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DERMAL SENSITIZATION POTENTIAL OF CANDIDATE INSECT REPELLENTS: --ETC(U)
FEB 82 J T FRUIN, M A HANES, K BLACK
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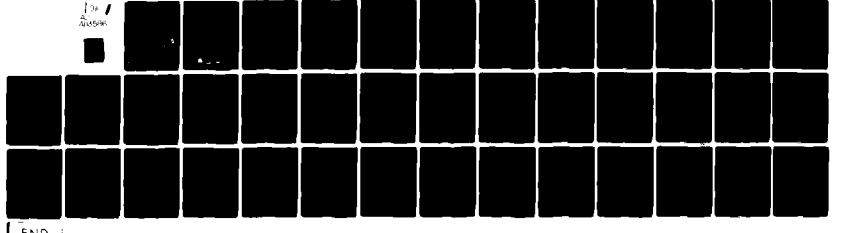

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: LAIR Technical Note No. 82-29TN	2. GOVT ACCESSION NO.: AD-A113586
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE *(and Subtitle)*: Dermal Sensitization Potential of Candidate Insect Repellents: CHF1, CHR2, CHR3, CHR5, CHR6	5. TYPE OF REPORT & PERIOD COVERED: Final, 22 Apr-8 Jun 81
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): J.T. Fruin, DVM, PhD, LTC, VC; M.A. Hanes, DVM, CPT, VC; K. Black, MD, LTC, MC; and V.L. Gildengorin, PhD, DAC	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Div of Research Support, Div of Cutaneous Hazards, and Information Sciences Group, Letterman Army Institute of Research, Presidio of San Francisco, CA	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Proj No. 3M16770A871 Work Unit No. 201
11. CONTROLLING OFFICE NAME AND ADDRESS: U.S. Army Medical Research & Development Command, Fort Detrick, Frederick, MD 21701	12. REPORT DATE: February 1982
	13. NUMBER OF PAGES: 41
14. MONITORING AGENCY NAME & ADDRESS *(If different from Controlling Office)*	15. SECURITY CLASS. *(of this report)*: UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

APPROVED FOR PUBLIC RELEASE AND SALE; DISTRIBUTION IS UNLIMITED

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

m-DEET, DEET, dermal sensitization, insect repellents, LAIR, toxicology, CHF1, CHR2, CHR3, CHR5, CHR6

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Arthropods represent a potential disease threat to U.S. Military Forces; consequently, a program to develop improved insect repellents was developed. The dermal sensitization potential of candidate insect repellents was determined using guinea pigs. Test substances CHF1, CHR2, and CHR3 were clearly non-sensitizing. CHR5 and CHR6 were irritating, possibly sensitizing, and should be retested.

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TECHNICAL NOTE NO. 82–29TN

DERMAL SENSITIZATION POTENTIAL OF CANDIDATE INSECT REPELLENTS: LAIR Formulation (CHF1)

N-(n-octyl) glutarimide (CHR2)

N-(n-hexyl) glutarimide (CHR3)

(E) 1,2,3,4-tetrahydro-6-methyl-1-(2-methyl-1-oxo-2-butenyl)quinoline (CHR5)

1,2,3,4-tetrahydro-6-methyl-1-(3-methyl-1-oxo-2-butenyl) quinoline (CHR6)

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DIVISION OF CUTANEOUS HAZARDS
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FEBRUARY 1982

Toxicology Series 12

LETTERMAN ARMY INSTITUTE OF RESEARCH PRESIDIO OF SAN FRANCISCO CALIFORNIA 94129

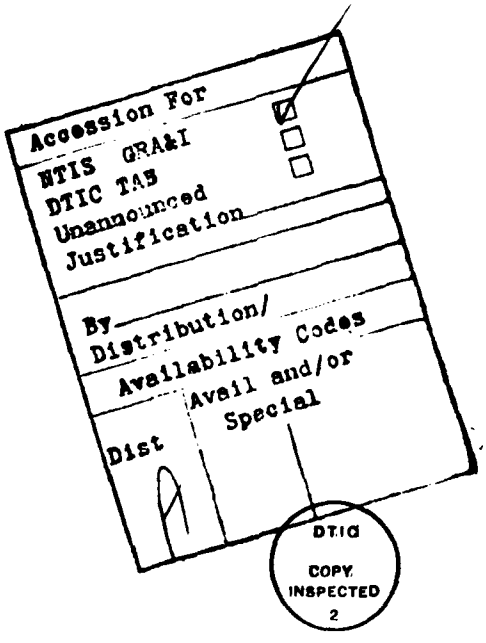
Toxicology Series 12 - Fruin, Hanes, Black, and Gildengorin

In conducting the research described in this report, the investigation adhered to the "Guide for the Care and Use of Laboratory Animals," as promulgated by the Committee on Revision of the Guide for Laboratory Animal Facilities and Care, Institute of Laboratory Animal Resources, National Research Council.

This material has been reviewed by Letterman Army Institute of Research and there is no objection to its presentation and/or publication. The opinions or assertions contained herein are the private views of the author(s) and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense. *(AR 360-5)*

John D. Marshall 2 16 Feb 82

(Signature and date)



PREFACE

Dermal Sensitization GLP Study Report

TESTING FACILITY: Letterman Army Institute of Research
Presidio of San Francisco, CA 94129

SPONSOR: Letterman Army Institute of Research
Presidio of San Francisco, CA 94129

PROJECT: Prevention of Military Disease Hazards 3M16770A871

GLP STUDY NUMBER: 81008

STUDY DIRECTOR: LTC (P) John T. Fruin, DVM, PhD, VC,
Diplomate of American College of
Veterinary Preventive Medicine

PRINCIPAL INVESTIGATOR: CPT Martha A. Hanes, DVM, VC

DERMATOLOGIST: LTC Kenneth Black, MD, MC
Diplomate of American Board of
Dermatology

STATISTICIAN: Virginia L. Gildengorin, PhD, DAC

RAW DATA: A copy of the final report, study protocol, as amended, raw data, and standard operating procedures will be retained in the LAIR Archives.

TEST SUBSTANCES: A. LAIR formulation consisting of 50% N,N-diethyl-m-toluamide (m-DEET), 25% Dow Corning 200 Fluid 1000 cs. viscosity and 25% isopropyl alcohol (CHF1).

B. N-(n-octyl)glutarimide (CHR2).

C. N-(n-hexyl)glutarimide (CHR3).

D. (E) 1,2,3,4-tetrahydro-6-methyl-1-(2-methyl-1-21-oxo-2-butenyl)quinoline (CHR5).

E. 1,2,3,4-tetrahydro-6-methyl-1(3-methyl-1-oxo-2-butenyl)quinoline (CHR6).

WORK UNIT: 201 Development of Repellents Against Medically Important Arthropods.

PURPOSE: The purpose of this study was to determine the dermal sensitization potential of the test substances listed above.

ACKNOWLEDGMENTS

The authors wish to thank MAJ George H.G. Eisenberg, PhD, MS; SSG Lance White; SP5 Leonard Sauers, BA; SP4 Thomas P. Kellner, BA; SP4 Larry Mullen, BS; PFC Evelyn Zimmerman; John Dacey; and Carolyn Lewis, MS, for their assistance in performing the research, administration, and support in planning, executing, and reporting the study. We also wish to thank Dr. A. McCreesh of the U.S. Army Environmental Health Agency for advice in establishing the test procedures and interpretation of results.

Signatures of Principal Scientists
Involved in the Study

We, the undersigned, believe the study, GLP Study No. 81008, described in this report to be scientifically sound and the results and interpretations to be valid. The study was conducted to comply, to the best of our ability, with the Good Laboratory Practice Regulations for Non-clinical Laboratory Studies outlined by the Food and Drug Administration.

Martha A. Hanes 7 Jan 82 John T Fruin 6 Jan 1982

MARTHA A. HANES, DVM /DATE
CPT, VC
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JOHN T. FRUIN, DVM, PhD /DATE
LTC (P), VC
Study Director

Kenneth Black 7 Jan 82 Virginia L Gildengorin 7 Jan 82

KENNETH BLACK, MD /DATE
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DEPARTMENT OF THE ARMY
LETTERMAN ARMY INSTITUTE OF RESEARCH
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

REPLY TO
ATTENTION OF

SGRD-ULZ-QA

25 June 1981

MEMORANDUM FOR RECORD

SUBJECT: Report of GLP Compliance

1. I hereby certify that in relation to LAIR GLP study 81008 the following inspections were made:

30 Apr 81
2 May 81
11 May 81
14 May 81
4 Jun 81

2. The report and raw data for this study were audited on 18 Aug 81.

3. Inspection findings were reported to the Study director on 15 May 81, 28 May 81, and 8 Jun 81. These inspections are also included in the July 1981 report to Management and the Study Director.

John C Johnson

JOHN C. JOHNSON
CPT, MC
Quality Assurance Officer

DERMAL SENSITIZATION POTENTIAL OF CANDIDATE INSET REPELLECTS: CHF1, CHR2, CHR3, CHR5, CHR6

Letterman Army Institute of Research (LAIR) has been directed to participate in the development of better insect repellents for the protection of soldiers from insects and insect-borne diseases in the field. In the last several years, investigators in the Division of Cutaneous Hazards at LAIR have tested a large number of chemical compounds submitted by SRI-International, the U.S. Department of Agriculture (USDA), and private industry against a variety of mosquitoes, sand flies, fleas, bugs, ticks, and mites in animal and in in vitro test systems. Several of these materials have shown sufficient repellent activity and persistence on the skin of animals to warrant consideration for use in lieu of, or in conjunction with, the current troop-issue repellent, 71.25% diethyl-toluamide (m-DEET) in ethanol. The investigators also evaluated a number of new formulations of m-DEET prepared at LAIR or submitted by private industry. Several of these new formulations have been more persistent on the skin in tests on animals than the current troop-issue repellent.

We now plan to test on human volunteers the most promising of the new compounds and formulations to confirm the results that have been obtained in the in vitro and animal tests and to evaluate the performance of these agents under conditions of actual use. Before this can be done, it is necessary to obtain certain toxicity data on each compound or formulation to insure that it is safe for application to the skin. The basic toxicity tests required for experimental use of the new compounds and formulations on human volunteers are prescribed by the LAIR and U.S. Army Medical Research and Development Command (USAMRDC) Human Use Committees. If adverse toxicity data are obtained in these tests, the respective material(s) will be eliminated from consideration, and the prospective tests on human volunteers will not be carried out. The toxicity testing program thereby serves both as a safety factor and secondary screen in the repellent development scheme.

Objective of the Study

The objective of this study was to determine the dermal

sensitization potential of candidate insect repellents CHF1, CHR2, CHR3, CHR5, and CHR6.

METHODS

Historical Listing of Study Events

22 Apr 81	Guinea pigs arrived at LAIR. They were observed for signs of clinical illness, sexed, ear-tagged, weighed, and housed individually in cages in room AS1410 for a one-week quarantine period.
29 Apr 81	Animals were removed from quarantine status and weighed.
30 Apr 81	Animals received the first sensitizing dose of 0.05 ml of 0.1% test substance. Injection sites were scored and the values recorded after 24 and 48 hr.
2,5,7,9,12, 14,16,19 and 21 May 81	Animals received sensitizing doses of 0.1 ml of test substance. Injections were scored and the values recorded 24 and 48 hr after each injection.
5,12,19, 26 May and 4 Jun 81	The animals were weighed.
4 Jun 81	The animals received the challenge dose of 0.1 ml of 0.1% test substance.
5 Jun 81	Injection sites were scored and the values recorded for the 24-hr reaction.
6 Jun 81	Injection sites were scored and the values recorded for the 48-hr reaction.

8 Jun 81 The animals were removed from the study.

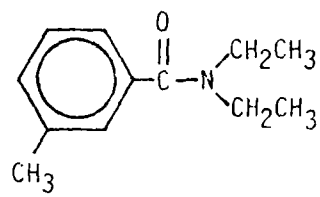
Chemical Data

A. CHF1 - a formulation of 50% N,N-diethyl-m-toluamide (m-DEET) in 25% Dow Corning 200 Fluid and 25% isopropyl alcohol. The formulation is a suspension that must be agitated to maintain homogeneity (1,2).

1. Chemical Name: N,N-diethyl-m-toluamide

Chemical Abstracts Service Registry No.: 134-62-3

Molecular formula/structure: $C_{12}H_{17}NO$



Molecular weight: 191.3

pH: N/A nonaqueous

Physical state: Liquid

Boiling range: 288-292C

Compound density: 0.996

Compound refractory index: $n_D^{20} = 1.5212$

Contaminants: Contains ortho and para isomers

Manufacturer: Aldrich Chemical Co., Inc.,
Milwaukee, WI 53233

Manufacturer Lot No.: 032697 (purity at purchase was 98%, April 1979)

Published Toxicity Data:

Oral LD_{50} (rat) 2000 mg/kg

Dermal LD_{50} (rabbit) 3180 mg/kg

Other information:

Listed as an irritant to eyes and mucous membranes. Can cause central nervous system distrubances.

2. Chemical Name: Dow Corning 200 Fluid, 1000 cs. viscosity (Dimethylsiloxane polymer)

Chemical Abstracts Service Registry No.: None.

Molecular formula: linear polydimethyl siloxanes

Molecular weight: about 25,000

pH: N/A nonaqueous

Physical state: fluid

Specific gravity: 0.971

Stability: high thermal stability -- manufacturer says unlimited useful life when stored at 25 C

Compound refractory index: $n_D^{20} = 1.403$

Manufacturer: Dow Corning Corp., Midland, MI 48640

Manufacturer Lot No.: MA 129889

Other information:

Water repellent, low surface tension, low toxicity, essentially non-toxic and non-irritating (although discomfort may result if rubbed into the eye).

3. Chemical Name: isopropanol(3)

Chemical Abstracts Service Registry No.: 67-63-0

Molecular structure: $CH_3CHOHCH_3$

Molecuar weight: 60.09

pH: N/A nonaqueous

Physical state: clear colorless liquid

Boiling point: 82.5C

Compound density: 0.7854

Manufacturer: VWR Scientific Products,
San Francisco, CA 94119

Manufacturer's Control Code: A17

Published toxicity data:

Oral LD_{50} (rat) = 5840 mg/kg

Dermal LD_{50} (rabbit) = 16,000 mg/kg

Other information:

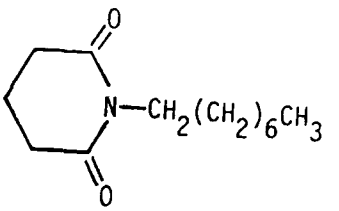
Listed as an irritant to eyes; acts as a local irritant and in high concentration as a narcotic. It can cause corneal burns and eye damage. Acts much like ethanol in regard to absorption and metabolism and elimination, but with a stronger narcotic action.

B. CHR2

1. Chemical Name: N(n-octyl)glutarimide

Chemical Abstracts Service Registry Information No.: Unknown

Molecular formula/structure: $C_{13}H_{23}NO_2$



Molecular weight: 225.3

pH: N/A nonaqueous

Physical state: liquid

Boiling Point: 134 @ 0.5 mm Hg

Compound density: unknown

Compound refractory index: unknown

Stability: unknown

Names of contaminants and percentages: unknown

Manufacturer: SRI International
333 Ravenswood Ave.
Menlo Park, CA 94025

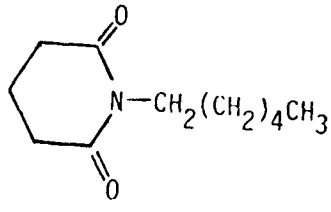
Manafacturer Lot No.: unknown

C. CHR3

1. Chemical name: N-(n-hexyl)glutarimide

Chemical Abstracts Service Registry No.: Unknown

Molecular formula/structure: $C_{11}H_{19}NO_2$



Molecular weight: 197.3

pH: N/A nonaqueous

Physical state: liquid

Boiling point: 115 C @ 0.5 mm Hg

Compound density: unknown

Compound refractory index: unknown

Stability: unknown

Names of contaminants and percentages: unknown

Manufacturer: SRI Intenational
333 Ravenswood Ave.
Menlo Park, CA 94025

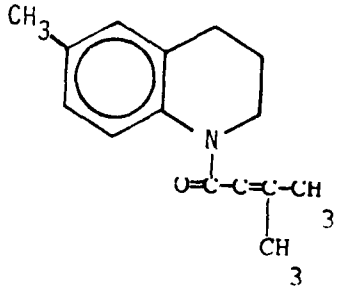
Manufacturer Lot. No.: 3905H23/31

D. CHR5

1. Chemical Name: (E) 1,2,3,4-tetrahydro-6-methyl-1-(2-methyl-1-oxo-2-butenyl)quinoline

Chemical Abstracts Service Registry No.: Unknown

Molecular formula/structure: $C_{15}H_{19}NO$



Molecular weight: 229

Physical state: liquid

Boiling point: unknown

Compound density: unknown

Compound refractory index: unknown

Stability: unknown

Names of contaminants and percentages: unknown

Manufacturer: SRI International
333 Ravenswood Ave.
Menlo Park, CA 94025

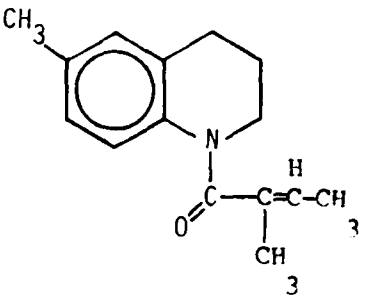
Manufacturer Lot No.: 4214H31

E. CHR6

1. Chemical Name: 1,2,3,4-tetrahydro-6-methyl-1-(3-methyl-1-oxo-2-butenyl)quinoline

Chemical Abstracts Service Registry No.: Unknown

Molecular structure: $C_{15}H_{19}NO$



Molecular weight: 229

pH: N/A nonaqueous

Physical state: liquid

Boiling range: unknown

Compound density: unknown

Compound refractory index: unknown

Stability: unknown

Names of Contaminants and Pecentages: unknown

Manufacturer: SRI International
333 Ravenswood Ave.
Menlo Park, CA 94025

Manufacturer Lot No.: 3905H83

Animal Data

Animal: albino guinea pig

Sex: male

Justification: The albino guinea pig is a proven acceptable model to determine dermal sensitization potential.

Source: Charles River Laboratories

Pre-test conditioning:

1. Quarantine from 22-29 April 1981

2. Animals' backs were close clipped.

Method of randomization: Manual, random numbers table

Number of animals on test: 10 animals per test substance

Age of animals at start of study: Young adults

Animal weight range at start of study: 250-400 g start,
550-750 g end

Condition of animals at start of study: Normal

Environmental conditions

Caging: Number/cage = 1; type cage used = stainless steel, wire mesh bottom, battery type, no bedding, automatic flushing

Diet: Purina Guinea Pig Chow No. 5025 ad libitum supplemented with about 100 cm^2 of fresh lettuce daily

Water: Central line to cage battery with automatic lick dispensers

Temperature: 70 ± 5 F (21 ± 3 C)

Relative Humidity: 70 ± 10%

Photoperiod: 0530-2000 hr/day (14-1/2 hr light)

Dosing Levels

The test substance concentration throughout the study was 0.1%.

A. CHF1 - initial dose 0.05 ml; 9 sensitizing doses of 0.1 ml and challenge dose of 0.1 ml

B. CHR2 - initial dose 0.05 ml; 9 sensitizing doses of 0.1 ml and challenge dose of 0.1 ml

C. CHR3 - initial dose 0.05 ml; 9 sensitizing doses of 0.1 ml and challenge dose of 0.1 ml

D. CHR5 - initial dose 0.05 ml, 9 sensitizing doses of 0.1 ml and challenge dose of 0.1 ml

E. CHR6 - initial dose Ø.Ø5 ml, 9 sensitizing doses of Ø.1 ml and challenge dose of Ø.1 ml

Treatment for Infectious Diseases

During the course of this study, no animal required treatment of infectious disease.

Rationale for Selection of Vehicle

Saline and propylene glycol have been used successfully as vehicles for this test and were compatible with the test substance.

Test Substance Preparation

A 3% stock solution of each test substance was prepared by adding Ø.3 ml of test substance to 9.7 ml of propylene glycol and refrigerated in Room LR1155. Just before sensitization injections, Ø.5 ml of stock solution was added to 14.5 ml of physiologic saline to achieve Ø.1% test substance preparation.

Animal Preparation

The hair was removed by close-clipping a strip running from the posterior flank to the scapular region on each side and across the back prior to initial dosing. Clipping was repeated as necessary for injection and accurate scoring.

Route of Administration

The test substance and carrier vehicle were injected intradermally using a 26-gauge needle and a tuberculin syringe.

Dosing

An initial dose of Ø.Ø5 ml of Ø.1% solution of test substance was injected intradermally in the right scapular area. Two days later, an

injection of Ø.1 ml of Ø.1% test substance was given. Injections were repeated three times weekly on alternate days for three weeks, starting in the right lumbosacral area. Similar injections of carrier solution (3.3% propylene glycol in physiologic saline) were injected at corresponding locations on the left side of the animal's back. Two weeks following the final injection, a challenge dose of Ø.1 ml of Ø.1% solution of test compound and carrier solution were administered on the right and left sides, respectively.

Scoring of Skin Reaction

The most recent injection sites (test substance, right side; vehicle control, left side) were scored at 24 and 48 hr after injection. The scoring system was designed so that the intensity of the skin reaction was represented by a proportionate numerical value. The product of the width and length (in millimeters) of the lesion was multiplied by the following reaction scores:

Ø = needle puncture	5 = bright red
1 = very faint pink - no wheal	6 = edema < 1 mm in height
2 = faint pink	7 = edema > 1 mm in height
3 = pink	8 = necrosis < 1 sq mm
4 = red	9 = necrosis > 1 sq mm

The width and length of the reaction was measured with an adjustable micrometer.

CHANGES TO ORIGINAL METHODS AND OBJECTIVES

- Compound purity and stability were not monitored because definitive analytical methods for monitoring test substance purity and stability have not been developed.

- Complete chemical characterization of test substance will be reported when it becomes available.

- Experience at the Army Environmental Health Agency (AEHA), Edgewood Arsenal, MD, has shown that a Ø.1% solution of test substance reduces chemical irritation and is sufficient for dermal sensitization. The recommendations of AEHA for

injecting the test substance at a concentration of 0.1% were followed.

- Certified feed was not available for the animals (guinea pigs in this study; however, fresh lettuce supplemented the guinea pig chow. The study was short (22 April-8 June 1981); experience has shown that certified feed is desirable but not necessary.

- The challenge dose was given as two 0.05 ml interdermal injections approximately 3 hr apart in the same site, equaling the correct dose of 0.1 ml of test substance.

RESULTS AND DISCUSSION

Scores were taken 24 and 48 hr after the initial sensitizing and challenge doses. The data are recorded as tabular average and final score values (Tables 1A-C through 5A-C for CHF1, CHR2, CHR3, CHR5, and CHR6, respectively).

Average final scores for CHFI, CHR2, and CHR3, i.e., test substance score minus diluent scores, remained under 10 throughout the sensitizing period and the challenge dose. The data collected clearly showed no indication of sensitization potential at this dose level for these three test substances.

The grand average final scores for CHR5 ranged from -0.2 on the first dose to 220.4 on dose number 7. Scores on later doses were lower and the grand average of the challenge dose was 126. The data collected did not present the classic picture of a dermal sensitizing agent, but there was clearly a dosage carryover effect. The linear correlation coefficient of the combined average score compared to dose number was low ($r^2 = 0.55$).

Substances that produce dermal sensitization classically cause higher scores after 48 hr than after 24 hr. A comparison of individual and average final 24 and 48-hr scores was inconclusive in determining which scores were higher.

There are no proven statistical techniques available for data of this type; consequently, classification must be made on the experience

and scientific judgement of the investigator. Substance CHR5 shows some characteristics of a sensitizing agent and some characteristics of a dermal irritant.

The grand average final scores for CHR6 ranged from 0.15 on the first dose to 114 on dose number 7. Scores on later doses were lower and the grand average of the challenge dose was 3.05. The data were similar to that collected for CHR5 in that the classical dose response was not evident. The correlation coefficient was quite low (r^2 = 0.07) and the 48-hr score appears to be less than the 24-hr score.

CONCLUSION

We believe that test substances CHF1, CHR2, and CHR3 are non-sensitizing. These conclusions are based on the low scores throughout the dosing and for the challenge dose.

Scores were considerably higher for CHR5 and CHR6. There was a progressive increase in test scores as the number of doses increased up to dose number 7; then the scores declined and did not increase with the challenge dose. The low correlation coefficient and the fact that the 48-hr scores were not greater than the 24-hr scores, indicate that no definite conclusions can be reached regarding the dermal sensitization potential of CHR5 and CHR6.

RECOMMENDATIONS

We recommend that compounds CHF1, CHR2, and CHR3 undergo further toxicological testing with the eventual goal being Federal clearance for general use as an insect repellent. We also recommend the dermal sensitization testing of compounds CHR5 and CHR6 be repeated with efforts made to test these compounds at a dose below the irritation level.

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APPENDIX A

TABLE 1A

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHF1 - RED

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol:Saline (1:30)

FINAL SCORE

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100015	0	0	0	0	0	0	0	0	0	0	0	0	8	4	1	0	0	0	78	6	79	0
E8100018	0	0	0	0	0	0	-4	0	2	-1	0	0	-16	-8	0	0	-4	-2	-10	2	-30	-2
E8100024	0	0	0	0	9	1	0	90	0	0	0	0	2	3	6	4	6	8	36	55	-18	0
E8100027	0	0	0	0	2	0	0	1	0	0	0	0	12	-2	2	2	0	7	-4	-4	-17	-24
E8100029	0	0	0	0	2	0	20	4	0	0	-12	-6	-8	0	-3	-4	1	0	-36	-12	4	0
E8100033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-18	-2	-2	-11
E8100044	0	0	0	0	-36	-2	1	1	0	0	0	0	12	0	0	-6	0	-8	32	8	16	12
E8100045	0	0	0	0	2	0	0	0	0	0	8	4	-1	-2	-1	0	1	0	4	2	-56	-4
E8100046	1	0	0	0	4	0	0	0	0	0	0	0	-6	0	0	0	7	-1	-1	0	15	-46
E8100053	0	0	0	0	1	1	0	0	2	1	0	0	-18	-2	4	8	-1	0	-20	-12	-17	-48
Average Score	0.1	0.0	0.0	0.0	-1.6	0.0	1.7	9.6	0.4	0.0	-0.3	-0.2	-1.5	-0.7	0.9	0.4	1.0	0.3	6.1	4.3	-19.6	-16.3

Average Score for Challenge: -16.0

Average Score for
1. 0.05
2. 0.00
3. -0.80
4. 5.65
5. 0.20
6. -0.25
7. -1.10
8. 0.65
9. 0.65
10. 5.20

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 1B

GLP STUDY # 81003

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHF1 - RED

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol: Saline (1:30)

TEST SUBSTANCE

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100015	0	0	0	0	0	0	0	0	0	0	0	0	3	4	1	0	1	0	96	3	72	2
E8100018	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	2	2	8	18	0
E8100024	0	0	0	0	9	1	0	90	0	0	0	0	6	4	6	4	8	8	216	105	12	2
E8100027	0	0	0	0	2	0	4	1	0	0	0	0	16	4	4	4	1	8	0	0	1	0
E8100029	0	0	0	0	2	0	20	4	0	0	1	0	0	0	1	0	1	0	0	0	8	0
E8100033	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	1	0	0	0	6	1
E8100044	0	0	0	0	0	0	1	1	0	0	0	0	12	0	1	2	1	0	36	8	48	12
E8100045	0	0	0	0	2	0	0	0	0	0	8	4	1	0	0	8	2	0	4	2	4	0
E8100046	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	140	4
E8100053	0	0	0	0	1	1	0	0	2	1	0	0	0	0	4	8	0	0	0	0	2	0
Average Score	0.1	0.0	0.0	0.0	2.0	0.2	2.5	9.6	0.4	0.1	0.9	0.4	4.7	1.6	2.5	3.5	2.7	1.8	35.4	13.1	31.1	2.1

Average Score for Challenge: 16.60

Average Score for
1. 0.05
2. 0.00
3. 1.10
4. 6.05
5. 0.25
6. 0.65
7. 3.15
8. 3.90
9. 2.25
10. 24.25

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 1C

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHF1 - RED

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol: Saline (1:30)

DILUENT

Sensitizing Dose: 1			2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	18	2	2	2
E8100018	0	0	0	0	0	0	4	0	0	1	0	0	16	8	0	0	8	4	12	6	48	2
E8100024	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	2	0	180	50	30	2
E8100027	0	0	0	0	0	0	4	0	0	0	0	0	4	6	2	2	1	1	4	4	18	24
E8100029	0	0	0	0	0	0	0	0	0	0	12	6	8	0	4	4	0	0	36	12	4	0
E8100033	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	1	1	18	2	8	12
E8100044	0	0	0	0	36	2	0	0	0	0	0	0	0	0	1	8	1	8	4	0	32	0
E8100045	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	8	1	0	0	0	60	4
E8100046	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	1	1	1	0	125	50
E8100053	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	1	0	20	12	180	48
Average Score	0.0	0.0	0.0	0.0	3.6	0.2	0.8	0.0	0.0	0.1	1.2	0.6	6.2	2.3	1.6	3.1	1.7	1.5	29.3	8.8	50.7	14.4

Average Score for Challenge: 32.55

Average Score for
1. 0.00
2. 0.00
3. 1.90
4. 0.40
5. 0.05
6. 0.90
7. 4.25
8. 2.35
9. 1.60
10. 19.05

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 2A

GLP STUDY # 31008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR2 - BLUE

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol: Saline (1:30)

FINAL SCORE

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100012	0	0	0	0	6	0	6	8	0	0	-1	0	8	0	0	0	0	0	-4	0	70	-12
E8100013	0	0	0	0	20	8	0	1	0	0	0	0	8	0	0	0	0	2	-1	0	-55	-14
E8100014	-1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	-1	0	0	10	3	-120	-22
E8100023	0	0	0	0	0	0	0	1	0	2	2	17	0	0	0	1	-11	0	4	8	232	10
E8100034	0	0	0	0	0	0	8	4	0	0	0	8	-1	-2	0	2	0	0	24	0	-48	-12
E8100037	0	0	0	0	12	7	0	1	0	0	0	0	2	2	0	0	0	0	2	0	0	-2
E8100039	0	0	0	0	4	1	0	1	1	0	-2	0	-9	-14	-3	-1	1	4	12	8	-24	-4
E8100041	0	0	0	0	8	14	1	2	0	0	0	0	0	0	-4	-2	68	24	0	0	36	4
E8100052	0	0	0	0	12	2	0	0	0	8	0	4	-12	-8	-1	0	-1	-2	-4	0	12	-10
E8100060	0	0	0	0	1	1	0	0	0	0	0	0	-8	-1	1	0	0	1	0	-2	-2	-2
Average Score	-0.1	0.0	0.0	0.0	6.4	3.3	1.5	1.8	0.1	1.0	-0.1	2.9	-1.2	-2.3	-0.7	-0.1	5.7	2.9	4.3	1.7	15.1	-6.2

Average Score for Challenge: 4.45

Average Score for
1. -0.05
2. 0.00
3. 4.90
4. 1.65
5. 0.55
6. 1.40
7. -1.75
8. -0.40
9. 4.30
10. 3.00

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 2B

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR2 - BLUE

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol: Saline (1:30)

TEST SUBSTANCE

Sensitizing Dose: 1			2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100012	0	0	0	0	24	6	6	8	0	0	0	0	8	0	0	0	0	0	0	0	196	4
E8100013	0	0	0	0	40	12	0	1	0	0	0	0	12	0	0	0	4	4	1	0	45	2
E8100014	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	12	4	40	4
E8100023	0	0	0	0	2	1	0	1	0	2	12	18	18	0	0	2	1	0	4	8	294	12
E8100034	0	0	0	0	0	0	8	4	0	0	0	8	0	0	0	2	1	0	24	0	48	4
E8100037	0	0	0	0	12	8	0	1	0	0	0	0	2	2	1	0	1	1	4	0	8	0
E8100039	0	0	0	0	4	1	0	1	1	0	0	0	15	4	1	0	1	4	12	8	24	8
E8100041	0	0	0	0	8	16	1	2	0	0	0	0	4	4	0	2	72	24	0	0	60	4
E8100052	0	0	0	0	12	2	0	0	0	3	0	4	0	0	0	0	0	0	0	0	48	2
E8100060	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	1	4	0	48	0
Average Score	0.0	0.0	0.0	0.0	10.4	4.8	1.5	1.8	0.1	1.0	1.2	3.0	5.9	1.0	0.3	0.7	8.2	3.4	6.1	2.0	81.1	4.0

Average Score for Challenge: 42.50

Average Score for
1. 0.00
2. 0.00
3. 7.60
4. 1.65
5. 0.55
6. 2.10
7. 3.45
8. 0.50
9. 5.80
10. 4.05

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 2C

GLP STUDY = 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR2 - BLUE

Principal Investigator: CPT HANES

Initial & Challenge Date: 30 Apr - 4 Jun

Diluent: Propylene Glycol: Saline (1:30)

DILUENT

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100012	0	0	0	0	18	6	0	0	0	0	1	0	0	0	0	0	0	0	4	0	126	16
E8100013	0	0	0	0	20	4	0	0	0	0	0	0	4	0	0	0	4	2	2	0	100	16
E8100014	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0	2	1	160	24
E8100023	0	0	0	0	2	1	0	0	0	0	10	1	18	0	0	1	12	0	0	0	12	2
E8100034	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	96	16
E8100037	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	2	0	8	2
E8100039	0	0	0	0	0	0	0	0	0	0	2	0	24	18	4	1	0	0	0	0	48	12
E8100041	0	0	0	0	0	2	0	0	0	0	0	0	4	4	4	4	4	0	0	0	24	0
E8100052	0	0	0	0	0	0	0	0	0	0	0	0	12	8	1	0	1	2	4	0	36	12
E8100060	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	1	0	4	2	50	2
Average Score	0.1	0.0	0.0	0.0	4.0	1.5	0.0	0.0	0.0	0.0	1.3	0.1	7.1	3.3	1.0	0.8	2.5	0.5	1.8	0.3	66.0	10.2

Average Score for Challenge: 38.10

Average Score for
1. 0.05
2. 0.00
3. 2.75
4. 0.00
5. 0.00
6. 0.70
7. 5.20
8. 0.90
9. 1.50
10. 1.05

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 3A

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR3 - BLACK

Principal Investigator: CPT HANES

Initial & Challenge Date: 30 APR - 4 JUNE

Diluent: Propylen Glycol:Saline (1:30)

FINAL SCORE

Sensitizing Dose: 1			2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100020	0	0	0	0	0	-3	0	18	0	1	-24	0	-27	0	0	0	-16	0	-4	2	-56	0
E8100025	0	0	0	0	1	1	0	0	0	0	0	0	12	0	0	-1	14	6	0	2	4	46
E3100028	0	0	0	0	16	0	0	1	0	0	0	0	0	0	-4	0	18	0	4	2	2	4
E3100030	0	0	0	0	0	-12	0	0	2	0	0	2	4	0	0	8	-12	0	8	0	0	-4
E8100036	0	0	0	0	1	0	10	30	0	0	0	0	17	0	0	2	-50	-6	4	6	-8	0
E3100040	0	0	0	0	0	0	0	0	0	0	0	0	-14	0	-1	7	10	0	-12	2	-110	9
E8100042	0	0	0	0	1	0	0	0	4	4	0	8	-2	-2	1	0	0	0	8	0	-14	8
E3100043	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1	4	0	2	1	4	40	32
E3100059	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	-1	8	6	2	-27	-6
E3100061	0	0	0	0	0	0	0	0	0	2	0	0	8	8	0	1	2	3	8	16	4	4
Average Score	0.0	0.0	0.0	0.0	1.9	-1.4	1.0	4.9	0.6	0.8	-2.4	1.0	0.1	1.0	-0.3	2.1	-3.5	1.3	2.3	3.6	-16.5	9.3

Average Score for Challenge: -3.60

Average Score for
1. 0.00
2. 0.00
3. 0.25
4. 2.95
5. 0.70
6. -0.70
7. 0.55
8. 0.90
9. -1.10
10. 2.95

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 3B

GLP STUDY = 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR3 - BLACK

Principal Investigator: CPT HANES

Initial & Challenge Date: 30 APR - 4 JUNE

Diluent: Propylene Glycol: Saline (1:30)

TEST SUBSTANCE

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100020	0	0	0	0	0	0	0	18	0	1	0	0	9	0	0	0	16	6	12	6	24	4
E8100025	0	0	0	0	1	2	0	0	0	0	0	0	12	0	0	0	14	6	0	2	16	48
E8100028	0	0	0	0	16	0	0	1	0	0	0	0	4	0	0	4	18	0	16	6	18	16
E8100030	0	0	0	0	0	0	0	0	2	0	0	2	6	0	0	8	0	0	8	0	36	0
E8100036	0	0	0	0	1	0	10	30	0	0	0	0	18	0	0	2	0	0	4	6	24	16
E8100040	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	8	18	0	8	8	16	36
E8100042	0	0	0	0	1	0	8	0	4	4	0	8	0	0	1	2	4	0	36	12	40	36
E8100043	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1	4	4	4	1	4	40	32
E8100059	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	8	6	2	18	18
E8100061	0	0	0	0	0	0	0	0	0	2	0	0	8	8	0	1	4	4	8	16	4	4
Average Score	0.0	0.0	0.0	0.0	1.9	0.2	1.8	4.9	0.6	0.8	0.0	1.0	6.2	1.2	0.2	2.9	7.9	2.8	9.9	6.2	23.6	21.0

Average Score for Challenge: 22.30

Average Score for
1. 0.00
2. 0.00
3. 1.05
4. 3.35
5. 0.70
6. 0.50
7. 3.70
8. 1.55
9. 5.35
10. 8.05

Injection dates:
1. 30 April
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 3C

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR3 - BLACK

Initial & Challenge Date: 30 APR - 4 JUNE

Principal Investigator: CPT HANES

Diluent: Proylene Glycol: Saline (1:30)

DILUENT

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100020	0	0	0	0	0	3	0	0	0	0	24	0	36	0	0	0	32	6	16	4	80	4
E8100025	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	12	2
E8100028	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4	0	0	12	4	16	12
E8100030	0	0	0	0	0	12	0	0	0	0	0	0	2	0	0	0	12	0	0	0	36	4
E8100036	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	50	6	0	0	32	16
E8100040	0	0	0	0	0	0	0	0	0	0	0	0	16	0	1	1	2	0	20	6	126	2[illegible]
E8100042	0	0	0	0	0	0	8	0	0	0	0	0	2	2	0	2	4	0	28	12	54	[illegible]
E8100043	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	1
E8100059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	45	24
E8100061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
Average Score	0.0	0.0	0.0	0.0	0.0	1.6	0.8	0.0	0.0	0.0	2.4	0.0	6.1	0.2	0.5	0.8	11.4	1.5	7.6	2.6	4[illegible]	[illegible]

Average Score for Challenge: 25.90

Average Score for
1. 0.00
2. 0.00
3. 0.00
4. 0.40
5. 0.00
6. 1.20
7. 3.15
8. 5.65
9. 6.45
10. 5.10

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 4A

GLP STUDY # 91006

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR5 - GREEN

Initial & Challenge Date: 30 APR & 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylen Glycol: Saline (1:30)

FINAL SCORE

Sensitizing Dose: 1			2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100011	0	0	0	48	31	60	156	50	72	70	126	50	116	172	36	13	66	52	24	2	63	10
E8100016	0	0	0	60	18	35	86	84	84	72	60	68	118	54	16	10	118	245	12	44	35	40
E8100019	0	0	0	32	26	62	34	140	140	120	192	97	420	245	54	30	100	140	119	150	30	32
E8100021	0	0	0	32	60	24	126	75	70	84	60	112	245	140	53	128	260	294	176	316	132	60
E8100022	0	0	0	32	18	48	86	4	34	48	48	0	168	100	54	160	48	160	196	336	160	104
E8100031	0	0	0	75	0	100	122	189	112	70	105	30	384	120	53	92	144	132	196	214	202	73
E8100047	0	0	0	0	12	56	36	75	84	8	90	180	392	210	48	171	295	194	80	48	96	52
E8100048	-4	0	0	0	2	19	0	48	96	72	25	0	188	100	12	-14	90	105	0	0	324	10
E8100051	0	0	0	100	95	82	30	9	48	54	50	90	240	12	8	12	119	48	252	140	138	234
E8100055	0	0	0	36	4	35	98	89	108	108	192	56	420	504	54	256	210	324	380	224	328	360
Average Score	-0.4	0.0	0.0	41.5	26.6	62.1	83.3	76.3	89.8	70.6	94.8	68.3	269.1	168.7	38.8	90.8	145	169	144	147	154	99.0

Average Score for Challenge: 126.0

Average Score for 1. -0.2 6. 81.6

2. 20.8 7. 218.9

3. 39.4 8. 64.8

4. 79.8 9. 157.1

5. 80.2 10. 145.4

Injection dates: 1. 30 Apr 6. 12 May

2. 2 May 7. 14 May

3. 5 May 8. 16 May

4. 7 May 9. 19 May

5. 9 May 10. 21 May

TABLE 4B

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Cnemical Name: CHR5 - GREEN

Principal Investigator: CPT HANES

TEST SUBSTANCE

Initial & Challenge Date: 30 APR & 4 JUNE

Diluent: Propylene Glycol: Saline (1:30)

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100011	0	0	0	48	40	60	162	54	72	70	126	50	140	180	36	16	72	60	36	14	175	50
E8100016	0	0	0	60	24	36	90	34	84	72	60	72	126	84	16	16	126	245	20	56	75	64
E8100019	0	0	0	32	27	72	34	140	140	120	192	105	448	245	54	80	108	140	135	150	90	64
E8100021	0	0	0	32	60	24	126	75	70	84	60	112	245	140	54	128	270	294	180	324	150	60
E8100022	0	0	0	32	18	54	90	4	84	48	48	0	168	100	54	160	60	160	196	336	168	125
E8100031	0	0	0	75	0	100	126	189	112	70	105	30	384	120	54	100	150	144	196	216	210	64
E8100047	0	0	0	0	12	60	36	75	84	8	90	180	392	210	48	175	288	200	80	48	100	64
E8100043	0	0	0	0	2	20	9	45	96	72	25	0	200	100	12	4	90	105	0	0	336	16
E8100051	0	0	0	100	96	82	30	9	48	54	50	90	252	12	8	12	120	48	252	140	200	240
E8100055	0	0	0	36	4	36	98	90	108	108	192	56	432	504	54	256	210	324	392	224	336	360
Average Score	0.0	0.0	0.0	41.5	28.3	54.4	85.1	76.8	89.8	70.6	94.8	69.5	278.7	169.5	39.0	44.7	149.4	172.0	148.7	150.8	184.0	110.7

Average Score for Challenge: 147.35

Average Score for 1. 0.00 6. 82.15
2. 20.75 7. 224.10
3. 41.35 8. 66.85
4. 70.15 9. 160.70
5. 80.20 10. 143.75

Injection dates: 1. 30 Apr 6. 12 May
2. 2 May 7. 14 May
3. 5 May 8. 16 May
4. 7 May 9. 19 May
5. 9 May 10. 21 May

TABLE 4C

GLP STUDY # 21009

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR5 - GREEN

Initial & Challenge Date: 30 APR & 4 JUN

Principal Investigator: CPT nAMES

Diluent: Propylene Glycol:Saline (1:30)

DILUENT

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100011	0	0	0	0	9	0	6	4	0	0	0	0	24	8	0	3	8	8	12	12	112	40
E8100016	0	0	0	0	6	1	4	0	0	0	0	4	8	0	0	6	0	0	8	12	60	24
E8100019	0	0	0	0	1	10	0	0	0	0	0	8	28	0	0	0	8	0	16	0	60	32
E8100021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	4	8	16	0
E8100022	0	0	0	0	0	6	4	0	0	0	0	0	0	0	0	0	12	0	0	0	12	0
E8100031	0	0	0	0	0	0	4	0	0	0	0	0	0	0	1	8	6	12	0	2	8	1
E8100047	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	3	6	0	0	4	12
E8100048	4	0	0	0	0	1	0	0	0	0	0	0	12	0	0	16	0	0	0	0	12	2
E8100051	0	0	0	0	1	0	0	0	0	0	0	0	12	0	0	0	1	0	0	0	12	6
E8100055	0	0	0	0	0	1	0	1	0	0	0	0	12	0	0	0	0	0	12	0	8	0
Average Score	0.4	0.0	0.0	0.0	1.7	2.3	1.8	0.5	0.0	0.0	0.0	1.2	9.6	0.8	0.2	3.9	4.8	2.6	5.2	3.4	29.6	11.7

Average Score for Challenge: 20.65

Average Score for
1. 0.20
2. 0.00
3. 2.00
4. 1.15
5. 0.00
6. 0.60
7. 5.20
8. 2.05
9. 3.70
10. 4.30

Injection dates:
1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 5A
GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR6 - GRAY

Initial & Challenge Date: 30 APR & 4 JUNE

Principal Investigator: CPT HANES

Diluent: Propylene Glycol:Saline (1:30)

FINAL SCORE

Sensitizing Dose: 1			2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100017	1	0	0	8	96	3	59	0	64	10	0	0	32	40	2	39	0	16	2	0	16	64
E8100026	1	1	0	64	27	48	28	8	69	16	50	10	232	180	18	31	16	42	0	0	56	30
E8100032	0	0	0	36	16	0	61	39	35	0	168	20	180	64	12	19	214	150	72	60	-53	-4
E8100038	0	0	0	60	0	2	24	40	12	0	-16	12	180	36	12	6	24	0	0	0	-15	0
E8100049	0	0	0	60	8	2	131	0	180	42	40	0	82	120	45	59	56	4	48	4	27	25
E8100050	0	-1	0	30	20	2	64	54	126	24	70	30	240	224	60	18	186	132	54	2	-5	46
E8100054	0	0	0	60	0	1	45	90	56	4	4	0	108	16	4	12	148	48	324	128	-40	-16
E8100056	0	1	0	16	12	35	108	30	32	4	60	4	40	64	4	2	59	4	28	26	-36	-28
E8100057	0	0	0	18	18	18	108	16	96	12	70	0	219	-6	36	8	30	44	36	0	-36	-10
E8100058	0	0	0	32	12	27	70	26	4	0	40	15	175	60	18	30	59	92	96	10	30	10
Average Score	0.2	0.1	0.0	38.4	20.9	13.8	69.8	30.3	67.4	11.2	48.6	9.1	148.8	79.8	21.1	22.4	79.2	52.2	65.0	22.0	-5.6	11.7

Average Score for Challenge: 3.05

Average Score for 1. 0.15 6. 28.85
2. 19.20 7. 114.30
3. 17.35 8. 21.75
4. 50.05 9. 65.70
5. 39.30 10. 44.00

Injection dates: 1. 30 Apr 6. 12 May
2. 2 May 7. 14 May
3. 5 May 8. 16 May
4. 7 May 9. 19 May
5. 9 May 10. 21 May

TABLE 5B

SLR STUDY # 81003

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHR6 - GRAY

Initial & Challenge Date: 30 APR & 4 JUNE

Principal Investigator: CPT HAINES

Diluent: Propylene Glycol:Saline (1:30)

TEST SUBSTANCE

Sensitizing Dose:	1		2		3		4		5		6		7		8		9		10		Challenge:	
Animals #	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E8100017	1	0	0	8	96	4	80	0	64	10	0	0	40	48	2	40	0	16	4	0	16	64
E8100026	1	1	0	64	27	48	28	8	70	20	50	10	240	180	18	32	32	42	0	0	56	30
E8100032	0	0	0	36	16	1	63	40	35	0	168	20	180	64	12	27	270	150	72	60	45	36
E8100038	0	0	0	60	1	2	24	48	12	0	0	18	180	36	12	18	24	0	2	0	12	4
E8100049	0	0	0	60	8	2	135	72	180	42	40	0	90	120	45	60	56	4	48	4	45	27
E8100050	0	0	0	30	20	4	72	54	126	24	70	30	240	224	60	18	210	150	56	4	45	96
E8100054	0	0	0	60	0	1	45	90	56	4	12	0	112	16	4	12	150	60	336	128	0	2
E8100056	0	1	0	16	12	36	108	30	32	4	60	4	60	72	4	4	60	16	60	30	4	4
E8100057	0	0	0	18	18	18	108	16	96	12	70	0	315	90	36	8	32	48	36	0	24	2
E8100058	0	0	0	32	12	27	70	36	4	0	48	15	175	60	18	32	60	84	90	10	60	12
Average Score	0.2	0.2	0.0	38.4	21.0	14.3	71.3	39.4	67.5	11.6	51.8	9.7	163.2	91.0	21.1	25.1	89.4	57.0	70.4	23.6	30.7	27.7

Average Score for Challenge: 29.20

Average Score for 1. 0.20
2. 19.20
3. 13.25
4. 55.35
5. 39.55
6. 30.75
7. 82.10
8. 23.10
9. 73.20
10. 47.00

Injection Dates: 1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May

TABLE 5C

GLP STUDY # 81008

GUINEA PIG SENSITIZATION TEST

Chemical Name: CHRG - GRAY

Principal Investigator: CPT HANES

Initial & Challenge Date: 30 APR & 4 JUNE

Sensit. Ing Dose: 1 | 2 | 3 | 4 | DILUENT | 5 | 6 | 7 | 8 | 9 | 10 | Challenge: 1

Diluent: Probylene Glycol:Saline (1:30)

Animals	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr	24hr	48hr
E81000	0	0	0	0	0	1	1	0	0	0	0	0	8	8	0	1	0	0	2	0	0	0		
E810000	0	0	0	0	0	0	0	0	1	4	0	0	8	0	0	1	16	0	0	0	0	0		
E810000	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	8	56	0	0	0	98	40		
E810000	0	0	0	0	1	0	0	8	0	0	16	6	0	0	0	12	0	0	2	0	27	4		
E810000	0	1	0	0	0	2	8	0	0	0	0	0	8	0	0	1	0	0	0	0	18	2		
E810000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	18	2	2	50	50		
E810000	0	0	0	0	0	1	0	0	0	0	8	0	4	0	0	0	2	12	12	0	40	16		
E810000	0	0	0	0	0	0	0	0	0	0	0	0	20	8	0	2	1	12	32	4	40	32		
E810000	0	0	0	0	0	0	0	10	0	0	8	0	96	96	0	0	2	4	0	0	60	12		
Average Score	0.0	0.1	0.0	0.0	0.1	0.5	1.5	9.1	0.1	0.4	3.2	0.6	14.4	11.2	0.0	2.7	10.2	4.8	5.4	0.6	36.3	16.0		

Average Score for Challenge: 26.15

Average Score for 1. 0.05
2. 0.00
3. 0.30
4. 0.30
5. 0.25
6. 1.90
7. 12.30
8. 1.35
9. 7.50
10. 3.00

Injection Dates: 1. 30 Apr
2. 2 May
3. 5 May
4. 7 May
5. 9 May
6. 12 May
7. 14 May
8. 16 May
9. 19 May
10. 21 May


DA
FILM