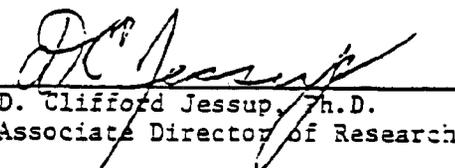


International Research and Development Corporation

SPONSOR: 3M Company
TEST MATERIAL: Fluorad[®] Fluorochemical FC-143
SUBJECT: Acute Oral Toxicity (LD₅₀)
Study in Rats.



Wilson P. Dean, B.A.
Director of Acute Toxicology
and Special Studies
(Study Director)



D. Clifford Jessup, Ph.D.
Associate Director of Research

Collaborators:

Gary Thompson, B.S.
Group Technical Supervisor
Greg Romig, B.S.
Unit Technical Supervisor
David Powell, B.A.
Unit Supervisor,
Report Preparation,
Acute and Special Studies
Department

Date: May 5, 1978

137-091

**Exhibit
1170**

State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

3M_MN01688767

1170.0001

International Research and Development Corporation

TABLE OF CONTENTS

	<u>Page</u>
I. Synopsis	1
II. Test Material	2
III. Method	3
IV. Results	4
A. Mortality and LD ₅₀ Values	4
B. Pharmacotoxic Signs	4
C. Body Weights	7
D. Necropsy Findings	8
1. Rats which died during the study period	9
2. Rats which were sacrificed following 14 days of observation	11
 <u>Table No.</u>	
1. Pharmacotoxic Signs	5- 6

137-091

3M_MN01688768

1170.0002

I. SYNOPSIS

Based upon the data obtained, the acute oral LD₅₀ values and 95% confidence limits were calculated to be as follows:

Male Rats: 680 (399 - 1157) mg/kg.

Female Rats: 430 (295 - 626) mg/kg.

Combined Male and Female Rats: 540 (389 - 749) mg/kg.

International Research and Development Corporation

Page 2

II. TEST MATERIAL

The test material was received from the 3M Company, St. Paul, Minnesota on October 24, 1977. It was identified as "Fluorad[®] Fluorochemical FC-143, 3M Stock No. 98-0211-0008-0, Lot 340" and was received as a white powder.

137-091

3M_MN01688770

1170.0004

III. METHOD

Twenty-five male and 25 female rats of the Charles River CD strain (obtained from Charles River Breeding Laboratories, Inc., Portage, Michigan), weighing from 180 to 221 grams, were used for this study. The rats were housed by sex in groups of 5 rats per cage, in hanging wire-mesh cages in temperature and humidity controlled quarters. They were maintained in accordance with the recommendations contained in H.E.W. Publication No. 74-23 (N.I.H.) entitled "Guide for the Care and Use of Laboratory Animals". Water and Purina Laboratory Chow were available ad libitum, except for an overnight period immediately preceding oral administration during which food, but not water, was withheld.

The test material was administered orally by gavage as an emulsion[✓] in 40% acetone/60% corn oil at the following dosage levels to male and female rats: 100, 215, 464, 1000 and 2150 mg/kg.

Five rats of each sex were used at each dosage level. Volumes of 10 ml/kg of body weight were administered at all dosage levels.

All rats were observed for mortality and pharmacotoxic signs during the first four hours after dosing, at 24 hours and daily thereafter for a total of 14 days. Body weights were recorded immediately prior to dosing (control weight) and at 7 and 14 days. All rats which died on study were subjected to gross necropsy examination as were all survivors at the end of the 14 day observation period.

IV. RESULTS

A. MORTALITY AND LD₅₀ VALUES:

Dose - Mortality Data

Dosage Level mg/kg	Number of Deaths														Total Mortalities					
	Hrs		Days												Male	Female	Total			
	0-4	1	2	3	4	5	6	7-14	M	F	M	F	M	F				M	F	
100																	1	1/5	0/5	1/10
215																		0/5	0/5	0/10
464				2	2					1								2/5	3/5	5/10
1000				2	2	2		1	1									3/5	5/5	8/10
2150	1	3	4	2														5/5	5/5	10/10

The Acute Oral LD₅₀ Values and 95% Confidence Limits

Male Rats: 680 (399 - 1157) mg/kg.

Female Rats: 430 (295 - 626) mg/kg.

Combined Male and Female Rats: 540 (389 - 749) mg/kg.

Slope

Male Rats: 1.00.

Female Rats: 1.00.

Combined Male and Female Rats: 1.00.

Statistical References

¹Weil, C. S. 1952. Tables for Convenient Calculation of Median Effective Dose and Instruction in Their Use. *Biometrics*, 8: 249-263.

²Thompson, W. R. and Weil, C. S. 1952. On the Construction of Tables for Moving Average Interpolation. *Biometrics*, 8: 51-54.

³Eby, R. 1957. Statistical Tables for Dose Evaluation, Report No. 5711. Miles-Ames Research Laboratory, Elkhart, Indiana.

B. PHARMACOTOXIC SIGNS:

The following pharmacotoxic signs were observed during the 14 day observation period: (see Table 1).

137-091

NUMBER OF RATS SHOWING PHARMACOTOXIC
SIGNS AND TIME [HOUR] (DAY) OBSERVED

TABLE - 1.

COMPOUND - FC-143:

MALES

OBSERVATION	100 mg/kg	215 mg/kg	464 mg/kg	1000 mg/kg	2150 mg/kg
Normal	3 (2 - 12), 4 (13 - 14)	4 (2 - 5), 5 (6 - 14)	2 (2 - 5), 3 (6 - 14)	2 (6 - 14)	
Ptosis	2 (1)	2 (1)	3 (1)	1 [1], 3 (1)	
Piloerection				1 (1)	
Hypoactivity	5 [1, 2 1/2, 4], 5 (1)	5 [1, 2 1/2, 4], 5 (1), 1 (2 - 3)	5 [1, 2 1/2, 4], 5 (1), 1 (2 - 3)	5 [1, 2 1/2, 4], 5 (1), 3 (2 - 3), 2 (4 - 5)	5 [1, 2 1/2], 4 [4]
Decreased Limb Tone	3 [1], 4 [2 1/2, 4], 3 (1)	4 [1, 2 1/2], 3 [4], 3 (1)	2 [1], 3 [2 1/2], 5 [4], 5 (1)	2 [1, 2 1/2], 4 [4], 5 (1), 1 (2 - 3)	5 [2 1/2], 4 [4]
Ataxia	4 [1], 5 [2 1/2], 2 [4]	4 [1], 3 [2 1/2, 4]	3 [1], 2 [2 1/2, 4], 1 (1)	2 [1], 3 [2 1/2, 4], 5 (1), 1 (2 - 3)	3 [1], 5 [2 1/2], 4 [4]
Corneal Opacity	2 (1 - 6), 1 (7 - 12)	2 (1), 1 (2 - 5)	2 (1), 1 (2 - 5)	4 (1)	
Death	1 (7)		2 (2)	2 (2), 1 (4)	1 [4], 4 (1)

NUMBER OF RATS SHOWING PHARMACOTOXIC
SIGNS AND TIME [HOUR] (DAY) OBSERVED

TABLE - 1. (Cont.)
COMPOUND - FC-143:

FEMALES

OBSERVATION	100 mg/kg	215 mg/kg	464 mg/kg	1000 mg/kg	2150 mg/kg
Normal	5 (2 - 14)	5 (2 - 14)	2 (4 - 14)		
Ptosis			3 (1)	2 (1)	
Piloerection				3 (1), 1 (2)	
Hypothermic to Touch			1 (2 - 3)		
Hypoactivity	5 [1, 2 1/2, 4], 5 (1)	5 [1, 2 1/2, 4], 5 (1)	5 [1, 2 1/2, 4], 5 (1), 3 (2 - 3)	5 [1, 2 1/2, 4], 3 (1), 1 (2)	5 [1, 2 1/2], 2 [4]
Decreased Limb Tone	4 [1, 2 1/2], 3 [4], 3 (1)	1 [1], 2 [2 1/2], 3 [4], 3 (1)	1 [1], 2 [2 1/2], 5 [4], 5 (1), 2 (2 - 3)	2 [1], 4 [2 1/2], 5 [4], 3 (1), 1 (2)	5 [2 1/2], 2 [4]
Ataxia	4 [1], 5 [2 1/2], 3 [4]	4 [1, 2 1/2, 4]	2 [1, 2 1/2], 3 [4], 3 (1), 2 (2 - 3)	4 [1, 2 1/2], 5 [4], 3 (1), 1 (2)	1 [1], 5 [2 1/2], 2 [4]
Corneal Opacity				1 (1)	
Death			2 (2), 1 (4)	2 (1), 2 (2), 1 (3)	3 [4], 2 (1)

International Research and Development Corporation

C. BODY WEIGHTS:

The following body weights were obtained during the 14 day observation period:

<u>Dosage Level (mg/kg)</u>	<u>Individual Rat Number</u>	<u>Sex</u>	<u>Control Weight (grams)</u>	<u>7 Day Weight (grams)</u>	<u>14 day Weight (grams)</u>	
100	76888	Male	194	242	296	
	76889	Male	189	228	275	
	76890	Male	210	Died	Died	
	76891	Male	190	240	285	
	76892	Male	198	246	304	
	76908	Female	198	217	240	
	76909	Female	192	212	226	
	76910	Female	186	208	227	
	76911	Female	204	225	244	
	76912	Female	188	191	212	
	215	76893	Male	214	266	318
		76894	Male	213	267	330
76895		Male	212	254	312	
76896		Male	210	252	290	
76897		Male	203	234	298	
76913		Female	195	218	243	
76914		Female	182	203	232	
76915		Female	190	209	230	
76916		Female	185	205	222	
76917		Female	182	203	236	
464	76898	Male	215	Died	Died	
	76899	Male	202	249	330	
	76900	Male	216	239	296	
	76901	Male	218	Died	Died	
	76902	Male	200	245	302	
	76918	Female	180	200	227	
	76919	Female	180	Died	Died	
	76920	Female	182	204	223	
	76921	Female	192	Died	Died	
	76922	Female	194	Died	Died	
1000	76903	Male	188	208	270	
	76904	Male	194	Died	Died	
	76905	Male	192	Died	Died	
	76906	Male	186	Died	Died	
	76907	Male	192	223	290	

137-091

International Research and Development Corporation

Page 8

<u>Dosage Level (mg/kg)</u>	<u>Individual Rat Number</u>	<u>Sex</u>	<u>Control Weight (grams)</u>	<u>7 Day Weight (grams)</u>	<u>14 Day Weight (grams)</u>
1000	76923	Female	202	Died	Died
	76924	Female	180	Died	Died
	76925	Female	184	Died	Died
	76926	Female	198	Died	Died
	76927	Female	196	Died	Died
2150	77208	Male	206	Died	Died
	77209	Male	213	Died	Died
	77210	Male	208	Died	Died
	77211	Male	211	Died	Died
	77212	Male	213	Died	Died
	77213	Female	221	Died	Died
	77214	Female	213	Died	Died
	77215	Female	217	Died	Died
	77216	Female	219	Died	Died
	77217	Female	206	Died	Died

D. NECROPSY FINDINGS:

Gross necropsy observations were noted as indicated on pages 9, 10 and 11.

137-091

3M_MN01688776

1170.0010

International Research and Development Corporation

1. Rats which died during the study period:

Gross Necropsy Observations:	Dosage Level (mg/kg)									
	Number Exhibiting Sign/Number Necropsied									
	100		215		464		1000		2150	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Yellow stained urogenital region								2/5	3/5	2/5
Lungs, congestion	1/1				2/2	1/3	2/3	4/5	4/5	5/5
Lungs, pitted									2/5	
Lungs, red foci										1/5
Stomach, distension						1/3	2/3	4/5	5/5	3/5
Stomach, fluid filled						1/3			5/5	4/5
Stomach, mucosa, hyperemia						3/3	1/3	1/5	4/5	1/5
Stomach, mucosa, thickened						2/3	2/3			
Stomach, contains dark red fluid						1/3				
Stomach, glandular mucosa, erosion						1/3				
Stomach, contains dark red particulate material									1/5	
Stomach, red fluid filled										1/5

137-091

International Research and Development Corporation

Page 10

Gross Necropsy Observations:	Dosage Level (mg/kg)									
	Number Exhibiting Sign/Number Necropsied									
	100		215		464		1000		2150	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Intestines, red fluid filled									2/5	1/5
Liver, pale coloration									1/5	
Partially, cannibalized	1/1									
Red stain around nose/mouth									3/5	4/5

137-091

3M_MN01688778

1170.0012

International Research and Development Corporation

2. Rats which were sacrificed following 14 days of observation:

Gross Necropsy Observations:	Dosage Level (mg/kg) Number Exhibiting Sign/Number Necropsied							
	100		215		464		1000	
	Male	Female	Male	Female	Male	Female	Male	Female
No gross lesions					1/3	1/2	1/2	
Lungs, foci				1/5				
Stomach, mucosa, thickened	4/4	5/5	5/5	4/5	2/3	1/2	1/2	
Stomach, glandular mucosa, hyperemia	1/4	2/5	1/5	1/5			1/2	
Uterus, hydrometra		1/5		2/5				
Kidneys, mottled coloration	2/4	2/5	3/5	4/5	1/3		1/2	

137-091