LBI PROJECT #2468

MUTAGENIC EVALUATION OF

COMPOUND FDA 71-18

PM9005372

PROPYLENE GLYCOL ALGINATE

SUBMITTED TO

FOOD AND DRUG ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
ROCKVILLE, MARYLAND

SUBMITTED BY

LITTON BIONETICS, INC.
5516 NICHOLSON LANE
KENSINGTON, MARYLAND

Litton BIONETICS

JUNE 30, 1975

Mutagenic Evaluation of Compound FDA 71-18, Propylene Glycol Alginate-6/30/75

F25

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EVALUATION SUMMARY

Compound FDA 71-18, Propylene Glycol Alginate, did not exhibit genetic activity in any of the *in vitro* microbial assays employed in this evaluation.

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DATE: June 30, 1975

SPONSOR: Food and Drug Administration, Contract Number 223-74-2104

SUBJECT: Evaluation of Test Compound PM9005372, Propylene Glycol Alginate FDA 71-18

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: August, 1974
2. Description: Pale brown powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: *Saccharomyces cerevisiae*, strain D4

Bacteria Strains: *Salmonella typhimurium*, strains: TA-1535, TA-1537, TA-1538

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

Component	Final Concentration/ml
1. TPN (sodium salt)	6 μM
2. Isocitric acid	49 μM
3. Tris buffer, pH 7.4	28 μM
4. $MgCl_2$	1.7 μM
5. Tissue homogenate fraction	72 mg

D. Tissue Homogenates and Supernatants

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mouse-ICR random bred adult males; rat-Sprague-Dawley adult males; and primate-*Macaca* mulatta adult males.

E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1

POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

Assay	Chemical[a]	Solvent	Probable Mutagenic Specificity
Nonactivation	Ethyl methanesulfonate	Water or saline	BPS[b]
	2-Nitrofluorene	Dimethylsulfoxide[c]	FS[b]
	Quinacrine mustard	Water or saline	FS[b]
Activation	Dimethylnitrosamine	Water or saline	BPS[b]
	2-Acetylaminofluorene	Dimethylsulfoxide[c]	FS[b]

[a] Concentrations given in the Results Section
[b] BPS = base-pair substitution; FS = frameshift
[c] Previously shown to be non-mutagenic

III. METHODS

A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose. Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.

B. Plate Tests

In the nonactivation procedure, approximately 10^9 cells of a log phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (Test, Positive Control and Solvent Control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

C. Suspension Tests

1. Nonactivation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of 1×10^9 cells/ml and 5×10^7 cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a 10^{-1} dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

2. Activation

Bacteria and yeast cells were grown and prepared as described in the nonactivation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for nonactivation tests.

D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities of tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. The data were then processed and printed from a computer program.

IV. RESULTS SECTION

A. Solubility Properties of the Test Compound

1. Name or code designation of the test compound: PM9005372 Propylene Glycol Alginate

2. Test solvent: DMSO

3. Solubility of the test compound under treatment conditions: Soluble under treatment conditions.

4. Additional comments: Pale brown powder

B. Toxicity and Dosage Determinations for the Test Compound

1. Test date for toxicity determination: March 25, 1975

2. The 50% survival level was determined for bacteria and yeast indicator organisms by conducting survival curves with the test compound at the following concentrations:

Percent Concentration (w/v or v/v)

2.0
0.2
0.02
0.002
0.0002

3. Concentrations of the test compound used in the mutagenicity tests:

Dose	Percent Concentration Bacteria	Percent Concentration Yeast
1/4 50% Survival	0.15	2.5
1/2 50% Survival	0.30	5.0
50% Survival	0.60	10.0
Plate Tests	0.30	--

V. SUMMARY OF TEST RESULTS

Plate Tests

A. Name or code designation of the test compound: PM9005372

B. Test date: April 30, 1975

C. Concentration of the test compound: 0.3%

Test	Species	Tissue	Revertants/Plate TA-1535 1	TA-1535 2	TA-1537 1	TA-1537 2	TA-1538 1	TA-1538 2
1. Nonactivation								
Solvent Control	---	---	138	146	25	22	26	35
Positive Control[a]	---	---	$>10^4$	$>10^4$	193	176	158	219
Test Compound	---	---	170	150	22	25	41	43
2. Activation								
Negative Control	---	---	56	74	9	25	28	16
Solvent Control	---	---	44	84	46	41	44	39
Reaction Mixture Control	---	---	83	72	35	42	30	43
Positive Control[b]	Mouse	Liver	10	10	86	94	332	341
Positive Control		Lung	96	87	9	11	43	80
Positive Control		Testes	84	121	10	17	22	26
Positive Control	Rat	Liver	$>10^3$	$>10^3$	85	86	382	310
Positive Control		Lung	87	72	8	14	27	21
Positive Control		Testes	84	116	11	15	19	36
Positive Control	Monkey	Liver	345	339	93	88	340	364
Positive Control		Lung	81	73	11	10	14	24
Positive Control		Testes	87	115	9	19	19	28
Test Compound	Mouse	Liver	20	30	46	39	31	46
Test Compound		Lung	30	22	20	21	27	36
Test Compound		Testes	50	42	26	32	27	22
Test Compound	Rat	Liver	21	29	44	36	38	44
Test Compound		Lung	29	21	15	19	21	30
Test Compound		Testes	49	56	18	22	26	30
Test Compound	Monkey	Liver	28	28	46	43	28	47
Test Compound		Lung	28	19	14	21	13	28
Test Compound		Testes	40	43	15	22	23	13

a
TA-1535 EMS 10 µl/plate
TA-1537 QM 20 µg/plate
TA-1538 NF 100 µg/plate

b
TA-1535 DMNA 50 µM/plate
TA-1537 AAF 100 µg/plate
TA-1538 AAF 100 µg/plate

DATA TABLE TERMS AND ABBREVIATIONS

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
COMPOUND	Client designated compound number appears in this column.
TEST CODES	NAN = Nonactivation: Solvent Control NAP = Nonactivation: Positive Control NA1 = Nonactivation: Test Compound Dose 1 NA2, etc. = Reflects the other dose level(s) A+C = Negative Chemical Control A-C = Activation: Solvent Control ACP = Activation: Positive Control ACT = Activation: Test Compound A+T = Activation: Tissue Control LI = Liver Tissue Activation Fraction LU = Lung Tissue Activation Fraction KI = Kidney Tissue Activation Fraction TE = Testes Tissue Activation Fraction 1,2, etc. = Dose Levels
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units. Example: 0025-2PCT = 0.25 percent concentration
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = x 10^6).
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = 10^0). For strain D4, MUT 1 represents the number of ADE+ convertants.
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.
CONTAM	Presence of contamination on any plates.

DATA TABLE TERMS AND ABBREVIATIONS (continued)

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDAW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey (*Macaca mulatta*)
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES / COMPOUND PM9005372

TEST	ORG	TA1537 HIS EX-8	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
NAN		8.32	23.63	8.33	8.31	3.84	0.40
NAP			688.06	1201.50	275.21	48.28	54.14
NA1		9.35	12.50	44.71	11.11	0.20	0.79
NA2		7.73	17.43	24.79	10.04	0.53	1.40

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REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES ICRFLO/MOUSE COMPOUND PM9005372

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	4.67	15.76	7.98	1.37	1.03
ACT	A+T	5.26	38.27	4.12	4.61	7.21
ACT	A-C	4.93	18.26	3.85	1.79	0.85
ACT	PLI	1645.41	11.55	48.85	1.90	1.27
ACT	PLU	10.34	17.27	13.07	2.38	0.59
ACT	PTE	12.72	10.79	4.88	3.14	1.73
ACT	LI1	7.34	9.69	21.72	1.52	0.85
ACT	LI2	9.67	12.90	14.43	0.73	0.98
ACT	LU1	7.31	12.86	8.58	1.28	0.94
ACT	LU2	6.36	17.86	10.26	1.93	0.89
ACT	TE1	7.24	17.32	10.73	1.56	1.22
ACT	TE2	6.93	13.13	9.67	2.80	0.59

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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES SPRDAW/RAT COMPOUND PM9005372

TEST	ORG	TA1537 HIS EX-8	TA1538 HIS EX-8	TA1535 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	12.71	13.08	3.29	1.49	2.48	1.16	1.25
ACT	A+T	7.28	14.37	8.40	3.82	3.65	4.50	4.00
ACT	A-C	7.93	5.52	3.97	1.61	1.93	2.03	1.80
ACT	PLI	19.95	104.90	510.04	4.20	4.06	3.67	4.43
ACT	PLU	17.01	6.36	5.26	5.45	3.23	4.12	3.09
ACT	PTE	12.62	6.78	6.48	4.09	1.57	4.18	3.00
ACT	LI1	9.88	12.05	3.28	******	******	2.85	3.11
ACT	LI2	11.97	3.90	4.40	8.37 ✓	11.37 ✓		
ACT	LU1	13.85	8.07	3.54	******	******	4.63	2.53
ACT	LU2	9.05	11.24	4.29	2.61	1.60		
ACT	TE1	12.41	6.12	4.94	******	******	4.09	3.84
ACT	TE2	13.23	11.18	3.82	4.72	9.44 ✓		

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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM

REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES SPRDAW/RAT COMPOUND PM9005372

TEST	ORG	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A-C	2.61	1.35
ACT	LI2	2.62	2.10
ACT	TE2	1.03	0.39

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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES RHESUS/MONKEY COMPOUND PM9005372

TEST	ORG	TA1537 HIS EX-8	TA1535 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	3.88	15.84	16.47	0.19	1.16
ACT	A+T	2.03	16.08	22.40	2.23	1.78
ACT	A-C	4.03	20.63	4.26	0.35	0.18
ACT	PLI	8.47	1281.46	63.19	3.59	4.71
ACT	PLU	15.66	7.60	9.33	0.65	2.11
ACT	PTE	5.72	22.09	6.55	1.48	2.69
ACT	LI1	5.32	6.67	8.09	1.70	2.04
ACT	LI2	1.53	3.96	13.06	3.60	3.00
ACT	LU1	7.11	12.56	6.25	0.84	2.31
ACT	LU2	3.27	8.15	9.27	1.14	1.33
ACT	TE1	1.83	13.68	5.18	2.62	1.69
ACT	TE2	7.50	14.43	10.98	2.38	1.19

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VI. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound PM9005372, Propylene Glycol Alginate, was tested for genetic activity in a series of *in vitro* microbial assays with and without metabolic activation. The following results were obtained:

A. *Salmonella typhimurium*

1. Plate tests

At a concentration of 0.3%, PM9005372, did not exhibit any mutagenic activity for the bacterial indicator organisms in direct or activation plate tests. A high number of spontaneous revertants of TA-1535 were observed in the nonactivation test. The results were considered to be acceptable.

2. Nonactivation suspension tests

The results of these tests were negative. The NA1 and NA2 doses with TA-1537 were repeated because of high responses probably resulting from reduced population counts. The repeat tests were negative.

3. Activation suspension tests

The results of these tests were negative. The PLI results for TA-1537 using mouse tissue were low, but the overall results were considered to be acceptable.

B. *Saccharomyces cerevisiae*

1. Nonactivation suspension tests

The results of these tests were negative.

2. Activation suspension tests

The results of these tests were negative. The LI1, LU1, and TE1 doses with rat tissue were repeated because of plating errors. The initial tests with LI2 and TE2 were increased. Repeat tests were negative.

C. Conclusions

The test compound, Propylene Glycol Alginate did not exhibit genetic activity in any of the assays employed in this evaluation.

Submitted by:

David Brusick

David Brusick, Ph.D.
Director of Genetics

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APPENDIX

Tabulation of Data

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 517504 DETECTOR TA1535 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0567	0134	23.63	0
	NAP		EMS 0.002 %	0620	4266	688.06	0
PM9005372	NA1		0003-1 PCT.	0536	0067	12.50	0
PM9005372	NA2		0015-2 PCT.	0505	0088	17.43	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 516303 DETECTOR TA1537 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0252	0021	8.33	0
	NAP		QM 1.0 UG/ML	0133	1598	1201.50	1
PM9005372	NA1		0003-1 PCT.	0085	0038	44.71	0
PM9005372	NA2		0015-2 PCT.	0117	0029	24.79	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 517007 DETECTOR TA1537 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0926	0077	8.32	0
PM9005372	NA1		0003-1 PCT.	0834	0078	9.35	0
PM9005372	NA2		0015-2 PCT.	0724	0056	7.73	2

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 512203 DETECTOR TA1538 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		DMSO	0433	0036	8.31	2
	NAP		NF 125 UG-ML	0476	1310	275.21	0
PM9005372	NA1		0003-1 PCT.	0243	0027	11.11	0
PM9005372	NA2		0015-2 PCT.	0279	0028	10.04	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 513403 DETECTOR 0000D4 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	NAN		SALINE	0495	0019	0002	3.84	0.40	3
	NAP		EMS 1.0 %	0290	0140	0157	48.28	54.14	2
PM9005372	NA1		0005-0 PCT.	0508	0001	0004	0.20	0.79	1
PM9005372	NA2		0025-1 PCT.	0571	0003	0008	0.53	1.40	1

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 513503 DETECTOR TA1535 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0514	0024	4.67	0
	A+T		***NO MATCH***	0228	0012	5.26	0
	A-C		SALINE	0608	0030	4.93	2
	ACP	LI	DMN 50 UM/ML	0207	3406	1645.41	2
	ACP	LU	DMN 50 UM/ML	0290	0030	10.34	0
	ACP	TE	DMN 50 UM/ML	0283	0036	12.72	2
PM9005372	ACT	LI1	0003-1 PCT.	0368	0027	7.34	2
PM9005372	ACT	LI2	0015-2 PCT.	0331	0032	9.67	2
PM9005372	ACT	LU1	0003-1 PCT.	0383	0028	7.31	0
PM9005372	ACT	LU2	0015-2 PCT.	0629	0040	6.36	0
PM9005372	ACT	TE1	0003-1 PCT.	0428	0031	7.24	2
PM9005372	ACT	TE2	0015-2 PCT.	0534	0037	6.93	2

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 515405 DETECTOR TA1537 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0533	0084	15.76	0
	A+T		***NO MATCH***	0081	0031	38.27	2
	A-C		DMSO	0493	0090	18.26	0
	ACP	LI	AAF 800 UG/ML	0303	0035	11.55	0
	ACP	LU	AAF 800 UG/ML	0278	0048	17.27	0
	ACP	TE	AAF 800 UG/ML	0380	0041	10.79	0
PM9005372	ACT	LI1	0003-1 PCT.	0289	0028	9.69	2
PM9005372	ACT	LI2	0015-2 PCT.	0155	0020	12.90	2
PM9005372	ACT	LU1	0003-1 PCT.	0412	0053	12.86	0
PM9005372	ACT	LU2	0015-2 PCT.	0280	0050	17.86	0
PM9005372	ACT	TE1	0003-1 PCT.	0410	0071	17.32	0
PM9005372	ACT	TE2	0015-2 PCT.	0457	0060	13.13	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 516402 DETECTOR TA1538 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0376	0030	7.98	0
	A+T		***NO MATCH***	1625	0067	4.12	0
	A-C		DMSO	0493	0019	3.85	0
	ACP	LI	AAF 800 UG/ML	0520	0254	48.85	0
	ACP	LU	AAF 800 UG/ML	0352	0046	13.07	0
	ACP	TE	AAF 800 UG/ML	0758	0037	4.88	0
PM9005372	ACT	LI1	0003-1 PCT.	0290	0063	21.72	2
PM9005372	ACT	LI2	0015-2 PCT.	0298	0043	14.43	2
PM9005372	ACT	LU1	0003-1 PCT.	0373	0032	8.58	2
PM9005372	ACT	LU2	0015-2 PCT.	0312	0032	10.26	0
PM9005372	ACT	TE1	0003-1 PCT.	0354	0038	10.73	2
PM9005372	ACT	TE2	0015-2 PCT.	0300	0029	9.67	2

Litton BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 515504 DETECTOR 0000D4 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU E?+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0584	0008	0006	1.37	1.03	2
	A+T		***NO MATCH***	0499	0023	0036	4.61	7.21	6
	A-C		SALINE	1175	0021	0010	1.79	0.85	3
	ACP	LI	DMN 90 UM/ML	0473	0009	0006	1.90	1.27	6
	ACP	LU	DMN 90 UM/ML	0505	0012	0003	2.38	0.59	2
	ACP	TE	DMN 90 UM/ML	0637	0020	0011	3.14	1.73	0
PM9005372	ACT	LI1	0005-0 PCT.	1182	0018	0010	1.52	0.85	0
PM9005372	ACT	LI2	0025-1 PCT.	0818	0006	0008	0.73	0.98	2
PM9005372	ACT	LU1	0005-0 PCT.	1170	0015	0011	1.28	0.94	0
PM9005372	ACT	LU2	0025-1 PCT.	0673	0013	0006	1.93	0.89	0
PM9005372	ACT	TE1	0005-0 PCT.	1151	0018	0014	1.56	1.22	0
PM9005372	ACT	TE2	0025-1 PCT.	0679	0019	0004	2.80	0.59	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 513301 DETECTOR TA1535 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0638	0021	3.29	0
	A+T		***NO MATCH***	0238	0020	8.40	2
	A-C		SALINE	0731	0029	3.97	0
	ACP	LI	DMN 50 UM/ML	0239	1219	510.04	0
	ACP	LU	DMN 50 UM/ML	0228	0012	5.26	0
	ACP	TE	DMN 50 UM/ML	0216	0014	6.48	2
PM9005372	ACT	LI1	0003-1 PCT.	0305	0010	3.28	2
PM9005372	ACT	LI2	0015-2 PCT.	0409	0018	4.40	0
PM9005372	ACT	LU1	0003-1 PCT.	0452	0016	3.54	0
PM9005372	ACT	LU2	0015-2 PCT.	0559	0024	4.29	0
PM9005372	ACT	TE1	0003-1 PCT.	0445	0022	4.94	0
PM9005372	ACT	TE2	0015-2 PCT.	0628	0024	3.82	0

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REPORT EXR33 . LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 515301 DETECTOR TA1537 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU E?+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0535	0068	12.71	0
	A+T		***NO MATCH***	0316	0023	7.28	0
	A-C		DMSO	0757	0060	7.93	0
	ACP	LI	AAF 800 UG/ML	0396	0079	19.95	0
	ACP	LU	AAF 800 UG/ML	0388	0066	17.01	0
	ACP	TE	AAF 800 UG/ML	0412	0052	12.62	0
PM9005372	ACT	LI1	0003-1 PCT.	0577	0057	9.88	0
PM9005372	ACT	LI2	0015-2 PCT.	0309	0037	11.97	0
PM9005372	ACT	LU1	0003-1 PCT.	0426	0059	13.85	0
PM9005372	ACT	LU2	0015-2 PCT.	0398	0036	9.05	0
PM9005372	ACT	TE1	0003-1 PCT.	0411	0051	12.41	0
PM9005372	ACT	TE2	0015-2 PCT.	0620	0082	13.23	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 514704 DETECTOR TA1538 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0879	0115	13.08	0
	A+T		***NO MATCH***	0327	0047	14.37	0
	A-C		DMSO	0761	0042	5.52	0
	ACP	LI	AAF 800 UG/ML	0245	0257	104.90	0
	ACP	LU	AAF 800 UG/ML	0645	0041	6.36	0
	ACP	TE	AAF 800 UG/ML	0767	0052	6.78	0
PM9005372	ACT	LI1	0003-1 PCT.	0697	0084	12.05	0
PM9005372	ACT	LI2	0015-2 PCT.	0615	0024	3.90	0
PM9005372	ACT	LU1	0003-1 PCT.	0805	0065	8.07	2
PM9005372	ACT	LU2	0015-2 PCT.	0703	0079	11.24	0
PM9005372	ACT	TE1	0003-1 PCT.	0948	0058	6.12	0
PM9005372	ACT	TE2	0015-2 PCT.	0841	0094	11.18	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 513201 DETECTOR 0000D4 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0606	0009	0015	1.49	2.48	3
	A+T		***NO MATCH***	0576	0022	0021	3.82	3.65	7
	A-C		SALINE	0622	0010	0012	1.61	1.93	0
	ACP	LI	DMN 90 UM/ML	0690	0029	0028	4.20	4.06	2
	ACP	LU	DMN 90 UM/ML	0495	0027	0016	5.45	3.23	0
	ACP	TE	DMN 90 UM/ML	0635	0026	0010	4.09	1.57	1
PM9005372	ACT	LI1	0005-0 PCT.	0000	0000	0000	******	******	1
PM9005372	ACT	LI2	0025-1 PCT.	0466	0039	0053	8.37	11.37	4
PM9005372	ACT	LU1	0005-0 PCT.	0000	0000	0000	******	******	1
PM9005372	ACT	LU2	0025-1 PCT.	0499	0013	0008	2.61	1.60	0
PM9005372	ACT	TE1	0005-0 PCT.	0000	0000	0000	******	******	1
PM9005372	ACT	TE2	0025-1 PCT.	0466	0022	0044	4.72	9.44	1

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 516803 DETECTOR 0000D4 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	1204	0014	0015	1.16	1.25	1
	A+T		***NO MATCH***	0800	0036	0032	4.50	4.00	0
	A-C		SALINE	1332	0027	0024	2.03	1.80	1
	ACP	LI	DMN 90 UM/ML	1446	0053	0064	3.67	4.43	0
	ACP	LU	DMN 90 UM/ML	1164	0048	0036	4.12	3.09	0
	ACP	TE	DMN 90 UM/ML	1100	0046	0033	4.18	3.00	0
PM9005372	ACT	LI1	0005-0 PCT.	0771	0022	0024	2.85	3.11	0
PM9005372	ACT	LU1	0005-0 PCT.	0950	0044	0024	4.63	2.53	2
PM9005372	ACT	TE1	0005-0 PCT.	0782	0032	0030	4.09	3.84	1
	ADDITIONAL REPEAT							DATE - 07/18/75	
	A-C		DMSO	1109	0029	0015	2.61	1.35	0
PM9005372	ACT	LI2	0025-1 PCT.	0954	0025	0020	2.62	2.10	0
PM9005372	ACT	TE2	0025-1 PCT.	0778	0008	0003	1.03	0.39	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 512706 DETECTOR TA1535 SPECIES RHESUS/MONKEY DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0341	0054	15.84	0
	A+T		***NO MATCH***	0199	0032	16.08	0
	A-C		SALINE	0320	0066	20.63	0
	ACP	LI	DMN 50 UM/ML	0205	2627	1281.46	0
	ACP	LU	DMN 50 UM/ML	0263	0020	7.60	0
	ACP	TE	DMN 50 UM/ML	0249	0055	22.09	0
PM9005372	ACT	LI1	0003-1 PCT.	0240	0016	6.67	0
PM9005372	ACT	LI2	0015-2 PCT.	0404	0016	3.96	2
PM9005372	ACT	LU1	0003-1 PCT.	0207	0026	12.56	0
PM9005372	ACT	LU2	0015-2 PCT.	0405	0033	8.15	0
PM9005372	ACT	TE1	0003-1 PCT.	0285	0039	13.68	0
PM9005372	ACT	TE2	0015-2 PCT.	0402	0058	14.43	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 515304 DETECTOR TA1537 SPECIES RHESUS/MONKEY DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	1522	0059	3.88	0
	A+T		***NO MATCH***	0887	0018	2.03	0
	A-C		DMSO	1489	0060	4.03	0
	ACP	LI	AAF 800 UG/ML	0248	0021	8.47	0
	ACP	LU	AAF 800 UG/ML	0281	0044	15.66	0
	ACP	TE	AAF 800 UG/ML	1189	0068	5.72	0
PM9005372	ACT	LI1	0003-1 PCT.	0432	0023	5.32	0
PM9005372	ACT	LI2	0015-2 PCT.	1701	0026	1.53	0
PM9005372	ACT	LU1	0003-1 PCT.	0830	0059	7.11	2
PM9005372	ACT	LU2	0015-2 PCT.	1681	0055	3.27	0
PM9005372	ACT	TE1	0003-1 PCT.	1475	0027	1.83	0
PM9005372	ACT	TE2	0015-2 PCT.	0693	0052	7.50	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 514801 DETECTOR TA1538 SPECIES RHESUS/MONKEY DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0692	0114	16.47	0
	A+T		***NO MATCH***	0250	0056	22.40	2
	A-C		DMSO	0728	0031	4.26	0
	ACP	LI	AAF 800 UG/ML	0546	0345	63.19	0
	ACP	LU	AAF 800 UG/ML	0654	0061	9.33	0
	ACP	TE	AAF 800 UG/ML	1008	0066	6.55	0
PM9005372	ACT	LI1	0003-1 PCT.	0482	0039	8.09	0
PM9005372	ACT	LI2	0015-2 PCT.	0421	0055	13.06	2
PM9005372	ACT	LU1	0003-1 PCT.	0544	0034	6.25	0
PM9005372	ACT	LU2	0015-2 PCT.	0604	0056	9.27	0
PM9005372	ACT	TE1	0003-1 PCT.	0560	0029	5.18	0
PM9005372	ACT	TE2	0015-2 PCT.	0601	0066	10.98	1

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 514903 DETECTOR 0000D4 SPECIES RHESUS/MONKEY DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0518	0001	0006	0.19	1.16	0
	A+T		***NO MATCH***	0449	0010	0008	2.23	1.78	0
	A-C		SALINE	0564	0002	0001	0.35	0.18	0
	ACP	LI	DMN 90 UM/ML	0446	0016	0021	3.59	4.71	0
	ACP	LU	DMN 90 UM/ML	0617	0004	0013	0.65	2.11	0
	ACP	TE	DMN 90 UM/ML	0744	0011	0020	1.48	2.69	0
PM9005372	ACT	LI1	0005-0 PCT.	0588	0010	0012	1.70	2.04	0
PM9005372	ACT	LI2	0025-1 PCT.	0333	0012	0010	3.60	3.00	0
PM9005372	ACT	LU1	0005-0 PCT.	0477	0004	0011	0.84	2.31	0
PM9005372	ACT	LU2	0025-1 PCT.	0526	0006	0007	1.14	1.33	0
PM9005372	ACT	TE1	0005-0 PCT.	0534	0014	0009	2.62	1.69	0
PM9005372	ACT	TE2	0025-1 PCT.	0505	0012	0006	2.38	1.19	1