

FORM NRC-313 I (1-79) 10 CFR 30  <b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL</b>		<b>1. APPLICATION FOR:</b> (Check and/or complete as appropriate)		
See attached instructions for details.  Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.		XX	a. NEW LICENSE	
			b. AMENDMENT TO: LICENSE NUMBER	
			c. RENEWAL OF: LICENSE NUMBER <i>19315</i>	
<b>2. APPLICANT'S NAME</b> (Institution, firm, person, etc.)  West Virginia School of <u>Osteopathic Medicine</u> TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (304) 645-6270 Ext. 226		<b>3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION</b>  Charles M. Paroda, Ph. D. TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (304) 645-6270 Ext. 226		
<b>4. APPLICANT'S MAILING ADDRESS</b> (Include Zip Code)  400 North Lee Street Lewisburg, West Virginia 24901		<b>5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED</b> (Include Zip Code)  400 North Lee Street Lewisburg, West Virginia 24901		
(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)				
<b>6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL</b> (See Items 16 and 17 for required training and experience of each individual named below)				
FULL NAME		TITLE		
a. See attachment # 1				
b.				
c. <i>8508120734 850724 REG2 LIC30 47-19315-01 PDR</i>				
<b>7. RADIATION PROTECTION OFFICER</b>  Charles M. Paroda, Ph. D.		Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.		
<b>8. LICENSED MATERIAL</b>				
L I N E  NO.	ELEMENT AND MASS NUMBER  A	CHEMICAL AND/OR PHYSICAL FORM  B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)  C	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME  D
(1)	Carbon-14	inorganic or labeled compounds	NA	500mCi (3-4users)
(2)	Hydrogen-3	labeled compounds	NA	700mCi (several users)
(3)	Phosphorus-32	inorganic	NA	500 mCi (several users)
(4)	Chromium-51	sodium chromate	NA	20 mCi (2 users)
<b>DESCRIBE USE OF LICENSED MATERIAL</b> E				
(1)	(1) Carbon-14 labeling of proteins and mebranes			
(2)	(2) Hydrogen-3 labeling of nucleic acids ; various metabolism studies			
(3)	(3) Phosphorus-32 labeling of nucleic acids			
(4)	(4) Chromium -51 Immunology studies with infamatory cell			

## 9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Not applicable		
(2)			
(3)			
(4)			

## 10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	Liquid scintillation	Beckman	LS8000	1	alpha, beta	0-1X10 <sup>6</sup> cpm/min
(2)	Survey Meter	Picker	655-186	1	beta, gamma	0-2000 mR/hr
(3)	Survey meter	Picker	655-187	1	alpha, beta	0-2000 mR/hr
(4)						

## 11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☒ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

Picker

Winchester, WV

☐ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

## 12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____	R. S. Landauer, Jr. & Co. Division of Technical Operations Glenwood Science Park Glenwood, Illinois 60425	<input checked="" type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____

## 13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.

☒ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.

☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

## 14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

RAD Services; Baltimore/Washington Division Laurel, MD

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

# INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

## 18. CERTIFICATE

(This item must be completed by applicant)

I have read and understand the regulations as stated in Title 10 part 30. The application is true and correct to the best of my knowledge and belief.

*Charles M. Paroda*  
Charles M. Paroda, Ph. D.

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED  
(See Section 170.31, 10 CFR 170)

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

Francis J. Hennessy, Ed. D.

(1) LICENSE FEE CATEGORY:

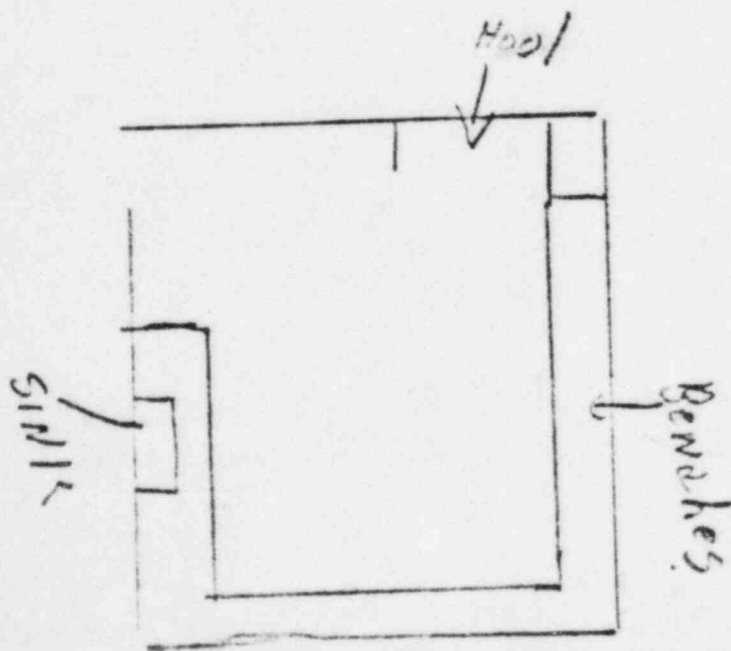
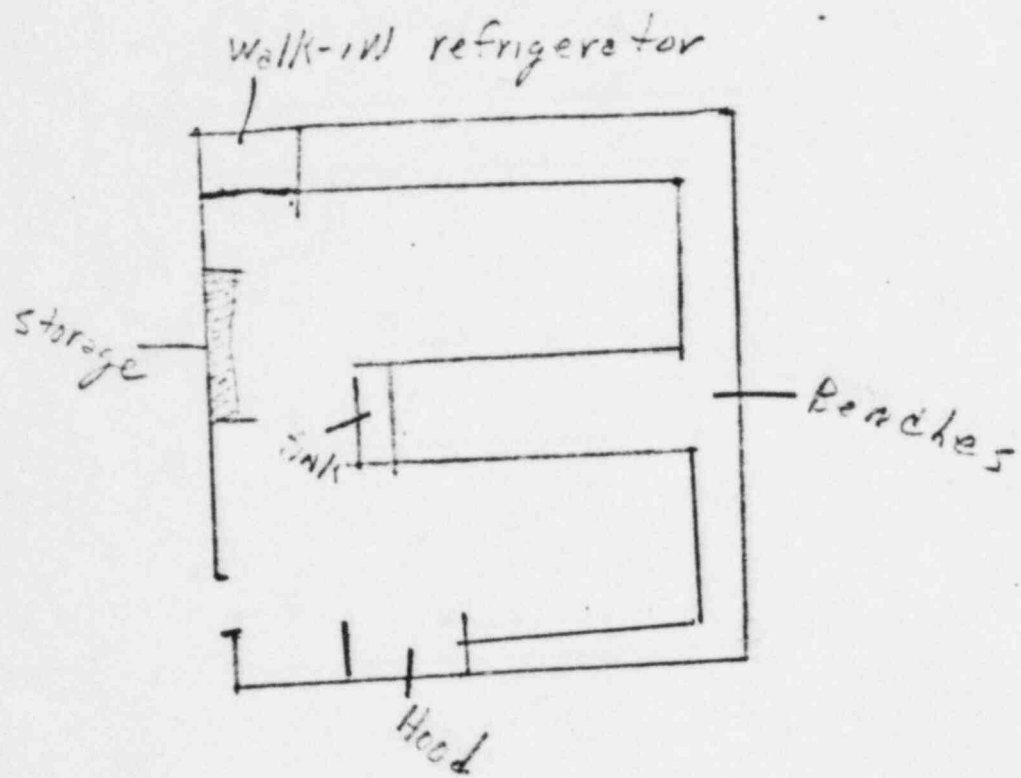
d. TITLE  
President

(2) LICENSE FEE ENCLOSED: \$

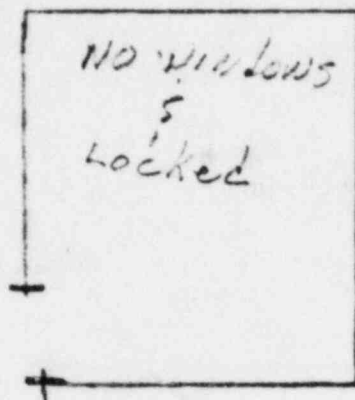
e. DATE

February 29, 1980

Item. 13 Laboratory Facilities for Isotope work



Item 13. Storage facility Central storage area





FULL NAME: Charles M. Paroda, Ph. D.

TITLE: Assistant Professor

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
Hydrogen-3	tritiated Thymidine		100 mCi
Phosphorus-32	inorganic and ATP		100 mCi

II. Describe use of licensed material:

Labeling of nucleic acid in vivo and in vitro

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	California State College	1 year	YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	California State College	1 year	YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	California State College	1 year	YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
d. Biological effects of radiation	California State College	1 year	YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	10-100 mCi	West Virginia University	3 years	labeling of
Phosphorus-32	50 mCi/Exp.	University of Co.	2 years	nucleic acids
		University of Colorado	2 years	<u>in vitro</u>
		and St. Louis Univ.	1 year	
Iodine 129	10mCi/Exp.	University of Colorado	2 years	and
		St. Louis University	1 year	<u>in vivo</u>
Hydrogen-3	10-100mCi/Exp	St. Louis University	1 year	

FULL NAME: John Chambers  
 TITLE: Professor Pharmacology

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
$^{14}\text{C}$		New England Nuclear	
$^{14}\text{C}$	amino acids protein nucleotides	"	1 millicurie

II. Describe use of licensed material:

Investigation of transport, metabolism of labeled substrate by isolated perfused liver in sealed system

III. Type of Training	Where Trained	Duration of Training	On	Formal
			The Job	Course
a. Principles & Practices of radiation protection	Vanderbilt University	2 years	<input checked="" type="radio"/> YES <input type="radio"/> NO	<input type="radio"/> YES <input type="radio"/> NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	"	"	<input checked="" type="radio"/> YES <input type="radio"/> NO	<input type="radio"/> YES <input type="radio"/> NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	"		<input checked="" type="radio"/> YES <input type="radio"/> NO	<input type="radio"/> YES <input type="radio"/> NO
d. Biological effects of radiation	"		<input type="radio"/> YES <input type="radio"/> NO	<input checked="" type="radio"/> YES <input type="radio"/> NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
$^{14}\text{C}$	1 millicurie	Vanderbilt U Med. Col. Va.	8 years 5 years	Research "

FULL NAME: David E. Crandall

TITLE: Assistant Professor of Biochemistry

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
Carbon - 14	Any	[14C]NaHCO <sub>3</sub> and "Carb 3x" - labeled amino acids, purines or pyrimidines, and intermediates of nitrogen metabolism.	75 millicuries
Hydrogen - 3	Any		10 millicuries

II. Describe use of licensed material:

To be used in the study of nitrogen metabolism, including enzyme assays and studies in tissue slices and cultured cells.

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	University of Rhode Island	10 years	(YES) NO	(YES) NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	"	"	(YES) NO	(YES) NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	"	"	(YES) NO	(YES) NO
d. Biological effects of radiation	"	"	(YES) NO	(YES) NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>14</sup> C	5 mCi / experiment	University of Rhode Island	10 years	Use as biochemical tracer
<sup>3</sup> H	1 mCi / exp.	"	10 years	"



FULL NAME:

Larry Davis

TITLE:

Assistant Professor

## I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
<sup>14</sup> C <sup>3</sup> H <sup>32</sup> P	Organic chemicals used for labelling biological membranes - inorganic phosphates		10 millicuries " 50 millicuries

## II. Describe use of licensed material:

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	Oklahoma STATE	1 year	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	University of North Carolina	3 years	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	University of North Carolina	3 years	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
d. Biological effects of radiation			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

## IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<sup>14</sup> C	10 $\mu$ C	University of N.C.	2 years	Tracers in animal and in vitro biochemistry research
<sup>3</sup> H	5 $\mu$ C	Chapel Hill		
<sup>14</sup> C	50 $\mu$ C	Oregon State University	4 years	
<sup>32</sup> P	1 mC			
<sup>14</sup> C	1 $\mu$ C	Oklahoma State University	2 years	

12/18/79

FULL NAME: ROBERT J. GRONAN, Ph.D.  
 TITLE: ASSISTANT PROFESSOR OF PHYSIOLOGY

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
$H^3$	S-adenosyl-L-Methionine ( $^3H$ -Methyl)	Upjohn Cata-kit (Catecholamine radioenzyme assay kit)	1. m Ci

II. Describe use of licensed material:

$^3H$ -SAM is used as a methyl donor in an enzymatic reaction involving the degradation of catecholamines. The tritiated metabolic products are separated by thin-layer chromatography and measured in a scintillation counter.

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	University of Louisville	Several months:	<input checked="" type="radio"/> YES <input type="radio"/> NO	<input type="radio"/> YES <input checked="" type="radio"/> NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	"	However, I need a refresher	<input checked="" type="radio"/> YES <input type="radio"/> NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	"	course before using this assay.	<input checked="" type="radio"/> YES <input type="radio"/> NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
d. Biological effects of radiation	"		<input checked="" type="radio"/> YES <input type="radio"/> NO	<input checked="" type="radio"/> YES <input type="radio"/> NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
$H^3$	?	Univ. Louisville	Several months	Biochemical separation; scintillation counting.
$C^{14}$	?			

FULL NAME: Anna D. Hooper MD

TITLE: Pathologist (Associate Professor of Pathology)

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
<i>for research</i> F <sub>259</sub>	F <sub>259</sub>		

II. Describe use of licensed material:

*Iron turnover studies*

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	<i>Doctors Hospital Washington, DC</i>	<i>total 2 wks all day, evening covering all this material</i>	YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	"		YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
c. Mathematic & calculations, basic to use & measurements of radioactivity	"		YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO
d. Biological effects of radiation	"		YES NO	<input checked="" type="radio"/> YES <input type="radio"/> NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cr <sub>51</sub>	<i>few microcuries</i>	<i>VA Hosp Contonville Ca</i>	<i>2 years</i>	<i>labeling blood for RBC survival and blood volume</i>
Co <sub>60</sub>	"	<i>Contonville Hosp, Contonville, Ca</i>	<i>1 year</i>	<i>Schilling tests</i>
I <sub>131</sub>	"	<i>BARH, Berkeley W V</i>	<i>2 yrs</i>	<i>thyroid function tests</i>

FULL NAME: Harold Edward Laubach, Ph.D.

TITLE: Assistant Professor and Acting Chairman, Department of Microbiology, WVSOM

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
Chromium-51	Sodium Chromate in Sodium Chloride Solution, Sterilized	Amersham 2636 S. Clearbrook Dr. Arlington Heights, IL 60005 (800) 323-9750	20 millicuries=maximum at any one time Activity = 100-400 mCi/mg Cr

II. Describe use of licensed material:

The Chromium-51 will be used to label infectious agents, in vitro, and then the release of the Chromium-51 from the infectious agents will be monitored when the suspension is treated with inflammatory cells, in vitro.

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	University of Alabama, Bham Alabama	40 hours	YES NO	xxx YES NO
b. Radioactivity measure- ment, standardization & monitoring techniques & instruments			YES NO	YES NO
c. Mathematic & calculat- ions, basic to use & measurements of radio- activity	Oklahoma State University	3 hour course	YES NO	xxx YES NO
d. Biological effects of radiation			YES NO	YES NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Chromium-51	20 millicuries	University of Alabama, Bham, Alabama	1 1/2 years	Same as described in II.

FULL NAME: John N. Mugaas

TITLE: Assistant Professor of Physiology

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
Sodium-22	NaCl	?	?

II. Describe use of licensed material:

Ion balance studies in renal physiology

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection	Moorehead State University	2 weeks Oak Ridge Associated Univ. Course Oct. 7-15, 1968	YES <input type="radio"/> NO <input checked="" type="radio"/>	YES <input type="radio"/> NO <input checked="" type="radio"/>
b. Radioactivity measure- ment, standardization & monitoring techniques & instruments	Moorehead State University	2 weeks Oak Ridge Associated Univ. Course Oct. 7-15, 1968	YES <input type="radio"/> NO <input checked="" type="radio"/>	YES <input type="radio"/> NO <input checked="" type="radio"/>
c. Mathematic & calculat- ions, basic to use & measurements of radio- activity	Moorehead State University	2 weeks Oak Ridge Associated Univ. Course Oct. 7-15, 1968	YES <input type="radio"/> NO <input checked="" type="radio"/>	YES <input type="radio"/> NO <input checked="" type="radio"/>
d. Biological effects of radiation	Moorehead State University	Oak Ridge Associated Univ. Course Oct. 7-15, 1968 2 weeks	YES <input type="radio"/> NO <input checked="" type="radio"/>	YES <input type="radio"/> NO <input checked="" type="radio"/>

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Carbon-14	20 $\mu$ Ci	Southwestern at Memphis	1 week/year for 3 years	General Botany Laboratory looking at C <sub>4</sub> uptake by plant leaves.



FULL NAME: John C. Westrick

TITLE: Assistant Professor

I. LICENSED MATERIAL

Element - and Mass Number	Chemical - and/or Physical Form	Name of Manufacturer and/or Model Number (if sealed source)	Maximum number of millicuries and/or sealed sources and maximum activity per source which will be possessed at any one time
Co 57	Salt Soln(?)	ICN	~1 millicurie

II. Describe use of licensed material:

III. Type of Training	Where Trained	Duration of Training	On The Job	Formal Course
a. Principles & Practices of radiation protection			YES NO	YES NO
b. Radioactivity measurement, standardization & monitoring techniques & instruments	No	Formal Training	YES NO	YES NO
c. Mathematic & calculations, basic to use & measurements of radioactivity			YES NO	YES NO
d. Biological effects of radiation			YES NO	YES NO

IV. Experience with Radiation (actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Ni 63	microcuries per kg.	Research Institute Hosp for Sick Children Toronto, Ont Canada	~1.5 yrs.	Tracer equilibrium analysis

02950