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U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY 3-905-174
San Francisco 24, California BPD/EHC:ja

7 JUN 1955

From: Commanding Officer, U. S. Naval Radiological Defense Laboratory
To: Assistant Secretary of Defense (Research and Development)
Department of Defense, Washington 25, D. C.
Via: Chief, Bureau of Ships (Code 348)

Subj: DD Form 613 for USNRDL FY 1955 AFSWP Beta Burn Proposal; submission of

Ref: (a) Ch BuShips ltr NP/12 (346) S90/1-2 Ser 348-88 of 29 Apr 1955 to AFSWP
(b) Ch AFSWP ltr SWPSG/936 of 21 Apr 1955 to Ch BuShips
(c) CO USNRDL 3-905-52 RLP/EHC:mjr of 23 Jun 1954 to Ch BuMed

Encl: (1) USNRDL FY 1955 AFSWP Project Proposal: "Effects of Beta Radiation on Skin" (DD Form 613)

1. In compliance with paragraph 5 of reference (a), and with request made in paragraph 3a of reference (b): "Your office submit DD Form 613 covering the contemplated work to the Assistant Secretary of Defense (Research and Development) showing the AFSWP as the supporting agency, with a copy of the form to this Headquarters for processing", enclosure (1) is herewith enclosed.

2. Enclosure (1) represents the approved USNRDL proposal for BioMedical Beta Burn Studies in the field of Radiological Defense, and resubmits on DD Form 613 work originally described and transmitted under a different format as enclosure (1) to reference (c).

R. A. HINNERS
Director

Copy to:
Chief, Armed Forces Special Weapons Project
Washington 25, D. C.
Chief, Bureau of Medicine
Department of the Navy
Washington 25, D. C.

WNRC: 17-28 Oct 94
RG: 330
Accession #61A-1491
File Name: 203.10 Weapons Effects
Box #46

ENCLOSURES RECEIVED IN 243

RDB PROJECT CARD	TYPE OF REPORT: NEW (FY 1955 Proposal)	REPORTS CONTROL SYMBOL: DD-RDB(A)48
1. PROJECT TITLE: EFFECTS OF BETA RADIATION ON SKIN (PHASE)	2. SECURITY: U	3. PROJECT NUMBER: Not known locally
	4. INDEX NUMBER:	5. REPORT DATE: 24 May 1955
6. BASIC FIELD OR SUBJECT: Not known locally	7. SUB FIELD OR SUBJECT: Not known locally	7a. TECHNICAL OBJECTIVE: AW-06601 (Atomic Warfare Defense)
8. COGNIZANT AGENCY: BuMed (Code 714C)	12. CONTRACTOR AND/OR LABORATORY: U.S. Naval Radiological Defense Laboratory, San Francisco 24, Cal. Dr. E. L. Alpen, Project Leader	CONTRACT/W.O. NUMBER:
9. DIRECTING AGENCY: BuShips (Code 348)		
10. REQUESTING AGENCY: AFSWP	13. RELATED PROJECTS:	17. EST. COMPL. DATES: RES. June 1958; DEV.; TEST; OP. EVAL.
11. PARTICIPATION AND/OR COORDINATION:	14. DATE APPROVED:	FY / 18. FISCAL ESTIMATES
	15. PRIORITY: / 16. MAJOR CATEGORY:	54: 0 M
		55: 20 M
19.		56: Not Determined
		T: Not Determined

20. REQUIREMENT AND/OR JUSTIFICATION

21. BRIEF OF PROJECT AND OBJECTIVE

a. Objective(s):

It is proposed to investigate the relationship between the dose of beta radiation to the skin and the severity of the resulting lesion, the time of onset of tissue breakdown, the time of healing and the nature and completeness of the healing process. These studies will also include an effort to evaluate the role of particle energy in burn production.

The other aspect of the problem will be the study of general systemic effects of large area beta radiation alone and in combination with gamma or X-irradiation as well as in combination with thermal radiation.

b. Approach:

Dogs and rats will be exposed to beta radiation from high dose rate large area radioisotope plaques. The dose to the surface will be adjusted by the exposure time. Serial biopsy of the irradiated area will be undertaken to establish the nature of changes occurring before the subsequent breakdown of the surface. The dose required for specific damage in terms of histologic and gross lesions observed will be ascertained with attention to the time span between irradiation and eventual evidence of a gross lesion.

D 1025

22. RDB	SN.	CN.	IC & P.	X.	I.	C.

In addition to studies with homogeneous plaque irradiators, the effect of irradiator particle size and distribution will be made with plaques prepared in this Laboratory. The particle size and specific activity will be varied and the effect of this change on the total surface beta rep required for production of burns will be evaluated.

By use of the monoenergetic electron beam from the Van de Graaff generator it is possible to irradiate animals with electron beams with energies in the range 0.5 KEV to 2 MEV. The effect of particle energy on burn production will be measured with this source.

Large area exposures of animals to beta irradiation after exposure to varying doses of gamma or X-irradiation will be utilized to evaluate the effect of beta radiation on mortality due to penetrating ionizing irradiation. The usual dose-response analysis will be utilized to establish the LD_{50} for X or gamma radiation when beta radiation is superimposed. The same technique will be applied to evaluation of combinations of standardized thermal burns and beta radiation to evaluate the effects of beta radiation on mortality and recovery following severe burns.

To establish the nature of the systemic effects of beta radiation and the cause of death from beta radiation, animals will be given large area skin burns with the electron beam from the Van de Graaff generator and the hemogram will be evaluated as a function of time following irradiation. Body weight changes, clinical course and other pertinent observations necessary to establish the nature of pathology resulting in death will be made.

c. Subtasks:

None

d. Background History and Progress:

This program has only very recently been activated. However, high dose rate P^{32} plaques have been obtained capable of delivering 10,000B rep/hr and these have been used to irradiate depilated rats. Doses of 1000 rep to 3000 rep have been given and the histologic sequelae are being studied.

e. Future Plans:

P^{32} plaque irradiations will be continued to establish doses required for various effects on skin. Monoenergetic electron beam irradiation will be commenced shortly.

f. References:

None

g. Other Information:

Effects of Beta Radiation on Skin (Cont'd.)

Est. Proj. Invest M/Yrs.	Agency	PO/Allot.	Rec'd FY 1955	Est. Oblig. FY 1955	Est. Req. FY 1955	Est. Req. FY 1956
-	-	/54	0	0	-	-
Approx.) 1.0 (Civ)) 0.5 (Mil))	AFSWP	/55	-	-	20.0 M	-
ND*	AFSWP	/56	-	-	-	ND*
			0	0	20.0 M	ND*

*Not yet determined.

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Department of the Navy
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RDB PROJECT CARD	TYPE OF REPORT: NEW (FY 1955 Proposal)	REPORTS CONTROL SYMBOL: DD-RDB(A)148
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10. REQUESTING AGENCY: AFSWP	13. RELATED PROJECTS:	17. EST. COMPL. DATES: RES. June 1958; DEV.; TEST; OP. EVAL.
11. PARTICIPATION AND/OR COORDINATION:	14. DATE APPROVED:	FY / 18. FISCAL ESTIMATES: 54 0 M; 55 20 M; 56 Not Determined; T Not Determined
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