NRC FORM 374
(10-89)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 01

MATERIALS LICENSE

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 I, Parts 30, 31, 32, 33, 34, 35, 39, 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). 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	
1. Tulsa Cordis Pharmacy	In accordance with letter dated September 25, 1996 3. License number 35-27517-01MD is amended in its entirety to read as follows:
2. 1523 S. Utica Tulsa, Oklahoma 74104	4. Expiration date July 31, 2005
	5. Docket or Reference No 030-33824

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 initially distributed in accordance with a specific license issued pursuant to 10 CFR 32.72 or equivalent Agreement State regulations	A. Any form initially distributed in accordance with a specific license issued pursuant to 10 CFR 32.72 or equivalent Agreement State regulations	A. Molybdenum-99 35.0 Ci Technetium-99m 35.0 Ci Xenon-133 1.0 Ci Strontium-89 990.0 mCi Phosphorus-32 50.0 mCi Rhenium-186 500.0 mCi Chromium-51 50.0 mCi Samarium-153 500.0 mCi
B. Molybdenum-99	B. Any form	B. 35 curies
C. Technetium-99m	C. Any form	C. 35 curies
D. Xenon-133	D. Any form	D. 1 curie
E. Strontium-89	E. Any form	E. 50 millicuries
F. Phosphorus-32	F. Any form	F. 50 millicuries
G. Rhenium-186	G. Any form	G. 100 millicuries
H. Any byproduct material listed in 10 CFR 31.11(a)	H. Prepackaged units for <u>in vitro</u> diagnostic tests	H. 50 millicuries

0/1

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ML40

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
35-27517-01

Docket or Reference Number
030-33814

Amendment No. 01

I. Any byproduct material authorized under 10 CFR 35.57(a)	I. Any sealed source listed in 10 CFR 35.57(a) that has been manufactured, labeled, packaged, and distributed in accordance with a specific license issued pursuant to 10 CFR 32.74 or equivalent Agreement State regulations	I. 50 millicuries
J. Any byproduct material listed in Sections 35.400 and 35.500 of 10 CFR Part 35	J. Any sealed source that has been manufactured, labeled, packaged, and distributed in accordance with a specific license issued pursuant to 10 CFR 32.74 or equivalent Agreement State regulations	J. 500 millicuries
K. Iodine-125	K. Prepackaged units for in-vivo diagnostic tests	K. 50 millicuries
L. Cobalt-58	L. Any form	L. 50 millicuries
M. Uranium (depleted in the isotope Uranium 235)	M. Metal encased in stainless steel	M. 180 kilograms

9. Authorized use:

A. through G. Preparation and distribution of radioactive drugs (includes Mo99/Tc99m generators) to authorized recipients.

H. Redistribution to specific licensees or general licensees pursuant to 10 CFR 31.11 provided the packaging and labelling remain unchanged.

I. Instrument calibration. Redistribution of sources to specifically authorized recipients. Pursuant to 10 CFR 32.74, the licensee is authorized to

redistribute sources to persons licensed pursuant to 10 CFR 35.57(a) or under equivalent licenses of Agreement States.

J. Redistribution of sealed sources as received from the manufacturer in the manufacturer's original packaging and shielding and accompanied by the manufacturer's approved instructions to authorized recipients for use and storage.

K. Redistribution to specifically authorized recipients provided the packaging and labelling remain unchanged.

L. Redistribution to specifically authorized recipients.

M. Shielding for Mo99/Tc99m generators.

Pursuant to 10 CFR 32.72 and 32.74, the licensee is authorized to distribute the byproduct material described in Items 6 and 7 A. through L. of this license to persons licensed pursuant to Sections 35.100, 35.200, 35.300, 35.400. and 35.500 of 10 CFR Part 35, or under equivalent licenses of Agreement States.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at 1523 South Utica, Tulsa, Oklahoma.

11. A. Licensed material shall be used by, or under the supervision of:

1) a pharmacist working or designated as an authorized nuclear pharmacist in accordance with 10 CFR 32.72(b)(2) and (3), or

2) authorized nuclear pharmacists: Robert Stinchcomb, Rh.P.; Vail M. Paschal, Rh.P.; Dennis Blair, Rh.P.; and Paul Townsend, Rh.P.

B. The Radiation Safety Officer for this license is Robert Stinchcomb, Rh.P.

12. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or

detector cell received from another person shall not be put into use until tested.

D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

E. Sealed sources need not be leak tested if:

(i) they contain only hydrogen-3; or

(ii) they contain only a radioactive gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

F. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Radiation Safety and Safeguards. The report shall specify the source involved, the test results, and corrective action taken.

G. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to Perform such services.

13. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
35-27517-01

Docket or Reference Number
030-33814

Amendment No. 01

14. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license.

15. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

16. 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 10 half-lives.

    B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall 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.

17. Radioactive waste may be picked up from the licensee's customers and disposed of in accordance with the procedures, statements, and representations in application dated March 24, 1995.

18. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35(d) for establishing decommissioning financial assurance.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
35-27517-01

Docket or Reference Number
030-33814

Amendment No. 01

19. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application dated March 24, 1995
B. Letter dated June 17, 1995
C. Letter dated July 3, 1995
D. Letter dated July 18, 1995
E. Letter dated September 25, 1996

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date NOV 19 1996

By Original Signed By
Vivian H. Campbell

Vivian H. Campbell
Nuclear Materials Licensing Branch
Region IV
Arlington, Texas 76011

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

November 19, 1996

Tulsa Cordis Pharmacy
ATTN: Robert Stinchcomb, Rh.P.
1523 S. Utica
Tulsa, Oklahoma 74104

SUBJECT: LICENSE AMENDMENT

Please find enclosed License No. 35-27517-01MD. You should review this license carefully and be sure that you understand all conditions. If you have any questions, you may contact the reviewer who signed your license at 817-860-8143.

NRC expects licensees to conduct their programs with meticulous attention to detail and a high standard of compliance. Because of the serious consequences to employees and the public which can result from failure to comply with NRC requirements, you must conduct your program involving radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Possess radioactive material only in the quantity and form indicated in your license.

3. Use radioactive material only for the purpose(s) indicated in your license.

4. Notify NRC in writing of any change in mailing address (no fee required if the location of radioactive material remains the same).

5. Request and obtain written NRC consent before transferring your license or any right t[illegible]nder, either voluntarily or involuntarily, directly or indirectly, through transfer of control of your license to any person or entity. A transfer of control of your license includes not only a total change of ownership, but also a change in the controlling interest in your company whether it is a corporation, partnership, or other entity. In addition, appropriate license amendments must be requested and obtained for any other planned changes in your facility or program that are contrary to your license or contrary to representations made in your license application, as well as supplemental correspondence thereto, which are incorporated into your license. A license fee may be charged for the amendments if you are not in a fee-exempt category.

6. Maintain in a single document decommissioning records that have been certified for completeness and accuracy listing all the following items applicable to the license:

   - Onsite areas designated or formerly designated as restricted areas as defined in 10 CFR 20.3(a)(14) or 20.1003.

   - Onsite areas, other than restricted areas, where radioactive materials in quantities greater than amounts listed in Appendix C to 10 CFR 20.1001-20.2401 have been used, possessed, or stored.

   - Onsite areas, other than restricted areas, where spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site have occurred that required reporting pursuant to 10 CFR 30.50(b)(1) or (b)(4), including areas where subsequent cleanup procedures have removed the contamination.

   - Specific locations and radionuclide contents of previous and current burial areas within the site, excluding radioactive material with half-lives of 10 days or less, depleted uranium used only for shielding or as penetrators in unused munitions, or sealed sources authorized for use at temporary job sites.

   - Location and description of all contaminated equipment involved in licensed operations that is to remain onsite after license termination.

7. Submit a complete renewal application with proper fee, or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.

8. Request termination of your license if you plan to permanently discontinue activities involving radioactive material.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation; imposition of a civil penalty; or an order suspending, modifying, or revoking your license as specified in the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy) 60 FR 34381, June 30, 1995.

Thank you for your cooperation.

Sincerely,

Original Signed By
Vivian H. Campbell

Vivian H. Campbell
Senior Health Physicist
Nuclear Materials Licensing Branch

Docket: 030-33824
License: 35-27517-01MD
Control: 466217

Enclosures: As stated

DOCUMENT NAME: P:\

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

RIV:NMLB	N	RIV:					
VHCampbell							
11/19/96							

OFFICIAL RECORD COPY

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 02500
Status Code: 0
Fee Category: 3D 2B
Exp. Date: 20050731
Fee Comments:
Decom Fin Assur Reqd: N

1996 OCT -1 PM 1:24

LICENSE FEE TRANSMITTAL

A. REGION IV

1. APPLICATION ATTACHED
   Applicant/Licensee: TULSA CORDIS PHARMACY
   Received Date: 960930
   Docket No: 3033824
   Control No.: 46621
   License No.: 35-27517-01MD
   Action Type: Amendment

2. FEE ATTACHED
   Amount: $430.00
   Check No.: 706

3. COMMENTS

Signed Billie Gruesynski
Date 9/30/96

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered (Y))

1. Fee Category and Amount: 3D 2B $430

2. Correct Fee Paid. Application may be processed for:
   Amendment ✓
   Renewal
   License

3. OTHER

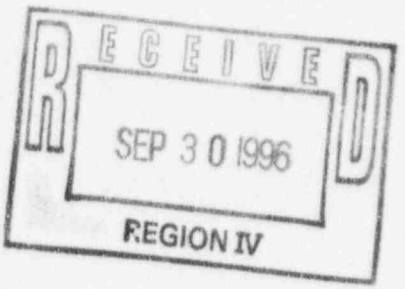
Signed Rita Messier
Date 10/1/96

RECEIVED
OCT 4 1996
REGION IV

Log Oct 1 IV
Remitter Robert Strickland
Check No. 706
Amount 430
Fee Category 3D 2B
Type of Fee Amd
Date Check Rec'd.
Date Completed 10/1/96
By: Ken

TULSA
CORDIS
PHARMACY

Vivian Campbell
Senior Health Physicist
Nuclear Materials Licensing Branch
USNRC, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064



License # 35-27517-01MD

September 25, 1996

Dear Ms. Campbell,

Please ammend my license to add the following:

1) Paul Townsend to the list of approved users-(see attached classroom hour breakdown, experience handling radioactive materials and copy of his current pharmacist registration from the Oklahoma State Board of Pharmacy).

Mr. Townsend, registered pharmacist, has completed more than 500 didactic(classroom) hours in the appropriate categories. He has also worked in the pharmacy for more than 600 hours experience working with radioactive materials. This work was done under the supervision of Robert Stinchcomb, RSO and Michael Morris, Medical Physicist.

2.)

	Byproduct,source and/or special nuclear material	Chemical and/or physical form	Maximum amount that licensee may possess at any one time
A.	Iodine-125	Prepackaged units for in-vivo diagnostic tests	50mCi
B.	Cobalt-58	Any Form	50mCi
C.	Chromium-51	Any Form	50mCi
D.	Samarium-153	Any Form	500mCi

Authorized Use:

A. Redistribution to authorized recipients in original unit dose packaging.

B. Redistribution to authorized recipients.

C. through D. Preparation and distribution of radioactive drugs to authorized recipients.

Enclosed is a check for $430. Please call if you have any questions.

Sincerely,

Robert Stinchcomb

Robert Stinchcomb

1523 South Utica • Tulsa, Oklahoma 74104 • Phone (918) 744-0000 • Fax (918) 744-1432

NUCLEAR PHARMACY CERTIFICATE PROGRAM

Synopsis of Clock Hours of Training

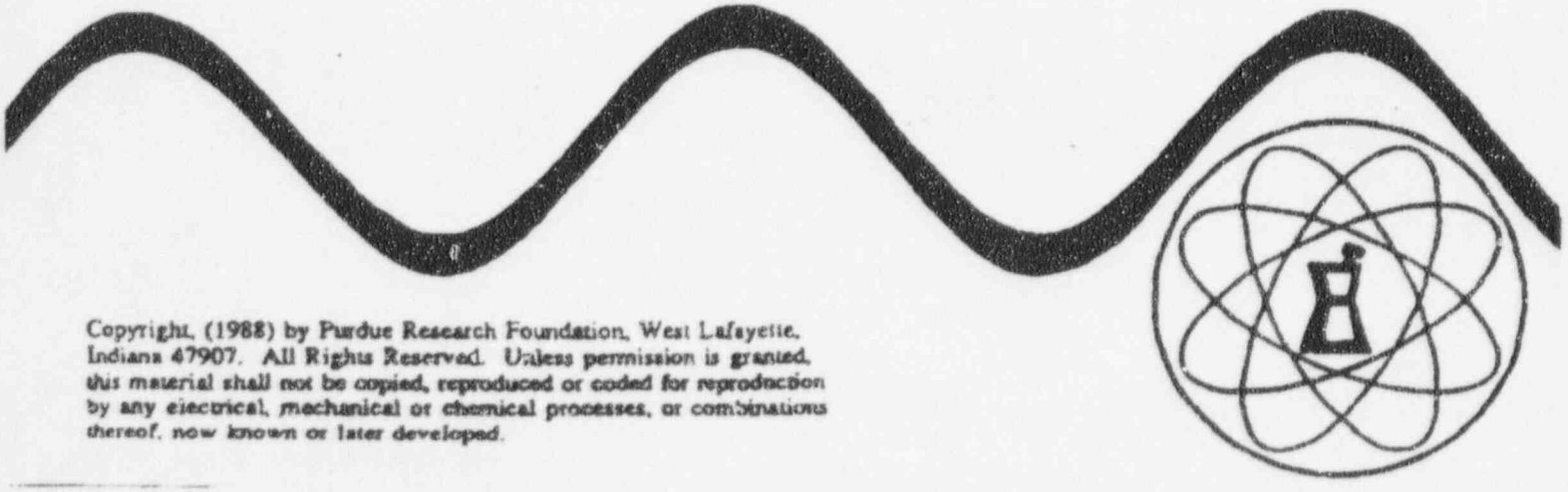
School of Pharmacy and Pharmacal Sciences

Department of Medicinal Chemistry and Pharmacognosy

Division of Nuclear Pharmacy

Purdue University

West Lafayette, Indiana 47907



Nuclear Pharmacy Certificate Program Outline

Contents:

Abbreviations Used:

RPI: Radiation Physics Instrumentation
RP: Radiation Physics
MA: Math
RB: Radiation Biology
RC: Radiochemistry

Nuclear Pharmacy Certificate Program Concept

The School of Pharmacy and Pharmacal Sciences at Purdue University offers a Certificate Program in Nuclear Pharmacy. The goal of the certificate program is to provide fundamental information to post-graduate pharmacists that will serve as a foundation for attaining competency as practitioners in nuclear pharmacy. The program follows the guidelines for nuclear pharmacy training prepared by nuclear pharmacists in the American Pharmaceutical Association, Section on Specialized Pharmacy Services.

There are two distinct phases of the certificate program. The first part utilizes self-study concepts, including lectures on videotape and correlated reading and problem-solving assignments. The nuclear pharmacy manager, or other qualified nuclear pharmacist at the practice site, serves as the clinical instructor and mentor for the pharmacist in training. This portion is self-paced by the student with regular examinations returned to Purdue to assist in monitoring the learning process. Successful completion of the didactic phase qualifies the student to attend a two-week long training session at Purdue. While on campus, the trainee participates in laboratory exercises and has opportunities for personal interaction with the instructors. Certification is awarded to those students who have completed the program and are able to demonstrate their knowledge and competence by examination in each of the key areas addressed by the program.

Form Revised 6/87

TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES*

Location of Training	Date(s) of Attendance	Nuclear Pharmacy Certificate Program	Total Clock Hours of Course	Breakdown of Course Content in Clock Hours								
				Radiation Physics & instrumentation		Radiation Protection		Math Pertaining to Radioactivity		Radiation Biology		Radiopharmaceutical Chemistry
				A	B	A	B	A	B	A	B	A
Purdue University		Video-Workbook	138	52		30		12		22		22
		On-Site	81	35		21		11		0		14
Column "A" refers to a Lecture/Laboratory Course			219	87		51		23		22		36
Column "B" refers to a Supervised Laboratory Experience			TOTAL HOURS	87		51		23		22		36

* This form is representative of that which is used to apply for an NRC license amendment for an authorized user.

Nuclear Pharmacy Certificate Program

Videocassette and Workbook (Self-Study Portion) Clock Hours

Instructor	Material	Clock Hours	
Dr. Stan Shaw	Physics and Overview	RPI	30
	Radiation Energy	RP	2
	Atomic Structure	MA	4
	Nuclides	RC	12
	Radioactive Decay and Half-Life		
	Ideal Radionuclide for Imaging		
	Modes of Radioactive Decay		
	Interaction of Ionizing Radiation with Matter		
	Radiation Detection Methods		
	Radiopharmaceuticals: Characteristics and Chemistry		
	Central Nervous System		
	Pulmonary System		
	Liver and Hepatobiliary System		
	Spleen		
	Cardiac Imaging		
	Skeletal System		
	Renal System		
	Endocrine System		
	Miscellaneous Procedures and Radiopharmaceuticals		
	In Vivo Radiopharmaceuticals Not Requiring Imaging		
	Radiopharmaceuticals Used in Therapy		

Dr. Robert Landolt	**Radiation Protection**	RP	16
	Terms and Units		
	Protection from External Exposure		
	Portable Survey Instruments		
	Personnel Monitoring		
	Internal Dose Calculations		
	Contamination Control		
	Waste Management		
	Packaging, Labels and Placards		
	10 CFR Standards for Protection Against Radiation		
	10 CFR Notices, Instructions, and Reports to Workers		
Mr. Jim Ponto	**Drugs & Radiopharmaceuticals**	RPI	4
	Drugs & Radiopharmaceuticals, Part 1	RP	2
	Drugs & Radiopharmaceuticals, Part 2	MA	4
	Drugs & Radiopharmaceuticals, Part 3	RC	8
	Criteria for Product Selection		
	Instrument Quality Assurance		
	Technetium Chemistry; Radiolytic Decomposition		
	Pediatric Dosage Calculations;		
	Adverse Reactions to Radiopharmaceuticals		
	Record Keeping		
	Preparation and Dispensing of Radiopharmaceuticals		
Dr. Wayne Kessler	**Instrumentation**	RPI	8
	Spectrometry	MA	2
	Counting Efficiency		
	Coincidence Loss		
	Background		
	Liquid Scintillation Counting		
	Statistics of Radioactivity		

Dr. James Cooper	Tc-99m Generator Principles, Part 1	RPI	4
	Tc-99m Generator Principles, Part 2	RP	2
	Quality Assurance of Radiopharmaceuticals, Part 1	MA	2
	Quality Assurance of Radiopharmaceuticals, Part 2		
Dr. Paul Simms	Radionuclide Production, Part 1	RPI	4
	Radionuclide Production, Part 2		
Dr. George Hinkle	Radiolabeled Antibodies for Diagnosis and Therapy	RPI	1
		RC	1
Dr. William Goeckeler	Development of a New Radiopharmaceutical for Metastatic Bone Disease	RPI	1
		RC	1
Dr. Stan Shaw	<u>Radiation Biology and Protection</u>	RB	20
	Energy Transfer	RP	8
	Mechanisms of Change		
	Aqueous Radiation Chemistry		
	Target Theory and Dose-Response		
	Radiation Effects on Macromolecules		
	Radiation Effects on Cells		
	Acute Effects		
	Delayed Effects		
	Genetic Effects		

Nuclear Pharmacy Certificate Program

On-Site Laboratory Schedule

Instructor	Laboratory	Clock Hours
Dr. Stan Shaw	Contamination and Decontamination	RP 3
	Basic Radiation Safety	RP 4
	G.M. Counting	RPI 3
Dr. Gordon Born	Counting Statistics	MA 3
Ms. Anne Smith	Gamma Ray Scintillation Spectrometry I	RPI 4
	Gamma Ray Scintillation Spectrometry II	RPI 3
	Multichannel Analyzer	RPI 3
	Dose Calibrator	RPI 3
	Shipping and Receiving	MA 1; RP 2
	Elution of the Tc-99m Generator and Quality Control of the Eluate	RPI 2; MA 2
	Radiochemical Purity Testing	RPI 2; RC 1
	Preparation and Dispensing of Radiopharmaceuticals	RPI 2; MA 2
	Aseptic Technique	RPI 2; MA 1
	Sterility Testing	RC 3
	Gamma Camera Instrumentation	RPI 4
Mr. Jim Ponto	Radiopharmaceutical Formulation Problems	RC 2
	Radiation Dosimetry	RB 1
Dr. Robert Landolt	Film Badge Dosimetry I	RP 3
	Film Badge Dosimetry II	RP 3
Dr. Paul Simms	Production of Radionuclides: Reactor	RPI 1
	Radioactive Waste Handling and Production of Radionuclides: Accelerator	RPI 2; RP 2

Nuclear Pharmacy Certificate Program

On-Site Lecture Schedule

Instructor	Topic	Clock Hours	
Dr. Mark Green	Chemistry of Metal-Labeled Radiopharmaceuticals	RC	5
	PET Radiopharmaceutical Chemistry	RPI	1
	PET Imaging and Concept		
	Radionuclide Generator for PET		
Ms. Anne Smith	Single Channel Analyzer	RPI	1
Dr. Stan Shaw	Regulatory Agencies	RP	4
Mack Richard	CFR Part 35 Medical Regulations	RP	3
Dr. Robert Landolt	Radiation Protection Problems	MA	2
Ms. Carla Mathias	Formed Element Labeling and Aids Safety Procedures	RC	2

Nuclear Pharmacy Certificate Program

Instructional Staff

Videocassette - Workbook

Dr. James F. Cooper, M.S., Pharm.D.
Medical University of South Carolina
Charleston, South Carolina 29412

Dr. William F. Goeckler, Ph.D.
Project Leader, Research-Bioproducts Laboratory
The Dow Chemical Company, Central
Midland, Michigan 48674

Mr. George Hinkle, M.S., B.C.N.P.
Director of Nuclear Pharmacy Services
The Ohio State University Medical Center
Columbus, Ohio 43210

Dr. Wayne V. Kessler, Ph.D.
Professor of Binnucleonics
Purdue University
West Lafayette, Indiana 47907

Dr. William R. Widmer, D.V.M.
Associate Professor of Diagnostic Imaging
Department of Veterinary Clinical Sciences
School of Veterinary Medicine
Purdue University
West Lafayette, Indiana 47907

Dr. Robert Landolt, Ph.D., B.C.H.P.
Professor of Health Physics
Purdue University
West Lafayette, Indiana 47097

Mr. James A. Ponto, M.S., B.C.N.P.
Division of Nuclear Medicine
University of Iowa Hospitals and Clinics
Iowa City, Iowa 52242

Dr. Stanley M. Shaw, Ph.D.
Professor of Nuclear Pharmacy
Purdue University
West Lafayette, Indiana 47097

Dr. Paul C. Simms, Ph.D.
Professor of Physics
Purdue University
West Lafayette, Indiana 47097

On-Site

Dr. Mark A. Green, Ph.D.
Professor of Nuclear Pharmacy
Purdue University
West Lafayette, Indiana 47097

Dr. Robert Landolt, Ph.D., B.C.H.P.
Professor of Health Physics
Purdue University
West Lafayette, Indiana 47097

Ms. Carla Mathias, B.A.
Dept. of Medicinal Chemistry
Purdue University
West Lafayette, Indiana 47907

Mr. Mack Richard, M.S.
Radiation Safety Officer
Indiana University Medical Center
Indianapolis, Indiana 46202

Dr. Stanley M. Shaw, Ph.D.
Professor of Nuclear Pharmacy
Purdue University
West Lafayette, Indiana 47097

Dr. Paul C. Simms, Ph.D.
Professor of Physics
Purdue University
West Lafayette, Indiana 47097

Ms. C. Anne Smith, M.S., B.C.N.P.
Nuclear Pharmacy Program Director
Purdue University
West Lafayette, Indiana 47097

EXPERIENCE WITH RADIATION

NAME: Paul F. Townsend

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Mo99	5000 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Tc99m	5000 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Ga67	20 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Tl201	30 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Xe133	100 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
I123	1 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
In111	3 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Sr89	10 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
P32	10 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Cs137	0.2 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)
Co57	5 mCi	Tulsa Cordis Pharmacy Tulsa, OK	600 hours	Medical (Nuclear Pharmacy)

Oklahoma State Board of Pharmacy

HEREBY CERTIFIES THAT

Registered Pharmacist Certificate No. 10717

Has Been Renewed for the Period Ending 06/30/97

PAUL FRANKLIN TOWNSEND
9249 S 88TH E AVE
TULSA, OK 74133-5510

To be placed in lower left hand corner of your certificate. 97-2672

Bryan H Potter DIRECTOR