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DIVISION OF MEDICAL PHYSICS
DONNER LABORATORY
BERKELEY 4, CALIFORNIA

May 21, 1951

US DOE ARCHIVES	
326 US ATOMIC ENERGY COMMISSION	
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Collection	<i>Division of Biology Medicine</i>
Box	<i>3358</i>
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Shields Warren, M. D., Director
Division of Biology and Medicine
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Shields:

Attached is a paper, ^{ON} "Blood Lipids and Human Atherosclerosis: II. The Influence of Heparin upon Lipoprotein Metabolism", which we feel you should know about as it represents the first real information we have on the physiological control of general defects in fat metabolism.

Heparin is extremely effective in restoring serum lipoproteins to apparent normal balance. In the attached paper it is pointed out in addition that there are striking and dramatic effects relating to anginal symptoms for long periods of time with doses as small as 15 to 20 mg IV. These quantities of heparin also have a parallel effect on the lipoproteins but it is not known how the anginal relief effect operates.

We are also studying the effects of radiation, and following acute radiation in the rabbit we believe that we can describe 12 to 90 hour post irradiation death as some sort of metabolic crisis based upon the pattern of lipoprotein response. Preceding these deaths there is a serum opalescence due to lipoproteins of the S_f 70-90 category. These, in severely irradiated animals, have indicated to be prognostic of lethal levels of radiations, and we believe the animals thus affected may be suffering from an acute physiological lack of heparin; at least heparin again restores the lipoprotein spectrum of serum to a normal pattern. We now have three rabbits irradiated with 800 r that have developed large concentrations of the S_f 70-90 molecules, that have survived after being treated with sufficient heparin (1 mg/kilo) to restore the blood serum lipids to normal patterns. Since we have seen such survival in only one rabbit of forty of this type developing serum opalescence after irradiation, we believe this effect is significant. The current statistical evaluation is somewhat less than five percent level of chance. We have current difficulties due to the fact our source of rabbits has been changed, and our titrations of mean lethal dose have thrown us off so that we will be several weeks in completing this study. However, I think you should be aware of it, and we are bending every effort to get out definitive information. From the plasma lipoprotein changes we estimate that the derangement of lipid metabolism from irradiation lasts about 72 hours, and it is our feeling that this phase may be produced by a deficiency of a heparin-like substance.

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MEDICINE, HEALTH & SAFETY

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Shields Warren, M. D.

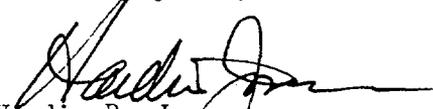
May 21, 1951

Page 2

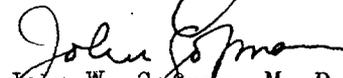
The active form of heparin in lipid metabolism is not free heparin, and hence may have to be differentiated from our thinking of heparin as an agent for preventing blood coagulation. The active form of heparin which initiates changes in fat metabolism appears to be a globulin complex which can be isolated from the serum of heparinized rabbits and man.

The attached paper has just been sent to CIRCULATION. No reports have been made as yet of the heparin effect in the post irradiation state.

Sincerely yours,



Hardin B. Jones



John W. Goeman, M. D.

HBJ/mic
Enclosure

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