30-2278

NRC Form 374 (12-81) U.S. NUCLEAR REGULATORY COMMISSION PAGE 1 OF 8 PAGES

MATERIALS LICENSE

Amendment Number 59

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with application dated January 29, 1981,
1. The Curators of the University of Missouri	3. License number 24-00513-32 is amended in its entirety to read as follows:
2. Columbia, Missouri 65202	4. Expiration date May 31, 1988
	5. Docket or Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material between Atomic Nos. 3 to 83, inclusive	A. Any	A. 2 curies of each byproduct material with a total possession limit not to exceed 30 curies, except as noted below:
B. Hydrogen-3	B. Any	B. 30 curies
C. Cobalt-60	C. Sealed sources	C. 1 curie
D. Hydrogen-3	D. Accelerator Targets	D. 100 curies (No single target to exceed 15 curies)
E. Gold-198	E. Any	E. 1 curie
F. Polonium-210	F. Any	F. 5 millicuries
G. Neptunium-237	G. Any	G. 5 millicuries
H. Cesium-137	H. Sealed sources	H. 1 source of 4 curies, 1 source of 1 curie, 1 source of 0.15 curie, other assorted sources. Total possession not to exceed 6 curies

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MATERIALS LICENSE
SUPPLEMENTARY SHEET

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License number 24-00513-32

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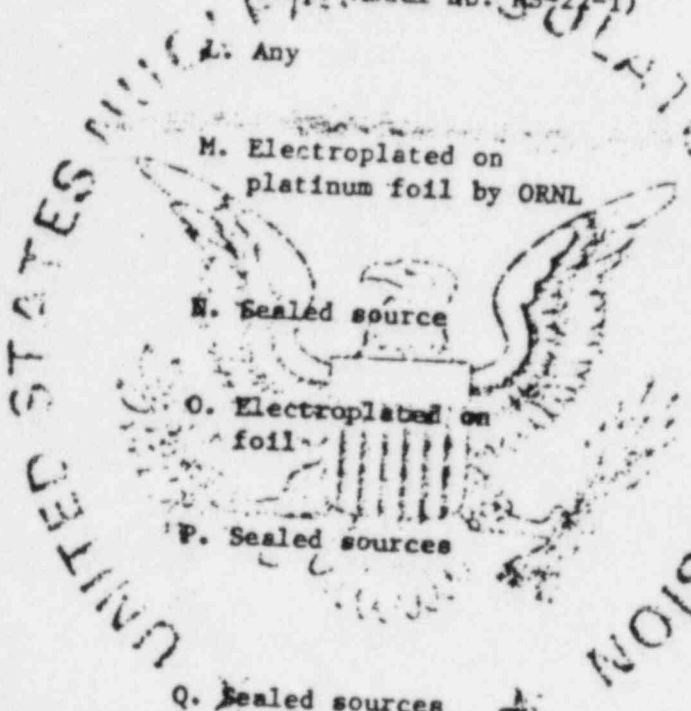
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time
I. Americium-241	I. Any	I. 40 millicuries
J. Molybdenum-99	J. Molybdenum-99/Technetium-99m Generators	J. 6 curies
K. Americium-241	K. Sealed sources (Monsanto Research Corp. Model No. NS-22-T)	K. 6 sources of 100 millicuries each
L. Mixed activation products	L. Any	L. 10 curies
M. Californium-252	M. Electroplated on platinum foil by ORNL	M. Ten sources, each source not to exceed 0.1 microgram (52 microcuries)
N. Californium-252	N. Sealed source	N. 1 microgram (520 microcuries)
O. Californium-249	O. Electroplated on foil	O. Ten sources of 0.1 microgram each (4 microcuries total)
P. Americium-241	P. Sealed sources	P. 100 millicuries total, no single source to exceed 10 millicuries
Q. Americium-241/ Cesium-137	Q. Sealed sources (Troxler Elec. Dwg. A100281)	Q. 50 millicuries Americium-241 and 10 millicuries Cesium-137
. Americium-241	R. Sealed source (Amersham/Searle in a type X-92 capsule)	R. 300 millicuries
. Activation products of natural uranium	S. Any	S. 10 millicuries
Americium-241	T. Sealed source (Monsanto Research Model MRC-N-SS-W-AmBe)	T. 3 curies



MATERIALS LICENSE
SUPPLEMENTARY SHEET

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Amendment Number 59

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6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time
U. Polonium-210	U. Sealed sources (Monsanto Research Corporation Model MRC-A-SS-P-Po)	U. 5 curies
V. Americium-241	V. Sealed source	V. 100 millicuries
W. Curium-244	W. Electroplated source	W. 1 microcurie
X. Americium-241	X. Sealed Sources (Campbell Pacific Model No. CPN 131-1 or 131-2)	X. No single source to exceed 50 millicuries
Y. Cesium-137	Y. Sealed Sources (Campbell Pacific Model No. CPN 131-1 or 131-2)	Y. No single source to exceed 10 millicuries
Z. Cesium-137	Z. Sealed source (contained in J. L. Shepherd Model No. 28-6A small instrument calibrator)	Z. .2 curies
A.A. Americium-241	A.A. Sealed source (contained in New England Nuclear Model No. NER-492B x-ray fluorescence exciter system)	A.A. 1 curie
B.B. Americium-241	B.B. Sealed sources (Campbell Pacific CPN 131)	B.B. No single source to exceed 50 millicuries
C.C. Molybdenum-99/ Technetium-99m	C.C. Solid	C.C. 4500 curies each
D.D. Sodium-24	D.D. Irradiation Cans Used in C.C.	D.D. 50 curies
E.E. Americium-241	E.E. Sealed sources (Troxler Dwg. No. A-102700)	E.E. No single source to exceed 10 millicuries

MATERIALS LICENSE
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9. Authorized use

A. through C. and E. through I. Medical research, diagnosis and therapy. Research and Development as defined in Section 30.4(q) of 10 CFR 30, "Rules of General Applicability to Licensing of Byproduct Material". Laboratory instruction. Instrument calibration

D. To be used in neutron generators.

J. Production of Technetium-99m Partechmotate.

K. To be used in Troxler Electronic Labs., Inc., Model No. 1257 Soil Moisture Gauge.

L. Storage.

M. through P. Research and Development as defined in Section 30.4(q) of 10 CFR 30 "Rules of General Applicability to Licensing of Byproduct Material".

Q. To be used in Troxler Elec. Model 1403 moisture/density gauge.

R. Laboratory moisture/density measurements of soil samples.

S. Research and Development as defined in Section 30.4(q) of 10 CFR 30, "Rules of General Applicability to Licensing of Byproduct Material".

T. Student instruction and research using Atomic Laboratories Neutron Beam Facility.

U. Studies in alpha stimulation of x-ray emissions in trace elements in water.

V. To be used in a Troxler Model 1257 soil moisture gauge.

W. To be used in an EG & G Model LET-SW1/1 counter.

X. and Y. To be used in Campbell Pacific Nuclear Corporation Model 500 series moisture density gauges.

Z. To be used for instrument calibration.

A.A. To be used for laboratory research and student instruction.

B.B. For use in Campbell Pacific Nuclear Model MC-M moisture gauge.

C.C. De-canning and repackaging for shipment.

D.D. Containers for C.C.

E.E. To be used in Troxler Electronics 3220 series moisture gauges.

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SUPPLEMENTARY SHEET

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CONDITIONS

10. A. Licensed material shall be used only at the licensee's facilities located at St. Louis, Rolla, Kansas City and Columbia Missouri.

B. Carbon-14 may be used at abandoned strip mine sites and at Ashland Wildlife Preserve in accordance with letters dated August 5, 1976, May 25, 1977 and June 25, 1980.

C. Material listed in Subitems 6.K., 6.Q., 6.V., 6.B.B. and 6.E.E. may be used at temporary job sites of the licensee throughout the state of Missouri.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. A. Licensed material shall be used by, or under the supervision of, individuals designated by the University of Missouri Central Radiation Safety Committee.

B. The use of licensed material in or on humans shall be by a physician.

C. The Radiation Protection Officer for the activities authorized by this license is John H. Tolan.

13. A. (1) Each sealed source acquired from another person and containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

(3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

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CONDITIONS:

13. B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.

C. Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.

D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region III, Office of Inspection and Enforcement, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, describing the equipment involved, the test results, and the corrective action taken.

14. Experimental animals administered licensed materials or their products shall not be used for human consumption.

15. Sealed sources containing licensed material listed in Subitems 6.K., 6.Q., 6.V., 6.X., 6.B.B. and 6.E.E. shall not be opened or removed from their respective source holders by the licensee.

16. A. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.

B. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.

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CONDITIONS:

17. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.

18. Detector cells containing licensed material shall not be opened by the licensee.

19. Maintenance, repair, cleaning, replacement and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.

20. Except as otherwise specified in this license, the licensee shall have available and follow the instructions contained in the manufacturer's instruction manual for the chromatography device.

21. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

22. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources listed in Subitems 6.K., 6.Q., 6.V., 6.X., 6.B.B. and 6.E.E. received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of the sealed sources and the date of the inventory.

23. Patients containing cobalt-60, cesium-137, or iridium-192 implants shall remain hospitalized until surveys made with an appropriate radiation detection instrument indicate that all implants have been removed. The results of these surveys shall be recorded and maintained for inspection by the Commission for five (5) years from the time the implants are removed.

24. Patients containing Iodine-131 for the treatment of thyroid carcinoma or patients containing therapeutic quantities of Gold-198 shall remain hospitalized until the residual activity is 30 millicuries or less.

25. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

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Docket or Reference number

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Continued from Page 7

CONDITIONS:

26. Pursuant to Section 20. 106(b) and 20.302, 10 CFR 20, the licensee is authorized to dispose of licensed material by incineration provided the gaseous effluent from incineration does not exceed the limits specified for air in Appendix B, Table II, 10 CFR 20. Ash residues may be disposed of as ordinary waste provided appropriate surveys pursuant to Section 20.201 are made to determine that concentrations of licensed material appearing in the ash residues do not exceed the concentrations (in terms of microcuries per gram) specified for water in Appendix B, Table II, 10 CFR 20.

27. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days for decay-in-storage before disposal in ordinary trash provided:

    A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of ten (10) half-lives.

    B. Prior to disposal as normal waste, radioactive waste shall be monitored to determine that its radioactivity cannot be distinguished from background with typical low-level laboratory survey instruments. All radiation labels will be removed or obliterated.

    C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

28. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated January 29, 1981; and letters dated August 6, 1982, October 11, 1982 and April 7, 1983. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U. S. Nuclear Regulatory Commission

Date APR 29 1983

By William J. Cl...
Materials Licensing Section
Region III

CONTROL NO. 79098

UNIVERSITY OF MISSOURI
AUTHORIZATION FOR POSSESSION AND USE OF RADIOACTIVE MATERIAL

Pursuant to the conditions of the licenses issued by the United States Atomic Energy Commission to the University of Missouri and to the regulations for safe use of radioactive material of the University as published in the "Handbook of Radiological Operations" and based upon the statements and representations made by the applicant, a permit is hereby issued to authorize the applicant to receive, acquire, possess, transfer, and import the radioactive material identified below and to use such radioactive material for the purpose and at the place designated below. The white copy is to be forwarded to the user, the pink copy is to be filed in the Radiation Safety Office, the salmon copy is to be sent to the campus health physicist, and the blue copy is to be sent to campus committee chairman.

Page 1 of 2 pages
Date: 1/23/76
Authorization no: 342
Amendment no: ---
Expiration date: Indefinite
AEC license no: 24-513-32 (---)
and or license no: 24-513-35

1. Name of authorized user: Rushdy Abadir, M.D.
2. Department: Radiology, UMC
3. University Address: U16 Medical Center

4. Radioactive material. (element and mass number)	5. Chemical and/or physical form.	6. Maximum amount of radioactivity authorized.
See attachment	See attachment	See attachment

7. Authorized use:

Treatment of disease in humans according to established protocols.

CONDITIONS

8. Unless otherwise specified, the authorized place of use is the address stated in Item 3 above.
9. The licensee shall conform to the recommendations for safe use of radioactive material as published by the University of Missouri Radiation Safety Committee in the "Handbook of Radiological Operations" and to the Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," which are a part of the "Handbook of Radiological Operations."
10. **Items 4.b. and 4.p. are covered by NRC license 24-513-35, and condition 12 of that license requires that the authorized user be certified by the American Board of Radiology. Approval of this authorization by the Radiation Safety Committee is contingent upon the granting of an exception of this condition by the NRC for Dr. Abadir.**

For the University Radiation Safety Committee

Date approved by Radiation Safety Committee 1/23/76

Authorization for Possession and Use of Radioactive Material
Rushdy Abadir, M.D.

	Item 4.	Item 5.	Item 6.
a.	P-32	soluble phosphate	25 mCi
b.	P-32	chromic phosphate	50 mCi
c.	Y-90	colloidal	20 mCi
d.	Sr-90	sealed source	60 mCi
e.	I-125	iodide	150 mCi
f.	I-125	seeds	150 mCi
g.	I-131	iodide	150 mCi
h.	Cs-137	sealed sources	500 mCi
i.	Ta-182	sealed sources	200 mCi
j.	Ir-192	sealed sources	200 mCi
k.	Au-198	colloid	200 mCi
l.	Au-198	seeds	500 mCi
m.	Rn-222	seeds	100 mCi
n.	Ra-226	sealed sources	500 mg
o.	U-238	solid	80 lb
p.	Co-60	sealed sources	14,000 Ci

UNIVERSITY OF MISSOURI
APPLICATION FOR POSSESSION AND USE OF RADIOACTIVE MATERIAL

1. NAME OF INDIVIDUAL USER:	2. DATE:
Rushdy Abadir, M.D.	12/15/75

3. DEPARTMENT TO USE MATERIAL:	4. ROOM, BUILDING, AND TELEPHONE:
Radiology-Radiation Oncology	U16 Medical Center 882-7130

5. ISOTOPE(S) TO BE USED:	6. FORM AND POSSESSION LIMIT REQUIRED:
Cobalt-60	Sealed Sources - 14,000 Ci (2 sources 7 K Ci each)
Radium-226	Sealed Sources - 500 mg
Cesium-137	Sealed Sources - 500 mg
Strontium-90	Sealed Source Applicator - 60 mCi
Uranium-238	Shielding Material - 80 pounds
Radon-222	Seeds 100 mCi
Gold-198	Seeds 500 mCi
Gold-198	Colloid 200 mCi

7. PROPOSED USE AND PLAN OF INVESTIGATION: (Continue on reverse side, if necessary)

Treatment of ~~malignant~~ diseases of humans according to established protocols.

8. PLAN FOR PERSONNEL MONITORING AND RADIATION PROTECTION: (See Section 2 of Handbook)

Personnel dosimeters are issued to all Radiation Therapy personnel by Health Physics Services. Radiation protection procedures are those as prescribed by Medical Center Health Physicist.

9. PLAN FOR DISPOSING OF RADIOACTIVE WASTES: (See Section 4 of Handbook)

Any generating wastes will be collected in radioactive waste receptacles for removal and disposal by Health Physics Services. Radioactive wastes from patients will be discharged to the sewer when convenient.

CONTROL NO. 7 9 0 9 8

Health Physics Evaluation	Campus or Medical Center Review	Radiation Safety Committee Review	
Date Received 12-22-75	Date Received	Date Received by Radiation Safety Officer	Rushdy Abadir M.D.
Date Evaluated 12-22-75	Date Approved 1/15/76		Applicant named in Item 1

Rushdy Abadir, M.D.

5. Isotope(s) To Be Used:	6. Form and Possession Limit Required:
Iodine-131	Iodide 150 mCi
Iodine-125	Iodide 150 mCi
Iodine-125	Seeds 150 mCi
Phosphorous-32	Soluble Phosphate 25 mCi
Phosphorous-32	Colloidal Chromic Phosphate 50 mCi
Yittrium-90	Colloidal 20 mCi
Tantalum-182	Sealed Sources 200 mCi
Iridium-192	Sealed Sources 200 mCi

Form AEC-313a (11-63) 10 CFR 30 PAGE 1	UNITED STATES ATOMIC ENERGY COMMISSION APPLICATION FOR BYPRODUCT MATERIAL LICENSE MEDICAL SUPPLEMENT A—HUMAN USE	Form approved. Budget Bureau No. 38-R0080

If byproduct material is for "human use" (internal administration of byproduct material, or the radiation therefrom to human beings), complete this supplement and attach to the application for byproduct material license.

1. (a) USING PHYSICIAN'S NAME	(b) NAME AND ADDRESS OF APPLICANT (If different from 1(a). Include ZIP Code.)
Rushdy Abadir	

	CIRCLE ANSWER		
2. THE USING PHYSICIAN INDICATED ABOVE IS LICENSED TO DISPENSE DRUGS IN THE PRACTICE OF MEDICINE BY A STATE OR TERRITORY OF THE UNITED STATES, THE DISTRICT OF COLUMBIA, OR THE COMMONWEALTH OF PUERTO RICO.		(YES)	NO
3. A STATEMENT OF USING PHYSICIAN'S CLINICAL RADIOISOTOPE EXPERIENCE (PAGE 3 OF THIS SUPPLEMENT) IS SUBMITTED IN SUPPORT OF THIS APPLICATION. IF ANSWER IS NO, USE PAGE 2 OF THIS SUPPLEMENT TO EXPLAIN OR REFER TO OTHER APPLICATION OR RELATED DOCUMENTS ON WHICH THIS INFORMATION APPEARS.		(YES)	NO

PROPOSED DIAGNOSIS OR TREATMENT

4. (a) DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED INCLUDING SPECIFIC CONDITIONS OR DISEASES TO BE DIAGNOSED OR TREATED (Use page 2 if necessary).

Treatment of cancer, leukemia, and malignancies and other diseases.

(b) CHEMICAL FORM ADMINISTERED:

(c) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL:

Radioisotopes will be stored in shields until use. Tongs will be used when appropriate.

(d) DESCRIPTION AND SKETCHES OF SPECIAL DEVICES TO BE USED FOR ADMINISTERING BYPRODUCT MATERIAL TO HUMAN BEINGS ARE	CIRCLE ANSWER		
(1) ATTACHED (LITERATURE REFERENCES WILL SUFFICE) On file Authorization 25		YES	NO
(2) ON FILE WITH THE ISOTOPES BRANCH REFER TO APPLICATION NO _____	CIRCLE ANSWER	YES	NO

5. PROPOSED DOSAGE SCHEDULE

(a) In millicuries for internally administered byproduct material other than discrete fixed sources; and in roentgens or rads, as appropriate, for internal or external irradiation from discrete fixed sources (gold seeds, cobalt needles, etc.) state separately for each condition or disease (use page 2 if necessary).

Standard dosage schedules.

(b) INVESTIGATIVE PROPOSAL FOR EXPERIMENTAL, NEW OR UNUSUAL HUMAN USES IS ATTACHED. (Attachment should include outline of conditions to be evaluated, including data from animal studies and/or abstract of literature references if any, number and type of patients (i. e. age group, moribund, etc.))	CIRCLE ANSWER	YES	(NO)

6. IF BYPRODUCT MATERIAL WILL NOT BE OBTAINED IN PRECALIBRATED FORM FOR ORAL ADMINISTRATION OR IN PRECALIBRATED AND STERILIZED FORM FOR PARENTERAL ADMINISTRATION, DESCRIBE IDENTIFICATION, PROCESSING, AND STANDARDIZATION PROCEDURES:

Will be procured as precalibrated and sterile form as required.

7. THE PROPOSED USE OF BYPRODUCT MATERIAL HAS BEEN, OR WILL BE, APPROVED BY THE MEDICAL ISOTOPE COMMITTEE.	CIRCLE ANSWER	(YES)	NO

HOSPITAL FACILITIES FOR INDIVIDUAL PRACTICE USE ONLY

8. (a) THE APPLICANT HAS COMPLETED ARRANGEMENTS FOR A HOSPITAL TO ADMIT RADIOACTIVE PATIENTS WHENEVER ADVISABLE.	CIRCLE ANSWER	YES	NO
(b) A COPY OF INSTRUCTIONS TO BE FURNISHED TO THE HOSPITAL AS TO RADIOLOGICAL SAFETY PRECAUTIONS TO BE TAKEN AND AVAILABLE RADIATION INSTRUMENTATION IS ATTACHED	CIRCLE ANSWER	YES	NO

STATE OF NEW YORK

APPLICATION FOR RADIOACTIVE MATERIALS LICENSE

SUPPLEMENT A — HUMAN USE

[illegible]

USING PROFESSIONAL PRACTITIONER'S NAME (Any person licensed or otherwise authorized under the State Education Law to practice medicine, dentistry, podiatry or osteopathy)	(b) NAME AND ADDRESS OF APPLICANT (if different from (a))
Dr Rushdy ABADIR	

CLINICAL TRAINING AND EXPERIENCE OF PROFESSIONAL PRACTITIONER WHO WILL USE RADIOACTIVE MATERIAL

(A) ISOTOPE	(B) CONDITION(S) DIAGNOSED OR TREATED	(C) NUMBER OF CASES	(D) TYPE OF PARTICIPATION FOR ALL CASES IN COLUMN D (circle applicable numbers of items in accordance with key set forth below)
I-131	Diagnosis of thyroid function	1500	(1) 2 3 4
	Treatment of hyperthyroidism	350	(1) 2 3 4
	Treatment of thyroid cancer	60	(1) 2 3 4
	Treatment of cardiac conditions		1 2 3 4
	Blood volume determinations		1 2 3 4
	Blood determinations		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
			1 2 3 4
P-32	Treatment of polycythemia and leukemia	150	(1) 2 3 4
	Brain tumor localization		1 2 3 4
	Treatment of bone metastases	10	(1) 2 3 4
	Others:		1 2 3 4
			1 2 3 4
			1 2 3 4
	Treatment of prostatic cancer		1 2 3 4
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
			1 2 3 4
	Treatment of prostatic cancer		1 2 3 4
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites	30	(1) 2 3 4
	Others: Au198 seeds	150	(1) 2 3 4
			1 2 3 4
	Blood determinations		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
			1 2 3 4
	Yttrium	10	1 (2) 3 4
	Tantalium	2	1 2 (3) 4
			1 2 3 4

KEY: Above numbers (column D) Active Participation and Discussion

1. Examination of patients to determine suitability for radioactive material diagnosis and/or treatment and recommendations on dosage to be prescribed.
2. Participation in calibration and administration of dosages including related measurements and plotting of data.
3. Adequate period of training and experience of sufficient duration to permit followup of patients through treatment and post-treatment period including evaluation of effectiveness and complications.
4. Study and discussion of case histories to establish most efficacious diagnostic and/or therapeutic techniques for this radioactive material use.

NUMBER OF HOURS OF PARTICIPATION IN CLINICAL TRAINING ______ hours

CONTROL NO. 79098

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FOREGOING IS A TRUE STATEMENT OF THE RECORD OF THE APPLICANT

[illegible] 1972

APPLICATION FOR BYPRODUCT MATERIAL LICENSE—MEDICAL

SUPPLEMENT A—HUMAN USE

(A) ISOTOPE	(B) CONDITIONS DIAGNOSED OR TREATED	(C) No. Cases Observed (See 1 in key below)	(D) No. Cases Involving Personal Participation (See 2 in key below)
Tc-99m	Placenta localization		
	Liver and spleen imaging		
	Lung imaging		
	Bone imaging		
Xe-133	Blood flow studies and pulmonary function studies		
Se-75	Pancreas imaging		
P-32	Treatment of polycythemia, leukemia, and Bone metastases		
	Intracavitary treatment		
I-131	Treatment of thyroid carcinoma		
	Treatment of hyperthyroidism and cardiac condition		
Au-198	Intracavitary treatment		
Co-60 or CO-137 Ra-226	Interstitial treatment		
	Intracavitary treatment		60
Ir-192	Interstitial treatment		
Co-60 CO-137	Teletherapy treatment		1200
Sr-90	Treatment of eye disease		12

Key to Columns (C) and (D) above

1. Observation should consist of observing radioisotope administration techniques and discussion with preceptor the case histories to establish most appropriate diagnostic and/or therapeutic procedure, limitation, contraindications, etc.

2. Personal participation should consist of (a) supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation on dosage to be prescribed; (b) collaboration in calibration of the dose and the actual administration of the dose to the patient, including calculation of the radiation dose, related measurements, and plotting of data; and (c) adequate period of training to enable the physician to manage radioactive patients and to follow patients through diagnosis and/or the course of treatment.

12. DATES AND TOTAL NUMBER OF HOURS OF CLINICAL RADIOISOTOPE TRAINING 1974-1975 Full Time

13. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF G. S. Lodwick

Dr. Abadir is a fully trained radiotherapist and is Chief of Radiation Oncology. Training and experience indicated here is indicated as being under the direction of the authorized user of radioactive material and chairman of the department.

AT University of Missouri
(Institution) Name and Address

24-00513-35
24-00513-32
(Byproduct Material License Number)

(Signature of Preceptor)

CONTROL NO. 9098