

UNIVERSITY OF WASHINGTON

U.S. PUBLIC HEALTH SERVICE HOSPITAL

Box 3145

SEATTLE, WASHINGTON 98114

703737

School of Medicine
Department of Medicine
CHIEF, ENDOCRINOLOGY

January 18, 1971

Dr. Frank Brooks
Division of Biology and Medicine
United States Atomic Energy Commission
Washington, D.C. 20545

Re: AT(45-1)-2225, Revision #2
to Task Agreement 6

Dear Dr. Brooks:

I am requesting supplementary financial support to our AEC contract which expires April 30, 1971. The reason for this is that we have no additional monies to travel to the National Symposium on Natural and Manmade Radiation in Space to present our data. It is essential to the pursuance of our goals to attend these meetings, since our presentation will be published in the proceedings of the symposium.

I am requesting the following amount of money:

Round trip fare, economy, Seattle-Las Vegas	
Drs. Thorslund and Paulsen @156.00	\$312
3 days per diem each @\$24/day	144
	<u>\$456</u>

Enclosed are copies of the letter of acceptance for our presentation and the abstract submitted to the selection committee.

Sincerely yours,

C. Alvin Paulsen, M.D.
Professor of Medicine
Principal Investigator

CAP:gg

CONCURRENCE:

Robert H. Osterle
Assistant Director
Grant & Contract Services

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FOLDER C.A. PAULSEN (45-1)2225
UNIV. of Washington Agreement #6

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COLLECTION MARKET FILES

BOX No. 2 of 6

EPOSITORY DOE-FORRESTAL



ATOMIC ENERGY COMMISSION



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

HOST:



AEROJET NUCLEAR SYSTEMS COMPANY
A DIVISION OF AEROJET-GENERAL

CO-SPONSORS:

○ AMERICAN NUCLEAR SOCIETY

○ Shielding and Dosimetry Division

○ Aerospace Division

○ AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS

DR, NATIONAL SYMPOSIUM ON NATURAL AND MANMADE RADIATION IN SPACE

March 2-5, 1971

Frontier Hotel

Las Vegas, Nevada

To *C. Alvin Paulsen*

~~Dr. Todd W. Thorslund~~
University of Washington
Department of Medicine
U.S.P.H.S. Hospital
Post Office Box 3145
Seattle, Washington 98114

8 December 1970

Dear Dr. Thorslund:

I am pleased to inform you that your paper entitled "Effects of X-ray Irradiation on Human Spermatogenesis" has been included in the following session in the forthcoming National Symposium on Natural and Manmade Radiation in Space.

Session IV-1 - Radiobiology: Some Human Responses to Radiation Exposure

Chairman: - Leo Fox, Office of Manned Space Flight - NASA

Time: - Tuesday, March 2, p.m.

Please prepare a reproducible master and three (3) copies of your manuscript and submit them at the time you register at the meeting. Use the two column wide style shown in the attached example. Figures and tables should be on separate 8 1/2" x 11" pages.

Please submit your reproducible master typed on the enclosed forms.

I will forward a preregistration form and hotel reservation form to you along with the symposium program in a few weeks.

Very truly yours,

Edward A. Warman, General Chairman
National Symposium on Natural and Manmade Radiation in Space
Aerojet Nuclear Systems Company
Post Office Box 15847
Sacramento, California 95813

EAW:mk
Enclosures

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EFFECTS OF X-RAY IRRADIATION ON HUMAN SPERMATOGENESIS

Todd W. Thorslund and C. Alvin Paulsen

Spermatogenesis has long been considered to be one of the most radiosensitive of the mammalian biological systems. This observation has been verified in man following several nuclear accidents in which loss of spermatogenesis was the only observed radiation symptom.

Thus it was deemed feasible to undertake a controlled study in order to obtain information on the amount of radiation required to disrupt human spermatogenesis and the mechanisms involved. A total of 209 normal adult non-catholic prison inmate volunteers at the Washington State Penitentiary were utilized in such a study. Sixty-four of the men received a single, graded dose of x-rays to their testes and the remainder served as a control group. Testicular function was evaluated primarily on the basis of monthly to weekly seminal fluid examinations where the response or end-point was taken to be either normal, clinically sterile without azoospermia, or azoospermia. However, in order to obtain direct information on testicular malfunction, periodic testicular biopsies were also performed on a number of individuals in both the irradiated group and non-irradiated group.

It was found that independent of irradiation, testicular biopsy, systemic illness, and in some men, unknown factors could cause extensive suppression of sperm counts. It was also observed that the duration of time from irradiation until azoospermia was inversely related to dose size. However, when azoospermia did occur, the degree of testicular damage noted on

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biopsy and the time required for recovery were independent of dose level. As a result, it was deduced that complete disruption of spermatogenesis was due to the effect of radiation on some fundamental controlling mechanism rather than due to the death of individual germ cells.

On the basis of these observations and the additional assumption that a single ionization could elicit the response in question, a mathematical model expressing the probability of a response occurring in an individual given the radiation level he was exposed to and the number of biopsies he underwent was derived. Estimates of the parameters in the model were found by the method of maximum likelihood and used to obtain an estimate of the dose where 50% of the population would respond by time t ($ED/50/t$) due to radiation. Confidence limits on $ED/50/t$ were also obtained and simulation experiments run to verify the statistical validity of the results.

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