

APPLICATION FOR MATERIALS LICENSE

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

OFFICE OF FEDERAL & STATE MATERIALS AND ENVIRONMENTAL MANAGEMENT PROGRAMS
DIVISION OF MATERIALS SAFETY AND STATE AGREEMENTS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
612 E. LAMAR BOULEVARD, SUITE 400
ARLINGTON, TX 76011-4125

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

A. NEW LICENSE

B. AMENDMENT TO LICENSE NUMBER 24-32339-01

C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)

Donald Danforth Plant Science Center
975 North Warson Road
St. Louis, Missouri 63132

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Donald Danforth Plant Science Center
975 North Warson Road
St. Louis, Missouri 63132

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Howard F. Beittenmiller, Radiation Safety Officer

TELEPHONE NUMBER

(314) 587-1051

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (See 10 CFR 170 and Section 170.31)

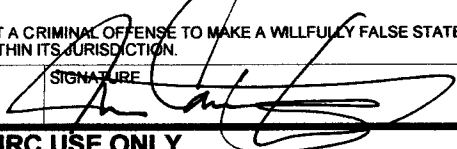
FEE CATEGORY **3M** AMOUNT ENCLOSED \$

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE **James C. Carrington, President**

SIGNATURE 

DATE **07/01/2011**

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

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DONALD DANFORTH
PLANT SCIENCE CENTER

July 1, 2011

Materials Licensing Branch
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Howard F. Beittenmiller
Radiation Safety Officer
Donald Danforth Plant Science Center
975 North Warson Road
St. Louis, Missouri 63132

Re: Request to Amend License Number 24-32339-01

Materials Licensing Branch

Enclosed, please find Form 313 and attached pages requesting amendment of the Materials License No. 24-32339-01 issued to the Donald Danforth Plant Science Center. The amendment request addresses the following areas:

1. Item 5: Radioactive Material
 - a. Please see attached sheet. Please remove Chlorine-36, Calcium-45, Chromium-51, Zinc-65, Rubidium-86 and Iron-59 from the Danforth Center Materials License.
 - i) Chlorine-36, Chromium-51 and Iron-59 were never ordered; none was ever in possession.
 - ii) All Calcium-45, Zinc-65 & Rubidium-86 have been removed from the Danforth Site either through Decay-in-Storage (^{86}Rb) and/or shipment as waste (^{45}Ca , ^{65}Zn , ^{86}Rb) by Bionomics, Inc., 1550 Bear Creek Road, Oak Ridge, TN 37830.
2. Item 7: Individual(s) Responsible for Radiation Safety Program and Their Training Experience
 - a. Please see attached sheet: The Danforth Center wishes to add three (3) Principal Investigators as Authorized Users:

Dr. James C. Carrington as Authorized User for All Materials and Uses. Dr. Carrington's *Curriculum vitae* with relevant information is attached.

Dr. Douglas K. Allen as Authorized User for All Materials and Uses. Dr. Allen's *Curriculum vitae* with relevant information is attached.

Dr. James G. Umen as Authorized User for All Materials and Uses. Dr. Umen's *Curriculum vitae* with relevant information is attached.
 - b. Please see attached sheet: The Danforth Center wishes to delete six (6) Principal Investigators as Authorized Users.

Daniel P. Schachtman, Ph.D.

Oliver Yu, Ph.D.

Yiji Xia, Ph.D.

Terry Woodford-Thomas, Ph.D.

Mark Paul Running, Ph.D.

Joseph Jez, Ph.D.

3. Item 9: Facilities and Equipment

- a. On the Danforth Center Application of 2001, it was stated that "Radioisotopes having significant photon yields will be used in Room 2036". With the removal from the License of radioisotopes with significant photon emissions, Room 2036 will be thoroughly surveyed. Once shown to have no residual radioactivity or exposure potential, the room will be returned to use as a standard laboratory. High atomic number/high density materials affixed to walls will be removed.

Thank you very much for your help in this matter.

Sincerely,



Howard F. Beittenmiller
Radiation Safety Officer
Donald Danforth Plant Science Center

Item 5: RADIOACTIVE MATERIAL

Please Delete from License:

<u>Byproduct, source, and/or Special nuclear material</u>	<u>Chemical and/or physical form</u>	<u>Maximum amount that license may possess at any one time</u>
Chlorine-36	Any	5 millicuries
Calcium-45	Any	5 millicuries
Chromium-51	Any	15 millicuries
Zinc-65	Any	5 millicuries
Rubidium-86	Any	10 millicuries
Iron-59	Any	5 millicuries

Item 7: INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE:

a. Please Add to License:

<u>Authorized User.....</u>	<u>Materials and Use</u>
James C. Carrington, Ph.D.	All
Douglas K. Allen, Ph.D.	All
James G. Umen, Ph.D.	All

b. It is the opinion of the Danforth Center that being named as Authorized User on the Materials License should be accompanied by authorization to use All Licensed Materials listed on the License. The reasons for this opinion are the following:

- 1) Although the Principal Investigator/Authorized User may not have direct experience with all Licensed Materials, all have gone through Radiation Safety Training at previous institutions and do so at the Danforth Center. Institutional Training programs are designed to train all potential users ALARA principles and safe use and handling of all licensed material. At Danforth Center, ALL laboratory personnel MUST successfully complete initial and annual refresher training whether they will or will not every use Licensed Materials.
- 2) The Danforth Center has many Authorized Users with significant and long-term experience with both direct use of and supervision of the use of Licensed Materials so Authorized Users with less experience have, in addition to the Training regimens, the experience of their peers and the Radiation Safety Department as mentors and as collaborators for both use of and supervision of the use of these research materials.
- 3) Experience with high energy beta (Phosphorous-32) and any of the low energy beta emitters will prepare users to work safely and in an ALARA manner with other beta-emitting isotopes. Safe and ALARA handling of Iodine-125 is simple to achieve and easily taught due to the isotope's low energy. Potential health effects are understood and are not difficult to prepare for and avoid through proper experimental design, a discipline common for users who employ large numbers of hazardous materials routinely in the laboratory.
- 4) In addition to requesting that the three (3) Principal Investigators being added to the Danforth Center License be given authorized use of All Materials on the License, we

request that the authorized uses granted to Yong-qiang An, Ph.D. and Ivan Baxter, Ph.D. on Amendment 8, September 24, 2009, be extended to All Materials.

c. Please Delete from License:

<u>Authorized User.....</u>	<u>Materials and Use</u>
Daniel P. Schachtman, Ph.D.	All
Oliver Yu, Ph.D.	All
Yiji Xia, Ph.D.	All
Terry Woodford-Thomas, Ph.D.	All
Mark Paul Running, Ph.D.	All
Joseph Jez, Ph.D.	All

Item 9: FACILITIES AND EQUIPMENT

- a. On the Danforth Center Application of 2001, Item 9, Page 9, it was stated that “Radioisotopes having significant photon yields will be used in Room 2036”. With the removal from the License of radioisotopes with significant photon emissions, Room 2036 will be thoroughly surveyed. Once shown to have no residual radioactivity or exposure potential, the room will be returned to use as a standard laboratory. High atomic number/high density materials affixed to walls will be removed.

James C. Carrington, Ph.D.
President and Member
Donald Danforth Plant Science Center

Education

1982 B.S., Plant Sciences
 University of California, Riverside

1986 Ph.D., Plant Pathology
 University of California, Berkeley

Employment and Record of Radioisotope Use

2011- Principal Investigator, Member
 Donald Danforth Plant Science Center
 St. Louis, MO

 Prospective Isotope use:
 ³²P, nucleotides for molecular biology

 Training:
 Radiation Safety Training by Radiation Safety Officer

 Supervision:
 Responsible for graduate students, technicians and postdoctoral fellows

2001-2011 Principal Investigator, Professor
 Oregon State University
 Corvallis, OR

 Isotopes used:
 ³²P, nucleotides for molecular biology

 Training:
 Institutional Radiation Safety Orientation/Training

 Supervision:
 Responsible for graduate students, technicians and postdoctoral fellows

1997-2001 Principal Investigator, Professor
 Washington State University
 Pullman, WA

 Isotopes used:
 ³²P, nucleotides for molecular biology

 Training:
 Institutional Radiation Safety Orientation/Training

 Supervision:
 Responsible for graduate students, technicians and postdoctoral fellows

James C. Carrington, Ph.D.
President and Member
Donald Danforth Plant Science Center

- 1988-1997 Principal Investigator, Associate Professor and Professor
Texas A&M University
College Station, TX
- Isotopes used:
³²P, nucleotides for molecular biology
³H, amino acids for molecular biology
¹²⁵I, amino acids for molecular biology
- Training:
Institutional Radiation Safety Orientation/Training
- Supervision:
Responsible for graduate students, technicians and postdoctoral fellows
-
- 1987-1988 Postdoctoral Researcher
Oregon State University
Corvallis, OR
- Isotopes used:
³²P, nucleotides for molecular biology
³H, amino acids for molecular biology
- Training:
Institutional Radiation Safety Orientation/Training
- Supervision:
None
-
- 1982-1986 Graduate Research Assistant
University of California
Berkeley, CA
- Isotopes used:
³²P, nucleotides for molecular biology
- Training:
Institutional Radiation Safety Orientation/Training
- Supervision:
None

Douglas K. Allen, Ph. D.
Research Computational Biologist, USDA/ARS
Assistant Member
Donald Danforth Plant Science Center
St. Louis, Missouri

Employment and Record of Radioisotope Use

2010- Research Computational Biologist USDA-ARS
Assistant Member
Donald Danforth Plant Science Center, St. Louis, Missouri

Isotope Use:

¹⁴C: Metabolite & Protein labeling – under Authorized User Status of
Radiation Safety Officer & Research Collaborators

Training:

Institutional Radiation Safety Training Course

Oversight:

2011: Member, Danforth Center Radiation Safety Committee

2008-2010 Research Assistant Professor
Department of Plant Biology
Michigan State University
East Lansing, Michigan

Isotope Use:

¹⁴C: Metabolite & Protein labeling

Training:

Institutional Radiation Safety Training Course

Supervision:

Mostly used radiation on my own experiments, however did help implement a
safe laboratory policy and guide others in responsible use of radioactivity.

2004-2008 Post-doctoral Scientist
Department of Plant Biology
Michigan State University
East Lansing, Michigan

Isotope Use:

¹⁴C: Metabolite & Protein labeling

Training:

Institutional Radiation Safety Training Course

Supervision:

Mostly used radiation on my own experiments, however did help implement a
safe laboratory policy and guide others in responsible use of radioactivity.

James G. Umen, Ph.D.
Associate Member
Donald Danforth Plant Science Center

Education

- 1987 B.S., Biology
 Stanford University, Stanford, CA
- 1995 Ph. D., Genetics
 Dept. of Biochemistry and Biophysics, University of California, San Francisco

Employment and Record of Radioisotope Use.

- 2011- Principal Investigator, Associate Member
 Donald Danforth Plant Science Center
 St. Louis, MO 63132
- Training:
 Institutional Radiation Safety Training
- Supervision:
 Responsible for graduate students, technicians and post-doctoral fellows
- 2002 - 2011 Assistant Professor, Salk Institute for Biological Studies
 La Jolla, CA 92037
- Isotope(s) used/purpose:
 ³H; inositol and inositol phosphates (IPs) for *in vivo* labeling of IPs
 ³²P; nucleotides for probes, protein kinase assays, orthophosphate *in vivo* labeling of
 algae
 ³⁵S; Metabolic sulfur labeling in algae; labeling of *in vitro* translation reactions.
- Training:
 Institute-wide training (3 hrs.) for use of radioisotopes and yearly training update.
- Supervisory responsibility:
 Responsible for safety of all members of the laboratory (on average, 2 users), all
 record keeping, and assuring all users received appropriate training on use of
 radioisotopes.
- Oversight positions held related to radiation use: none
- 1996-2002 Postdoctoral Research Fellow, Washington University, Department of Biology
 St. Louis, MO 63130
- Isotope(s) used/purpose:
 ³²P; nucleotides for probes
- Training:
 Departmental radiation safety training
- Supervisory responsibility:
 Supervised technicians and undergraduate students. Kept records of personal
 isotope use and disposal
- Oversight positions held related to radiation use: none

James G. Umen, Ph.D.
Associate Member
Donald Danforth Plant Science Center

1989-1995

Graduate Student, University of California, San Francisco

Isotope(s) used/purpose:

³²P; nucleotides for labeling RNAs and oligonucleotides

³⁵S; nucleotides for DNA and RNA sequencing

Training:

University radiation safety training

Supervisory responsibility: none

Oversight positions held related to radiation use: none

Materials Licensing Branch
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352
630-829-9500
Toll Free: 1-800-522-3025

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HOWARD BEITENMILLER 3145871051 DONALD DANFORTH PLANT CTR 975 N WARSON RD SAINT LOUIS MO 63132		0.4 LBS LTR	1 OF 1
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