriate test article and approved protocol(s) for the program to be conducted in accordance with the Good Laboratory Practice (GLP) Regulations on the material described above. Below is a projected schedule for the work to be performed.

NAMSA Code	NAMSA Lab Number	Study	Estimated Start Date:	Estimated Report Release Date:
TI261_300	07T_37252_02	ISO Maximization Sensitization Study - Extract - 0.9% SC Extract	June 15, 2007	August 14, 2007
TI261_300	07T_37252_03	ISO Maximization Sensitization Study - Extract - SO Extract	June 15, 2007	August 14, 2007
TI251_800	07T_37252_04	ISO Intracutaneous Study - Extract - 0.9% SC Extract	June 15, 2007	July 10, 2007
TI251_800	07T_37252_05	ISO Intracutaneous Study - Extract - SO Extract	June 15, 2007	July 10, 2007
TS200_901	07T_37252_06	Two Week Rat Study, Repeated Parenteral Administration of Two Extracts - 0.9% SC Extract	June 15, 2007	October 19, 2007*
TS200_901	07T_37252_07	Two Week Rat Study, Repeated Parenteral Administration of Two Extracts - SO Extract	June 15, 2007	October 19, 2007*

*This amendment has been revised to change the estimated report release dates.

Michelle C. Longstreet

Michelle E. Longstreet, B.S.
Study Director

10-4-07
Date

cc: QA (NAMSA)
GLP study file

NAMSA

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July 10, 2007

Paul Tiege
ViRexx Medical Corporation
8223 Roper Road NW
Edmonton, Alberta, T6E 6S4 Canada

PROTOCOL AMENDMENT II

Test Article:	Occlusin® 500 Artificial Embolization Device
Identification:	Batch: FL288
Protocol:	TS200_901 Two Week Rat Study, Repeated Parenteral Administration of Two Extracts – 0.9% SC, SO Extracts
NAMSA Lab No.:	07T_37252_06, 07

This amendment has been written to correct the **Preparation** section of the study protocol:

- Disregard the number of vials specified for each prep. Use the appropriate number of vials to provide the necessary amount of extract for each prep.
- Add the extract vehicle to the sponsor provided vials to remove the test article. Transfer the test article and extract to appropriate container for extraction.

This amendment was written prior to testing.

Michelle E. Longstreet

Michelle E. Longstreet, B.S.
Study Director

7-10-07
Date

cc: QA (NAMSA)
GLP study file

NAMSA

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August 1, 2007

Paul Tiege
ViRexx Medical Corporation
8223 Roper Road NW
Edmonton, Alberta, T6E 6S4 Canada

PROTOCOL AMENDMENT III

Test Article:	Occlusin® 500 Artificial Embolization Device
Identification:	Batch: FL288
Protocol:	TS200_901 Two Week Rat Study, Repeated Parenteral Administration of Two Extracts – 0.9% SC, SO Extracts
NAMSA Lab No.:	07T_37252_06, 07

This amendment has been written to correct the **Test System** section of the study protocol:

- The animals will not receive an animal code. Each animal will be identified by individual ear tag.

This amendment was written prior to testing.

Michelle E. Longstreet

Michelle E. Longstreet, B.S.
Study Director

8-1-07
Date

cc: QA (NAMSA)
GLP study file

TEST FACILITY:

NAMSA
6750 Wales Road
Northwood, OH 43619-1011

SPONSOR:

Paul Tiege
ViRexx Medical Corporation
8223 Roper Road NW
Edmonton, Alberta,
Canada

STUDY TITLE:

Two Week Toxicity Study in the Rat, Repeated Parenteral Administration of Two Extracts

07T-37252 07

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Approvals

Sponsor Representative (Sponsor): [signature]

Date Approved: 23 MAY 07

Study Director (NAMSA): Michelle C. Longstreet

Date Initiated: 6-11-07

07T-37252-07

1. Introduction

Purpose
The purpose of this study is to evaluate the subchronic systemic toxicity of leachables extracted from the test article following repeated intravenous injections in rats for a period of 14 consecutive days, and intraperitoneal injections in the same rats twice a week during the same 14 day period.

GLP Compliance
Good Laboratory Practice – This nonclinical laboratory study will be conducted in accordance with the United States Food and Drug Administration Good Laboratory Practice Regulations, 21 CFR Part 58.

Duplication of Experimental Work
By signature on this protocol, the sponsor confirms that the conduct of this study does not unnecessarily duplicate previous experiments.

2. Materials

Test Article
The sponsor will submit the test article to be evaluated. Detailed information about the test article will be provided by the sponsor on the NAMSA Sample Submission Form or on a similar attachment to the protocol.

Preparation
The following is to be completed by the sponsor or study director. Further instructions may be attached to the protocol. The sample will be prepared for each day of dosing with 0.9% sodium chloride USP solution (SC) and Sesame Oil (SO) as follows:

① **Ratio of test article to extraction vehicle (select one):**

- √ Material thickness less than 0.5 mm - ratio of 120 cm^2:20 ml
- ___ Material thickness greater than or equal to 0.5 mm - ratio of 60 cm^2:20 ml
- ___ Irregularly shaped objects and/or sponsor option - ratio of 4 g:20 ml
- ___ Other (explain): ___

① **Test Article Preparation Instructions:**

each vial of occlusin 505 has a total of 44 cm^2 SA per vial
please extract 3 vials, 132 cm^2, in an appropriate volume
for each of sc and so extracts

extraction procedure should be done under constant agitation
eg. end-over-end, to prevent particles from clumping

① **Extraction Conditions (select one):**

- ___ 50°C, 72 hours
- ___ 70°C, 24 hours
- ___ 121°C, 1 hour
- ___ Other (specify): 37°C 72h

The extracts will be used within 24 hours of completion of the extraction process or as directed by the sponsor.

① **Disposition of Test/Control Article (select one):**

√ Discard ___ Return unused article ___ Return unused and used article

① completed by sponsor MEL 6-1-07

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07T-37252 07

Special Laboratory Instructions:

Control Article
Vehicle controls (SC and SO without test article) will be prepared in the same way and at the same time as the test extract. A single group of common control animals may be dosed when multiple test articles are evaluated at the same time.

3. Test System

Test System

Species:	Rat (*Rattus norvigicus*)
Strain:	Hla®:(SD)CVF®
Source:	Hilltop Lab Animals, Inc.
Sex:	Fourteen male, fourteen female
Body Weight Range:	No particular weight range is prescribed for this study, however, individual pretreatment body weights will be within 20% of the group mean for each sex
Age:	Approximately 6 to 8 weeks old at first treatment
Acclimation Period:	Minimum 5 days
Number of Animals:	Twenty-eight
Identification Method:	Ear punch or tag

Justification of Test System
Preparation and testing of extracts is recognized as an acceptable method for evaluating potential leachables from solid materials. The laboratory rat is suggested in the ISO standards and OECD guidelines as an acceptable model for evaluating the intravenous toxicity of various materials.

4. Animal Management

Husbandry:	Conditions will conform to Standard Operating Procedures that are based on the "Guide for the Care and Use of Laboratory Animals."
Food:	A commercially available rodent feed will be provided daily (except at termination).
Water:	Potable water will be provided *ad libitum* through species appropriate water containers or delivered through an automatic watering system.
Contaminants:	Reasonably expected contaminants in feed or water supplies should not have the potential to influence the outcome of this test.
Housing:	Animals will be individually or group housed in stainless steel suspended cages identified by a card indicating the lab number, animal number(s), test code, sex, animal code and date of first injection.
Environment:	The room temperature will be monitored daily. The recommended temperature range for the room is 64-79°F. The room humidity will be monitored daily. The humidity range for the room is 30-70%. The light cycle will be controlled using an automatic timer (12 hours light, 12 hours dark).
Accreditation:	NAMSA is an AAALAC International accredited facility and is registered with the United States Department of Agriculture. Additionally, NAMSA maintains an approved Animal Welfare Assurance on file with the National Institutes of Health, Office for Laboratory Animal Welfare.
Personnel:	Associates involved will be appropriately qualified and trained.
Selection:	Only healthy, previously unused animals will be selected.

Sedation, Analgesia or Anesthesia:	It has been determined that the use of sedation, analgesia or anesthesia will be necessary during the routine course of this procedure.
Veterinary Care:	In the unlikely event that an animal should become injured, ill, or moribund, care will be conducted in accordance with current veterinary medical practice. If warranted for humane reasons, euthanasia will be conducted in accordance with the current report of the American Veterinary Medical Association's Panel on Euthanasia. The objective of the study will be given due consideration in any decision and the study sponsor will be advised.
IACUC:	This protocol has been approved by NAMSA Institutional Animal Care and Use Committees (IACUC), and is reviewed at least annually by the same committees. Any significant changes to this protocol must be approved by the IACUC prior to conduct.

5. Method

No more than one day prior to the first dose, rats will be weighed and randomly assigned to each treatment group (test, control) as shown below.

Number of Animals Injected			
Test		Control	
Male	Female	Male	Female
7	7	7	7

The animals will receive an intravenous injection of the SC test article extract once each day for 14 consecutive days. The SC test extract will be injected via the lateral tail vein at a dose of 10.0 ml/kg. The same animals will receive an intraperitoneal injection of the SO test extract at a dose of 5.0 ml/kg body weight on days 1, 4, 8 and 12. The individual daily dose will be based on the weight of each animal on the first dose day of each week. The appropriate dose volume will be calculated to the nearest 0.1 ml. An appropriate gauge needle attached to a disposable syringe will be used to deliver the injection. The injection rate will be approximately 1.0 ml/10seconds. Animals will be dosed at approximately the same time each day. The vehicle control will be similarly injected in each previously designated control animal. The first day of dosing will be designated as day 1.

Laboratory Observations

1. Animals will be observed daily for general health. Rats will also be observed for any adverse reactions immediately after injection.
2. Detailed examinations for clinical signs of disease or abnormality will be conducted at randomization and on days 8 and 15.
3. Body weights will be recorded to the nearest whole gram prior to the first dose, on day 8, 14 (pre-fasted weight) and 15 (fasted weight).
4. In the event of mortality, the following contingencies will apply:
   a. Should any animal die during the study, a macroscopic examination of the viscera will be conducted. Because of rapid postmortem tissue changes in small rodents, no final body weight or blood collection will be attempted. The organs and tissues designated in the Terminal Procedures portion of this protocol will be collected and fixed for histopathologic evaluation. The number of days the animal was on test will be considered in the final evaluation.
   b. Should any animal exhibit adverse clinical signs or suffer from cage injury that for humane reasons necessitates euthanasia, it will be subject to the Terminal Procedures. The number of days the animal was on test will be considered in the final evaluation.

Terminal Procedures

At the end of the workday on day 14, the animals will be weighed and food will be withheld for a maximum of 20 hours. On day 15, the animals will be weighed and then anesthetized by intraperitoneal injection of ketamine hydrochloride and xylazine (88 mg/kg + 12 mg/kg) dosed at 3.0 ml/kg. The abdomen will be opened and a blood specimen will be collected from the posterior vena cava. The blood specimens will be forwarded to a contract laboratory for complete blood cell count with differential and clinical chemistry analyses as outlined in Appendix 1. Rats will be euthanized by exsanguination while anesthetized.

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Following exsanguination, a macroscopic observation of the viscera will be conducted. The following organs will be removed: heart, lungs, liver, spleen, thymus, kidneys (2), adrenal glands (2), mesenteric lymph nodes, submandibular lymph nodes, gonads (2) and any tissue with visible gross lesions. The liver, spleen, thymus, kidneys, adrenal glands and gonads will be weighed. Paired organs will be weighed together. The tissues will be preserved in 10% neutral buffered formalin (NBF) until further processing. The carcasses will be discarded.

After fixation, the tissues will be histologically processed (embedded, sectioned and stained in hematoxylin and eosin) for microscopic evaluation by a qualified pathologist.

6. Evaluation and Statistical Analysis

Body weight data, organ weight data, organ/body weight ratios, hematology and clinical chemistry data will be evaluated statistically. Pre-fasted body weights will be used to determine weight gain and the fasted body weights will be used to determine anesthetic dosages at termination and organ/body weight ratios. Descriptive statistics and group comparisons of data will be accomplished using a validated statistical software package. After screening the data for normality and equal variance, the appropriate parametric or nonparametric tests will be performed. Normally distributed data with equal variance will be considered parametric and evaluated using an "unpaired t-test" for comparison of two groups. If data is nonparametric, a two sample t-test unequal variance (Welch Test) was used for two group comparisons. The data to be analyzed will include: body weight, organ weight and hematological parameters. The treatment groups will be used as variables. Calculations resulting in probability (p) values less than 0.05 will be considered statistically significant. If directed by the evaluating pathologist, statistical evaluation of pathologic findings may be conducted.

Clinical signs of systemic illness or death will not be analyzed statistically unless a rationale (such as frequently observed clinical signs or emergence of a pattern) for such analysis is apparent from these data. If the incidence of occurrence of any one or more observations is sufficient to warrant analysis, a chi-square test will be employed.

Data from male and female rats for body weights will be analyzed separately until and unless a rationale exists for combining the sexes. Body weight data will be expressed as absolute values. Data from male and female rats for hematology parameters will be analyzed separately unless a rationale exists for combining the sexes. In the event of statistical significance for any hematologic parameter, the results will be compared to a reference range to aid in determining biological significance.

7. Report

The final report will include a description of the methods employed, clinical observations, body weight data, hematology and clinical chemistry data, organ weight data, organ/body weight ratios, necropsy findings, the microscopic evaluation in the histopathology report, the statistical analyses and conclusions.

8. Quality Assurance

Inspections will be conducted at intervals adequate to assure the integrity of the study in conformance with 21 CFR 58.35(b)(3). The final report will also be reviewed for conformance to Section 58.185, Subpart J, of the GLP Regulations. A Statement of Quality Assurance Activities will be provided with the final report.

9. Proposed Dates

The study dates will be finalized by the study director following receipt of the sponsor-approved protocol and appropriate material for the study. Initiation of the study will be the date on which the study director signs the GLP protocol. Projected dates for starting the study (first treatment) and for the completion of the study (final report release) will be provided to the sponsor (or representative of the sponsor).

10. Records

Test extract and control vehicle preparation, dates of relevant activities (such as initiation and completion), body weights, daily health observations, necropsy findings and organ weights will be recorded.

All raw data, paraffin blocks and tissue slides pertaining to this study and a copy of the final report will be retained in designated NAMSA archive files.

11. References

21 CFR 58 (GLP Regulations).

Guide for the Care and Use of Laboratory Animals, Institute for Laboratory Animal Research, National Academy of Sciences (Washington: National Academy Press, 1996).

ISO 10993-11 (2006) Biological evaluation of medical devices - Part 11: Tests for systemic toxicity

OECD Guideline for Testing of Chemicals, *Repeated Dose Oral Toxicity - Rodent: 28-day or 14-day Study*, Document Number 407.

OLAW, Public Health Service Policy on Humane Care and use of Laboratory Animals (NIH Publication).

12. Protocol Changes

Any necessary changes to the protocol after sponsor approval or study initiation will be documented and approved by the study director as protocol amendments. Copies will be distributed to the sponsor, the raw data file, and the NAMSA Quality Assurance department.

Appendix 1 - Routine Hematology and Clinical Chemistry Parameters

Routine Hematology
(CBC with differential)

Bands

Basophils (BASO)

Eosinophils (EOS)

Hematocrit (HCT)

Hemoglobin (HGB)

Lymphocytes (LYMPH)

Mean Corpuscular Hemoglobin (MCH)

Mean Corpuscular Hemoglobin Concentration (MCHC)

Mean Cell Volume (MCV)

Monocytes (MONO)

Neutrophils (NEUTRO)

Red Blood Cell count (RBC)

White Blood Cell count (WBC)

Clinical Chemistry
(Diagnostic - Multi Chem)

Albumin/Globulin Ratio (ALB/GLOB)

Albumin (ALB)

Alkaline Phosphatase (ALP)

Amylase, serum (AMY)

Bilirubin, total (TOT BIL)

Blood Urea Nitrogen (BUN)

BUN/Creatinine Ratio (BUN/CR)

Calcium (Ca)

Chloride (Cl)

Cholesterol (CHOL)

Creatinine, serum (CR)

γ-Glutamyl transferase (GGT)

Globulin, total (TOT GLOB)

Glucose, serum (GLU)

Lactate dehydrogenase (LDH)

Phosphorus (P)

Potassium (K)

Aspartate aminotransferase (AST)

Alanine aminotransferase (ALT)

Sodium (Na)

Total protein (TOT PRO)

Triglycerides (TRI)