

APPLIED BIOLOGICAL SCIENCES LABORATORY  
RESEARCH • DEVELOPMENT

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6320 SAN FERNANDO ROAD

• GLENDALE, CALIFORNIA 91201

• 242-6944

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TEST REPORT

NOVEMBER 1979 - MARCH 1980

"PRELIMINARY SCREENING STUDY OF THE EFFECTS  
OF FLUORESCENT RADIATION ON BLOOD CHEM-  
ISTRIES OF RATS IN THE PRESENCE AND ABSENCE  
OF PULSOR ANTI-RADIATION DEVICES"

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## LABORATORY REPORT

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Sample	Pulsor Anti-Radiation Devices	Date	3/6/80
Submitted By	Razorback Limited	Received	11/26/79
Subject	Radiation Effects Determination	Laboratory No.	14978

### A B S T R A C T

Sprague-Dawley male rats were exposed to fluorescent light irradiation for a period of three weeks, 12 hours per day in the absence of Pulsor anti-radiation devices and in the presence of Pulsor anti-radiation devices. The radiation source in all experiments was constant and the radiation dosage was 13.3 mW/cm<sup>2</sup>.

At the end of the three week exposure period, blood was removed from each rat and twenty-five blood chemistries determined on each rat. Food consumption and animal weight gains for each group were determined at the end of the three week experimental period.

Data obtained indicates that fluorescent radiation appears to alter the blood chemistry of some blood components such as iron, uric acid, glucose, phosphorous, when compared to these blood components of control animals (animals not exposed to radiation). The Pulsor anti-radiation device in some instances maintains the approximate control values of these and other blood components.

In a similar manner, blood enzyme components measured were altered by fluorescent light radiation. The pulsor anti-radiation was able to maintain these blood enzymes at their normal physiological levels in the presence of fluorescent light radiation.

LABORATORY REPORT (CONTINUATION)

Client	Razorback Limited	Sample	Pulsor Devices	Lot Number	
Test and Reference	Radiation Effects Determination	ABSL Number	14978	Page <u>2</u> of <u>5</u>	
Date Received	11/26/79	Date Initiated	12/19/79	Date Completed	2/7/80

METHODS

Three groups of male, Sprague-Dawley rats weighing from 250-400 gms, five animals per group, were used in this study. Each rat was individually identified by tattoo.

Group A was the control and was housed in a sheltered area and not exposed to fluorescent light radiation.

Group B was exposed to fluorescent light radiation for an eight hour period each day for three weeks. The cage housing this group was kept approximately 5-1/2 inches from the fluorescent light.

Group C was also exposed to the fluorescent light under the same conditions as Group B; however, the Pulsor Devices were used with this group. The radiation source was four 40 watt 4 ft. fluorescent tubes made by General Electric. The radiation dose under these conditions was 13.3 mW/cm<sup>2</sup>.

The Pulsor Devices were used with Group C rats. Five devices were placed on top of the light fixture in the following color code sequence; red, blue, red, blue, red. Three devices were taped to the cage top of the Group C rats in the following color code sequence; green, green, red. Two devices were taped on the cage itself; one green device on each side.

All animals were weighed before and after the study and changes in appearance and behavior were recorded during the study. Food and water were provided ad libitum; however, the food was weighed before and at the conclusion of the study to determine the consumption for each group.

Groups B and C were kept on the study for three weeks each and the control Group A was kept on the study the entire six week period. At the end of the study periods, the animals were weighed, sacrificed, and blood removed by cardiac puncture for blood chemistries by conventional methods. At this time all animals were autopsied to determine if any gross physiological changes in tissues or organs had occurred.

**LABORATORY REPORT (CONTINUATION)**

Razorback Limited		Sample	Pulsor Devices	Lot Number
Reference	Radiation Effects Determination	ABSL Number	14978	Page <u>3</u> of <u>5</u>
Received	11/26/79	Date Initiated	12/19/79	Date Completed
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**RESULTS**

**A. FOOD CONSUMPTION**

**Average Daily Food  
Consumption per group**

Group A	116.3 gms
Group B	117.2 gms
Group C	108.2 gms

**B. WEIGHT GAINS**

	<u>Average Beginning Weight</u>	<u>Average Ending Weight</u>	<u>Average Total Weight Gain</u>
Group A	271.7 gms	415.94 gms	144 gms/6 weeks
Group B	254.5 gms	331.8 gms	77.3 gms/3 weeks
Group C	348.68 gms	376.36 gms	37.7 gms/3 weeks

**C. BEHAVIORAL AND PHYSICAL CHARACTERISTICS:** All animals were observed daily during the study periods. In no instances did any of the animals exhibit any noticeable behavioral or physical changes.

**D. AUTOPSY FINDINGS:** At the time of sacrifice all animals were examined grossly for abnormalities. Nothing unusual was noted in any animal.

**E. BLOOD CHEMISTRIES RESULTS:** Attached is a chart showing the averages by group of the blood chemistries.

LABORATORY REPORT (CONTINUATION)

Client	<b>Razorback Limited</b>	Sample	<b>Pulsor Devices</b>	Lot Number
Test and Reference	<b>Radiation Effects Determination</b>	ABSL Number	<b>14978</b>	Page <u>4</u> of <u>5</u>
Date Received	<b>11/26/79</b>	Date Initiated	<b>12/19/79</b>	Date Completed
				<b>2/7/80</b>

BLOOD CHEMISTRIES RESULTS

<u>Test</u>	<u>Group A Control</u>	<u>Group B Fluorescent Light</u>	<u>Group C Fluorescent Light Plus Pulsor Device</u>	<u>Units</u>
Calcium	10.30	10.1	9.13	mg/dl
Phosphorous	7.36	8.36	7.62	mg/dl
BUN	19.6	20.2	17.75	mg/dl
Creatinine	1.04	1.0	0.96	mg/dl
BUN/Creat. Ratio	18.87	20.29	18.69	-----
Uric Acid	3.86	3.6	6.56	mg/dl
Glucose (CS)	277.4	225.6	283.5	mg/dl
Total Protein	5.94	6.32	6.08	gm/dl
Albumin	2.64	3.0	2.72	gm/dl
Globulin	3.30	3.32	3.27	gm/dl
ALB/Glob. Ratio	0.80	0.90	0.84	-----
Total Bilirubin	0.154	0.158	0.206	mg/dl
Direct Bilirubin	0.04	0.04	0.04	mg/dl
Transaminase, SGO	189.4	162.2	212.6	IU/L
Transaminase, SGP	64.0	81.66	42.6	IU/L
Alk. Phosphatase	36.0	52.7	36.2	IU/L
Cholesterol	72.2	74.2	70.0	mg/dl
Iron	146.5	202.3	295.0	mcg/dl
Magnesium	2.45	2.46	2.47	meq/l
Sodium	145.8	147.4	146.0	mmol/l
Potassium	5.94	6.30	6.28	mmol/l
Chloride	102.0	103.6	105.6	mmol/l
G-Glutamyl Transpep.	2.75	1.0	1.25	units/l
Triglycerides	144.2	143.6	136.2	mg/dl
LDH Serum	834.8	638.6	696.5	Units

LABORATORY REPORT (CONTINUATION)

Razorback Limited		Sample	Pulsor Devices	Lot Number	
Reference	Radiation Effects Determination	ABSL Number	14978	Page <u>5</u> of <u>5</u>	
Received	11/26/79	Date Initiated	12/19/70	Date Completed	2/7/80

CONCLUSION

Based on this preliminary screening program we observed a change in weight gain of the animals in each group. The data indicates that the animals in the presence of the Pulsor anti-radiation device did not gain as much weight as the control animals or the animals exposed to the fluorescent light radiation. This is of particular interest because the blood chemistries of animals exposed to fluorescent light radiation in the presence of the Pulsor anti-radiation device were maintained at a normal level whereas animals exposed to fluorescent light radiation without the device were different from normal.

A similar situation exists relative to food consumption. Animals ate less food daily in the presence of the Pulsor anti-radiation device than did the control animals or the animals exposed to the fluorescent light radiation without the Pulsor anti-radiation device. The significance of these observations can only be ascertained by additional evaluations in this area.

Blood chemistries were altered in some cases depending on the system used. Of great interest, is the fact the blood enzymes measured were maintained at a more or less normal state when compared to the controls when the Pulsor anti-radiation device was used in the presence of fluorescent light radiation. This was not the case when the Pulsor anti-radiation device was not used with the fluorescent light radiation. In this latter situation, blood enzymes measured were in most instances depressed or below the levels obtained with the control animals - as much as 20% in most instances. In view of these observations and findings, we believe, and it is our opinion, that the Pulsor anti-radiation device is effective in producing beneficial physiological and functional changes in animals exposed to fluorescent light radiation. We feel that additional studies would evolve the true significance of these findings and produce very important and much needed data for the general public and for scientific interest.

Respectfully submitted,

APPLIED BIOLOGICAL SCIENCES LABORATORY



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Date 4/29/80