Litton BIONETICS

Mutagenic Evaluation of Compound FDA 71-88 (Lecithin) 4/15/75

MUTAGENIC EVALUATION OF

COMPOUND MX8002435

LECITHIN

(71-88) I 17

5516 Nicholson Lane
Kensington, Maryland
20795

LBI PROJECT #2468

MUTAGENIC EVALUATION OF

COMPOUND MX8002435

LECITHIN

(71-88)

SUBMITTED TO

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

SUBMITTED BY

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Litton BIONETICS

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EVALUATION SUMMARY

Compound MX8002435, Lecithin, did not exhibit significant genetic activity in any of the *in vitro* assays employed in this evaluation.

DATE: 04/15/75

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

SUBJECT: Evaluation of Test Compound

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: Translucent, brown, viscous liquid

B. Indicator Microorganisms

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

Yeast Strain: *Saccharomyces cerevisiae* 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 Supernatant

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
Non-activation	Ethylmethane sulfonate	Water or saline	BPS
	2-Nitrofluorene	Dimethylsulfoxide[c]	FS
	Quinacrine mustard	Water or saline	FS
Activation	Dimethylnitrosamine	Water or saline	BPS
	2-Acetylaminofluorene	Dimethylsulfoxide[c]	FS

[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. Non activation

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 non activation 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 non activation tests.

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

Male animals (sufficient to provide the necessary quantities 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. Data was 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: MX 800 2435 Lecithin

2. Test solvent: DMSO

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

4. Additional comments: Translucent Brown Viscous Liquid

B. Toxicity and Dosage Determinations for the Test Compound MX 800 2435

1. Test date for toxicity determination: February 10, 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)
10.0
1.0
0.1
0.01
0.001

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

	Percent Concentration	
Dose	Bacteria	Yeast
1/4 50% Survival	0.01	1.875
1/2 50% Survival	0.02	3.750
50% Survival	0.04	7.500
Plate Tests	0.02	--

C. Summary of Test Results

Plate Tests

1. Name or code designation of the test compound: MX 800 2435

2. Test date: February 14, 1975

3. Concentration of the test compound: 0.02%

Test	Species	Tissue	TA-1535		TA-1537		TA-1538	
Non-activation			1	2	1	2	1	2
Solvent Control	--	--	47	78	11	14	26	6
Positive Control[a]	--	--	>10^3	>10^3	209	301	147	140
Test Compound	--	--	15	23	12	10	12	15
Activation								
Negative Control	--	--	40	90	14	22	14	4
Solvent Control	--	--	27	47	10	33	17	18
Reaction Mixture Control	--	--	47	31	12	34	20	22
Positive Control[b]	Mouse	Liver	>500	>500	>100	95	>200	>200
Positive Control		Lung	59	59	10	7	20	10
Positive Control		Testes	42	60	11	10	11	10
Positive Control	Rat	Liver	>300	>300	53	36	>100	>100
Positive Control		Lung	63	77	10	7	20	10
Positive Control		Testes	44	61	10	8	12	9
Positive Control	Monkey	Liver	>100	>100	11	4	46	43
Positive Control		Lung	71	54	9	8	20	6
Positive Control		Testes	47	61	10	9	13	10
Test Compound	Mouse	Liver	25	40	13	13	14	10
Test Compound		Lung	26	11	14	14	15	12
Test Compound		Testes	16	17	11	11	17	13
Test Compound	Rat	Liver	17	37	13	14	15	10
Test Compound		Lung	21	10	14	14	15	2
Test Compound		Testes	16	19	12	13	7	14
Test Compound	Monkey	Liver	22	38	7	13	13	10
Test Compound		Lung	19	14	13	14	7	12
Test Compound		Testes	20	25	11	11	7	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 = Non Activation: Solvent Control NAP = Non Activation: Positive Control NA1 = Non Activation: 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 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 = X 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 04/15/75

SPECIES COMPOUND MX8002435

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	TA1538 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
NAN		1.61	12.08	5.80	4.04	2.21	3.14
NAP		243.05	2686.46	469.44		66.33	77.39
NA1		2.49	16.94	14.94		1.80	3.07
NA2		2.21	7.21	******	2.62	1.31	1.79

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES ICRFLO COMPOUND MX8002435

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	0.93	3.59	4.92	6.30	12.91
ACT	A-C	1.04	3.21	5.77	6.38	13.81
ACT	PLI	128.68	6.71	24.04	9.48	29.12
ACT	PLU	1.00	2.19	7.37	6.67	16.81
ACT	PTE	1.63	2.90	7.02	4.73	17.40
ACT	LI1	1.28	2.77	7.91	4.81	14.74
ACT	LI2	1.91	2.04	8.58	5.04	16.00
ACT	LU1	1.64	1.63	10.73	2.84	15.95
ACT	LU2	1.07	2.12	8.82	4.99	18.33
ACT	TE1	1.87	1.68	8.99	4.60	13.15
ACT	TE2	2.25	2.09	7.61	6.42	20.61

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES SPRDAW COMPOUND MX8002435

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	2.22	6.77	7.88	5.52	14.73
ACT	A-C	1.45	2.70	6.66	7.34	18.04
ACT	PLI	184.24	44.71	27.00	9.87	21.94
ACT	PLU	2.45	4.96	10.52	6.34	16.64
ACT	PTE	2.83	4.50	8.02	1.63	2.90
ACT	LI1	2.65	24.58	18.90	3.18	12.99
ACT	LI2	2.92	18.78	12.75	3.70	16.64
ACT	LU1	1.58	5.36	8.49	3.22	16.54
ACT	LU2	2.04	4.71	8.09	3.78	18.71
ACT	TE1	2.35	10.14	7.16	4.33	21.30
ACT	TE2	2.84	4.64	8.72	4.88	20.54

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES RHESUS COMPOUND MX8002435

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	6.27	11.64	8.12	3.21	49.15
ACT	A-C	3.13	0.52	6.60	5.18	45.95
ACT	PLI	52.59	9.57	24.07	6.74	79.77
ACT	PLU	5.62	5.13	10.43	1.01	68.34
ACT	PTE	6.42	8.91	6.49	3.76	42.38
ACT	LI1	3.34	1.64	9.72	2.69	28.51
ACT	LI2	3.82	3.85	11.42	2.94	37.50
ACT	LU1	5.34	4.42	13.71	2.40	31.86
ACT	LU2	3.69	2.68	7.37	3.93	61.93
ACT	TE1	3.26	7.05	11.78	36.36	0.00
ACT	TE2	3.86	2.00	11.50	3.01	49.16

V. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound MX8002435, Lecithin, was evaluated 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 0.02%, MX8002435 was not mutagenic for any of the bacterial indicator strains with or without activation.

2. Nonactivation suspension tests

The results of these tests were negative. The NA2 dose with TA-1538 was repeated because the population plates were defective in the initial test.

3. Activation suspension tests

The results of these tests were negative. The positive control values for TA-1537 were lower than anticipated.

B. *Saccharomyces cerevisiae*

1. Nonactivation suspension tests

The results of these tests were negative.

2. Activation suspension tests

Two tests points were slightly increased in these assays, Rat TE1 TRY and Monkey TE1 ADE. The fact that only one of the two heteroalleles was increased in each case suggests that the responses were not induced but reflected fluctuations in spontaneous values. The overall results of these tests, therefore, are considered negative.

C. Conclusions

Compound MX8002435, Lecithin, did not exhibit significant genetic activity in the assays employed in this evaluation.

Submitted by:

David Brusick

David Brusick, Ph.D.
Director of Genetics

APPENDIX

Tabulation of Data

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500902 DETECTOR TA1535 SPECIES DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	1308	0021	1.61	0
	NAP		EMS 0.002 %	1057	2569	243.05	0
MX8002435	NA1		0002-2 PCT.	0964	0024	2.49	2
MX8002435	NA2		0001-2 PCT.	1133	0025	2.21	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 502302 DETECTOR TA1537 SPECIES DATE -.04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0240	0029	12.08	0
	NAP		DM 1.0 UG/ML	0096	2579	2686.46	0
MX8002435	NA1		0002-2 PCT.	0301	0051	16.94	0
MX8002435	NA2		0001-2 PCT.	0333	0024	7.21	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 502301 DETECTOR TA1538 SPECIES DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		DMSO	0414	0024	5.80	0
	NAP		NF 125 UG-ML	0288	1352	469.44	0
MX8002435	NA1		0002-2 PCT.	0241	0036	14.94	0
MX8002435	NA2		0001-2 PCT.	0000	0020	******	2

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 505005 DETECTOR TA1538 SPECIES DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		DMSO	0570	0023	4.04	0
MX8002435	NA2		0001-2 PCT.	0573	0015	2.62	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 504801 DETECTOR 000004 SPECIES DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	NAN		SALINE	1084	0024	0034	2.21	3.14	0
	NAP		EMS 1.0 %	1004	0666	0777	66.33	77.39	0
MX8002435	NA1		0375-2 PCT.	0946	0017	0029	1.80	3.07	1
MX8002435	NA2		1875-3 PCT.	0838	0011	0015	1.31	1.79	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 434601 DETECTOR TA1535 SPECIES ICRFLO DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	1286	0012	0.93	0
	A-C		SALINE	1248	0013	1.04	2
	ACP	LI	DMN 50 UM/ML	1210	1557	128.68	0
	ACP	LU	DMN 50 UM/ML	1095	0011	1.00	2
	ACP	TE	DMN 50 UM/ML	1163	0019	1.63	2
MX8002435	ACT	LI1	0002-2 PCT.	1015	0013	1.28	0
MX8002435	ACT	LI2	0001-2 PCT.	1202	0023	1.91	2
MX8002435	ACT	LU1	0002-2 PCT.	1342	0022	1.64	0
MX8002435	ACT	LU2	0001-2 PCT.	1216	0013	1.07	0
MX8002435	ACT	TE1	0002-2 PCT.	1233	0023	1.87	2
MX8002435	ACT	TE2	0001-2 PCT.	1067	0024	2.25	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 434701 DETECTOR TA1537 SPECIES ICRFLO DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	1783	0064	3.59	0
	A-C		DMSO	1590	0051	3.21	0
	ACP	LI	AAF 800 UG/ML	1983	0133	6.71	3
	ACP	LU	AAF 800 UG/ML	1460	0032	2.19	2
	ACP	TE	AAF 800 UG/ML	1619	0047	2.90	2
MX8002435	ACT	LI1	0002-2 PCT.	1986	0055	2.77	2
MX8002435	ACT	LI2	0001-2 PCT.	1913	0039	2.04	2
MX8002435	ACT	LU1	0002-2 PCT.	2026	0033	1.63	2
MX8002435	ACT	LU2	0001-2 PCT.	1463	0031	2.12	2
MX8002435	ACT	TE1	0002-2 PCT.	1670	0028	1.68	2
MX8002435	ACT	TE2	0001-2 PCT.	1870	0039	2.09	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 435001 DETECTOR TA1538 SPECIES ICRFLO DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	1363	0067	4.92	0
	A-C		DMSO	1820	0105	5.77	0
	ACP	LI	AAF 800 UG/ML	1252	0301	24.04	3
	ACP	LU	AAF 800 UG/ML	1262	0093	7.37	2
	ACP	TE	AAF 800 UG/ML	1140	0080	7.02	2
MX8002435	ACT	LI1	0002-2 PCT.	1265	0100	7.91	2
MX8002435	ACT	LI2	0001-2 PCT.	1037	0089	8.58	2
MX8002435	ACT	LU1	0002-2 PCT.	0960	0103	10.73	0
MX8002435	ACT	LU2	0001-2 PCT.	1032	0091	8.82	0
MX8002435	ACT	TE1	0002-2 PCT.	1368	0123	8.99	2
MX8002435	ACT	TE2	0001-2 PCT.	1393	0106	7.61	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500701 DETECTOR 000004 SPECIES ICRFLO DATE - 04/15/75

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	0968	0061	0125	6.30	12.91	0
	A-C		SALINE	1050	0067	0145	6.38	13.81	0
	ACP	LI	DMN 90 UM/ML	0728	0069	0212	9.48	29.12	2
	ACP	LU	DMN 90 UM/ML	0809	0054	0136	6.67	16.81	2
	ACP	TE	DMN 90 UM/ML	0931	0044	0162	4.73	17.40	6
MX8002435	ACT	LI1	0375-2 PCT.	0624	0030	0092	4.81	14.74	4
MX8002435	ACT	LI2	1875-3 PCT.	0675	0034	0108	5.04	16.00	4
MX8002435	ACT	LU1	0375-2 PCT.	0740	0021	0118	2.84	15.95	2
MX8002435	ACT	LU2	1875-3 PCT.	0682	0034	0125	4.99	18.33	2
MX8002435	ACT	TE1	0375-2 PCT.	0631	0029	0083	4.60	13.15	0
MX8002435	ACT	TE2	1875-3 PCT.	0592	0038	0122	6.42	20.61	4

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500201 DETECTOR TA1535 SPECIES SPRDAW DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0450	0010	2.22	0
	A-C		SALINE	0826	0012	1.45	2
	ACP	LI	DMN 50 UM/ML	0628	1157	184.24	0
	ACP	LU	DMN 50 UM/ML	0653	0016	2.45	0
	ACP	TE	DMN 50 UM/ML	0566	0016	2.83	2
MX8002435	ACT	LI1	0002-2 PCT.	0490	0013	2.65	0
MX8002435	ACT	LI2	0001-2 PCT.	0479	0014	2.92	2
MX8002435	ACT	LU1	0002-2 PCT.	0633	0010	1.58	0
MX8002435	ACT	LU2	0001-2 PCT.	0442	0009	2.04	2
MX8002435	ACT	TE1	0002-2 PCT.	0596	0014	2.35	2
MX8002435	ACT	TE2	0001-2 PCT.	0387	0011	2.84	2

REPEAT
LI
LI 2

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 502101 DETECTOR TA1537 SPECIES SPRDAW DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0251	0017	6.77	0
	A-C		DMSO	0185	0005	2.70	0
	ACP	LI	AAF 800 UG/ML	0170	0076	44.71	2
	ACP	LU	AAF 800 UG/ML	0141	0007	4.96	0
	ACP	TE	AAF 800 UG/ML	0111	0005	4.50	0
MX8002435	ACT	LI1	0002-2 PCT.	0179	0044	24.58	2
MX8002435	ACT	LI2	0001-2 PCT.	0197	0037	18.78	2
MX8002435	ACT	LU1	0002-2 PCT.	0056	0003	5.36	0
MX8002435	ACT	LU2	0001-2 PCT.	0085	0004	4.71	0
MX8002435	ACT	TE1	0002-2 PCT.	0138	0014	10.14	2
MX8002435	ACT	TE2	0001-2 PCT.	0151	0007	4.64	0

REPEAT TEST

Compound	Test	Population	Mutants	Frequency ($X10^{-8}$)
	A-C DMSO	0601	32	5.32
MX8002435	LI 1 0002-2 PCT.	0625	30	4.80
MX8002435	LI 2 0001-2 PCT.	0467	16	3.43

REPEAT
LI 1
LI 2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500301 DETECTOR TA1538 SPECIES SPRDAW DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0964	0076	7.88	0
	A-C		DMSO	1276	0085	6.66	1
	ACP	LI	AAF 800 UG/ML	1052	0284	27.00	0
	ACP	LU	AAF 800 UG/ML	1017	0107	10.52	0
	ACP	TE	AAF 800 UG/ML	1347	0108	8.02	2
MX8002435	ACT	LI1	0002-2 PCT.	0582	0110	18.90	0
MX8002435	ACT	LI2	0001-2 PCT.	0753	0096	12.75	0
MX8002435	ACT	LU1	0002-2 PCT.	1178	0100	8.49	0
MX8002435	ACT	LU2	0001-2 PCT.	0964	0078	8.09	0
MX8002435	ACT	TE1	0002-2 PCT.	1089	0078	7.16	2
MX8002435	ACT	TE2	0001-2 PCT.	1009	0088	8.72	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500801 DETECTOR 000004 SPECIES SPRDAW DATE - 04/15/75

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	0706	0039	0104	5.52	14.73	0
	A-C		SALINE	0654	0048	0118	7.34	18.04	0
	ACP	LI	DMN 90 UM/ML	0679	0067	0149	9.87	21.94	0
	ACP	LU	DMN 90 UM/ML	0631	0040	0105	6.34	16.64	0
	ACP	TE	DMN 90 UM/ML	0861	0014	0025	1.63	2.90	0
MX8002435	ACT	LI1	0375-2 PCT.	0785	0025	0102	3.18	12.99	0
MX8002435	ACT	LI2	1875-3 PCT.	0649	0024	0108	3.70	16.64	5
MX8002435	ACT	LU1	0375-2 PCT.	0683	0022	0113	3.22	16.54	0
MX8002435	ACT	LU2	1875-3 PCT.	0529	0020	0099	3.78	18.71	0
MX8002435	ACT	TE1	0375-2 PCT.	0554	0024	0118	4.33	21.30	7
MX8002435	ACT	TE2	1875-3 PCT.	0594	0029	0122	4.88	20.54	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 500901 DETECTOR TA1535 SPECIES RHESUS DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0734	0046	6.27	0
	A-C		SALINE	1119	0035	3.13	2
	ACP	LI	DMN 50 UM/ML	0945	0497	52.59	3
	ACP	LU	DMN 50 UM/ML	0908	0051	5.62	0
	ACP	TE	DMN 50 UM/ML	0748	0048	6.42	2
MX8002435	ACT	LI1	0002-2 PCT.	1108	0037	3.34	2
MX8002435	ACT	LI2	0001-2 PCT.	0995	0038	3.82	2
MX8002435	ACT	LU1	0002-2 PCT.	1067	0057	5.34	2
MX8002435	ACT	LU2	0001-2 PCT.	1029	0038	3.69	0
MX8002435	ACT	TE1	0002-2 PCT.	1042	0034	3.26	2
MX8002435	ACT	TE2	0001-2 PCT.	0751	0029	3.86	3

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 502201 DETECTOR TA1537 SPECIES RHESUS DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0146	0017	11.64	0
	A-C		DMSO	0192	0001	0.52	0
	ACP	LI	AAF 800 UG/ML	0188	0018	9.57	0
	ACP	LU	AAF 800 UG/ML	0156	0008	5.13	2
	ACP	TE	AAF 800 UG/ML	0101	0009	8.91	0
MX8002435	ACT	LI1	0002-2 PCT.	0244	0004	1.64	0
MX8002435	ACT	LI2	0001-2 PCT.	0130	0005	3.85	0
MX8002435	ACT	LU1	0002-2 PCT.	0113	0005	4.42	0
MX8002435	ACT	LU2	0001-2 PCT.	0112	0003	2.68	0
MX8002435	ACT	TE1	0002-2 PCT.	0156	0011	7.05	0
MX8002435	ACT	TE2	0001-2 PCT.	0150	0003	2.00	1

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 501001 DETECTOR TA1538 SPECIES RHESUS DATE - 04/15/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0936	0076	8.12	0
	A-C		DMSO	1076	0071	6.60	2
	ACP	LI	AAF 800 UG/ML	0810	0195	24.07	3
	ACP	LU	AAF 800 UG/ML	1064	0111	10.43	0
	ACP	TE	AAF 800 UG/ML	1263	0082	6.49	2
MX8002435	ACT	LI1	0002-2 PCT.	0648	0063	9.72	2
MX8002435	ACT	LI2	0001-2 PCT.	0543	0062	11.42	0
MX8002435	ACT	LU1	0002-2 PCT.	0773	0106	13.71	0
MX8002435	ACT	LU2	0001-2 PCT.	1181	0087	7.37	0
MX8002435	ACT	TE1	0002-2 PCT.	0866	0102	11.78	0
MX8002435	ACT	TE2	0001-2 PCT.	0939	0108	11.50	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 502901 DETECTOR 000004 SPECIES RHESUS DATE - 04/15/75

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	0529	0017	0260	3.21	49.15	4
	A-C		SALINE	0618	0032	0284	5.18	45.95	0
	ACP	LI	DMN 90 UM/ML	0341	0023	0272	6.74	79.77	0
	ACP	LU	DMN 90 UM/ML	0398	0004	0272	1.01	68.34	2
	ACP	TE	DMN 90 UM/ML	0505	0019	0214	3.76	42.38	0
MX8002435	ACT	LI1	0375-2 PCT.	0484	0013	0138	2.69	28.51	2
MX8002435	ACT	LI2	1875-3 PCT.	0408	0012	0153	2.94	37.50	4
MX8002435	ACT	LU1	0375-2 PCT.	0499	0012	0159	2.40	31.86	4
MX8002435	ACT	LU2	1875-3 PCT.	0331	0013	0205	3.93	61.93	4
MX8002435	ACT	TE1	0375-2 PCT.	0429	0156	0000	36.36	0.00	2
MX8002435	ACT	TE2	1875-3 PCT.	0299	0009	0147	3.01	49.16	4