



INSTITUTE FOR MEDICAL RESEARCH

CEDARS OF LEBANON HOSPITAL
4751 FOUNTAIN AVENUE
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August 11, 1953

Chairman, Medical Research and Development Board
Office of the Surgeon General
Department of the Army
Room 2151, Main Navy Building
Washington 25, D. C.

Dear Colonel Wood:

Enclosed, please find our quarterly report of progress
which was due August 10, 1953.

Very truly yours,

Peter F. Salisbury, M.D., Ph.D.
Principal Investigator

PFS/gm
encl.

*Copy to [unclear] 14-5-53
Copy to [unclear] 21 Aug 1953
Copy to [unclear] 9 Oct 1953
14 Aug 53*

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August 10, 1953

TO: Chairman, Medical Research and Development Board
Office of the Surgeon General
Department of the Army
Room 2151 Main Navy Building
Washington 25, D. C.

SUBJECT: PROGRESS REPORT

Reporting Period: 1 May 1953 to 31 July 1953

Principal Investigator: Peter F. Salisbury, M.D., Ph.D.
Institute for Medical Research
Cedars of Lebanon Hospital
4751 Fountain Ave.
Los Angeles 29, California

Title Of Study: Analysis of the Indirect Effect
of Radiation

Contract No.: DA-49-007-MD-263

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1. ABSTRACT: During the period covered by this report, preliminary efforts were made to define the blood fraction which is considered effective in exerting a protective action on dogs after 450r total body irradiation. A total of sixteen experiments was performed in which groups of four dogs each were injected with various blood fractions after irradiation. The blood fractions consisted of concentrates of intact and destroyed leukocytes and of concentrates of intact and destroyed platelets. In the small series used, a protective effect of these fractions was not observed. On the contrary, the injected material seemed to enhance the toxic effect of radiation both as far as survival and severity of symptoms was concerned.

It should be noted that under the conditions under which we have observed protective effects of cross transfusion after total body irradiation, blood is transferred from the donor to the recipient at a high rate, in a closed system, in large amounts, under conditions of markedly reduced oxygen tension, and in such a way that the formed elements of the blood are traumatized. It is felt that before further attempts to isolate a protective factor are made, it will have to be determined whether or not all of the above mentioned conditions will be necessary for the successful characterization of such factor. With this objective in view we will perform replacement transfusions of pooled dog blood after lethal doses of Irradiation. If the protective effect could be

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demonstrated not only with intact donors, but also with blood which has temporarily been stored in clean siliconed glassware one may then confidently expect that this factor is susceptible to characterization and eventual isolation. Conversely, the characterization and demonstration of this factor is deemed beyond our resources if it should prove impossible to demonstrate the protective effect when blood which has been collected in bottles is used instead of blood coming directly from donor animals.

2. PROGRESS: (1) Control Studies: None performed during the reported period.

(2) Experimental Studies: Dogs were selected, prepared and irradiated with treatment as described before (Progress Report 29 July 1952). Within the period of thirty minutes after irradiation the dogs were injected with various blood fractions in groups of four. The fractions were obtained from pooled blood of healthy stock animals which were exsanguinated after previous heparinization. For each irradiated animal the total bleeding volume of a donor dog was used as a source for blood fractions for injection. The blood was collected in clean siliconed glassware. For each liter of blood 50 cc of 6% Dextran was used as a means to sediment the red cells. The blood-dextran mixture was centrifuged at 700rpm for five minutes. The supernatant plasma-dextran mixture was used as a source for leukocytes or platelets. Leukocytes were obtained by centrifugation of the supernatant plasma

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at 1200 rpm for fifteen minutes. Platelets were obtained from the supernatant plasma by centrifugation of the leukocyte freed plasma at a speed of 3000 rpm for one hour. It is realized that the fractions obtained are only relatively pure. Dogs were injected with the platelet fraction and the leukocyte fraction respectively. Experiments were also performed in which the leukocyte and platelet fractions were traumatized by repeated freezing and thawing. A protective effect of these fractions could not be demonstrated; on the contrary, the life span of the injected animals appeared to be shortened and their leukopenia was considered more severe.

3. FUTURE: It will be attempted to demonstrate the protective effect of blood transfer after lethal doses of irradiation by using blood which has been freshly withdrawn from donor animals into siliconed glassware. Such blood will be administered to irradiated animals by means of our pump number twelve and with a technique which has been found to confer protection. At the same time equivalent amounts of blood will be removed from the irradiated animals. If it is found that the protective effect can be demonstrated in this type of experiment, we will feel encouraged to proceed with further attempts to characterize the effect of blood fraction. If the letting of blood from a donor animal into a clean glass vessel exposed to atmospheric oxygen tension should preclude the demonstration of a protective effect we would feel that the problem of isolating and characterizing a protective blood fraction would

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be beyond our resources. These experiments are presently being conducted.

4. REFERENCES AND MANUSCRIPTS: None.

Respectfully submitted,

Peter F. Salisbury
Peter F. Salisbury, M.D., Ph.D.
Principal Investigator

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