

BIOMEDICAL AND ENVIRONMENTAL RESEARCH  
PROGRAM BUDGET

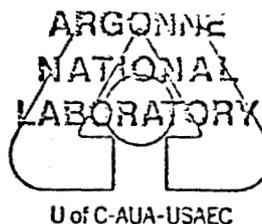
1715  
May 1973

CONTRACT W-31-109-ENG-33  
SUPPLEMENT NO. 16

1. TITLE  
Health Studies —  
Exposure to External and Internal Radiation

JLB  
Row 1

728225



2. BUDGET ACTIVITY NO.  
AEC RX-01-01 Summary  
ANL 63100 - 63300 (RER, BIM)

3. SCIENTIST RESPONSIBLE  
R. E. Rowland and W. K. Sinclair

4. WORK STARTED  
FY Continuing

5. RELATED WORK (With Same Contractor or Others)  
Other RX-01-01 programs

6. MANPOWER AND COST DATA

ESTIMATED FOR FISCAL YEARS

	FY 1973	FY 1974 PRESIDENT'S BUDGET	FY 1974 INCREMENTAL REQUIREMENTS	FY 1975
<b>6a. DIRECT MANPOWER (Man Years)</b>				
<b>SCIENTIFIC</b>				
REGULAR	45.4	48.5	-	58.8
TEMPORARY PAID BY ANL	3.8	6.6	.3	7.8
TEMPORARY PAID BY OTHERS	.4	.5	-	.5
<b>TOTAL SCIENTIFIC</b>	<b>49.6</b>	<b>55.6</b>	<b>.3</b>	<b>67.1</b>
<b>OTHER TECHNICAL</b>				
REGULAR	5.1	7.0	-	5.0
TEMPORARY PAID BY ANL	.3	-	-	.3
TEMPORARY PAID BY OTHERS	.6	.6	-	.7
<b>TOTAL OTHER TECHNICAL</b>	<b>6.0</b>	<b>7.6</b>	<b>-</b>	<b>6.0</b>
<b>TOTAL MAN YEARS</b>	<b>55.6</b>	<b>63.2</b>	<b>.3</b>	<b>73.1</b>

6b. OPERATING COSTS (In Thousands)

EFFORT-RELATED COSTS	\$1658	\$1911	\$3	\$2263
MATERIALS AND SERVICES	779	788	-	964
MAJOR PROCUREMENTS	260	270	-	285
<b>TOTAL COST</b>	<b>\$2697</b>	<b>\$2969</b>	<b>\$3</b>	<b>\$3512</b>

6c. Cost (Recap of Subactivities) (In Thousands)

63100	\$ 577	\$ 629	\$3	\$ 838
63200 Radioactivity and Trace Element Metabolism	220	220	-	249
63300 Radium Studies	1900	2120	-	2425
<b>Total RX-01-01</b>	<b>\$2697</b>	<b>\$2969</b>	<b>\$3</b>	<b>\$3512</b>

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(over)

6d. Major Procurements (In Thousands)

	<u>FY 1973</u>	<u>FY 1974 President's Budget</u>	<u>FY 1975</u>
63300 Radium Studies	\$260	\$270	\$285

See individual 189's for detail

6e. Equipment Obligations (In Thousands)

63100			
63200 Radioactivity and Trace Element Metabolism	\$ 3	\$ 8	\$ 15
63300 Radium Studies	80	62	159

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7. Description (Contd.)

In the Radiological and Environmental Research Division, the Center for Human Radiobiology includes two programs, one directed toward concepts and models of radiation toxicity, the other toward the study of radiation effects on man.

Radioactive and Trace Element Metabolism. This activity continues in the general field of radioactive and trace element metabolism, but with increased emphasis on the development of concepts and models for evaluating the toxicity of radium in man and translation to the toxicity in man of other radionuclides, particularly plutonium. The mode of operation is to relate data from the radium studies to physical and biological processes which may affect dose-response relationships. The work is now concentrated into two items. The first item deals primarily with the retention and distribution of internal emitters. The other deals with the tissues exposed to internal emitters: properties affecting detailed estimates of dose, and properties which may elucidate mechanisms of radiation damage. Almost without exception, personnel in this activity devote time to the Radium Studies. This is natural, for it is difficult to separate the effort applied to the programmatic aspects of the Radium Studies from related efforts to generalize on the problems of localization, identification, and evaluation of the toxicity of internal emitters in man.

Radium Studies. This program is designed to study the long-term effects of radium and other internal emitters in man. It includes specific responsibility for locating humans with significant body burdens of radium, evaluating radiation doses, and accumulating pertinent medical data during their entire life spans. Responsibility for radium cases located and studied by the Radioactivity Center of MIT, the ANL-Argonne Cancer Research Hospital project and the New Jersey Radium Research Project has been transferred to this Center.

The program set up around these radium cases includes clinical, biological and physical studies on the living cases, a search for new cases, acquisition and study of autopsy material and willed bodies, exhumations and epidemiology. In addition, reproductive patterns of female radium patients and medical histories of their children are being studied for evidence of effects of low doses of radiation on fetal development. It is hoped that these studies will eventually include other bone-seeking isotopes in man, so we are developing the capability for measurement of very low levels of transuranic elements in tissues and excreta. During FY 1972 and FY 1973, a comprehensive new computer system for storing and processing data on radium cases was designed and put into operation. Data from the former computer system have already been incorporated, but the full potential of the new system requires additional data which are now being abstracted from existing records or obtained as new information. Both systems will be operated for a period of time in order to provide continuity with results previously calculated by means of the former system.

A field office in Orange, New Jersey, maintains contact with radium cases and searches for new cases along the east coast of the United States.

A satellite laboratory is operated in Cambridge, Mass., under a subcontract with MIT. This laboratory is equipped to make whole body radium measurements and radon breath measurements on the patients in this area. Personnel also contribute vigorously to locating radium patients and obtaining willed and exhumed bodies.

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7. Description (Contd.)

Medical examinations, including x-rays, are made on the patients by cooperating physicians in the Cambridge area.

The case records from the former New Jersey Radium Research Project, the MIT Radioactivity Center, and (with only a few exceptions), the ANL-ACRH Radium Studies have been copied and are in the possession of the Center for Human Radiobiology. During FY 1972, the entire collection of original files, x-rays, specimens, and microscopic slides of the New Jersey Radium Research Project was acquired.

As of March 31, 1973, we have the names of 3,400 persons who have had industrial or medical exposure to radium. Of these, 1,400 living persons have been positively identified and located and 1,000 other persons are now known to be dead. Estimates of body burdens, while alive or after death, have been made on 1,300 of the 2,400 located persons.

An urgent need for a medical staff within the Center for Human Radiobiology has now been met. The Health Division of the Argonne National Laboratory, under the direction of Dr. Francis W. Strehl, performs the necessary physical examinations on the patients who come to the Argonne site, and reading of x-rays is done in the Radiological and Environmental Research Division by a consulting radiologist. Dr. Margaret S. Littman, a certified pathologist, joined our regular full-time staff during the past year. Cooperative arrangements with the University of Chicago Hospitals and Clinics have been made for detailed ENT and diagnostic radiographic examinations of patients considered at some degree of risk to carcinomas of the paranasal sinuses and the mastoid air cells. All medical work of the Center is under the direction of Dr. Austin M. Brues, who joined the Center in FY 1972. Continued emphasis will be placed on increasing the medical capabilities of the Center.

All work with humans in the Radium Studies is done in conformity with DHEW policy on protection of human subjects. The protocol of procedures and practices was approved on September 17, 1971, by the Argonne Review Committee for Research Projects Involving Human Subjects, and a follow-up report for the period 1 July, 1971 to 31 December, 1972 was accepted by the Committee on February 5, 1973.

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