NRC FORM 374
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 22

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, 36, 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.

302354

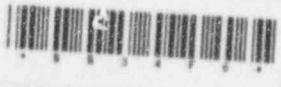
Licensee	
1. Children's Mercy Hospital	In accordance with letter dated February 7, 1997 3. License Number 24-15513-01 is amended in its entirety to read as follows:
2. 2401 Gillham Road Kansas City, MO 64108-9898	4. Expiration Date October 31, 2000
	5. Docket or Reference No. 030-09259

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 identified in 10 CFR 35.100	A. Any radiopharmaceutical identified in 10 CFR 35.100	A. As needed
B. Any byproduct material identified in 10 CFR 35.200	B. Any radiopharmaceutical identified in 10 CFR 35.200 (excluding xenon-133, aerosols, and generators)	B. As needed
C. Hydrogen-3	C. Prepackaged kits	C. 5 millicuries
D. Iodine-125	D. Prepackaged kits	D. 10 millicuries
E. Iodine-131	E. Prepackaged kits	E. 10 millicuries
F. Cesium-137	F. Sealed sources (CIS-US Model No. CEA-ORIS-APIB 437C)	F. 2 sources not to exceed 4100 curies total per device
G. Phosphorus-32	G. Any	G. 160 millicuries
H. Sulfur-35	H. Any	H. 15 millicuries
I. Phosphorus-33	I. Any	I. 150 millicuries

9. Authorized Use:

A. Medical use described in 10 CFR 35.100.

120021



COPY

9/1 ML 2 30 SD

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: 24-15513-01

Docket or Reference Number: 030-09259

Amendment No. 22

B. Medical use described in 10 CFR 35.200 (excluding xenon-133, aerosols, and generators).

C. through E. To be used in in vitro studies.

F. To be used in CIS-US Model IBL 437C irradiator for blood irradiation studies and irradiation of tissue cultures and laboratory animals (excluding explosive and flammable materials).

G. through I. To be used for in vitro laboratory research and development as described in 10 CFR 30.4.

CONDITIONS

10. A. Locations of Use: 2401 Gillham Road, Kansas City, Missouri, and 2801 Wyandotte, Kansas City, Missouri.

B. Licensed material in Item 9.F. shall be used in the Main Chemistry Laboratory located at 2401 Gillham Road, Kansas City, Missouri.

11. Radiation Safety Officer: William J. Fields, Jr.

12. Licensed material listed in Item 6 above is only authorized for use by, or under the supervision of, the following individuals for the materials and uses indicated:

Authorized Users	Material and Use
A. Campbell Howard, M.D.	In vitro studies.
B. William J. Fields, Jr.	Cesium-137 irradiator.
C. Steven Buckley.	Cesium-137 irradiator.
D. Kenneth M. Alfieri, M.D.	10 CFR 35.100, 35.200 (excluding xenon-133, aerosols, and generators), and in vitro studies.
E. F. Glen Seidel, M.D.	10 CFR 35.100 and 35.200 (excluding xenon-133, aerosols, and generators).
F. Jeffrey L. Foster, M.D.	10 CFR 35.100, 35.200 (excluding xenon-133, aerosols, and generators), and in vitro studies.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number 24-15513-01

Docket or Reference Number 030-09259

Amendment No. 22

12. (Continued)

Authorized Users	Material and Use
G. Robert Allen White, Ph.D.	Items 6.G., 6.H. and 6.I.
H. Judy L. Tate.	Cesium-137 irradiator.
I. Paul G. Rothberg, Ph.D.	Item 6.G. and 6.I.
J. I. David Schwartz, M.D.	In vitro studies.
K. Katherine Gyves-Ray, M.D.	10 CFR 35.100 and 35.200 (excluding xenon-133, aerosols, and generators), and in vitro studies.
L. Stephen Brent Little, M.D.	10 CFR 35.100 and 35.200 (excluding xenon-133, aerosols and generators).
M. Cynthia Karfias Rigsby, M.D.	10 CFR 35.100 and 35.200 (excluding xenon-133, aerosols and generators).
N. Jennifer Thrutchley Helber, M.S.	Items 6.G., 6.H., and 6.I.
O. Karen Kover, Ph.D.	Item 6.G.

13. Step-by-step operating procedures for the blood irradiator will be extracted from manufacturer supplied manuals and given to each operator of the unit, as part of the training and use program.

14. The emergency procedure in Item 4.e. of letter dated October 27, 1988, shall be implemented.

15. The licensee shall establish and implement the model training program that was published in Appendix A to Regulatory Guide 10.8, Revision 2.

16. The licensee shall establish and implement the model procedure for leak testing sealed sources that was published in Appendix H to Regulatory Guide 10.8, Revision 2.

17. The licensee shall establish and implement the model personnel external exposure monitoring program published in Appendix D to Regulatory Guide 10.8, Revision 2.

18. The licensee shall establish and implement the model waste disposal procedure published in Appendix R to Regulatory Guide 10.8, Revision 2.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: 24-15513-01

Docket or Reference Number: 030-09259

Amendment No. 22

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, except for minor changes in the medical use radiation safety procedures as provided in 10 CFR 35.31. The 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 27, 1990; and

B. Letters dated June 22, 1990 (with attachments), July 30, 1990 (with attachments), November 7, 1990 (with attachments), December 6, 1991, September 21, 1992 (excluding Item No. 1), February 22, 1993, April 22, 1993, June 21, 1993, June 6, 1994, September 8, 1995, December 18, 1995, November 15, 1996, February 6, 1997 and February 7, 1997 (excluding references to A. Gaedigk, Ph.D., R.R. Gotschall, M.S., Carol Moyer, B.S. and Zhaouhi Geng, M.D., M.S.).

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date MAY 14 1997

By Colleen L. Casey
Nuclear Materials Licensing Branch, Region III

S6

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 02120
Status Code: 0
Fee Category: 7C 3E
Exp. Date: 20001031
Fee Comments: 7C EFF. 2/12/86 3E-88
Decom Fin Assur Reqd: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
   Applicant/Licensee: CHILDREN'S MERCY HOSPITAL
   Received Date: 970224
   Docket No: 3009259
   Control No.: 302354
   License No.: 24-15513-01
   Action Type: Amendment

2. FEE ATTACHED
   Amount: 440
   Check No.: 3023933

3. COMMENTS

Signed D. Hersey
Date 2/27/97

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

1. Fee Category and Amount: 7C 3E $440

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

3. OTHER ---

Signed SC
Date 3/27/97

MAR 0 6 1997

Log Feb 13 III
Remitter
Check No. 3023933
Amount $440
Fee Category 7C 3E
Type of Fee AMD
Date Check Rec'd 3/26/97
Date Completed 3/27/97
By: SC

The CHILDREN'S Mercy Hospital
2401 GILLHAM ROAD
KANSAS CITY, MISSOURI 64108
PHONE (816) 234-3000 FAX # (816) 842-7420
In Affiliation with The University of Missouri • Kansas City School of Medicine

February 7, 1997

Materials Licensing Section
U.S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Subject: Amendment to NRC License No. 24-15513-01

Children's Mercy Hospital requests an amendment to add two Clinical Pharmacology research groups to the subject named NRC License. The experiments to be performed and the radio-nuclides to be used are submitted for both groups. Both groups will conduct the experimental protocols in the same laboratory, devoted to radioactive material research, within the larger Main Laboratory, Room 2538, CMH, which is devoted to non-radioactive clinical pharmacology research. The smaller laboratory is not numbered. See Attachment No. 1. The Curriculum Vitae of both groups are enclosed as Research Group No. 1 and Research Group No. 2. These applications were approved at the October 31st meeting of the CMH's Radiation Safety Committee.

RESEARCH GROUP NO. 1

The following experiments will be performed: Southern and Northern hybridizations, DNA sequencing and Single Strand Conformational Polymorphism (SSCP) analysis. The radionuclides to be used in these experiments are ^{32}P, ^{33}P and ^{35}S. No more than 40 µCi per labeling reaction and typically 5 to 10 µCi per experimental application. SSCP analysis is based on the PCR technique where reactions are spiked with ^{32}P. In a typical experiment 24 to 48 PCR reactions each containing 0.5 to 1.0 µCi will be performed and only 1/20th of each sample will be analyzed by polyacryl-gel electrophoresis. Sequencing typically requires 10 to 50 µCi at a time depending on the number of samples to be sequenced. Procedures will follow standard protocols, are adapted to the minimal use of radioactivity, and will be conducted in compliance with NRC regulations and current CMH's radiation safety procedures. Initial use of radioactivity will be supervised by CMH's Radiation Safety Officer, William J. Fields, Jr.

The following personnel will perform the experiments as listed above: Andrea Gaedigk, Ph.D., R. Russell Gotschall, M.S., and Jennifer Thrutchley Helber, M.S. Curriculum Vitae are enclosed for these individuals including their experience with radioactivity.

Equipment used for radioactive procedures will be dedicated to that purpose and will remain within the laboratory in which the work is authorized and performed. Safety features include plexiglass shields, racks, containers, etc. to provide personnel protection. See Attachment No. 2 for a listing of plexiglass safety and storage equipment for radioactivity. This group also

possesses three Hoefer SQ3 sequencers which have built-in plexiglass shielding. A Model 14C Ludlum GM survey meter equipped with a Model 44-9 Pancake Hand Probe will be used for radiation surveys and wipe samples will be counted in a Packard LSC. Radioactive wastes will be stored for ten half lives, solids surveyed with the GM survey meter and liquids analyzed by LSC. Wastes will be disposed to the normal trash and sewerage systems if survey and analysis results are equivalent to background radiation levels of the instruments.

RESEARCH GROUP NO. 2

The following experiments will be performed: Oligoprobe Labeling and Hybridization. The radionuclide to be used is ^{32}P. The Oligoprobe labeling experiment will use 100 µCi of ^{32}P. Standard labeling procedures will be followed. About 10 µCi of the labeled probe will be used in the Hybridization experiments. The amount of radioactivity per membrane used in the autoradi-ography set is about 3-5 µCi. Procedures will follow standard protocols, are adapted to the minimal usage of radioactivity, and will be conducted in compliance with NRC regulations and current CMH's radiation safety procedures. Initial use of radioactivity will be supervised by CMH's Radiation Safety Officer, William J. Fields, Jr.

The following personnel will perform the experiments as listed above: Karen Kover, Ph.D., Carol Moyer, B.S, and Zhaouhi Geng, M.D., M.S. Curriculum Vitae are enclosed for these individuals including their experience with radioactivity.

Equipment used for radioactive procedures will be dedicated to that purpose and will remain within the laboratory in which the work is authorized and performed. Safety features include plexiglass shields, racks, containers, etc. to provide personnel protection. See Attachment No. 2 for a listing of plexiglass safety and storage equipment for radioactivity. A Model 14C Ludlum GM survey meter equipped with a Model 44-9 Pancake Hand Probe will be used for radiation surveys and wipe samples will be counted in a Packard LSC. Radioactive wastes will be stored for ten half lives, solids surveyed with the GM survey meter and liquids analyzed by LSC. Wastes will be disposed to the normal trash and sewerage systems if survey and analysis results are equivalent to background radiation levels of the instruments.

Request authorization for ^{33}P, in any form, to be used by Drs. Rothberg and White for *in vitro* laboratory research and development as described in 10 CFR 30.4. Dr. Rothberg is currently licensed for ^{32}P and Dr. White for ^{32}P and ^{35}S. Work to be performed at 2801 Wyandotte. Approved by the Radiation Safety Committee on December 5, 1996.

In order to provide sufficient radionuclide authorization limits for these applicants and those currently authorized by the license, we are requesting an **increase** in the licensed limit for **^{32}P** from the **140 mCi to 160 mCi** and **^{35}S** from **5 mCi to 15 mCi,** and add **150 mCi ^{33}P**, all radionuclides in **any form**, for *in vitro* laboratory research and development as described in 10 CFR 30.4. Approved by the Radiation Safety Committee on December 5, 1996.

A further request is made to add Drs. Stephen Brent Little and Cynthia Karfias Rigsby to the list of Authorized Users for the following Material and Use: 10 CFR 35.100 and 35.200 (excluding xenon-133, aerosols, and generators). Curriculum Vitae, Certifications and experience with radionuclides are included as Attachments Nos. 5 and 6. Approved by the Radiation Safety Committee on December 5, 1996.

The following individuals are no longer Authorized Users as listed in Item 12. of the license and should be deleted from that listing:

Jerome Grunt, M.D.
Joy Johnson, M.D.
William Shaw, Ph.D.

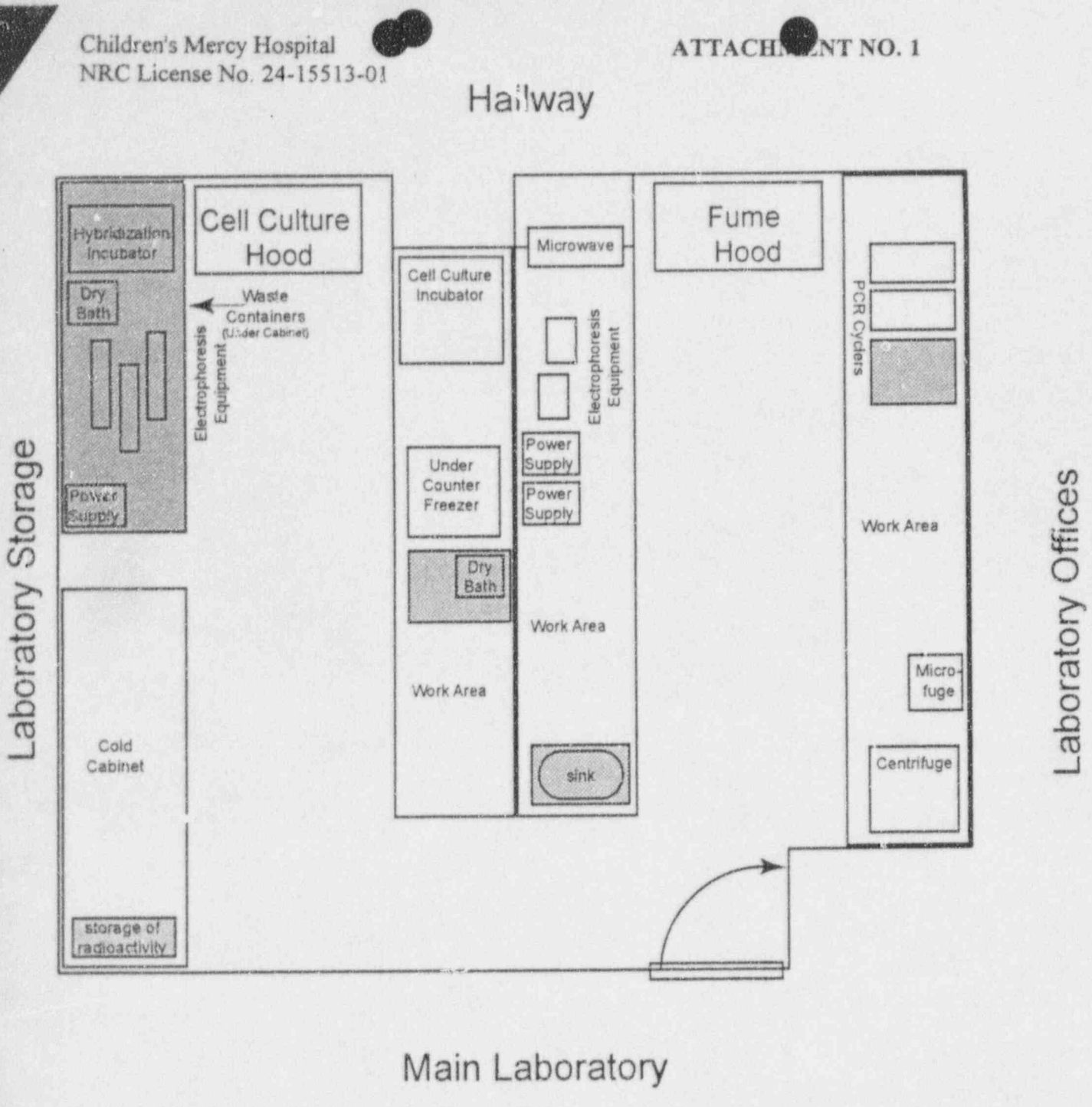
Enclosed is a check in the amount of $440 for the amendment as specified in fee Category 7C of 10 CFR 170.31.

William J. Fields, Jr.
Radiation Safety Officer

Encl: Attachment No. 1, Room Layout
Attachment No. 2, Plexiglass Safety and Storage Equipment List
Attachment No. 3, Curriculum Vitae for Research Group No. 1
Attachment No. 4, Curriculum Vitae for Research Group No. 2
Attachment No. 5, Curriculum Vitae, etc. for Dr. Little
Attachment No. 6, Curriculum Vitae, etc. for Dr. Rigsby

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 1



= space and equipment designated to radioactive use

Adove The Area - Infectious Disease Unit
Below The Area - Neurophysiology Laboratory

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 2
PLEXIGLASS SAFETY AND STORAGE EQUIPMENT

Quantity	Item	Owl Order No.
2	Benchtop microtube storage	RZ-24
1	Containment chamber mid size	RC-2
1	Radiation storage-beta 3/8"	RC-1
2	Shipping vial holders	BR-555
2	Finger blocks	BR-400
2	Well rack boxes	RF-7
2	Fitted lid beta-mini chambers	RB-24
1	Fitted lid beta-mini chamber	RB-48
2	Benchtop microtube storage	RZ-48
1	Microtube rack with fitted lid	RX-15
1	Pipet rack and stand	BT-8A
2	Personal angled shields	BT-9
1	Angled shield with base	BT-2
2	Storage/disposal containers	SC-6

SURVEY METER

1	Ludlum Model 14C GM Survey Meter
1	Ludlum Model 44-9 GM Pancake Detector

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 3

CURRICULUM VITAE
for
RESEARCH GROUP NO. 1

Curriculum Vitae

Andrea Gaedigk, Ph.D.

Present Address

phone work (816) 234-3941
E-mail: agaedigk@cmh.edu

Nationality Canadian and German citizenships

Birthdate

Academic degree Ph.D. (Dr. rer. nat., University of Stuttgart, Germany)

EDUCATION

1971-1980	High School (Ev. Heidehofgymnasium, Stuttgart, Germany)
1980-1986	University of Stuttgart, Germany, Studies in Natural Sciences
19. 02. 1987	Diploma (M. Sc.) in Biology
1987-1990	Ph.D. training at the Margarete-Fischer-Bosch-Institute of Clinical Pharmacology, Stuttgart, laboratory of Prof. Michel Eichelbaum and the Biocenter, University of Basel, Switzerland, Dept. of Pharmacology, laboratory of Prof. Urs A. Meyer
17. 05. 1990	Ph. D. (Dr. rer. nat. with magna cum laude) in Biology
1990-1991	Temporary postdoctoral fellow at the Margarete-Fischer-Bosch-Institute of Clinical Pharmacology
Feb. 1991-April 1993	Postdoctoral fellow in the laboratories of Drs. Steven P. Spielberg and Denis M. Grant, The Hospital for Sick Children, Div. of Clinical Pharmacology & Toxicology, Toronto, Canada

FELLOWSHIPS

1985-1986	Supporting fellowship from Fridrich Ebert Foundation, Germany
1987-1990	Ph. D. fellowship from Robert-Bosch-Foundation, Germany
1991-1992	Postdoctoral fellowship from Boehringer Ingelheim Fonds, Germany, Foundation for medical basic research

EMPLOYMENT

May 1993-Aug 1996	Research Associate in the laboratories of Drs. J.S. Leeder, D.M. Grant and P.A. Harper, The Hospital for Sick Children, Div. of Clinical Pharmacology & Toxicology, Toronto, Canada
Aug 1996-present	Associate Director of the Clinical Pharmacology Research Laboratory/NICHD Pediatric Pharmacology Research Unit Laboratory at Children's Mercy Hospital, Kansas City, MO, USA

WORK RELATED ASSETS

SUPERVISORY EXPERIENCE

1990-1991	Co-supervision of a Ph.D. student, L. Jorge at the Margarete-Fischer-Bosch-Institute of Clinical Pharmacology in collaboration with the University of Panama
1993	Supervision of two summer students, K. Kathiramalainathan, University of Toronto, and P. Acklin, University of Paris, France.
1993/94	Co-supervision of an undergraduate project student, K. Kathiramalainathan, University of Toronto
1994	Supervision of a summer student, W. Chu, University of Toronto

1994/95	Co-supervision of an undergraduate project student, P. Lekas, University of Toronto
1995	Supervision of two summer students, Miriam Berchuk, McGill University, Montreal and Stephanie Smith, University of Toronto
1995/96	Co-supervision of an undergraduate project student, R. Taylor, University of Toronto
1995-96	Adviser to Dr. P.A. Harper's master student, R. Khanna, University of Toronto
from Sept. 1995	Co-supervision of Dr. D.M. Grant's master student, V.L. Yu-Plant, University of Toronto

SPECIALITY COURSES

Oct 1986	At the Genecenter, University of Munich, Germany: Sequencing and sequencing strategies. Organizer: Dr. H. Domdey
Nov 1987	EMBO course at the EMBL, Heidelberg, Germany: Nonradioactive DNA sequencing and applications. Organizer: Dr. W. Ansorge
April 1989	SKMB course at the Biocenter, Basel, Switzerland: Computer concepts for the sequence analysis of macromolecules. Organizer: Dr. R. Doelz

PUBLICATIONS

1. **GAEDIGK, A.** (1987). Diploma Thesis. Purification and partial sequencing of prosomal RNA of mice erythroblasts

2. **GAEDIGK, A.** (1990). Ph.D. Thesis. The sparteine/debrisoquine polymorphism: Identification of a deletion of the cytochrome P450 CYP2D6 gene.

3. GOUGH, A.G., MILES, J.S., SPURR, N.K., MOSS, J.E., **GAEDIGK, A.**, EICHELBAUM, M. AND WOLF, C.R. (1990). Identification of the primary gene defect at the cytochrome P450 CYP2D locus. *Nature* **347**, *773-776*

4. **GAEDIGK, A.**, BLUM, M., GAEDIGK, R., EICHELBAUM, M. AND MEYER, U.A. (1991). Deletion of the entire cytochrome P450 CYP2D6 gene as a cause of impaired drug metabolism in poor metabolizers of the debrisoquine/sparteine polymorphism. *Am J. Hum. Genet.* **48**, *943-950*

5. BROLY, F., **GAEDIGK, A.**, HEIM, M., EICHELBAUM, M., MöRIKE, K. AND MEYER, U.A. (1991). Debrisoquine/sparteine hydroxylation genotype and phenotype: Analysis of common mutations and alleles of CYP2D6 in a European population. *DNA and Cell Biol.* **10**, *545-558*

6. **GAEDIGK, A.**, SPIELBERG, S.P. AND GRANT, D.M. (1994). Characterization of the microsomal epoxide hydrolase gene in patients with anticonvulsant adverse drug reactions. *Pharmocogenetics* **4**, *142-153*

7. **GAEDIGK, A.**, NAKAMURA, H. AND GRANT, D.M. (1994). Expression of functional human microsomal epoxide hydrolase in *Escherichia coli*. *Cytochrome P450, 8th Intern. Conference. Ed. M.C. Lechner. John Libbey Eurotext, Paris.*

8. GREEN, V.J., PIROHAMED, M., KITTERINGHAM, N.M., **GAEDIGK, A.**, GRANT, D.M., BOXER, M., BURCHELL, B. AND PARK, B.K. (1995). Genetic analysis of microsomal epoxide hydrolase in patients with carbamazepine hypersensitivity. *Biochemical Pharmacology* **50**, *1353-1359*

9. LEEDER, J.S., **GAEDIGK, A.** LU, X. AND COOK, V. A. (1996). Epitope mapping studies with human anti-cytochrome P450 3A antibodies. *Molecular Pharmacology* **49**, *234-243*

10. GRANT, D.M., HUGHES, N.C., JANEZIC S.A., GOODFELLOW G.H., CHEN, H.J. **GAEDIGK, A.**, YU, V.L. AND GREWAL, R. (1996). Human Acetyltransferase Polymorphisms. *Mutation Research, in press*

11. **GAEDIGK, A.**, BEATTY B. AND GRANT, D.M. (1996). Human phenol sulfotransferase gene *HAST4:* Molecular cloning, structural organization and chromosomal mapping. *Genomics (accepted)*

12. **GAEDIGK, A.**, LU, X. AND LEEDER, J.S. (1996). Identification of prostaglandine synthase (CYP8), thromboxane synthase (TBXAS1) and cholesterol 7 alpha-hydroxylase (CYP7) as targets of human anti-cytochrome P450 antibodies *(Manuscript in preparation, to be submitted to Molecular Pharmacology)*

13. **GAEDIGK, A.**, PIRMOHAMED, M., PARK, B.K. AND LEEDER, J.S. (1996). Genetic polymorphisms of NAD(P)H:quinone oxidorecductase (NQO) and catechol O-methyltransferase (COMT) in patients with anticonvulsant hypersensitivity reactions *(Manuscript in preparation, to be submitted to Pharmacogenetics)*

14. **GAEDIGK, A.** AND GRANT, D.M. (1996). Tissue-specific expression of alternatively spliced transcripts encoding human microsomal epoxide hydrolase *(Manuscript in preparation, to be submitted to Mol. Genetics)*

15. **GAEDIGK, A.** AND GRANT, D.M. (1996). Sulfotransferases cloned by PCR: Real clones or artifacts? *(to be published in Chemico-Biological Interactions, proceedings of the 3rd International Sulfation Workshop)*

ABSTRACTS

1. **GAEDIGK, A.** & EICHELBAUM, M. (1989). Frequencies of the mutant alleles of the sparteine/debrisoquine polymorphism. *Naunyn Schmiedeberg's Arch. Pharmacol.* **339** *(Suppl), R113*

2. **GAEDIGK, A.** & EICHELBAUM, M. (1989). *Xba*I RFLPs associated with the poor metabolizer phenotype of the sparteine/debrisoquine polymorphism. *Eur. J. Clin. Pharmacol.* **36** *(Suppl), A119*

3. **GAEDIGK, A.**, BLUM, M., EICHELBAUM, M. AND MEYER, U.A. (1989). The sparteine/ debrisoquine polymorphism of drug oxidation: One of the frequent mutant alleles is the result of a deletion of the IID6 gene on chromosome 22. *Falk Symposium No. 22, Basel Liverweek: Proteins in the Regulation of Hepatic Genes*

4. **GAEDIGK, A.**, BLUM, M., MEYER, U.A., AND EICHELBAUM, M. (1990). Sparteine/ debrisoquine polymorphism of drug oxidation: The 11.5 kb allele is the result of a deletion of the IID6 gene on chromosome 22. *Naunyn Schmiedeberg's Arch. Pharmacol.*

5. **GAEDIGK, A.**, BLUM, M., EICHELBAUM, M. AND MEYER, U.A. (1990). The sparteine/ debrisoquine-type polymorphism of drug oxidation: Deletion of the cytochrome P450 CYP2D6 gene as a frequent cause. *8th International Symposium on Microsomes and Drug Oxidations, Stockholm, Sweden*

6. **GAEDIGK, A.**, SPIELBERG, S.P. AND GRANT, D.M. (1991). Anticonvulsant adverse drug reactions: Determination of the nature of the pharmacogenetic defect. *The Pharmacologist* **33**, *A229*

7. **GAEDIGK, A.**, SPIELBERG, S.P. AND GRANT, D.M. (1992). Anticonvulsant adverse drug reactions: Are mutations in the epoxide hydrolase gene responsible for the pharmacogenetic defect? J Basic&Clinical Physiol and Pharmacol **3** (Suppl) P103. *9th nternational Symposium on Microsomes and Drug Oxidations, Jerusalem, Israel*

8. **GAEDIGK, A.**, SPIELBERG, S.P. AND GRANT, D.M. (1993). Epoxide Hydrolase is not defective in patients with anticonvulsant adverse drug reactions. *Can. Fed. Biol. Soc., Windsor, Canada*

9. KITTERINGHAM, N.R., PIRMOHAMED, M., **GAEDIGK, A.**, GRANT, D.M. AND PARK, B.K. (1994). Carbamazepine idiosyncratic toxicity: investigation of the role of microsomal epoxide hydrolase. *IUPHAR 12th International Congress of Pharmacology, Montreal, Canada.*

10. **GAEDIGK, A.**, KATHIRAMALAINATHAN, K., GREWAL, R. AND GRANT, D.M. (1994). High-level expression of recombinant human phenol sulfotransferase in *E. coli. Can. Fed. Biol. Soc.* **37**

11. **GAEDIGK, A.** AND GRANT, D.M. (1994). Tissue-specific expression of alternatively spliced transcripts encoding human microsomal epoxide hydrolase. *10th International Symposium on Microsomes and Drug Oxidations, Toronto, Canada*

12. **GAEDIGK, A.**, KATHIRAMALAINATHAN, K., GREWAL, R. AND GRANT, D.M. (1994). High-level expression of recombinant human phenol sulfotransferase in *E. coli. 10th International Symposium on Microsomes and Drug Oxidations, Toronto, Canada*

13. LEEDER, J.S., **GAEDIGK, A.**, LU, X. AND COOK, V.A. (1994). Characterization of the human anti-cytochrome P450 antibody response in hypersensitivity reactions to aromatic anticonvulsants. *10th International Symposium on Microsomes and Drug Oxidations, Toronto, Canada*

14. LEEDER, J.S., **GAEDIGK, A.**, AND LU, X. (1995). Identification of prostacyclin synthase (CYP8) and not human CYPs3A as the target of "anti-CYP3A" antibodies in patients with anticonvulsant hypersensitivity reactions. *4th International ISSX Meeting, Proceedings Vol. 8, Seattle, USA*

15. **GAEDIGK, A.** AND GRANT, D.M. (1995). Tissue-specific expression and alternative splicing of human microsomal epoxide hydrolase. *4th International ISSX Meeting, Proceedings Vol. 8, Seattle, USA*

16. **GAEDIGK, A.**, LEKAS, P. AND GRANT, D.M. (1995). Functional characterization of a novel monoamine-metabolizing phenol sulfotransferase isozyme. *4th International ISSX Meeting, Proceedings Vol. 8, Seattle, USA*

17. **GAEDIGK, A.** AND GRANT, D.M. (1995). Cloning of human arylaminesulfotransferase *HAST3* and *HAST4* genes by genomic library screening and XL-PCR. *4th International ISSX Meeting, Proceedings Vol. 8, Seattle, USA*

18. WINDMILL, K.F., **GAEDIGK, A.**, GRANT, D.M. AND MCMANUS, M.E. (1995). Localisation of N-Acetyltransferase gene expression in human tissues using hybridization histochemistry. *Proceedings of the Australian Society of Clinical & Experimental Pharmacology & Toxicology, Vol 2, p 122, 1995*

19. **GAEDIGK, A.**, PIRMOHAMED, M., PARK, B.K. AND LEEDER, J.S. 1996) Genetic Polymorphisms of NAD(P)H:Quinone Oxido-reductase (NQO1) and Catechol O-Methyltransferase (COMT) in Patients with Anticonvulsant Hypersensitivity Reactions. *To be presented at the 11h International Symposium on Microsomes and Drug Oxidations, Los Angeles*

REFERENCES

1. J.S. LEEDER, Ph.D., Pharm.D.
Children's Mercy Hospital
Pediatric Pharmacology Research Unit
2401 Gillham Rd
Kansas City, MO 64108

2. D.M. GRANT, Ph.D.
The Hospital for Sick Children
Dept. of Clinical Pharmacology
555 University Ave
Toronto, Ontario, M5G 1X8

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The Hospital for Sick Children
Dept. of Clinical Pharmacology
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Exploratory Biochemistry and Toxicology
Merck, Sharp & Dohme Research Laboratories
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West Point, PA 19486
USA

5 U.A. MEYER, M.D.
Biocenter of the University of Basel
Dept. of Clinical Pharmacology
Klingelbergstr. 70
4056 Basel
Switzerland

6. M. EICHELBAUM, M.D.
Margarete-Fischer-Bosch Institute of Clinical Pharmacology
Auerbachstr. 115
70376 Stuttgart
Germany

Andrea Gaedigk, Ph.D.

Isotope Experience

1985 - 1987

At the beginning of my master's thesis at the University of Stuttgart I underwent a safety course for handling radioactivity according to the University's guidelines.
I worked with ^{32}P γ dCTP to end-label RNA which was subsequently analyzed by gel electrophoresis.

1987-91

During four years of my Ph.D. training I was responsible for the handling and disposal of radioactivity (^{32}P α dCTP and ^{35}S α dATP) at the molecular biology unit of the Margarete-Fischer-Bosch Institute of Clinical Pharmacology along the institute's guidelines.
The radioactive nucleotides were used for labeling DNA and subsequent Southern hybridization, and DNA sequencing.

Since 1991

In the Dept. of Clinical Pharmacology & Toxicology at the Hospital for Sick Children I was advised about the regulations for working with radioactive substances. I was routinely working with ^{32}P α dCTP for Southern and Northern hybridizations as well as SSCP (Single Strand Conformation Polymorphism) analysis, and ^{35}S α dATP for DNA sequencing. Occasionally I performed oligonucleotide endlabelling using ^{32}P γ dCTP. Furthermore, we were employing ^{35}S PAPS as a substrate in enzyme activity assays to biochemically characterize sulfotransferases.

The amounts of radioactivity handled in a single experiment were 1 to 100 µCi depending on the procedure. Maximum total amounts handled in a period of 2 weeks did not exceed 500 µCi.

CURRICULUM VITAE

NAME: R. Russell GOTSCHALL **SOCIAL SECURITY #**

ADDRESS:

DATE OF BIRTH:

PLACE OF BIRTH: Olatha, Kansas

CITIZENSHIP: United States Citizen

EDUCATION:
Wichita State University, B.S., 1992
Wichita State University, M.S., 1995

ACADEMIC AND PROFESSIONAL EXPERIENCE:

1992 - 1993	Graduate Teaching Assistant, Wichita State University
1995	Biology Instructor, Upward Bound, Wichita State University.
1994 - 1995	Graduate Reasearch Assistant, Wichita State University
1996 - present	Research Assistant, Wichita State University

PROFESSIONAL ORGANIZATIONS AND HONORS:

1993, Golden Key National Honor Society Graduate Teaching Award
1994, Young Investigator Award, Watkins Life Sciences Conference

PUBLICATIONS:

1. Gotschall RR, Bousfield GR 1995 Oligosacharide mapping reveals hormone-specific glycosylation patterns on equine gonadotropin α subunit Asn^{56}. Endocrinology: (in press 1996)

2. Butnev VY, Gotschall RR, Baker VL, Moore WT, Bousfield GR 1995 Negative influence of O-linked oligosaccharides of high molecular weight equine chorionic gonadotropin (eCG) on its LH and FSH receptor binding activities. Endocrinology :(in press 1996)

IN PREPARATION:

1. Butnev VY, Gotschall RR, Baker VL, William T. Moore, Jr., Peter W. Gout, Bousfield GR 1995 Glycosylated equine prolactin and its carbohydrate moiety.

ABSTRACTS:

1. Butnev VY, Gotschall RR, Baker VL, Bousfield GR, Glycosylated equine prolactin. 77th Annual Meeting of Endocrine Society, Washington, DC, 1995, abstact P2-17.

2. Butnev VY, Gotschall RR, Baker VL, Bousfield GR, Equine CG forms with different receptor binding activities. 28th Annual Meeting of the Society for the Study of Reproduction, Davis, CA, 1995, abstract 74.

3. Butnev VY, Gotschall RR, Baker VL, Bousfield GR 1995 Influence of Asn^{56} oligosaccharides on *in vitro* subunit association and FSH receptor binding of equine gonadotropins.

4. Hashmi RA, Gotschall RR, Baker VL, Bousfield GR, Studies on the reassociation of FSH and LH subunits. Watkins Life Science, Wichita, Kansas, 1994, abstract #2.

5. Gotschall RR, Baker VL, Bousfield GR, Oligosaccharides specific to equine LHα are primarily attached to Asparagine 56. 27th Ann. Meeting Society for the Study of Reproduction, Ann Arbor, 1994, abstract 48.

6. Gotschall RR, Baker VL, Bousfield GR, Comparison of equine FSH alpha and pituitary free alpha subunit oligosaccharides released by peptide N-glycanase digestion. 26th Ann. Meeting of the Society for the Study of Reproduction, Ft. Collins, Colorado, 1993, abstract 286.

AREAS OF EXPERTISE:

Enzymatic removal of carbohydrates from proteins, oligosaccharide mapping, amino acid analysis, sulfate analysis, carbohydrate analysis, liquid chromatography (HPLC, reverse-phase HPLC, FPLC, ion-exchange, anion exchange, and gel-filtration), electrophoresis, radioligand assays, ultrafiltration, and protein sequencing.

Dionex Ion/Anion Analyzer, Milligen Prosequencer, Waters Amino Acid Analyzer, Waters 625 LC system, Waters Pico•Tag Work Station, Cahn MicroBalance, Hoeffer Standard Gel electrophoresis equipment, BioRad Minigel electrophoresis equipment, Glyko FACE electrophoresis equipment, Virtis 25EL lyophilizer, Packard Cobrall gamma counter, Beckman DU 70 spectrophotometer, Sorvall SC200 SpeedVac, Sorvall RC-3 centrifuge, and Sorvall RT 600B centrifuge.

IBM and Macintosh computers.

Computer software: Microsoft Word, Wordperfect, Microsoft Excel, Lotus 123, Microsoft PowerPoint, Adobe Illustrator, Adobe Distiller, Adobe Acrobat, Adobe Pagemaker, DeltaGraph, Cricket Graph, Claris Works, Professional File, Norton Utilities, Entrez, Netscape, MacImdad, Kinemage, Dionex AI-450, Maxima, and DNA Star.

RESEARCH INTERESTS:

Reproductive endocrinology, protein chemistry, structure-function relationships of glycosylated hormones, regulation and mechanisms of hormone action.

Gotschall, Russell

From: George R. Bousfield[SMTP:bousfiel@twsuvm.uc.twsu.edu]
Sent: Tuesday, October 22, 1996 1:20 PM
To: Gotschall, Russell
Subject: Re: iodination protocol

Hi Russell,

Just a quick note to accompany the iodination protocol. I believe Viktor has modified it by dissolving the hormones in 0.1 M sodium phosphate buffer, since he seemed to be observing FSH precipitation when the proteins were dissolved in phosphate buffered saline. Here goes.

PREPARATION FOR IODINATION
RECIPES FOR RIA BUFFERS AND SOLUTIONS

1. 0 5 M Sodium Phosphate Buffer pH 7 6

A) 17.5 gm NaH2P04-H20 (monobasic) in distlled H20 to a total volume of 250 ml.
B) 35.5 gm anhydrous NaH2P04 (dibasic) in distlled H20 to a total volume of 500 ml
Grind the dibasic Na Phosphate in a blender before weighing to help it go into solution faster.

To attain pH 7.6, add monobasic Na Phosphate (approx.50 to 60 ml total) to 500 ml dibasic Na Phosphate.

0.5 M Sodium Phosphate pH 7.6 can be stored at 4! C for several months. Crystals usually form in the solution at 4!. Heat the buffer in warm water and the crystals will go back into solution. There will be junk in the buffer fronn the phosphates, so filter through glass wool before diluting.

2. Phosphate Buffered Saline (PBS) approx. 5 ml/tube
(0.01 M Sodium Phosphate - 0.14 M NaCl, pH 7.6)

20 ml of 0.5 M Phosphate buffer pH 7.6
9 gm NaCl
Dilute to 1 liter with distlled H20

3. PBS P 0.25 % BSA
Dissolve 0.375 gm BSA in 150 ml PBS: float the BSA on top of the buffer. Mix only after all the BSA is dissloved. This prevents a lot of foaming.

COLUMN PREPARATION

Pre-packed Pharmacia PD-10 columns containing Sephadex G-25 wash with dH20 are used to desalt the iodination reaction mixture.

Cut off ends and let buffer run into column.

On day of iodination run 0.25% BSA 0.01 M PBS (pH 7.6) into column; a total of l0 ml per column and cap bottom of column.

Number 12 plastic plastic tubes per column. Falcon #2052. Use 100 ml Kimax beakers bottom-up covered with parafiim as tube collection platforms - Parafilm included for its non-skid property and easy removal if it becomes contaminated.

Develop column and load sample with 0.25'% BSA in 0.01 M PBS, pH 7.6 .

Iodination mixture may be transferred to column with Pasteur pipette that has been exposed to 0.25% BSA 0.01 M PBS. Use a 100 5l wash.

If 1 ml fractions are collected, iodinated protein elutes in tubes 3,4, or 5 - P the bulk being in tube 4.

REACTION PREPARATION

A. Rx. may be performed in 500 5l capacity conical microfuge tubes with caps (Denville Scientific Inc., P.O. Box 304, Denville, N.J. Cat. No. 8001 18001 Micro centrifuge tubes).

B. Sample Preparation:

Using Cahn Balance weigh out hormone and place into samll plastic Eppendorf microfuge tube. Add the necessary amount of 0.05 M PBS (pH 7.6) so that a vol. of 10 5l contains:
10 5g for oLH, hCG, oFSH, eFSH
20 5g for PMSG (eCG)
Store at -20lC.

C. Treatment of 125l:

Approx. 0.5 mCi/Rx is desired.

If 125l is ordered from NEN or Isotex and comes as a miniumum diluent product (usually approx. 5 mCi in 10 ~1 0.01 N or 0.1 N NaOH) enough 0.5 M PB pH 7.6 should be added to vial and mixed well enough so that approx. 0.5 mCi will be present in 10 5l. Pipetting may be done preferably with pipetman using disposable tips. This iodide should be used fresh only.

If 125l is ordered from Amersham which comes in a 1 mCi/10 5l of 10-5 M NaOH, buffering should be done in a separate tube in order to save the remainder of iodide for iodinations that may be performed on other days. 0.5 M PB pH 7.6 sllould be pipeted into conical tube then an equal amt. of Amersham product should be transferred to vial and soln should be mixed well Pipetman and plastic tips are suitable for this.

D. Preparation of Chloramine T. (ChlT)

Need a 1 mg/ml solution.
Need 10 5g/10 5l for Rx. Weigh out between 5 to 15 mg ChlT. Put it in a 20 ml glass scintillation vial. Right before start of the iodination, dissolve the ChlT with PBS pH 7.6 so that the concentration of solution is 1 mg/ml. Keep on ice.
The ChlT and sodium meta bisulfite can be weighed out (but not diluted) the day before iodination. If this is done, wrap the scintillation vials in foil and store in a drawer until ready to dilute.

E. Preparation of Sodium Meta Bisulfide (Na2S205)

Na2S205 used Fisher Sci. Comp. Put 25 mg into glass scintillation vial and do as described above for ChlT. Need 25 5g/25~1.

Rx Conditions.
10 5g of either oLH, hCG, or oFSH or 20 5g PMSG (10 5l)
0.5 mCi 125l approx. 10 5l
10 5g Chloramine T approx. 10 5l
20 sec. 4lC (10 sec for FSH)
25 5g Na2S205 approx. 25 5l
100 5g 0.25% BSA in PBS

ORDER OF ADDITION OF REAGENTS TO RX VIAL

All solns. 4lC except iodide-l25 do these in sequence for each iodination Rx.
1) 10 5l hormone soln. (may be prepipetted)
2) 20 5l 0.5 M PB pH 7.6 (mix well with pipette)
3) 10 5l 125l
4) 10 5l ChlT 2U sec (10 sec for FSH) on ice
5) 25 5l Na2S2O5

6) IO0 5i 0.25% BSA PBS pH 7.6
Take 10 5l for total est. of mCi/Rx.

Estimation of Spec. Act. 5Ci/5g (manual method).

A. Estimation of Specific Act. Hunter Greenwood (manual method).

Cap each 1 ml fraction tube with parafilm.
Place in AT's, count for 0.5 min
Calculate 5Ci in each tube by multiplying
KA.T. U.5 min. count (1000 5Ci/mCi) = 7.3~ x 10 4

#5Ci/Rx - 5Ci salt peak = S.A
Total 5g protein in Rx

To calc. recovery of protein add up 5Ci in protein peak and divide by S.A. to get 5g. This divided by total of protein/Rx = prot. recovery.

Often the estimate of total iodide per Rx by the aliquot method is less than the total iodide accounted for in all fractions. In this case total iodide used per RX is based on the assumptiorl the iodide on all fractions represents 85% of total.

B. Max Schlamowitz lab assumes 50% recovery of protein in major tube and estimates specific activity using this assumption.

good luck with whatever you are doing.

If you need exposure information on yourself you should be able to get it from our radiation safety office.

Twins saw their first snow this morning. Luckily, it turned to water soon.

George

Russell Gotschall

Summary of Radioactive Experience

1994 - 1996

Wichita State University

^{125}I Labeling of glycoprotein hormones
Chloramine T labeling reaction
Pharmacia PD-10 columns used for recovery

Jennifer Thrutchley Helber

Experience

University of Missouri--Kansas City
***Research Associate** — **Feb. 1989--Dec. 31, 1995**
Plan and carry out experiments
Review and present literature summaries
Order chemicals and maintain inventories
Prepare posters for presentation at national ASM meetings

University of Kansas Medical Center — **Kansas City, Kansas**
***Research Assistant** — **March 1986--Feb. 1989**
Plan and carry out experiments
Maintain laboratory supplies
Keep track of expenditures

Shook, Hardy, and Bacon — **Kansas City, Missouri**
Research Analyst — **Sept. 1985--March 1986**
Review corporate research documents
Write summaries of documents

University of Missouri--Kansas City
***Graduate Research Assistant** — **Aug. 1983--May 1985**
Teach undergraduate lab sessions
Plan graduate research
Prepare and present thesis

Mobay Chemical (Bayer) — **Kansas City, Missouri**
Technician III — **June 1980--Aug. 1983**
Analyses of pesticides in wastewater (GC, HPLC)

Kansas City Kansas Water Pollution Control — **Kansas City, Kansas**
Wastewater Technician — **Nov. 1978--May 1980**
Analyses of wastewater

Education

University of Missouri--Kansas City — **Kansas City, Missouri**
Master of Science, Microbiology — **1982--1985**
Two publications of graduate research in the Journal of Bacteriology

Central Missouri State University — **Warrensburg, Missouri**
Bachelor of Science — **1976--1978**
Major Biology (botany emphasis)
Minor Chemistry

Longview Community College — **Lee's Summit, Missouri**
Associate of Science — **1974--1976**

Publications

Cobb, C., J.T. Helber, and R. Hirschberg: Scanning electron microscopy of *Eikenella corrodens* colony morphology variants. J. Perio. Res., 29:410-417, 1994.

E.B. Cambareri, J.T. Helber, and J.A. Kinsey: Tad1-1, an active LINE-like element of *Neurospora crassa*. Mol. Gen. Genetics 242:658-665, 1994.

Kinsey, J.A. and J. Helber: Isolation of a transposable element from *Neurospora crassa*. Proc. Natl. Acad. Sci. USA 86:1929-1933, 1989.

Helber, J.T., T.R. Johnson, L.R. Yarbrough, and R. Hirschberg: Effect of nitrogenous compounds on nitrogenase gene expression in anaerobic cultures of *Anabaena variabilis*. J. Bacteriol. 170:558-568, 1988.

Helber, J.T., T.R. Johnson, L.R. Yarbrough, and R. Hirschberg: Regulation of nitrogenase gene expression in anaerobic cultures of *Anabaena variabilis*. J. Bacteriol. 170:552-557, 1988.

Five Abstracts for Annual Meetings of the American Society for Microbiology have also been published.

Special Skills

Bacterial and yeast growth and maintenance of stock cultures
Molecular biology techniques including:
- *DNA cloning and sequencing
- Protein and nucleic acid gel electrophoresis
- *Southern and Northern hybridizations with radio-labelled probes
- Tissue culture
- PCR amplification

Comfortable in presenting hour-long seminars
Writing of manuscripts for publication; posters for meetings
Computer-literate; has PC at home

*Radiation Experience and Training

Week-long radiation safety training at KU Medical Center
Well-versed in radiation safety and waste disposal policies at UMKC
Has worked with ^{32}P, ^{35}S, (250 uCie in 50 uCie aliquots for radiolabelled probes; typically 20 uCie for a sequencing gel) and also some work with ^{14}C and ^{3}H (incorporation into metabolites)
Radiation exposure records available at both KU Medical Center and UMKC

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 4

CURRICULUM VITAE
for
RESEARCH GROUP NO. 2

CURRICULUM VITAE

PERSONAL

Name: Karen Kover

Date of Birth:

Place of Birth:

Home Address:

Home Phone:

Business Address: University of Kansas Med Center
3901 Rainbow blvd
G001 HCM building
Dept. Pediatrics
Kansas City, KS 66160

Business Phone: 913-588-5692

Social Security #:

EDUCATION

1990-1996 University of Kansas Medical Center
School of Medicine, Dept. of Physiology
Kansas City, KS 66160
Degree: Ph.D. Physiology, Molecular & Cellular Biology. Title of dissertation: Differential Regulation of Mouse Uterine Genes *In Vivo* and *In Vitro*.

1973-1978	Southwest Missouri State University Springfield, MO Degree: B.S. Secondary Education, Biology and Chemistry

PROFESSIONAL EXPERIENCE

1996-present	Research Assist. Professor Dept. Pediatrics University of KS Medical Center Kansas City, KS
1990-1994	Graduate Teaching Assistant Department of Physiology University of KS Medical Center Kansas City, KS
1987-1990	Research Instructor research coordinator, human, pig, rodent islet transplantation and transplantation immunology. University of KS Medical Center, Dept Pediatrics-Endocrinology
1986-1987	Research Associate islet transplantation in rats University of KS Medical Center, Dept. Pediatrics-Endocrinology
1982-1985	Research Assistant Characterization of ligand/receptor interactions of the prolactin/growth hormone family in liver tissue. University of Kansas Med Center, Dept. Pediatrics-Endocrinology
1979-1981	Research Assistant *In vivo* and *in vitro* chemotherapeutic drug dose response experiments in the treatment of mammary carcinoma and osteosarcoma. Michigan Cancer Foundation, Detroit, MI

TEACHING EXPERIENCE

1991-1994	Teaching assistant in Medical Physiology. University of KS Medical Center
	Medical Physiology tutor for medical and graduate students. University of KS Medical Center
	Lecturer in Neurophysiology for undergraduate allied health students. University of KS Medical Center
1978-1979	Secondary education science teacher in the Ferndale school district, Ferndale, MI

ABSTRACTS AND RESEARCH PRESENTATIONS

1. Kover K, Moyer C, Moore WV, Forster J. The development of donor-specific tolerance can be influenced by strain combinations. Poster Presentation, 1996 *The Cell Transplant Society, Third International Congress*, Miami Beach, Florida.

2. Kover K, Moyer C, Moore WV, Forster J. The influence of donor strain combinations on the development of donor-specific tolerance in rats. Poster Presentation, 1996 *15th Annual Meeting of American Society of Transplant Physicians*, Dallas, TX.

3. Kover K, Dey SK. Expression of the interleukin-1 α and β genes in the mouse uterine epithelium. Slide presentation, 1994 University of Kansas Medical Center Student Research Forum.

4. Kover K, Dey SK. Analysis of steroid hormone effects on lactoferrin gene expression in the mouse uterus. Slide presentation, 1993 *26th Annual Meeting Society for the Study of Reproduction.*

5. Kover K, Andrews G, and Dey SK. Regulation of gene expression in the mouse uterine epithelium. Slide presentation, 1993 Department of Physiology seminar.

6. Kover K, Andrews G, Dey SK. Analysis of steroid hormone effects on lactoferrin gene expression in the mouse uterus. Slide presentation, 1993 University of Kansas Medical Center Student Research Forum.

7. Kover K, Andrews G, Dey SK. Regulation of lactoferrin gene expression in the mouse uterine epithelium. Slide presentation, 1993 University of Kansas Reproductive and Developmental Biology Group seminar.

8. Kover K, Moore WV. Development of a method for the isolation of true islets from human fetal pancreas. Slide presentation, 1989 *The 2nd International Congress on Pancreas and Islet Transplantation.*

9. Kover K, Moyer C, Moore WV. The direct effect of interferon and tumor necrosis factor on both expression of Class II antigens on isolated islets and initiation of rejection of the islets. Poster presentation, 1989 *49th Annual Meeting of the Diabetes Association.*

10. Moore WV, Kover K, Popiela H. Crossreactivity of different organs in the initiation of rejection. Poster presentation, 1987 *37th Annual Meeting of the Diabetes Association.*

11. Moore WV, Kover K, Hung CH. Characteristics of the somatotropic growth hormone binding. Poster presentation, 1984 *7th International Congress of Endocrinology.*

12. Moore WV, Kover K, Hung CH. Growth hormone binding to macrophages and hepatocytes from rat liver. Poster presentation, 1983 *65th Annual Meeting of the Endocrine Society.*

PUBLICATIONS

1. Kover K, Liang L, Andrews, GK, Dey SK. Differential expression and regulation of cytokine genes in the mouse uterus. *Endocrinology* 136:1666-1673, 1995.

2. Dalton T, Kover K, Dey SK, Andrews GK. Analysis of the expression of growth factor, cytokine and lactoferrin genes in the preimplantation mouse oviduct. *Biol Reprod* 51:597-606, 1994.

3. Kover K, Moore WV. Initiation of rejection of established islet allografts by third-party thyroid allografts and splenic dendritic cells. *Diabetes* 40:754-758, 1991.

4. Kover K, Moore WV. Expression of class II antigen on neonatal rat islets by interferon and tumor necrosis factor: lack of correlation of expression of class II antigen and allograft rejection. *Transplantation Proceedings* 22:853-854, 1990.

5. Kover K, Moore WV. Development of a method for the isolation of true islets from human fetal pancreas. *Transplantation proceedings* 22:761-762, 1990.

6. Moore WV, Moyer C, Kover K. Effect of isolated and purified splenic dendritic cells (antigen presenting cells) on initiation of islet allograft rejection. *Transplantation Proceedings* 22:838-840, 1990.

7. Kover K, Moyer C, Ketchum R, Moore WV. Successful allogenic transplantation of rat islets expressing cytokine-induced major histocompatibility complex class II antigen. *Transplantation* 49:148-151, 1990.

8. Kover K, Moore WV. Development of a method for the isolation of islets from human fetal pancreas. *Diabetes* 38:917-924, 1989.

9. Kover K, Hegre O, Popiela H, Biggs T, Moore WV. Cross-reactivity of organs in allograft rejection. *Diabetes* 36: 1268-1270, 1987.

10. Moore WV, Kover K, Hung CH. Binding of growth hormone to hepatic receptors. National Hormone & Pituitary Program, (eds Salvatore Raiti and Robert A. Tolman), *Human Growth Hormon.* Plenum Publishing Corporation, 1986, pg. 475-498.

11. Hung CH, Kover K, Moore WV. Characteristics of somatotropic growth hormone binding to homologous liver plasma membranes. *Molecular & Cellular Endocrinology* 39:189-196, 1985.

12. Kover K, Hung CH, Moore WV. The characteristics of hGH binding to the liver macrophages. *Horm Metab Res* 18:26-30, 1986.

13. Kover K, Hung CH, Moore WV. Enhancement of rat growth hormone binding by membrane disulfide reduction. *Endocrinology* 116:1017-1023, 1985.

14. Kover K, Moore WV. Comparison of hGH binding to isolated rat liver macrophages and hepatocytes. *Horm Metab Res* 16:193-197, 1984.

With regards to the use of Radioisotopes:

Education:

Radiation Safety Class at KUMC, 1982

Yearly Radiation Safety exams

Experience:

1982-1985; iodination of growth hormone using the cloramine T protocol (2mCi ^{125}I) which was purified on a sephadex column and utilized in a RIA.

1985-1990; ^{125}I-insulin kits (3uCi)

1990-1994; used ^{35}S and ^{32}P cRNA labeled probes (specific activity $2x10^9$ dpm/ug) for *in situ* hybridization and Northern blot analysis respectively.

CURRICULUM VITAE

PERSONAL

Name: Carol Moyer

Date of Birth: [redacted]

Marital Status:

Home Address: [redacted]

Home Phone: [redacted]

Business Address: University of Kansas Med Center
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G021 HC Miller building
Dept. Pediatrics
Kansas City, KS 66160

Business Phone: 913-588-6383

Social Security #:

EDUCATION

5/86 B.S. in Biology with Minor in Chemistry, Missouri Western State College, St. Joseph, Missouri.

5/85 A.S. in Nursing, Missouri Western State College of Nursing with subsequent RN Licensure in Missouri.

PROFESSIONAL EXPERIENCE

10/93-Present	Research Associate Univ. of Kansas Med. Center Kansas City, KS., Management of research lab, experiments planned by research group. This includes designing techniques, protocols, then teaching techniques to assistants and students. Computer utilization in gathering, organizing data, evaluating data. Assisting in publishing results.
10/87-10/93	Research Assistant Univ. of Kansas Med. Center, Kansas City, KS.. Independently conducted assigned experiments including literature searches, researching techniques, rodent surgery, monitoring research animals, tissue collection, histology and data organization, statistical evaluation. Researched and developed techniques for successful isolation and culturing of rat porcine and human islets of langerhans. Developed rodent surgery techniques including tissue transplantation into the thymus.
9/86-8/87	Community Health Nurse Platte City, Mo. Conducted health clinics involving immunizations, nutrition education, blood pressure monitoring, venereal disease detection and treatment. Made home visits to home-bound clients. Initiated teenage prenatal group support sessions connected to the WIC Program.

PUBLICATIONS AND POSTERS

1. Kover, K., Moyer, C., Ketchum, R., and Moore,W.V. Successful allogeneic transplantation of rat islets expressing cytokine-induced major histocompatibility complex class II antigen. Transplantation 49(1), 148-151, 1990

2. Moore, W.V., Moyer,C., and Kover K. Effect of isolated and purified splenic dendritic cells (antigen presenting cells) on initiation of islet allograft rejection. Transplantation Proceedings 22(2), 838-840,1990.

3. Ketchum.R.J., Su H.C., Moyer, C. and Moore, W. V. Cyclosporine therapy concomitant with renal allotransplatation induces tolerance to subsequent donor MHC-identical islet grafts. Transplantation Proceedings 24: 899-900, 1992.

4. Ketchum,R.J., Moyer,C. Pan,F. and Moore,W.V. Intrathymic transplantation of allogeneic perinatal islets does not induce donor-specific tolerance. Transplantation 56(3): 728-730, 1993.

5. Robert J. Ketchum, Hua-Chang Su, Carol Moyer and Wayne V. Moore, Failure of Nonimmunogenic islet allographs to induce donor-specific immunological unresponsiveness. Cell Transplantation.3(2): 179-1186, 1994

6. Kover,K. Moyer,C. and Moore,W.V. The effect of interferon and tumor necrosis factor on both expression of Class II antigens on isolated islets and initiation of rejection of the islets. 49th Meeting of the American Diabetes Association, June 1989, Detroit, Michigan

7. Moore,W.V., Moyer, C. and Kover,K. Effect of isolated and purified splenic dendritic cells (antigen presenting cells) on initiation of islet allograft rejection. Congress on Pancreatic and Islet Transplantation, September, 1989, Minneapolis, MN.

8. Moore,W.V., Moyer,C. and Su,H.C. Islet allografts do not initiate rejection of established renal allografts due to tolerance induced by the renal transplantation. 14th international Diabetes Federation Congress, June 1991, Washington, D.C. (poster session)

9. Ketchum,R.J. Su, H.C., Moyer, C. and Moore,W.V. Cyclosporin therapy concomitant with renal allotransplantation induces tolerance to subsequent donor MCH-identical islet grafts. Third international Congress on Pancreatic and Islet Transplantation Symposium on Articial Insulin Delivery System, June, 1991, Lyon, France.

10.Moore,W.V., Moye. C., Pan,F., Forester,J., Ketchum,R.,Intrthymic Transplantation of Allogeneic Perinatal Rat Islets Does Not Induce Donor Specific Tolerance. 12th International Immunology and Diabetes Workshop, April,1993, Orlando, Florida.

11. Moore,W.V., Moyer,C., Pan,F., Forester,J., Ketchum,R., Intrthymic Transplantation of Allogeneic Perinatal Rat Islets Does Not Induce Donor

Specific Tolerance. American Diabetes Association. June, 1993, Los Vegas, NV.

12.Moore,W.V., Moyer,C., Pan,F., Forester,J., Ketchum,R., Intrthymic Transplantation of Allogeneic Perinatal Rat Islets Does Not Induce Donor Specific Tolerance. International Pancreas and Islet Transplantation Association, June,1995. Miami.

13. Kover K, Moyer C, Moore WV, Forster J , The Influence of donor and recipient strain combinations on the development of donor-specific tolerance in rats. American Society of Transplant Physicians, May 1996. Dallas (poster)

14. Kover K, Moyer C, Forster J, Moore WV. The Influence of donor and recipient strain combinations on the development of donor-specific tolerance in rats. Cell Transplantation Society, October 1996, Miami. (poster)

Name: Carol J Moyer
Current Position: Research Associate
Radiation Safety Instruction:

(1988) Radiation Safety Course at University of Kansas Medical Center
(1989-1994) Annual refresher exams on radioactive isotpes, safety measures, and institutional regulations

Experience with radioactive isotopes:

(1987)I experimented with using ^{111}Indium oxide to trace the path of dendritic cells in an allografted rat model.Radiopharmacy gave us leftover vials containing ~ 5-10 μCi/vial.
Our lab had been looking at transplanting Islets of Langerhans across MHC barriers. We had observed that an established allograft would reject after challenged with $1X10^6$ dendritic given IP
Briefly the dendritic cells were labeled , washed, and injected IP into the experimental animals. The rats were euthanized at various time periods.
The radioactivity of various tissues was then measured with a gamma counter, and observed via radiography.

(1994)I ran a series of assays utilizing a kit from Hybritech Inc. measuring human growth hormone on a group of patients . This kit was an immunonradiometric assay using ^{125}I (~20μCi/kit). The kit measures growth hormone through utilization of a sandwich assay with plastic beads coated with a monoclonal antibody directed toward a unique site on the hGH molecule and a radiolabeled monoclonal antibody directed against a distinctly different antigenic site on the same hGH molecule.
After washing the bound radioactivity was measured with a gamma counter.

CURRICULUM VITAE

Name:
Zhaohui Geng

[redacted]

(O) 913-588 6383

Gender:
Female

Date of Birth

CURRENT POSITION:

Research assistant in Dr. Wayne V. Moore's laboratory.

EMPLOYMENT HISTORY:

1994-1996, Postdoctoral Research Fellow, Microbiology Department, Loma Linda University, California

1. To study the effect of NF-_B activity on the transcription of c-myc, c-jun and c-fos in breast tumor cells. The main purpose is to determine the role of NF-_B in breast carcinoma cells. I also investigate the NF-_B activity induced by H_2O_2, PMA and TNF-_ in Jurkat T cell line and the property of NF-_B on the proliferation of neuron cells with the hippocampus in a rat model.
2. To detect IGFBPs and IGF-II by using ECL Western blot, RIA and dot blot in the breast cancer MCF-7 cell line. The antitumor possessions of taxol and the mechanism are also studied in the same cell line.
3. Using the methods of cell and molecular biology to study the antioxidant activity of several substances such as Pycnogenol, *Ginkgo Biloba*, garlic and thymic peptide.

1993-1994, Lecturer and Research Fellow, Department of Pharmacology, Capital Medical College, China

1. To demonstrate the effect of oxidant and antioxidant on DNA damage and on the expression of glutathione reductase *in Vitro*.
2. Using the different cell line or animal model to dissect the activity of superoxide dismutase, glutathione reductase, lactate dehydrogenase or/and the quantity of malondialdehyde and glutathione.
3. *In Vitro* and *In Vivo* studies on the antithrombotic effects of pure compounds of snake venom.

1990-1993, Master Student, Department of Pharmacology, Capital Institute of Medicine, China

1. Using a rabbit coronary artery ischemia-reperfusion model to analyze the damaged myocardial contractility.
2. To evaluate the effect of PAF and its antagonist WEB-2086 on the calcium metabolism and on the platelet aggregation *Ex Vivo*.
3. To determine free radical scavenging actions by using oxidative burst fluorescence assay and Electron Paramagnetic Resonance Spectroscopy.

EDUCATION:

M.S. Pharmacology, Capital Medical College, China, 1993
M.D. Capital Institute of Medicine, China, 1990

TRAINING IN RADIATION SAFETY:

November, 1994: Loam Linda University
September, 1996: University of Kansas Medical center

EXPERIENCES OF WORKING WITH RADIOISOTOPE:

1996-: Pulsing the mixed lymphocyte cultures with ^{3}H-thymidine to assay proliferative responses of lymphocytes. The quantity of ^{3}H is **1 mCi.**

1994-1996: To determine the role a of antioxidants in the NF-Kappa B related disease by using ^{32}P labeled DNA as the probe. The quantity of ^{32}P was **5 mCi.**

ADDITIONAL SKILLS:

1. Proficiency in general laboratory procedures.
2. Molecular biology techniques: transformation of plasmid, isolation of plasmid, molecular cloning, isolation of DNA and RNA from different tissues, radio labeling of DNA, nucleic acid hybridization (dot blotting, Southern blotting), RNA hybridization (Northern blotting), extraction for nuclear protein, polymerase chain reaction, agarose and polyacrylamide gel electrophoresis, gel mobility shift assay.
3. Biochemical assays using tissue culture systems and animal systems such as MTT assay, cytotoxicity assay, lipofuscin assay, redox cycle, antioxidative enzyme, oxidative burst fluorescence assay and calcium metabolism.

PUBLICATIONS:

1. Jin, Y.Y., and Geng, Z. 1994. Protective effects of *Zhimusaponin-D* on myocardial ischemia and reperfusion damage. J. Capital Institute Med. 15:138.
2. Geng, Z., and Jin, Y.Y. 1994. New target of developing anti-asthmatic drugs (review). Pharmacy of Overseas Medicine 21:151-154.
3. Rong, Y.Q., Geng, Z., and Lau, B.H.S. 1995. *Ginkgo biloba* attenuates oxidative stress in macrophages and endothelial cells. Free Radical Biology & Medicine 20:121-127.
4. Geng, Z., and Lau, B.H.S. 1995. Aged garlic extract modulates glutathione redox cycle and superoxide dismutase in vascular endothelial cells. Submitted to Phytotherapy in October, 1995.
5. Geng, Z., and Lau, B.H.S. 1995. Thymus peptide inhibits activation of nuclear factor _B in human Jurkat cells. Submitted to Journal of Leucocyte Biology in November, 1995.

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 5

CURRICULUM VITAE
CERTIFICATION
for
STEVE LITTLE

The American Board of Radiology

Organized through the cooperation of the
American College of Radiology, the American Roentgen Ray Society,
the American Radium Society, the Radiological Society of North America,
the Section on Radiology of the American Medical Association,
the American Society for Therapeutic Radiology and Oncology, the Association of
University Radiologists, and American Association of Physicists in Medicine
Hereby certifies that

Stephen Brent Little

Has pursued an accepted course of graduate study
and clinical work, has met certain standards and qualifications and
has passed the examinations conducted under the authority of
The American Board of Radiology
On this ninth day of June, 1994
Thereby demonstrating to the satisfaction of the Board
that he is qualified to practice the specialty of
Diagnostic Radiology

THE AMERICAN BOARD OF RADIOLOGY
INCORPORATED IN THE DISTRICT OF COLUMBIA
1934

AMERICAN BOARD MEDICAL SPECIALTIES

Leal F Rogers M.D. President
Lester J Peters Secretary-Treasurer
M. Paul Capp M.D. Executive Director

CURRICULUM VITAE

NAME: Stephen Brent Little, M.D.
SOCIAL SECURITY NUMBER:
ADDRESS:

Residence:

Business: Department of Radiology
Children's Mercy Hospital
2401 Gillham Rd.
Kansas City, Missouri 64108

PERSONAL INFORMATION:

Birthplace and Date:

Citizenship: U.S.A.

Marital Status:

EDUCATION:

Undergraduate:	Weber State College Ogden, Utah Bachelor of Science, Zoology Mathematics, Chemistry and Physics Minors	1982-1986
Postgraduate:	University of Utah School of Medicine Salt Lake City, Utah Doctor of Medicine	1986-1990

POSTDOCTORAL TRAINING:

Residency:	North Carolina Baptist Hospital Department of Radiology Bowman Gray School of Medicine Winston-Salem, North Carolina	1990-1994
Fellowship:	North Carolina Baptist Hospital Department of Radiology Bowman Gray School of Medicine Winston-Salem, North Carolina	1994-1995

PROFESSIONAL LICENSE:	North Carolina #35962 Missouri MD 108195	September 1992 June 1995
BOARD CERTIFICATION:	National Board of Medical Examiners	July 1991
SPECIALTY CERTIFICATION:	American Board of Radiology	June 1994
EMPLOYMENT:	River and Backpacking Guide Teton High Adventure Jackson Hole, Wyoming	1987
	Radiologist, Courtesy Staff Northern Hospital of Surry County Mt. Airy, North Carolina	1993
PROFESSIONAL MEMBERSHIPS:	American Roentgen Ray Society Society for Pediatric Radiology	1990 - Present 1995
HONORS:	Leadership Scholarship University of Utah	1981
	Honors at Entrance Scholarship University of Utah	1981
	Academic Scholarship Weber State College	1985
	Phi Kappa Phi Honor Society	1986
	Alpha Omega Alpha	1990
	Internal Medicine Honors Program	1990

Children's Mercy Hospital
NRC License No. 24-15513-01

ATTACHMENT NO. 6

CURRICULUM VITAE
CERTIFICATION
for
CYNTHIA RIGSBY

The American Board of Radiology

Organized through the cooperation of the
American College of Radiology, the American Roentgen Ray Society,
the American Radium Society, the Radiological Society of North America,
the Section on Radiology of the American Medical Association,
the American Society for Therapeutic Radiology and Oncology, the Association of
University Radiologists, and American Association of Physicists in Medicine
Hereby certifies that

Cynthia Karkias Rigsby, M.D.

Has pursued an accepted course of graduate study
and clinical work, has met certain standards and qualifications and
has passed the examinations conducted under the authority of
The American Board of Radiology
On this seventh day of June, 1995
Thereby demonstrating to the satisfaction of the Board
that she is qualified to practice the specialty of

Diagnostic Radiology

THE AMERICAN BOARD OF RADIOLOGY
INCORPORATED IN THE DISTRICT OF COLUMBIA
1934

AMERICAN BOARD OF MEDICAL SPECIALTIES
EXCELLENCE

Douglas Maynard MD
President

Willis Jensell MD
Secretary Treasurer

M Paul Capp, M.D.
Executive Director

CURRICULUM VITAE

Cynthia Karfias Rigsby, M.D.
Department of Radiology
Children's Mercy Hospital
2401 Gillham Road
Kansas City, Missouri 64108
(816) 234-3273
FAX (816) 855-1990

HOME ADDRESS:

DATE AND PLACE OF BIRTH:

SOCIAL SECURITY: [redacted]

MARTIAL STATUS:

EDUCATION AND TRAINING

Undergraduate:

Duke University
Durham, North Carolina
A.B. - Chemistry, Magna Cum Laude
1982-1986
Graduated: May 1986

Medical School:

Duke University School of Medicine
Durham, North Carolina
Doctor of Medicine (M.D.)
1986-1990
Graduated: June 1990

Internship:

University of North Carolina Hospitals
Chapel Hill, North Carolina
Internal Medicine
July 1, 1990 to June 30, 1991

Residency:

Mallinckrodt Institute of Radiology
Barnes Hospital
St. Louis, Missouri
Diagnostic Radiology
July 1, 1991 to June 30, 1995
Chief Resident 1994-1995

Fellowship:

Children's Hospital Medical Center
Department of radiology
Cincinnati, Ohio
Pediatric Radiology

HONORS AND AWARDS:

Alpha Omega Alpha
E.E. Owen, M.D., Clinical Scholar Award
Phi Lambda Upsilon

BOARD CERTIFICATION:

American Board of Radiology
Certified - June 7, 1995

MEDICAL LICENSES:

Missouri - MD 110124
Kansas - 04-26446
North Carolina - #9500288
Ohio - 68343- issued: 4-14-95; expires 9-30-96

SOCIETY MEMBERSHIPS:

American Association of Academic Chief Residents in Radiology
American Association of Women Radiologists
American College of Radiology
American Medical Association
Radiological Society of North America

HOSPITAL APPOINTMENTS:

Associate Staff, Children's Hospital Medical Center, Department of Radiology, Children's Hospital Medical Center, 3333 Burnet Avenue, Cincinnati, Ohio 45229-3039, **July 1, 1995 - June 30, 1996.**

Volunteer Clinical Instructor, Departments of Radiology and Pediatrics, University f Cincinnati College of Medicine, 234 Goodman Street, Cincinnati, Ohio 45267, **July 1, 1995 - June 30, 1996.**

OTHER APPOINTMENTS:

Chief Resident, Mallinckrodt Institute of Radiology, Barnes Hospital, 510 South Kingshighway Blvd., St. Louis, Missouri 63110, **June 1994- June 1995.**

Fellow, Pediatric Radiology, Children's Hospital Medical Center, Department of Radiology, children's Hospital Medical Center, 3333 Burnet Avenue, Cincinnati, Ohio 45229-3039, **July 1, 1995 - June 30, 1996.**

PUBLISHED ABSTRACTS:

Thermodynamics in the Structure of Acids.
Karfias CA
The Illinois Junior Academy of Science.
Champaign-Urbana, Illinois
1982

Thermodynamics in the Structure of Acids. Thermodynamics in the Structure of Acids.
Karfias CS
The 33rd Science and Engineering Fair.
Houston, Texas
1982

Integration of MRS and MRI for Evaluation of Phosphorus-31 Spectroscopic Imaging.
Boyko OB, Prost RA, Schold SC, **Karfias CS**, Charles HC
The Twenty-Seventh Annual Meeting of The American Society of Neuroradiology.
Orlando, Florida
1989

A Comparison of Slice Selection Strategies for Phosphorus-31 Spectroscopic Imaging.
MacFall J, Prost RA, **Karfias CS**, Charles HC
The Twenty-Seventh Annual Meeting of The American Society of Neuroradiology.
Orlando, Florida
1989

Selective Saturation: An Improved CSI Technique for monitoring In-Vivo Phosphorus Metabolism.
Karfias CS, Charles HC
The Thirty-Seventh Annual Meeting of The Association of University Radiologists.
Seattle, Washington
1989

Normal CT Appearance and Measurements of Pediatric Uterus and Ovaries.
Rigsby CK, Siegel MJ
The Radiological Society of North America.
Chicago, Illinois
1992

Wilms Tumor: Accuracy of CT in Detecting Local Disease.
Rigsby CK, Siegel MJ
The Radiological Society of North America.
Chicago, Illinois
1993

PUBLISHED PAPERS:

1. **Rigsby CK,** Siegel MJ. CT Appearance of Pediatric Ovaries and Uterus. J Comput Assist Tomogr 1994;18:72-6.

2. **Rigsby CK,** Siegel MJ. Wilms' Tumor: Reliability of CT in Detecting Local Disease. In Review.

BOOK CHAPTERS:

1. Beckman JS, Campbell GA, Hannan CJ, Jr., **Karfias CS,** Freeman BA. Involvement of Superoxide and Xanthine Oxidase with Death due to Cerebral Ischemia-Induced Seizures in Gerbils. IN: Tetillo G, ed., **Superoxide and Superoxide Dismutase in Chemistry, Biology, and Medicine.** Elsevier Science Publishing Co., 1986, pp. 602-607.

MIR
MALLINCKRODT
INSTITUTE OF RADIOLOGY
WASHINGTON UNIVERSITY
MEDICAL CENTER

DIVISION OF
NUCLEAR MEDICINE

17 June 1996

TO WHOM IT MAY CONCERN

Re: Training and Experience of Cynthia Rigsby, M.D.

Cynthia Rigsby was a resident in diagnostic radiology at Mallinckrodt Institute of Radiology, Washington University School of Medicine, during the period 1 July 1991 through 30 June 1995. She was certified in diagnostic radiology by the American Board of Radiology in June 1995 (copy of certificate enclosed). Accordingly, Dr. Rigsby meets the requirements to be named as an authorized-user for uptake, dilution, and excretion studies and for imaging and localization studies in accordance with 10 CFR 35.910 and 10 CFR 35.920 (or comparable agreement-state regulations). A copy of the institutional radioactive materials license, under which Dr. Rigsby's training and experience were obtained, is enclosed.

Dr. Rigsby's training also incorporated the elements specified in 10 CFR 35.932. She has had supervised clinical experience, under the supervision of the several authorized users on the staff of the Division of Nuclear Medicine at Mallinckrodt Institute of Radiology, that includes the use of I-131 for diagnosis of thyroid function and for treatment of hyperthyroidism in at least 15 patients.

Please let me know if additional information is required.

Sincerely yours,

Barry A. Siegel, M.D.
Director, Division of Nuclear Medicine
Mallinckrodt Institute of Radiology

Vice-Chairman, Radiation Safety Committee
Washington University School of Medicine
(Materials License No. 24-00167-11)

Enclosure

510 South Kingshighway Boulevard
St. Louis, Missouri 63110-1076
(314) 362-2809 FAX (314) 362-2806

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

DEC 2 8 1993

Washington University School
of Medicine
ATTN: John Eichling, Ph.D.
Radiation Safety Officer
P.O. Box 8053
4566 Scott Avenue
St. Louis, MO 63110

License No. 24-00167-11
Control No. 396119

SUBJECT: LICENSE RENEWAL APPLICATION

Dear Dr. Eichling:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Robert D. Gatten Jr. for

J. R. Madera, Acting Chief
Nuclear Materials Support Section

NRC FORM 374
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 48

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, 36, 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. Washington University Medical School	In accordance with letter dated October 25, 1995 3. License Number 24-00167-11 is amended in its entirety to read as follows:
2. P. O. Box 8053 4566 Scott Avenue St. Louis, MO 63110	4. Expiration Date December 31, 1993
	5. Docket or Reference No. 030-02271/24-00063-12

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 identified in 10 CFR 35.100	A. Any radiopharmaceutical identified in 10 CFR 35.100	A. As needed
B. Any byproduct material identified in 10 CFR 35.200	B. Any radiopharmaceutical identified in 10 CFR 35.200	B. As needed
C. Any byproduct material identified in 10 CFR 35.300	C. Any radiopharmaceutical identified in 10 CFR 35.300	C. As needed
D. Any byproduct material identified in 10 CFR 35.400	D. Any brachytherapy source identified in 10 CFR 35.400	D. As needed
E. Any byproduct material identified in 10 CFR 35.500	E. Sealed sources identified in 10 CFR 35.500	E. As needed
F. Any byproduct material identified in 10 CFR 31.11	F. Prepackaged Kits	F. As needed

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
24-00167-11

Docket or Reference number
030-02271

Amendment No. 48

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
W. Cesium-137	W. Sealed sources (Amersham Corp. Model CDCK)	W. 22 sources per device, total activity not to exceed 875 millicuries per device. Total possession not to exceed 44 sources
X. Iridium-192	X. Seeds encased in nylon ribbon (Manufactured labeled, packaged, and distributed in accordance with a specific license issued pursuant to Section 32.74 of 10 CFR Part 32 or a specific license issued to a manufacturer by an Agreement State pursuant to equivalent State regulations)	X. 45 ribbons (15 seeds per ribbon) not to exceed 712 millicuries total
Y. Cesium-137	Y. Sealed sources (Amersham Corp. Model CDC. SP1)	Y. 20 sources per device not to exceed 16 millicuries each. Total possession not to exceed 40 sources
Z. Iridium-192	Z. Sealed sources (BYK Mallinckrodt, Model CI LBV)	Z. Two sources not to exceed 10 curies each
A.A. Iridium-192	A.A. Sealed sources BYK Mallinckrodt, Model CI-2BV)	A.A. Two sources not to exceed 1 curie each
B.B. Cesium-137	B.B. Sealed source (J.L. Shepherd and Assoc. Model No. 6810 Series)	B.B. 6000 curies

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
24-00167-11

Docket or Reference number
030-02271

Amendment No. 48

A.A. One source to be used in Nucletron Corporation Pulsed Selectron, No. 180.000 remote afterloading brachytherapy unit for interstitial, intracavitary and intraluminal treatment of cancer. One source in its shipping container to be in possession of the licensee as necessary for replacement of the source in the irradiation device.

B.B. To be used in a J.L. Shepherd Model Mark-I Series Submodel 25 self contained irradiator for irradiation of biological materials excluding explosives or highly flammable materials.

CONDITIONS

10. A. Licensed material shall be used only at the licensee's facilities located at Washington University and Washington University Medical Center (Barnes Hospital, Central Institute for the Deaf, Children's Hospital, Jewish Hospital, Mallinckrodt Institute of Radiology and the Schools of Dentistry and Medicine), St. Louis, Missouri and Vital Cardiac Laboratories, 456 N. New Ballas Road, Creve Coeur, MO.

B. Licensed material listed in Subitem B.B. of Items 6., 7., 8., and 9. shall be used only at the Washington University School of Medicine Radiation Room, Section of Cancer Biology, Department of Radiology, 4511 Forest Park Avenue, St. Louis, MO.

11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the Radiation Safety Committee, Carlos A. Perez, M.D., Chairman.

B. Physicians designated to use licensed material in or on humans shall meet the appropriate training and experience criteria in 10 CFR Part 35, Subpart J.

C. The Radiation Protection Officer for the activities authorized by this license is John Eichling, Ph.D.

12. A. (1) Each sealed source acquired from another person and containing licensed material, other than hydrogen-3, with a half-life greater than 30 days and in any form other than gas shall be tested for contamination and/or leakage before use. In the absence of a certificate from a transferor indicting that a test has been made within 6 months before 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 materials or 10 microcuries or less of alpha emitting material.

C. Electrical interlocks on the entrance door to the irradiator room shall be tested for proper operation at least once a month. Records of test results shall be maintained for inspection by the Commission.

D. In the event of malfunction of the door interlock, the irradiation device shall be locked in the "off" condition and not used, except as may be necessary for repair or replacement of the interlock system, until the interlock system is shown to be functioning properly.

14. Prior to initiation of a treatment program, and subsequent to each source exchange for the Nucletron Corporation afterloading brachytherapy units, radiation surveys and tests shall be performed in accordance with the following:

A. (1) (a) For MicroSelectron-LDR units, a radiation survey shall be made of the irradiator source housing, with the source in the shielded position. The maximum radiation levels at 10 centimeters from the surface of the main source safe shall not exceed 1 milliroentgen per hour.

(b) For MicroSelectron-HDR and Pulsed Selectron units; a radiation survey shall be made of the irradiator source housing, with the source in the shielded position. The maximum radiation levels at 100 centimeters from the surface of the source head shall not exceed 0.25 milliroentgen per hour.

(2) For all Nucletron Corporation afterloading brachytherapy units, a radiation survey shall be made of all areas adjacent to the treatment room with source in the "irradiation" position. The survey shall clearly establish:

(a) That radiation levels in restricted areas are not likely to cause personnel exposure in excess of the limits specified in Section 20.101, Title 10, part 20, Code of Federal Regulations, Chapter 1, "Standard for Protection Against Radiation" (10 CFR 20).

B. Records of the survey results shall be maintained for inspection by the Commission.

15. The following shall be performed in accordance with the procedures outlined in the attachment to letter dated March 30, 1990, only by Conrad Granda, Anthony Abkemeier, Richard Guthrie or by persons specifically authorized by the Commission or an Agreement State to perform such services:

A. Installation and replacement of the cesium-137 sources contained in the Nucletron Corporation afterloading brachytherapy units.

23. Emergency manual afterloading of MicroSelectron cesium-137 sources into patients whose treatment has been interrupted by machine failure, shall be performed in accordance with procedures described in letter dated August 16, 1990.

24. Manual removal and replacement of cesium-137 sources, contained in the Nucletron Corporation afterloading brachytherapy units, for routine quality assurance tests shall be performed by brachytherapy physicists who have been approved by the licensee's Radiation Safety Committee to perform the tests.

25. The licensee shall not perform repairs or alterations of the irradiator involving removal of shielding or access to the licensed material. Removal, replacement, and disposal of sealed sources in the irradiator shall be performed by a person specifically licensed by the Commission or an Agreement State to perform such services.

26. The procedures contained in J.L. Shepherd and Assoc. instruction manual for the Model Mark I Series device shall be followed and a copy of this manual shall be made available to each person using or having responsibility for the use of licensed material.

27. Electrical and/or mechanical interlocks of the irradiator shall be tested for proper operation at least once every 6 months. Records of test results shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.

28. 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 April 27, 1988 (with attachments);

    B. Letters with attachments dated September 9, 1987, April 18, 1988, May 11, 1988, October 24, 1988, November 23, 1988, November 6, 1989, September 4, 1990, March 30, 1990 (with attached letter and procedures dated February 7, 1990, except Item G(4), in-house certification program), November 2, 1990, February 1, 1991 (with attachments), March 14, 1991, January 15, 1991 (with attachments), March 22, 1991 (with attachments), July 18, 1991 (with attachments), October 7, 1991, August 16, 1990, July 10, 1991, December 26, 1991 (not including Item 1), March 5, 1993, March 29, 1993 and April 2, 1993; and

MAY 14 1997

William J. Fields, Jr.
Radiation Safety Officer
Children's Mercy Hospital
2401 Gillham Road
Kansas City, MO 64108-9898

Dear Mr. Fields:

Enclosed is Amendment No. 22 to your NRC Material License No. 24-15513-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office at (630) 829-9887 so that we can provide appropriate corrections and answers.

A. Please note that we were unable to authorize Andrea Gaedigk, Ph.D., R. Russell Gotschall, M.S., Carol Moyer, B.S. and Zhaouhi Geng, M.D., M.S., as authorized users at this time because the information submitted in your letter dated February 7, 1997, was insufficient for us to complete our review. If you wish to pursue these authorizations, please address the information requested below and submit it to us as additional information to Control No. 302354. We will then continue our review, without an additional fee, limited to these authorizations. Be advised that, if you request anything other than these authorizations, an amendment fee will be required.

If necessary to permit a more timely review, you may submit the requested information for your proposed authorized users separately, addressing each as additional information to Control No. 302354.

Please address the following:

1. In order for us to approve your current and future authorized user applicants, it will be necessary for you to demonstrate that each applicant's training and experience adequately support his/her proposed use of byproduct material, with respect to the types of radionuclides and quantities to be used and specific procedures/protocols to be followed.

For example, a minimal level of training and experience would be necessary for an authorized user working with microcurie amounts of pre-labelled soft beta emitting radionuclides "in vitro," as referred to below (*).

302354

Additional training and experience in the safe handling of radioactive materials, appropriate to the type of use, would be necessary for an authorized user working with millicurie amounts of gamma-emitting microspheres "in vivo" or for an authorized user working with millicurie or curie amounts of tritium, iodine-125, carbon-14 or phosphorus-32 in labelling procedures.

Please refer to sections 16 and 17 of the enclosed Regulatory Guide 10.7 for guidance in preparing future applications. Also, the criteria in 10 CFR 33.15(b), which describe minimally acceptable training and experience (copy enclosed), may assist you (*).

Generally, please do not submit resumes or curricula vitae- use the enclosed Supplement A forms only and, if appropriate, include a brief narrative statement of explanation on a separate sheet of paper. Resumes and curricula vitae typically contain proprietary, personal information that we must then protect, in accordance with 10 CFR 2.790, as well as extraneous information which does not contribute to our evaluation of the applicant's radiation safety training and experience.

2. Specifically, each applicant will need to submit additional information, as follows:

   a. Please demonstrate that each applicant's training and experience are commensurate with his/her proposed possession and use. Please specify which radionuclides and the maximum quantities of each radionuclide that the applicant wishes to be authorized for (should be part of each radionuclide's total possession limit on the license), including waste activity.

   b. Describe in **simple** terms the types of work that the applicant wishes to perform, such as labelling compounds with volatile forms of tritium, use of pre-bound materials "in vitro," etc.

      (For future applicants only- please state whether the applicant intends to conduct "in vivo" research studies with animals. If so, please contact a license reviewer at this office to determine what additional information may be required.)

   c. Please describe **in detail** each applicant's on-the-job and formal coursework training, including the location and duration of the training and the dates when the training was received.

Training should consist of at least forty hours and cover:

(1) principles and practices of radiation protection,

(2) radioactivity measurements, standardization, and monitoring techniques,

(3) mathematics and calculations basic to the use and measurement of radioactivity,

(4) biological hazards of exposure to radiation appropriate to the type and form of byproduct material to be used, and

(5) radiation detection instrumentation.

Address each applicant's training in each of these areas on the enclosed Supplement A form, "Training and Experience." The description of prior use of licensed materials should include the specific isotopes handled, the maximum quantities of materials handled, where the experience was gained (and the facility's license number), the dates and duration of experience, the names of previous authorized users/principal investigators that the applicant worked under and the types of use.

Please prepare the requested information separately for each different facility that the applicant studied/worked at, i.e., the information for training/experience at "XYZ University" should be complete and distinct from training/experience at any other academic institution, etc.

3. For each proposed authorized user, please include the following:

a. The application for Andrea Gaedigk, Ph.D., did not indicate that sufficient radiation safety training had been obtained.

Please provide the information described in Item A.1. and Item A.2.c. above.

b. The application for R. Russell Gotschall, M.S., did not indicate that sufficient, appropriate radiation safety training and experience had been obtained.

Please provide the information described in all of Item A.1. and A.2. above.

c. The application for Carol Moyer, B.S., did not indicate that sufficient, appropriate radiation safety training and experience had been obtained.

Please provide specific information on her coursework at the University of Kansas Medical Center, in accordance with Item A.1. and A.2.c. above.

Please provide specific information about her on-the-job experience using phosphorus-32, or similar radionuclides (i.e., hard beta emitters), in accordance with Item A.2.a. and A.2.b. above.

d. The application for Zhaouhi Geng, M.D., M.S., did not indicate that sufficient, appropriate radiation safety training had been obtained.

Please provide specific information on Dr. Geng's coursework at Loma Linda University and at the University of Kansas Medical Center, in accordance with Item A.1. and A.2.c. above.

B. Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct 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; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Notify NRC, in writing, within 30 days:

a. When an authorized user or Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or

b. When the mailing address listed on the license changes. (No fee is required if the location of byproduct material remains the same.)

3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.

4. Request and obtain a license amendment before you:

   a. Receive or use byproduct material for a clinical procedure permitted under Part 35 but not permitted by your license issued pursuant to this Part;

   b. Permit anyone, except individuals described in 10 CFR 35.13(b), to work as an authorized user under the license;

   c. Change Radiation Safety Officers;

   d. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;

   e. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or

   f. Change ownership of your organization.

5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

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, or 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. Since serious consequences to employees and the public can result from failure to comply with NRC

requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Original Signed By
Colleen C. Casey
Nuclear Materials Licensing Branch

License No. 24-15513-01
Docket No. 030-09259

Enclosures:
1. Amendment No. 22
2. 10 CFR Part 33
3 10 CFR Part 2
4. NRC Form 313
5. Reg. Guide 10.7
6. Supplement A Forms

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

February 27, 1997

William J. Fields, Jr.
Radiation Safety Officer
Children's Mercy Hospital
2401 Gillham Road
Kansas City, MO 64108-9898

SUBJECT: ACKNOWLEDGEMENT OF CORRESPONDENCE
(Letter Dated 02/07/97)

Dear Licensee:

In response to your request, we have completed the initial processing, which is an administrative review of your application for a(n):

___ New License X Amendment ___ Renewal
___ Termination ___ Auth User (Amendment not required)
___ Other_____

No administrative deficiencies were identified during this initial review. However, it should be noted that a technical review may identify omissions in the submitted information.

It appears that your request is routine (see 1-3 below, as applicable).

1. New and amendment actions are normally processed within 90 days, unless we find major deficiencies, or policy issues requiring central program office assistance.

2. Renewal actions are normally processed within 180 days, however, under timely filing (before expiration), you may continue to operate under your existing license.

3. Termination actions are normally processed within 90 days, unless confirmatory surveys following decontamination/decommissioning activities are involved.

A copy of your correspondence has been forwarded to our Licensing Fee and Debt Collection Branch (301/415-6097) for approval of the fee category and amount, if required.

If you have a compelling safety or business-related reason for requesting expedited review, please contact the Materials Licensing Branch at (630) 829-9887. We will try to complete your request as soon as practicable. Any correspondence about this request should reference the control number.

Nuclear Materials Support Branch

Mail Control No. 302355
License No. 24-20415-01