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OAK RIDGE NATIONAL LABORATORY  
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX X  
OAK RIDGE, TENNESSEE 37831

April 19, 1988

718441

Dr. Robert W. Wood, Acting Associate Director  
for Health and Environmental Research  
Office of Energy Research  
Department of Energy  
Washington, D.C. 20545

Dear Dr. Wood:

Report of Foreign Travel

Enclosed is a copy of a report by R. Julian Preston covering his recent foreign travel to Japan. It does not contain any proprietary data or classified information.

Sincerely,

*F. C. Hartman*

for  
Alexander Zucker  
Acting Director

AZ:bcs

Enclosure

cc: R. J. M. Fry  
F. C. Hartman  
J. A. Lenhard  
C. R. Richmond

REPOSITORY Oak Ridge Operations  
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1120461

1515 2

**COVER SHEET  
FOR TRIP REPORTS SUBMITTED TO THE  
OFFICE OF ENERGY RESEARCH**

**Destination(s) and Dates for  
Which Trip Report Being Submitted:** Japan, March 16-26, 1988

**Name of Traveler:** R. Julian Preston

**Joint Trip Report**  **Yes**  
 **No**

**If so, Name of Other Traveler(s):** \_\_\_\_\_  
\_\_\_\_\_

**OAK RIDGE NATIONAL LABORATORY**

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.  
POST OFFICE BOX X OAK RIDGE TENNESSEE 37831

**ORNL**  
**FOREIGN TRIP REPORT**

ORNL/FTR-2840

**DATE:** April 7, 1988

**SUBJECT:** Report of Foreign Travel of R. Julian Preston  
Senior Research Staff Member, Biology Division

**TO:** Alex Zucker

**FROM:** R. Julian Preston

**PURPOSE:** To participate in a Workshop at the Radiation Effects Research Foundation (RERF), Hiroshima, Japan (March 18-20, 1988) on "Radiation Susceptibility," and to provide recommendations to RERF on future studies designed to address the identification of possibly susceptible population sub-groups.

To visit Dr. Masao Sasaki, Radiation Biology Center, Kyoto University, to discuss current research on the role of specific chromosomal and molecular alterations in cell transformation.

**SITES** March 17-20, 1988 RERF, Hiroshima, Japan  
**VISITED:** March 22-23, 1988 Kyoto, Japan

**ABSTRACT:** The traveler was a participant in a workshop at RERF that was established to determine if current data or future studies could be utilized to address the question of whether radiation-sensitive individuals could have been over-represented in the A-bomb non-survivors in Hiroshima and Nagasaki and thereby affect the cancer incidences. The topic was addressed by presentations by RERF staff on their current studies pertinent to radiation susceptibility; round-table discussions among panel members and observers; a written series of recommendations prepared by the workshop members and presented to the RERF council.

Access to the information in this report is limited to those indicated on the distribution list and to U.S. Government Agencies and their Contractors.

1120485

The Radiation Effects Research Foundation has established a series of workshops to take place over the next 2-1/2 years to address a variety of questions that arise from the long-term studies of A-bomb survivors and on the future directions that might address these. It is particularly important to determine what additional studies might be important because of the limited time that is now available due to the age of the exposed population. The Workshop attended by the traveler was the first in the series and addressed the question of radiation susceptibility, *i.e.* is the surviving population more representative of a cancer resistant population than the general population, making the estimates of radiation-induced cancer artificially low?

The first day of the Workshop consisted of presentations by the staff of RERF to provide background information on previous studies and data collection and also results from ongoing studies of the Radiation Biology and Cytogenetics Groups that were designed to attempt to address the question of radiation susceptibility.

Dr. Finch, Chief of Research, RERF, provided a summary of the data on late effects that had been collected over the past 40 years with particular reference to the effect that the new dosimetry (DS86) had on the conclusions, and on the comparisons between Hiroshima and Nagasaki. In general, it can be concluded that no differences in cancer rates or chromosome aberrations can be observed in persons exposed in Hiroshima and Nagasaki. This is in rather good agreement with the expected outcomes based upon the similarity of doses for both gamma rays and neutrons for the two cities (DS86). In addition, Dr. Finch described the Tumor Registries that were established in the 1950's. These now contain a large and valuable collection of tumor information. RERF has recently also become

involved in the establishment of a Cancer Registry for Nagasaki Prefecture. RERF also maintains a bank of biological materials for additional studies, and is currently expanding this. Peripheral blood samples are stored, and since 1985 some EBV-transformed permanent lymphoblastoid cell lines have been established for the analysis of mutant frequencies. Human skin and lung fibroblasts, together with a range of tumor cell lines, are also stored. Thus, it is possible to consider devising studies that would address the question of radiation susceptibility utilizing some of these cell samples and lines.

The Cell Biology Group has already initiated a study of cell killing and mutation induction in lymphocytes, thyroid cells, and skin fibroblasts in exposed and control persons to determine if there are variations in radiation sensitivity to X rays and/or neutrons. The cell killing studies with lymphocytes have been performed with T-lymphocytes and recombinant interleukin-2. The individual variation in radiosensitivity is generally smaller than that observed for skin fibroblasts, and increased radiosensitivity is observed when cloning efficiency is low. A similar response has been observed by other laboratories for mutants at the hgp<sub>r</sub>t locus. No conclusions are yet available on the ranges of sensitivity for persons who had received different estimated A-bomb exposures. Mutants have also been analyzed in erythrocytes and T-lymphocytes of control and A-bomb exposed persons, utilizing the glycophorin A method (MN loci) and thioguanine resistance (HGPRT locus). It is also possible to further analyze the HGPRT mutants by Southern blot analysis (point mutation or deletion) and by using probes for the T cell antigen receptor gene to determine if multiple mutants are independent events or the result of clonal expansion from a single induced mutation. There is a general dose response for glycophorin mutants in exposed persons, with some clear outliers that might result from fluctuations in the

number of mutants in the stem-cell pool. However, the nature of these outliers needs to be studied in greater detail. One drawback of this assay is that since erythrocytes are analyzed for variant forms, it is not possible to determine if these are true mutations.

Mutations at the HGPRT locus have been analyzed in 30 exposed persons ( $> 1$  rad) and 17 age- and sex-matched controls ( $< 1$  rad). In general, mutant frequency correlates with revised dose estimates (DS86). A very small subset of individuals (3 exposed; 2 controls) have been further studied to determine the nature of mutations and the independence of induction. The method requires clonal expansion of mutant colonies using interleukin-2 followed by Southern blot analysis and T cell receptor gene analysis. The only conclusion of note to date is that one A-bomb survivor had a 100 times higher than control mutant frequency. All the mutant T-cell colonies possessed the same HGPRG gene alteration, but different rearrangements of the T cell receptor gene. This result almost certainly arises from a single mutation in an immature stem cell. Thus the complete analysis of mutant colonies allows for a very specific interpretation of the mode of induction, and an accurate measure of induced mutation frequency. One drawback to the use of the HGPRT assay is that since it is an X-linked gene, deletions that include surrounding loci that are essential for viability will not be recovered, and observed mutant frequency will be an underestimate of the induced frequency. It was recommended that additional loci be studied, for example, the APRT locus and HLA mutations.

Cell killing in thyroid cells can be assessed by growth *in vitro* or by grafts in athymic Nu/Nu mice. Preliminary studies have shown that the method is feasible, using normal thyroid cells from persons treated surgically for malignant or benign thyroid tumors irradiated *in vitro*. The thyroid cells are

more sensitive than most non-hematologic cells ( $D_0 = 92.9 \pm 2.8$  cGy). Additional preliminary studies on cells from A-bomb exposed persons have been performed, but the sample sizes are too small for conclusions to be drawn, although no clear increase or decrease in X ray sensitivity was observed for these samples.

A large study has been conducted on the sensitivity of skin fibroblasts to X ray- and Cf-252-induced cell killing and chromosome aberration induction. The cell lines studied were from control samples with or without breast cancer and A-bomb exposed persons with or without breast cancer. The hypotheses being tested are: (1) Is the exposed group more resistant to radiation, and (2) are cells from breast cancer patients more or less sensitive than those without? The study is fraught with some technical difficulties, although in concept it is good. The authors concluded that there were no cell lines in any group that were clearly radio-sensitive, although perhaps of interest (and not mentioned) is that there is a wide range of sensitivities to killing by X rays, and rather less following neutron irradiation. The authors' conclusion that cells from exposed persons with breast cancer contained more stable chromosome aberrations than those without breast cancer or non A-bomb exposed did not appear to be supported by the data presented.

A very small study has been initiated on cytogenetic and somatic mutation outliers, i.e. individuals whose aberration or mutant frequencies were much higher or lower than the calculated dose response curve for all individuals studied. No results are yet available to establish the nature of these outliers. However, it might well be that they could represent examples whereby the issue of radiation susceptibility could be addressed experimentally. This was the basis for one of the Workshop Group's recommendations.

The studies described by the RERF were both rather extensive and well-conducted. However, although they were intended to address the question of radiation susceptibility, it was difficult to see how they would indeed provide appropriate data for drawing conclusions pertinent to the question. Of course, the ideal approach would be to base studies on individuals that could be matched to the non-survivors, but this is difficult or impossible to do. Thus the Workshop members moved to the next stage, to devise practical approaches to determine factors that could influence radiation susceptibility.

On the second day, there was considerable discussion of ongoing studies and on different approaches for addressing the issue of radiation susceptibility. These discussions formed the basis for a series of recommendations for future research.

Recommendations by category only:

1. DNA Damage and Repair
2. Acute Radiosensitivity and Cancer Susceptibility
3. Correlation among end-points
  - (a) Mutations vs. Chromosome Aberrations
  - (b) Mutations vs. Cancer
  - (c) Marker Differences
    - (i) HLA
    - (ii) ARPT
4. Cell Bank
5. Outliers ("Sensitive" and "Resistant")
6. F<sub>1</sub> Study
7. DNA Damage and Repair - oxygen radicals
8. Chromosome Specific Staining
9. G<sub>2</sub> Chromosome Hypersensitivity

#### 10. Skin Cancer.

These recommendations were presented in draft form for submission to the RERF Scientific Council. They will be described more fully for final submission.

The Workshop provided an excellent opportunity for exchange of ongoing research and ideas for future directions. It proved to be a valuable experience, and the end-product should provide the basis for addressing the question of possible individual differences in radiation susceptibility and perhaps provide opportunities for collaborative research. The question being addressed is an important and worthy of a fairly extensive research effort. In addition, animal models could be developed for studying radiation susceptibility and are worthy of consideration.

The traveler visited Dr. Sasaki at Kyoto University for discussions of current research. The studies that Dr. Sasaki has been conducting on the nature of the production of retinoblastoma appears to be related to studies of the mechanism of chromosome aberration production by a recombination mechanism involving repetitive DNA sequences being conducted by the traveler at Oak Ridge. It was also particularly informative to compare the results from the two laboratories on the possible role of specific chromosome alterations in the induction or progression of tumors. Dr. Sasaki has access to human tumor samples, while the traveler is utilizing animal models to address similar questions. The information obtained will be shared with colleagues at ORNL.

## APPENDIX

Itinerary

March 15-17, 1988	Travel from Oak Ridge, Tennessee to Hiroshima, Japan
March 18-21, 1988	RERF Workshop, Hiroshima, Japan
March 22-23, 1988	Visit with Dr. Masao Sasaki, Kyoto University, Kyoto, Japan
March 23, 1988	Travel from Kyoto, Japan, to Oak Ridge, Tennessee

Literature Acquired

Preprints of research discussed at RERF Workshop

## APPENDIX II

10 February 1988

RADIATION SUSCEPTIBILITY WORKSHOP

Place: Radiation Effects Research Foundation  
5-2 Hijiyama Park, Minami-ku, Hiroshima  
732 Japan

## Time and date:

Day 1: 09:00-17:00 hours, 18 March 1988 (Friday)  
Day 2: 08:30-17:00 hours, 19 March 1988 (Saturday)  
Day 3: 08:30-17:00 hours, 20 March 1988 (Sunday)

List of Expected ParticipantsWorkshop Members:

Dr. Hiraku Takebe (workshop co-chairman), Professor, Department of Experimental Radiology, Faculty of Medicine, Kyoto University

Dr. Taisei Nomura, Professor, Department of Fundamental Radiology, Medical School, Osaka University

Dr. Hiroshi Kasai, Senior Investigator, Biology Division, National Cancer Center Research Institute

Dr. Kouichi Tatsumi, Associate Professor, Department of Molecular Oncology, Faculty of Medicine, Kyoto University

Dr. Richard B. Setlow (workshop co-chairman), Biology Department, Brookhaven National Laboratory

Dr. Kenneth Kraemer, Laboratory of Molecular Carcinogens, National Cancer Institute

Dr. Robert Painter, Associate Director, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco

Dr. R. Julian Preston, Cytogenetics, Biology Division, Oak Ridge National Laboratory

RERF Science Councillors:

Dr. Masanori Kuratsune, Dean, Nakamura Gakuen University and College

Dr. Toshiyuki Kumatori, Chairman, Radiation Effects Association

Dr. Shigefumi Okada, Professor, Radiation Biology Center, Kyoto University

Dr. Barry R. Bloom, Chairman of Microbiology and Immunology, Albert Einstein College of Medicine

List of Expected Workshop Participants (continued)

Dr. Mortimer L. Mendelsohn, Associate Director for Biomedical and Environmental Research, Lawrence Livermore National Laboratory

Dr. Robert W. Miller, Chief of Clinical Epidemiology, National Cancer Institute

Dr. Arno G. Motulsky, Professor of Medicine and Genetics, School of Medicine, University of Washington

Dr. Donovan J. Thompson, Professor Emeritus, University of Washington

Observers:

Dr. Masao Sasaki, Professor, Radiation Biology Center, Kyoto University

Dr. Kenjiro Yokoro, Professor, Research Institute for Nuclear Medicine and Biology, Hiroshima University

Ministry of Health and Welfare representative(s)

Ministry of Foreign Affairs representative

Dr. Robert W. Wood, Acting Associate Director for Health and Environmental Research, Office of Energy Research, Department of Energy

Dr. Alvin G. Lazen, Executive Director, Commission on Life Sciences, National Research Council

Dr. Charles W. Edington, Associate Director for International Affairs, Commission on Life Sciences, National Research Council

Dr. James E. Norman, Assistant Associate Director for International Affairs, Commission on Life Sciences, National Research Council

Mr. Paul Sullivan, Office of the Comptroller, National Academy of Sciences

Dr. Richard W. Getzinger, Counselor for Scientific and Technological Affairs, U.S. Embassy

Mr. Robert M. Jackson, Senior Representative, Department of Energy, U.S. Embassy

Mr. Seymour Jablon, former Associate Director for International Affairs, Commission on Life Sciences, National Research Council

Dr. Gilbert W. Beebe, Clinical Epidemiology Branch, National Cancer Institute

List of Expected Workshop Participants (continued)

Dr. Seymour Abrahamson, Professor, Department of Zoology, University of Wisconsin

Dr. James V. Neel, Professor, Department of Human Genetics, University of Michigan

Dr. Howard B. Hamilton, former Chief, Department of Clinical Laboratories, RERF

RERF Directors:

Dr. Itsuzo Shigematsu, Chairman [Former Director, Department of Epidemiology, Institute of Public Health]

Dr. J.W. Thiessen, Vice Chairman [Former Deputy Associate Director for Health and Environmental Research, Office of Energy Research, U.S. Department of Energy]

Dr. Stuart C. Finch, Permanent Director and Chief of Research [(on leave from) Professor, University of Medicine and Dentistry of New Jersey - Rutgers Medical School]

Dr. Fumihiko Munakata, Permanent Director [Former Director, Health Center Division, Public Health Bureau Ministry of Health and Welfare]

Mr. Tomoyuki Kono, Permanent Director and Chief of Secretariat [Former Director, Social Insurance Training Institute, Ministry of Health and Welfare]

Dr. Tsutomu Sugahara, Visiting Director [Professor Emeritus, Kyoto University]

## APPENDIX III

(Tentative Program)

3 March 1988

**Radiation Susceptibility Workshop****Hiroshima RERF****March 18 - 20, 1988****Day 1: March 18 (Friday)**

9:00 - 9:15	Executive session	Drs. Setlow and Takebe
9:15 - 9:25	Greetings by the RERF Chairman	Dr. Shigematsu

**Morning Program Chairman: Dr. Takebe**

9:25 - 10:05	Summary of radiation effects, availability of biological materials & definition of the problems	Dr. Finch
10:05 - 10:15	Discussion	
10:15 - 10:30	Coffee break	
10:30 - 11:10	Population samples and DS86 cancer risk estimates	Dr. Kato
11:10 - 11:20	Discussion	
11:20 - 12:00	Lymphocyte, thyroid and fibroblast radiation sensitivity studies	Drs. Nakamura and Ban
12:00 - 12:10	Discussion	
12:10 - 12:25	Group photograph	
12:25 - 1:30	Lunch	

**Afternoon Program Chairman: Dr. Setlow**

1:30 - 2:10	Current and proposed micronucleus studies at RERF	Dr. Ban
2:10 - 2:20	Discussion	
2:20 - 3:00	Somatic mutation (HPRT, glycophorin A) studies	Drs. Akiyama and Nakamura
3:00 - 3:10	Discussion	
3:10 - 3:25	Coffee break	
3:25 - 4:05	Chromosome radiosensitivity and cancer	Drs. Awa and Ban
4:05 - 4:15	Discussion	

4:15 - 4:35	Cytogenetic outliers	Dr. Awa
4:35 - 4:40	Discussion	
4:40 - 5:00	Somatic mutation outliers	Dr. Akiyama
5:00 - 5:10	Discussion	
6:00	Reception and dinner	

**Day 2: March 19 (Saturday)**

**Morning Program Chairman: Dr. Takebe**

- 8:30 - 10:00 Consideration of hypothesis and population effects
- Possible relationship between acute radiosensitivity and carcinogenesis
  - Effective radiation dose range
  - Relationship between survival and late effects
  - Estimation of maximum effect on surviving populations
- 10:00 - 10:15 Coffee break
- 10:15 - 12:00 Radiation sensitivity and carcinogenesis
- Probability of demonstrating significant variation in radiation sensitivity in survivors
  - Possible relationship between increased radiation sensitivity and carcinogenesis
  - Possible radiation sensitivity studies (repair, free radicals, oxygen protection, etc.)
- 12:00 - 1:30 Lunch

**Afternoon Program Chairman: Dr. Setlow**

- 1:30 - 3:00 Somatic mutation and carcinogenesis
- Types of A-bomb somatic mutation with possible cancer implications (e.g. glycoporphins, chromosomes, HLA, DNA, etc.)
  - Significance and types of somatic mutations induced by irradiating cells of A-bomb survivors (e.g. micronuclei, DNA mutations of many types, sister chromatid exchange, chromosome aberrations, etc.)
- 3:00 - 3:15 Coffee break

- 3:15 - 5:00 Resistance - sensitivity mechanisms
- Evaluation of free radicals scavengers
  - Generation of free radicals in response to radiation, peroxidants, etc.
  - Evaluation of repair systems (enzymes, etc.)
  - Oncogene activation
- 6:00 Dinner for members of the Workshop only

**Day 3: March 20 (Sunday)**

Morning Program Chairman: Dr. Takebe

- 8:30 - 10:00 Open for discussion or special topic presentations
- 10:00 - 10:15 Coffee break
- 10:15 - 12:00 Closed session of Workshop for organization of recommendations
- 12:00 - 1:30 Lunch
- 1:30 - 3:00 Closed session of Workshop for organization of recommendations
- 3:00 - 3:15 Coffee break
- 3:15 - 4:15 Closed session of Workshop for organization of recommendations
- 4:15 - 4:30 Preliminary recommendations (Drs. Takebe and Setlow)

Distribution

1. Assistant Secretary for International Affairs, DOE, Wash.
2. Dr. Robert W. Wood, Acting Associate Director, OHER, DOE, Wash.
3. Director, Division of Safeguards and Security, DOE/ORO
- 4-5. Office of Scientific and Technical Information, P.O. Box 62,  
Oak Ridge, TN 37831
6. C. R. Richmond
7. A. Zucker
- 8-9. F. C. Hartman
10. J. S. Cook
11. R. J. M. Fry
12. R. Julian Preston
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**OAK RIDGE NATIONAL LABORATORY**

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX X  
OAK RIDGE, TENNESSEE 37831

January 21, 1988

Dr. Robert W. Wood, Acting Associate Director  
for Health and Environmental Research  
Office of Energy Research  
Department of Energy  
Washington, D.C. 20545

Dear Dr. Wood:

Foreign Travel by R. Julian Preston

Enclosed is our submission of DOE F 1512.1, "Request for  
Approval Official Foreign Travel," for R. Julian Preston.

Dr. Preston wishes to depart for Japan on March 16, 1988.

Sincerely,



for

Herman Postma  
Director

HP:bcs

Enclosure

cc: D. J. Cook, DOE/ORO  
R. J. Preston  
S. V. Kaye  
W. C. Kuykendall  
J. A. Lenhard, DOE/ORO  
P. T. Marquess, DOE/ORO  
C. R. Richmond  
M. P. Ross  
Travel - RC  
Lab Records

1126498

REQUEST FOR APPROVAL OFFICIAL FOREIGN TRAVEL

All Other Editions Are Obsolete

PART A--SUMMARY TRAVEL INFORMATION

ORGANIZATION: ORNL ORIGINAL STI FAXED TO IE

COST TO DOE: \$400.00 1/22/88

FUND SOURCE: HA 02 02 02 0

NAME OF TRAVELER: R. Julian Preston

DOE/CONTRACTOR/UNIVERSITY: C

DESTINATION: Hiroshima, Japan

DATES: 03 / 18 88 TO 03 / 20 88

PURPOSE: To participate in workshop sponsored by the Radiation Effects Research Foundation.

AGREEMENT: \_\_\_\_\_

DESTINATION: Kyoto, Japan

DATES: 03/21/88 TO 03/23/88

PURPOSE: To visit the laboratory of Dr. Masao Sasaki and present a seminar.

AGREEMENT: \_\_\_\_\_

DESTINATION: Tokyo, Japan

DATES: 03/23/88 TO 03/25/88

PURPOSE: To visit the laboratory of Dr. K. Morimoto and to present a seminar

AGREEMENT: \_\_\_\_\_

DESTINATION: \_\_\_\_\_

DATES: \_\_/\_\_/\_\_ TO \_\_/\_\_/\_\_

PURPOSE: \_\_\_\_\_

AGREEMENT: \_\_\_\_\_

## REQUEST FOR APPROVAL OFFICIAL FOREIGN TRAVEL

(Previous Editions are Obsolete)

PART B—To be completed by traveler's administrative officer

Budget and Reporting Classification to be charged: HA 02 02 02 0  
(see Chapter II, Accounting Practices and Procedures Handbook)

PART C—To be completed by traveler

1a. NAME OF TRAVELER R. Julian Preston	c. DATE AND PLACE OF BIRTH [REDACTED] England
b. CITIZENSHIP USA	d. PASSPORT NUMBER (if available)
2a. HOME ADDRESS [REDACTED]	b. BUSINESS ADDRESS Oak Ridge National Laboratory P.O. Box Y, Oak Ridge, Tennessee 37831
3a. EMPLOYER Martin Marietta Energy Systems, Inc.	c. TELEPHONE NUMBER FIS: 624-0212
b. ORGANIZATIONAL UNIT Oak Ridge National Laboratory	c. CONTRACT NUMBER DE-AC05-84OR21400
	d. POSITION TITLE (including profession) Section Head/Senior Research Staff Member Geneticist

4. PURPOSE OF TRAVEL—Include all pertinent background information leading to travel and attach copies of invitations and correspondence regarding travel to present papers, give speeches, or to attend conference or symposia. Justification for travel must be provided including benefit to be derived by the government if trip is taken. Also identify by name and organization other DOE and contractor personnel who, to the traveler's knowledge, are going to the same destination at the same time as the traveler. In addition, specify nature and classification of information to be disclosed including titles of papers to be presented; nature of information to be obtained at each of the places to be visited and conferences to be attended and its relation to traveler's work. Travelers are responsible for obtaining clearances for papers or speeches when necessary. If more space is required, attach a separate sheet. NOTE: IF THIS INFORMATION IS CLASSIFIED BE SURE TO CLASSIFY THIS FORM APPROPRIATELY.

The traveler has been invited to participate in a workshop sponsored by the Radiation Effects Research Foundation (RERF), to be held in Hiroshima, Japan, March 18-20, 1988. The purpose of the workshop is to discuss the future directions of genetic research within RERF as an addition to the current long-term studies on atomic bomb survivors. Four persons from the USA is the maximum number to be invited. The responsibility of the traveler is to consider genetic and cytogenetic studies, based upon his proven record in the area of radiation genetics, and current research in the area of molecular cytogenetics. In addition, the traveler plans to visit Dr. Sasaki at Kyoto University and Dr. Morimoto at Tokyo University and to present seminars on the induction of specific chromosome alterations and their role in cell transformation.

Participation in the workshop and visits with colleagues will be beneficial to the traveler in terms of discussing on-going research and defining plans for future research. Since RERF is a joint U.S./Japan venture, there will also be direct benefit to the federal government by outlining future research for the program.

Dr. Robert Painter, Laboratory of Radiobiology, University of California, San Francisco, and Dr. Richard Setlow, Brookhaven National Laboratory, are also invited to attend the workshop.

All information and discussions will be unclassified and will be related directly to the traveler's responsibilities at ORNL.

The traveler has no other plans for employment.

1126500

5. PROPOSED ITINERARY (Account for all time from beginning and ending dates of travel. Vacation dates taken in conjunction with this travel shall be indicated. NOTE: IF INFORMATION IS CLASSIFIED, CLASSIFY THIS FORM APPROPRIATELY.)

DATES	LOCATION (Installation, City, Country)	INDIVIDUALS TO BE CONTACTED	SUBJECTS OF DISCUSSION	(Check One)	
				Classified	Unclassified
3/16-17/88	Travel from Oak Ridge to Hiroshima				
3/18-20	Hiroshima, Japan	Workshop participants	Future directions, RERF		X
3/21-23	Kyoto, Japan	Dr. Masao Sasaki	Cytogenetics of tumors		X
3/23-25	Tokyo, Japan	Dr. K. Morimoto	Induction of chromosome alterations		X
3/26/1988	Travel from Tokyo, Japan, to Oak Ridge, TN				

6. HAS TRAVELER SUBMITTED DOE FORM 1512.2 TO COGNIZANT DOE SECURITY OFFICE? (Required for travel to a sensitive country by an individual who currently holds or has ever held, within the last 5 years, a DOE Access Authorization.)

YES  NO: Have not held a DOE Access Authorization within last 5 years.

7. SIGNATURE OF TRAVELER - By signing, the traveler acknowledges the obligation to file a trip report within 30 days of return to duty station.

(DUE: April 11, 1988)

*[Handwritten Signature]*  
(Signature)

*1-11-88*  
(Date)

PART D - To be completed by official responsible for travel funds

8a. ESTIMATED COST OF TRAVEL TO DOE

Transportation \$ 0  
 Per Diem and Miscellaneous \$ 400.00  
 Total \$ 400.00

b. IF PART OF COST OF TRAVEL IS TO BE PAID OR HAS BEEN REQUESTED FROM SOURCES OTHER THAN DOE, INDICATE SOURCE AND AMOUNT.

National Academy of Sciences will pay all costs associated with workshop in Hiroshima. The traveler will give a complete itemized accounting of any money received.

TRAVEL FUNDS ARE NOW AVAILABLE FOR THIS TRIP

*[Handwritten Signature]*  
(Signature and Title)

*1/11/88*  
(Date)

PART E - To be completed by Traveler's supervisor

9. REVIEW AND COMMENTS: *This trip will benefit our DOE-sponsored research programs.*

*[Handwritten Signature]*  
(Signature and Title of Supervisor)

*1/11/88*  
(Date)

PART F - To be completed at DOE Field Organization

10. NON SENSITIVE TRAVEL: Review/approval by Head of DOE Field Organization. (Approval may be given if such authority has been delegated by the Cognizant Secretarial Officer.)

APPROVED

*[Handwritten Signature]*  
for Herman Postma, Director  
(Signature)

Oak Ridge National Laboratory  
(Title)

*20 Jan 88*  
(Date)

11. SENSITIVE TRAVEL: Review by Head of DOE Field Organization. Has Field Security reviewed DOE F 1512.2 and completed DOE F 1512.37

YES  NO

PART G - To be completed at Headquarters

12. REVIEW/COMMENTS BY DIRECTOR OF DIVISION OR OFFICE

(Signature)

(Title)

(Date)

13. COGNIZANT SECRETARIAL OFFICER

IF DOE EMPLOYEE TRAVEL  IE Determination Received

IF SENSITIVE TRAVEL  IE Determination Received  ISA Determination Received  OSS Determination Received

1128501

NATIONAL RESEARCH COUNCIL

COMMISSION ON LIFE SCIENCES

2101 Constitution Avenue Washington, D. C. 20418

BOARD ON RADIATION EFFECTS RESEARCH

ADVISORY COMMITTEE  
ON THE RADIATION EFFECTS  
RESEARCH FOUNDATION

Office Location  
Room 370  
2001 Wisconsin Avenue, N.W.  
(202) 334-2232

11 January 1988

Dr. R. Julian Preston  
Biology Division  
Oak Ridge National Laboratory  
Oak Ridge, TN 37830

Dear Dr. Preston:

As you know, the Radiation Effects Research Foundation (RERF) is hosting a binational Radiation Sensitivity Workshop in Hiroshima, Japan on 18-20 March 1988 and you have been invited by Dr. Richard Setlow to participate in this workshop. This letter is to formally notify you that although no honorarium will be paid, the National Academy of Sciences will pay the cost of your travel from funds provided by our contract with the Department of Energy. Per diem costs will be shared by the National Academy of Sciences and the RERF. You will be receiving a formal letter of invitation from the RERF soon with a broader outline of what is hoped to be accomplished at this workshop.

Mrs. Catherine Berkley of this office is in charge of travel coordination. You should get in touch with her as soon as possible to make your travel arrangements. Her phone number is 334-2830.

Sincerely,



Charles W. Edington  
Director

1128502