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Bristol-Myers Squibb Company

P.O. Box 191 New Brunswick, NJ 08903-0191

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August 12, 2008

Licensing Assistance Team
Division of Nuclear Material Safety
U. S. Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Re: **Radioactive Material License Renewal -**
License No. 29-00139-02, Docket No. 030-05222

Dear Sir or Madam:

Enclosed for your review is a completed radioactive material license renewal application for E. R. Squibb & Sons, LLC, a wholly owned subsidiary of Bristol Myers Squibb Company. This application supersedes all previous submissions associated with this license and covers operations at the Lawrenceville, NJ; New Brunswick, NJ; and Pennington, NJ facilities.

If you require any additional information concerning this application, please contact me at michael.vala@bms.com or (732) 227-5096.

Sincerely,

Michael J. Vala

Michael J. Vala, CHP
Radiation Safety Officer

Enclosure

RECEIVED
REGION 1
2008 AUG 12 AM 10:05

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NRC FORM 313 (4-2008) 10 CFR 30, 32, 33, 34, 35, 36, 39, and 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIALS LICENSE

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 10/31/2009

Estimated burden per response to comply with this mandatory collection request: 4.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

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

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

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X

IF YOU ARE LOCATED IN:

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

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

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

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

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

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

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER
- [x] C. RENEWAL OF LICENSE NUMBER 29-00139-02

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

E. R. Squibb & Sons, LLC
One Squibb Drive
P.O. Box 191
New Brunswick, NJ 08903-0191

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

See Attached License Renewal Application

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Michael J. Vala, CHP

TELEPHONE NUMBER

(732) 227-5096

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

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

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

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

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

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

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

FEE CATEGORY | AMOUNT ENCLOSED $

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

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

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

CERTIFYING OFFICER -- TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Louis Fedele, Vice Pres., Facilities & Maintenance		

FOR NRC USE ONLY

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

Item #3 - Addresses where licensed material will be used or possessed

One Squibb Drive, P.O. Box 191
New Brunswick, NJ 08903-0191

Route 206 & Provinceline Road
Lawrenceville, NJ 08540

311 Pennington-Rocky Hill Road
Pennington, NJ 08534

Items #5 and #6 - Radioactive Materials Data

Any byproduct material with an atomic numbers 1 through 83, except Strontium 90	Any	100 millicuries per radionuclide and 2 Curies total	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	New Brunswick
Hydrogen 3	Any	20 Curies	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments; preparation and distribution of radioactive drugs to authorized recipients in accordance with 10 CFR 32.72	New Brunswick
Carbon 14	Any	20 Curies	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the	New Brunswick

			licensee's instruments; preparation and distribution of radioactive drugs to authorized recipients in accordance with 10 CFR 32.72	
Strontium 90	Any	2 millicuries	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	New Brunswick
Any byproduct material with an atomic numbers 84 through 103	Any	1 millicurie	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	New Brunswick
Nickel 63	Foil or plated sources registered with the USNRC 10 CFR 32.210 or an Agreement State	No single source to exceed the maximum activity specified in the certificate of registration issued by the USNRC or Agreement State	For sample analysis in compatible gas chromatography devices that have been registered with either the USNRC under 10 CFR 32.210 or an Agreement State.	New Brunswick, Lawrenceville, Pennington
Any byproduct material with an atomic numbers 1 through 83, except Strontium 90	Any	100 millicuries per radionuclide and 2 Curies total	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Lawrenceville
Hydrogen 3	Any	250 Curies	Research and	Lawrenceville

			development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments; preparation and distribution of radioactive drugs to authorized recipients in accordance with 10 CFR 32.72	
Carbon 14	Any	25 Curies	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments; preparation and distribution of radioactive drugs to authorized recipients in accordance with 10 CFR 32.72	Lawrenceville
Phosphorous 33	Any	1 Curie	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Lawrenceville
Sulfur 35	Any	10 Curies	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Lawrenceville
Iodine 125	Any	500 millicuries	Research and	Lawrenceville

[redacted]

			development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	
Technetium 99m	Any	750 millicuries	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Lawrenceville
Cesium 137	(b)(4)	No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the USNRC or an Agreement State	For irradiation of materials in registered self-shielded irradiator devices	Lawrenceville
Any byproduct material with an atomic numbers 1 through 83, except Strontium 90	Any	100 millicuries per radionuclide and 2 Curies total	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Pennington
Hydrogen 3	Any	1 Curie	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Pennington

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[redacted]

Carbon 14	Any	1 Curie	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Pennington
Sulfur 35	Any	300 millicuries	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Pennington
Calcium 45	Any	300 millicuries	Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments	Pennington

Item #7 – Individuals Responsible for the Radiation Safety Program and Their Training and Experience

The designated Radiation Safety Officer (RSO) is currently Michael J. Vala, CHP, Manager, Environment, Health & Safety. The management executive for licensed activities is Louis Fedele, Vice President, Facilities. The RSO ultimately reports to the management executive as illustrated in Attachment #1. The RSO is supported by Radiation Safety Supervisors and technicians. As a broad scope licensee, the Radiation Safety Committee (RSC) works with the RSO and management to implement the radiation safety program. The RSC is composed of the RSO, a management representative, and members which represent major areas of radioactive material use who are trained and experienced in the safe use of radioactive materials. The major activities of the RSC include, but are not necessarily limited to the following items:

- Establish and periodically update policy and programs that will maintain radiation doses to all employees and the general public to levels As Low As Reasonably Achievable (ALARA).

- Approve the procurement and use of all sources of ionizing radiation materials and the users of such materials.
- Ensure that the disposal of radioactive waste meets Federal, State, and local requirements.
- Provide guidance, support and authorization to the Radiation Safety Officer (RSO) in the planning and daily administration of the radiation safety program.
- Conduct periodic reviews of the radiation safety program, initiate corrective action based on the findings, verify program implementation and training/retraining of personnel involved with the use of ionizing radiation.
- Conduct periodic reviews of personnel dosimetry data, radiation survey results, and other data collected to document the radiation safety program.
- Review deviations from established procedures and unplanned events to prevent recurrences.
- Meet quarterly, at a minimum.
- Periodically review the member representation of the Committee, and formally approve new members.
- Publish the minutes of each meeting.

Current Membership of the RSC

Craig Woodard*	Director	Corporate EHS
Alban Allentoff	Principal Scientist	Radiochemical Synthesis
Patrick Chow	Research Investigator	Bio Imaging
Ramaswamy Iyer	Group Leader	Biotransformation
Jonathan Lippy	Senior Research Scientist	LEAD Discovery
Ning Lee	Sr. Research Investigator II	Discovery Biology - HPW
James Pooler**	Sr. Environmental Counsel	Corporate Legal
Marlene Rathnum	Associate Director	R&D Administration
Dawn Stetsko	Senior Research Scientist	Discovery Biology - LV
Michael J. Vala	Radiation Safety Officer	Environment, Health & Safety

*- Committee Chairman
** - Ad hoc member; is a resource to the RSC, as needed, for any topics that require legal expertise.

See Attachment #2 for the current RSC member's resumes.

Review and Approval of Principle Users of Licensed Material

All principle users of radioactive materials are approved by the Radiation Safety Committee. Before any use of licensed material is approved, a user must complete an application that identifies how the material will used. The application is completed by the Principal Radiation User (PRU) who is typically

the laboratory supervisor or senior scientist. Coworkers are included on the application as additional users. All users of licensed material are required to participate in the initial radiation safety training and subsequent refresher training. Additional training may be provided as appropriate.

Information on the PRU application includes:

- Radionuclide(s) to be used
- Chemical and physical form of the licensed material
- Total activity per experiment
- Total activity per purchase
- Total possession limit
- Storage location for the licensed material
- Whether the material will be transferred to or from another facility or PRU
- Whether the material will used in human or animal studies
- Non-radiological hazards
- Physical condition under which the material will be processed
- Safety and ancillary equipment that is available
- Radiation detection equipment available for use
- Types of waste that will be generated

The Radiation Safety Supervisor will review the application for completeness and perform a laboratory evaluation to verify adequate equipment and facilities. The application will typically be presented at the next RSC meeting for approval. The RSC authorization is valid for two (2) years. In addition, the Radiation Safety Supervisors in the Radiation Safety Group can grant a temporary 90 day approval for requests of less than 10 millicuries of total radioactive material.

Upon approval of the authorization to use radioactive materials, the EHS – Radiation Safety Department will issue a *Radioactive Material Use Permit* to the PRU. The PRU will ensure that the individuals listed on their application are appropriately trained prior to handling radioactive materials, survey their work area as appropriate, and utilize personal protective equipment as required.

Radiation Safety Officer Responsibilities And Training

The Radiation Safety Officer is responsible for:

- Ensuring compliance with all applicable regulations of the Nuclear Regulatory Commission, the State of New Jersey, and the conditions of all licenses.
- Managing the implementation of all aspects of the radiation protection program.
- Ensuring there is adequate staff to perform all radiation protection tasks.
- Preparing or reviewing safety evaluations prepared by members of his/her staff of all proposed uses of radioactive materials.

- Temporarily approving new uses and users of radioactive materials and radiation producing machines as outlined in the licenses.
- Ensuring procedures are prepared for conducting selected aspects of the radiation protection program.
- Administering the radioactive waste disposal program.
- Administering the radiological training program for all occupational radiation workers.
- Ensuring the ALARA principles are incorporated into the radiation protection program.

See Attachment #3 for the Radiation Safety Officer Delegation of Authority. The RSO is an individual who, by virtue of education and/or experience in Health Physics is qualified to oversee the functions of the Radiation Safety Group. The RSO maintains his/her qualifications by keeping abreast of current developments in the field of Health Physics by attendance at professional meetings, refresher training courses, and review and study of articles published in professional journals in Health Physics and radiation safety. He/she oversees the development and the conduct of the training and refresher training course for all personnel involved with licensed activities.

The RSO is knowledgeable of all the facility systems used for handling radioactive materials. This individual is familiar with the design parameters and capabilities of these systems and conducts design reviews and makes recommendations for all new facilities and modifications to existing facilities that may affect the operation or release of radioactive materials to the environment.

Radiation Safety Staff Responsibilities and Training

The RSO and the Radiation Safety Program is supported by Radiation Safety Supervisors and technicians. The supervisors are professionals who are in the same category as the RSO since they are qualified by virtue of their education and/or experience to perform their duties as supervisors. They also maintain their qualifications by attendance at professional meetings, refresher training courses, and review of related articles in professional journals. They develop and conduct training for all personnel involved with licensed activities. The technicians are qualified by education and experience to perform all functions as directed by supervision including; making routine and special radiation surveys, making routine and special smear surveys for contamination, taking routine and special air samples as required, counting of samples on laboratory equipment, and bringing to the attention of supervision any unusual conditions pertaining to radiological safety.

Item #8 – Training for Individuals Working In or Frequenting Restricted Areas

Individuals working or frequenting restricted areas are required to be trained in the safe handling of licensed materials and in maintaining their exposure as low as reasonably achievable. Function specific training is provided each calendar year for users of licensed material and triennially for support personnel that service areas where licensed material is present. Initial training is instructor led sessions for users of licensed material. Refresher training for users of licensed material may be either instructor led or in electronic format. Initial and refresher training for support staff may be either instructor led or in electronic format. Training programs may include, but are not limited to, the following topics:

Radiation And Radioactivity

- Atomic structure
- Types of radiation
- Characteristics of ionizing radiation
  - Sources
  - Man made sources

Biological Effects Of Ionizing Radiation

- Risks associated with exposure to radiation
- Effects on man
- Pregnancy and radiation exposure

Measurement And Control

- Instrumentation
- Time
- Distance
- Shielding
- Contamination controls
- Decontamination procedures
- Personnel monitoring
  - Bioassay
  - Frisking
  - Dosimetry
  - Whole body counting
- Air monitoring
- Protective clothing

Radiation Protection Program

- Radiation protection standards
  - NRC
  - State of New Jersey
  - DOT
- Exposure limits
  - Visitors
  - Occupational workers
  - Declared pregnancy
  - General public

- License activities
- ALARA
- Radiation Safety Committee
- Radiation Safety/Health Physics
- Individual responsibilities
- Group responsibilities
- Warning signs and labels
- Control of restricted areas
  - Security
- Radiation surveys
- Standard operating procedure

Emergency Procedures

- Small Spill (≤ 1 millicurie)
- Large Spill (> 1 millicurie)
- Alarms
- Medical Treatment
- Telephone numbers of safety personnel

Radioactive Waste

- Classification
- Segregation
- Collection
- Disposal

Radioactive Material Use

- Authorized user
- Purchase
- Receipt
- Transfer and/or shipment

Documentation of all training will be maintained in a database and include, but not necessarily be limited to:

- List of attendees
- Instructor
- Organization trained
- Date of training
- Topics discussed

Item # 9 – Facilities and Equipment

All three licensed sites maintain perimeter security twenty-four hours a day, seven days a week, to prevent unauthorized access. Additional access controls and monitoring are utilized in specialized facilities such as waste consolidation rooms,

high use laboratories and animal facilities. The receipt, processing and storage of licensed material at each site is controlled in a manner to prevent accessibility to unauthorized use.

Laboratory Facilities

Laboratories utilizing licensed material are extensive at the Lawrenceville and Pennington facilities. The majority of areas where licensed materials are used are general purpose biological laboratories. Depending on the type of research being conducted, these laboratories may include pre-filter, HEPA and carbon filters within selected fume hood exhaust systems. All laboratory areas where licensed materials are used or stored have fume hoods and containment ventilation systems available that utilize non-recirculating air. The criteria in NRC NUREG 1556, Volume 11, Appendix L are reviewed and considered for laboratory construction and/or renovation.

Radiochemistry Suites

Radiochemistry suites are located at the Lawrenceville and New Brunswick facilities. These suites were specifically designed for labeling compounds with C^{14} and H^3 and are equipped with HEPA and charcoal exhaust filtration. Work surfaces and flooring are impermeable or resistant to spills and fume hood decks have coved corners to facilitate decontamination.

Waste Facilities

Lawrenceville, New Brunswick and Pennington each have an area designated for radioactive waste management. These ventilated areas are specifically designed for this purpose and are used to consolidate, stage, and decay radioactive waste. They are secured from unauthorized access when unattended via an electronic access system. Waste Management activities are discussed in Item #11.

Self-Shielded Irradiators

Two self shielded irradiators are located at the Lawrenceville facility and operated in accordance with NUREG-1556, Volume 5. Each irradiator is registered as an approved Sealed Source & Device per the State of California. The irradiators currently possessed are:

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(b)(4)

The following program is in place to ensure the compliant utilization of this equipment:

- The irradiator safety program will be reviewed as part of the annual radiation safety program review conducted by the Radiation Safety Committee.
- An appropriate radiation detection instrument, calibrated on annual basis by a licensed contractor, will be available for use with the irradiators. The instruments will be checked weekly with a radioactive source to verify operation.
- The two irradiators contain a total of (b)(4) and will be used as designed and in accordance with the manufacturer's instructions and recommendations for the irradiation of materials, excluding explosive and flammable materials.
- Authorized users will be trained and tested prior to use of the irradiators in the topics outlined in Appendix G of NUREG-1556, Volume 5.
- Ancillary personnel (i.e. maintenance, housekeeping staff) are provided awareness training commensurate with their responsibilities, including general radiation safety concepts, recognition of radiation warning symbols, and key contact personnel for assistance.
- (b)(4) (b)(4) In addition, a key is required to operate the irradiator control panel. The key is stored in a secure location. The areas where the irradiators are located are protected with automatic fire detection (smoke and heat sensors) and control systems (sprinklers). The floors of these areas are adequate to support the weight of the irradiators.
- Quarterly NVLAP approved dosimetry will be provided to all authorized irradiator users to monitor any occupational radiation exposure.
- Dose to the public from the irradiators is less than 100 millirem per year and will be verified by routine radiation surveys.
- The operating manual, including emergency procedures, for each irradiator is located in the room by the control panel of each irradiator. A posting with emergency contact information is located in each irradiator room. The Lawrenceville site Crisis Management Plan covers numerous contingencies that may impact the facility, including fire, hazardous material incidents, and severe weather conditions.
- To verify proper operation of the irradiator safety systems, the source interlock, door interlock, and source rod system will be tested every six months in accordance to the manufacturer's instructions and recommendations.
- Physical accountability and leak testing on the irradiators will be performed every six months in accordance with the manufacturer's instructions and NRC requirements.
- Maintenance on the irradiators that involve the source, source drive mechanism, or removing the shielding or source, any safety related equipment, or any other activities during which personnel could receive radiation doses exceeding NRC limits will be performed by the manufacturer. Routine maintenance (as defined in NRC NUREG 1556, Volume 5, Section

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8.10.8) may be performed by the manufacturer or the licensee in accordance with the manufacturer's instructions and recommendations. All non-routine maintenance will be performed by the manufacturer.

Item #10 – Radiation Safety Program

Management and RSC Audits

Audits of the radiation safety program will be conducted by the RSC each calendar year. The audit process follows the recommendations of NRC NUREG 1556, Volume 11, Appendix M unless the RSC mandates an alternative approach. The findings will be reviewed by the RSC, RSO and management. Modifications to the radiation safety program based upon the audit results will be made as appropriate.

The RSC is also informed of regulatory requirements and operating procedures through routine meetings and correspondence with the EHS – Radiation Safety staff.

RSO and Staff Audits

The RSO or Radiation Safety Supervisors perform audits of radiation safety practices in areas where licensed material is used. These are typically performed quarterly and the results are recorded and presented to the RSC. The purpose of these audits is to ensure users are handling radioactive material safely and are complying with all terms and conditions of the site license and standard operating procedures.

The frequency of routine monitoring surveys performed by EHS – Radiation Safety staff is based upon the radionuclides, amount, and activities in accordance with the recommendations of NRC NUREG 1556, Volume 11, Appendix S. The monitoring consists of surface contamination monitoring and radiation dose rate surveys where appropriate. Smear surveys are quantified using instrumentation suitable for the radionuclides present.

Control of Procurement and Use

The RSC is responsible for assuring that all operations involving licensed materials are carried out in conformance with our overall radiation safety program which is administered and enforced by the RSO and the EHS – Radiation Safety staff. The committee has the authority and responsibility to approve or disapprove all proposals for radioactive material use prior to the purchase of the materials, and to review the facilities and generic uses of licensed materials prior to their use. The committee has delegated the RSO and his designees the

responsibility and authority to temporarily approve individual uses and users of licensed material up to ten millicuries for ninety days or less.

All purchases of licensed material are reviewed and approved by the EHS – Radiation Safety staff prior to processing. The review and approval process includes verifying that person requesting the purchase is authorized to use the licensed material ordered.

The Principle Radiation User (PRU) will provide a physical inventory of radioactive material possessed under their permit (including waste) to the EHS – Radiation Safety Department as requested, typically twice per year. The PRU will ensure that requests to purchase licensed material by individuals listed on the permit application comply with isotope and quantity limitations of their permit. The PRU shall ensure that radioactive material under their control is secured to prevent unauthorized access or removal from storage. The PRU will also ensure that constant surveillance and control is maintained over radioactive material when it is being used (i.e. not in storage). Operational contamination surveys will be performed as practical on days when unsealed licensed material is used. Any area identified as contaminated must be promptly addressed.

The PRU will notify the EHS – Radiation Safety staff via email of any changes to the permit information. This includes the list of individuals listed in the permit, the location(s) where radioactivity will be used, and the chemical form. Any request to modify the quantity limitations per experiment, purchase, and total possession, or the addition of a new isotope, will require the approval of the RSC. If PRUs do not wish to renew their permit, or choose to terminate their permit prior to expiration, they must ensure that the radioactive material inventory possessed under their permit is either transferred to another PRU or disposed as waste.

Emergency Procedures

All occupational employees are trained in emergency procedures as part of their initial and refresher radiation safety training. Emergencies may include equipment failures, fires, spills, and site incidents. Emergency procedures for minor spills and major spills are posted in areas where licensed material is utilized.

Minor spills, typically less than or equal to one millicurie, in a controlled area, are addressed by the user. EHS – Radiation Safety is notified by the user to provide assistance if needed, and to verify the decontamination effort. Major spills, typically greater than a millicurie in a controlled area, or any spill in a non-controlled area, or a spill that results in personnel contamination require immediate notification of EHS – Radiation Safety and/or the site emergency response number. The remediation of a major spill is managed by EHS – Radiation Safety. If the spill also involves other hazards such as hazardous

chemicals or fire, EHS – Radiation Safety will act as an advisor to the site emergency response team in dealing with the radiological component of the incident.

All three licensed sites (Lawrenceville, New Brunswick, and Pennington) have comprehensive emergency response teams made up of qualified employees from EHS, and trained volunteers from other departments. These teams are trained to respond to medical, fire, and hazardous spills at their sites. The emergency response teams are activated by Security or the site incident commander.

The Security Department monitors all three licensed sites twenty-four hours a day, seven days a week. In an event of an emergency during off hours at a site, the Security Department has contact information of the RSO and Radiation Safety Supervisors. Radiation Safety personnel can assist Security staff over the phone to assess or stabilize the situation, and if necessary, respond to the site.

Operating and Handling Procedures

Each occupational worker is trained on the appropriate procedures in radiation safety for that person's job function before they work alone with radioactive material. In addition, support personnel are trained at an awareness level to recognize licensed material and to initiate emergency response interventions if necessary. Occupational workers who come in contact with licensed material are instructed to abide by the following radiation protection precautions to ensure the safe use of such material as well as his/her safety:

- All users and uses of licensed material must be approved by the Radiation Safety Officer and/or the Radiation Safety Committee. Each operating department must notify the EHS - Radiation Safety Department when an occupational worker is hired, transferred or terminated.
- Wear safety glasses with side shields, laboratory coat or other protective equipment, as necessary, when working with licensed material.
- Wear disposable gloves at all times while handling licensed materials.
- Do not eat, drink, smoke, apply cosmetics, chew gum, store food or beverages in any area where licensed materials are used or stored.
- If assigned, wear personnel monitoring devices while in restricted areas where licensed materials are stored or utilized.
- Do not pipette by mouth.
- Segregate, collect, store, package and dispose of radioactive waste according to approved radioactive waste disposal procedures.
- Do not discard radiation warning labels, tape or cartons marked as radioactive in an unrestricted area unless the radiation labels or tape is defaced. Radiation labeled cartons must be surveyed. If found free of contamination, they should be labeled as such.

- Do not discard radioactive aqueous solutions into the sanitary sewage system unless approved by EHS – Radiation Safety in advance. All radioactive aqueous waste for release into a site's POTW must be soluble.
- Assure that all radioactive materials in storage bear a radiation warning label specifying isotope, date, and amount of activity.
- Survey their work areas as practical for contamination during the processing and after completing each assignment. All contaminated surfaces must be cleaned and rechecked.
- Obtain approval from EHS – Radiation Safety prior to all purchases and transfer of radioactive materials.
- Do not use refrigerators and freezers both for food and radioactive materials.
- Use absorbent covering and spill trays in fume hoods and on lab benches where radioactive materials are stored or whenever possible.
- Remove all non-essential paperwork and equipment from areas where licensed materials are handled or processed.
- Open and process radioactive substances only in ventilated enclosures.
- Store and process radioactive materials only in areas approved by EHS – Radiation Safety.
- Monitor gloves, clothing, equipment, and work surfaces as appropriate. Change or clean when contaminated.
- Use extended reach equipment (e.g., tongs, forceps, "Grabbers", etc.) when handling concentrated sources of beta/gamma emitting radioactive materials such as P^{32}, Cr^{51}, Ca^{45}, F^{18}, Na^{22}.
- Notify EHS before instituting procedures that involve the use of larger quantities of radioactive materials, new isotopes, added risks of contamination, volatilization and/or exposure.
- Promptly report any abnormal occurrences, spills, or deviations involving potential exposure and contamination to EHS – Radiation Safety.
- Transport radioactive materials between laboratories or to the waste disposal area in labeled, closed, protected containers.
- Use an approved ventilated enclosure for all work with radioactive materials that involve grinding, mixing of powders, production of gases or aerosols,. The sash of a radiological enclosure should be closed when not in use.
- All occupational workers must receive initial radiation training prior to the use of radioactive material, and attend refresher training annually.
- Plan ahead to minimize time spent handling radioactivity. Perform a dry run without the use of radioactive material prior to start of a new experiment or process.

Sealed Sources

Sealed sources containing greater than 100 microcuries of a beta/gamma emitter (except H^3) or 10 microcuries of an alpha emitter will be tested for leakage and/or

contamination every six months by EHS – Radiation Safety staff in accordance with NRC NUREG 1556, Volume 11, Appendix T. Records of leak testing results will be documented and maintained. All repairs, alterations or removal of a source from its enclosure will only be performed by persons specifically licensed by the NRC or an agreement state.

Package Receipt

The external surfaces of all incoming packages labeled with a Department of Transportation Radioactive White–I, Yellow-II, or Yellow-III label will be monitored for removable contamination and exposure rate at the package surface and at one meter. All other packages containing licensed material will be monitored for removable contamination and exposure rate only if the package is damaged and/or leaking. Packages are opened in accordance with the guidance in NRC NUREG 1556, Volume 11, Appendix P.

Pregnant Workers

Each female occupational worker is urged to notify the company when she becomes pregnant. If she chooses, declaration of pregnancy is to be made by the employee to the EHS - Radiation Safety, Medical and/or her supervisor. Once pregnancy has been declared in writing, the occupational worker will be limited to a 500 millirem dose to the embryo/fetus. If possible, the dose to the embryo/fetus will be limited to no more than 50 millirem per month.

Offices within Controlled Area

All offices within radioactive material laboratories are considered controlled areas.

Respiratory Protection

Respiratory protection equipment may be required to reduce the possibility of individuals inhaling radioactive materials. Respiratory protection equipment is not normally used but is available in the event of emergencies requiring access to areas in which licensed material may have become airborne. Work on highly contaminated equipment may also require the use of respirators. Respiratory protection devices may consist of half face masks, full face masks, or supplied air breathing apparatus. Use of such equipment is determined by either the RSO or Industrial Hygiene staff. Persons must be trained and be medically certified that they are physically able to use a respirator prior to their use.

Licensed Material Inventory and Accountability

Licensed materials are controlled by maintaining records and procedures to ensure accountability at all times. All receipts of licensed material are logged into the

site's inventory. All site licensed material inventories are maintained by EHS - Radiation Safety staff. Records indicate total site possession, responsible person, location of material, date delivered, and the method of material disposition.

Personnel Monitoring Procedures

Individuals working with licensed materials are expected to maintain their dose As Low As Reasonably Achievable (ALARA). Employee training, the proper design and use of engineered and administrative controls, and advance planning are keys to maintaining doses ALARA.

External Radiation Exposure

All restricted licensed material areas will be evaluated by the RSO, including personnel designated by the RSO, to determine if individuals in these areas require personal dosimetry. In general, individuals that utilize millicurie quantities of beta/gamma/positron emitting radionuclides (e.g. P^{32}, I^{125}, Cr^{51}) are issued a whole body dosimeter and, if needed, extremity dosimetry. If dosimetry is required, it is issued by EHS – Radiation Safety to the individual. Dosimetry cannot be shared. Only a NVLAP approved contractor will be used to provide dosimetry services. Currently, TLD badges and rings supplied by Mirion Technologies Dosimetry Services are utilized.

Personnel Contamination

In addition to the personnel monitoring performed by the use of TLD badges as noted in the previous section, personnel must also be monitored for contamination. This is performed by the use hand held detectors which the individual slowly moves over the hands, feet, and the rest of his/her body. In some cases whole body "friskers" or hand/foot monitors may be used. Each laboratory in which radioactive work is performed has radiation detectors located at a convenient location for the scientists to monitor themselves upon exiting their laboratory.

Internal Radiation Exposure

If the intake of licensed materials by an employee is likely to exceed 10% of the Annual Limit of Intake (ALI), the resulting internal dose will be evaluated. The majority of occupational radiation workers are not expected to exceed this level. Employees who are expected to exceed 10% of the ALI of a specific radionuclide will be monitored to evaluate their intake, typically by bioassay. Methods of bioassay include thyroid monitoring, urine sampling and whole body counting. In addition to internal dose assessment, bioassay results may be used as a quality assurance tool to verify the effectiveness of work practices, and engineering or administrative controls.

Radiation Detection Equipment

Various types of equipment are used to perform the necessary surveillance, counting and monitoring functions throughout the licensed facilities. Sufficient laboratory and field instrumentation is available for this purpose.

Portable Instruments

Survey instruments consist of geiger-mueller (G-M) tubes, ionization chambers and a variety of solid state detectors. These detectors are connected to various types of scalars or ratemeters and can detect levels of radiation across a wide range of rates, from microRem per hour to tens of Rem per hour.

There are sufficient numbers of beta-gamma survey instruments available for use by EHS - Radiation Safety and laboratory personnel. The majority of the instruments are manufactured by Ludlum or Victoreen, and consist of pancake type thin window detectors for low levels of contamination, ion chambers for low to high levels of radiation, and other G-M tubes, and solid scintillators for the ranges of energies and dose rates encountered. The detectors are connected to either scalars or ratemeters depending on their use.

All portable survey meters used by the EHS - Radiation Safety Department are calibrated annually and operational checks are performed the first time an instrument is used in any given week. These checks are performed with standard sources appropriate for the radioisotopes to be detected by the specific instrument.

Area Monitors

Area monitors are designed to provide a continuous indication of the ambient radiation levels within an area. Currently area monitors are only in use in the K1 Bio Imaging Laboratory at the Lawrenceville facility. These monitors have local readout and alarm capability in addition to having the capacity for remote readouts and alarms. Area radiation monitors are normally set to alarm at a preset rate. They can however be designed to alarm when a specified integrated dose is received. The detectors are chosen to respond primarily to gamma radiation, but can also be adjusted to respond to high energy beta particles. As with all instrumentation, the area radiation monitors are calibrated annually.

Laboratory Equipment

The primary laboratory counting equipment consists of liquid scintillation counters. These counters are used for the analysis of various samples containing low energy beta emitters, including contamination smears and experimental samples. All laboratory instrumentation is calibrated on a routine basis and documented.

Instrument Calibration

All portable radiation detection instrumentation is calibrated annually by a vendor specifically licensed to perform instrument calibrations. The instruments are marked with the calibration date and the calibration certificates are reviewed and maintained by EHS – Radiation Safety. The current vendor providing calibration services is Antkowiak and Mahoney Enterprises, Inc., 3 Valley Court, Chester, New York.

Item #11 – Waste Disposal

Radioactive waste is generated in the normal course of research and development activities. This waste may consist of solids, liquids, biologicals, or mixed radioactive/hazardous waste (mixed waste). Waste is sorted at the point of generation into separate containers based upon its form, half-life, and intended treatment and/or disposal option.

Storage for Decay

Waste containing licensed material with half-lives less than 100 days may be held for radioactive decay. Waste held for decay will be held in storage until the radiation levels cannot be distinguished from background. The unshielded waste will be monitored at the container's surface utilizing a monitor sensitive to the radionuclides identified in the waste. The monitor will be set on its lowest scale and the waste will be monitored in a low background area. Radiation labels on the waste will be removed or defaced prior to non-radioactive disposal. Records of the survey meter used, the results for each container and the ambient background will be documented.

Radioactive Waste Management

Waste not held for decay is consolidated into Department of Transportation approved containers in a designated waste management area at each of the three licensed sites. These containers are staged for shipment to a licensed commercial treatment facility. Currently, non-hazardous radioactive waste is shipped to Energy Solutions in Oak Ridge, Tennessee for sorting, compaction, and/or incineration prior to shipment to a low level radioactive waste disposal facility.

Mixed Waste Management

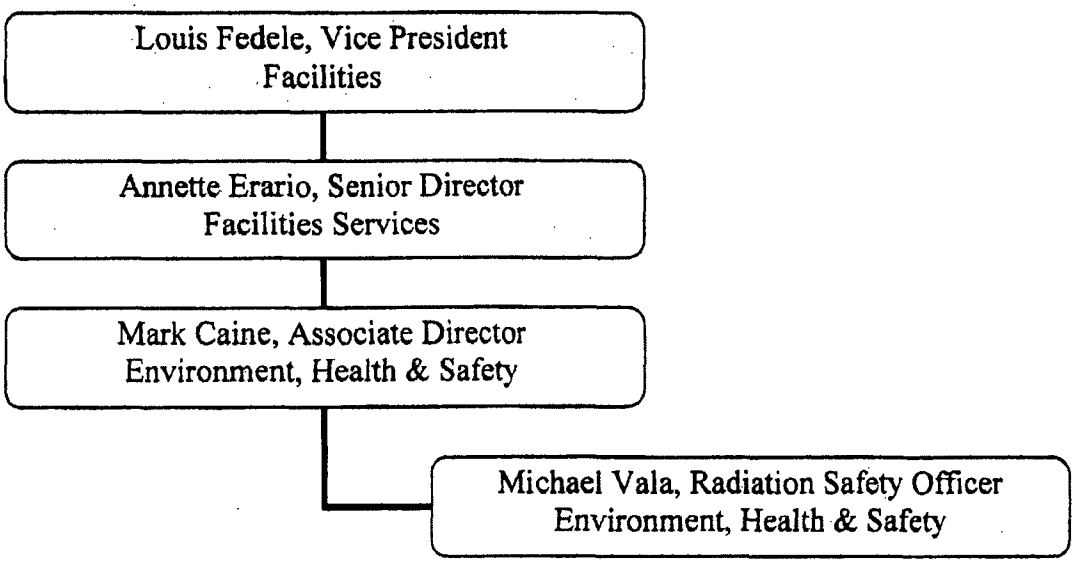
Mixed waste is shipped to a licensed commercial waste facility with a RCRA Part B TSDF permit for treatment and disposal. Currently mixed waste is shipped to NSSI of Houston, Texas. If mixed waste cannot be shipped within 90 days for disposal, the New Brunswick facility possesses a Part B RCRA permit for the storage of mixed waste for greater than

ninety days. The permit allows waste from the Lawrenceville and Pennington sites to be transferred to New Brunswick for storage only.

Releases to the Sanitary Sewer

Soluble, non-hazardous radioactive liquid waste may be released to the sanitary sewer within the limits of NJAC 7:28, 10 CFR Part 20, and each facility's discharge permit with their local Sewer Authority. Currently, there are no routine releases to the sanitary sewer. Should this program resume, all releases to the sanitary sewer will be under the control of the EHS – Radiation Safety staff. A designated central release point for each site will be identified for these releases. Individual laboratories are not permitted to release any licensed material from their laboratory sinks unless specifically authorized by the RSC.

Attachment #1 – Facilities Organizational Chart



Attachment #2 – RSC Member Resumes

Alban Allentoff	Principal Scientist	Radiochemical Synthesis
Patrick Chow	Research Investigator	Bio Imaging
Ramaswamy Iyer	Group Leader	Biotransformation
Jonathan Lippy	Senior Research Scientist	LEAD Discovery
Ning Lee	Sr. Research Investigator II	Discovery Biology - HPW
James Pooler	Sr. Environmental Counsel	Corporate Legal
Marlene Rathnum	Associate Director	R&D Administration
Dawn Stetsko	Senior Research Scientist	Discovery Biology - LV
Michael J. Vala	Radiation Safety Officer	Environment, Health & Safety
Craig Woodard	Director	Corporate EHS

Alban J. Allentoff

Bristol Myers Squibb Co.
Radiochemical Synthesis
Department of Chemical Synthesis
Building 107/2554
One Squibb Drive
New Brunswick, NJ 08903
(732) 227-6634
Alban.Allentoff@bms.com

[redacted]

EX. 6

EDUCATION:

Brandeis University
Waltham, Massachusetts
Ph.D., Organic Chemistry, (b)(6)

University of Rochester
Rochester, New York
B.A., Chemistry (b)(6)

EXPERIENCE:

Priniciple Scientist, Radiochemical Synthesis, Department of Chemical Synthesis
Bristol Myers Squibb Co., New Brunswick, New Jersey
September 2005 - present

- Planning, development, and execution of syntheses of radiolabeled (^{14}C) drug candidates, and stable-labeled (^{13}C and ^{2}H) MS internal standards for use in preclinical and human ADME studies.
- Overseeing scheduling and project prioritization for radiochemical synthesis support of Oncology and Immunology therapeutic areas.
- Supervise and mentor associates performing laboratory synthetic work.

Fellow, Isotope Laboratory, Drug Metabolism and Pharmacokinetics
Novartis Pharmaceuticals, East Hanover, New Jersey
July 2001- August 2005

- Planning, development, and execution of syntheses of radiolabeled (^{14}C and ^{3}H) drug candidates, and stable-labeled (^{13}C and ^{2}H) MS internal standards; expertise in NMR, HPLC (analytical and preparative scale), microscale reactions, inert atmosphere techniques, and tritium gas labeling technology.
- Synthesis of labeled inhibitors, antagonists, and peptides for drug candidate screening processes

- Development and application of new radiochemical synthetic methods to pharmaceuticals, especially palladium-catalyzed cyanation reactions, and iridium-catalyzed tritiations.

- Drug metabolite structure identification and metabolism pathway elucidation.

- Represent the Isotope Laboratory on the Novartis Radiation Safety Committee.

International Project Team Representative
Novartis Pharmaceuticals, East hanover, New Jersey
December, 1997 - February, 1999

- Represented the Preclinical Safety line function on the international project team of a key project in the arthritis/inflammation therapeutic area from the early selection phase through initiation of Phase I.

- Coordinated key project-related activities within Preclinical Safety including Toxicology/Pathology studies, Metabolism and pharmacokinetic investigations, and Allometric scaling of animal pharmacokinetic data.

Senior Scientist II, Drug Metabolism and Pharmacokinetics
Novartis Pharmaceuticals, East Hanover, New Jersey
December, 1995 - June 2001

Research Scientist II, Drug Metabolism and Exploratory Toxicology, Ciba Pharmaceutical Division
February, 1994 - December 1995

Postdoctoral Research under the guidance of Professor John A. Thompson
School of Pharmacy, University of Colorado
May, 1990 - January, 1994

- Bio-organic Chemistry, Metabolism Chemistry, Molecular Toxicology. Studied the mechanism of the oxidative metabolism of drugs and chemicals by cytochrome P450 and other hemeproteins.

- Analytics of oxidative metabolites (especially hydroperoxides) derived from biomatrices.

Doctoral Research under the guidance of Professor Barry B. Snider
Brandeis University, Waltham, Massachusetts
May 1986 - April 1990

- Synthetic Organic Chemistry, methods development, total synthesis. Thesis Title: Intramolecular [2 + 2] cycloadditions of vinylketenes to alkenes.

- Application of the intramolecular [2 + 2] cycloaddition of vinylketenes to the synthesis of taxane diterpenes.

Graduate Teaching Assistant in Organic Chemistry
September, 1985 - May, 1988
Brandeis University, Waltham, Massachusetts

- Responsible for teaching Organic and General Laboratory courses.

Laboratory Technician
March, 1985 - August, 1985
Eastman Kodak Company
Rochester, New York

- Performed quality control analysis on products and production materials.

AWARDS:

Leadership Excellence Award, September 1999
For efficiently coordinating the Preclincial Safety activities of a key Novartis project from the early selection stage through Phase I clinical trial.

Novartis Business Excellence Award, May 2001
For playing a key role in the increased productivity and efficiency of the Novartis Isotope Laboratory (US) during the year 2000.

PROFESSIONAL AFFILIATIONS:

American Chemical Society (On the executive committee of the North Jersey Chapter of the Organic Topical Division 2000-2001)

International Isotope Society

PUBLICATIONS:

"Stable Isotope Enrichment Measurement by Mass Spectrometry (MS): Effect of an Electrochemical Reaction to MS Ion Intensity." Wu, A, Markus, B., Allentoff, A., Ray, T. *Synthesis and Applications of Isotopically Labelled Compounds*, **2004**, 8, 403.

"Iridium-Catalyzed Direct Tritium Labeling: Synthesis of a Tritium Labeled CCR-3 Inhibitor." Allentoff, A., Wu, A., Ray, T. *Synthesis and Applications of Isotopically Labelled Compounds*, **2004**, 8, 439.

"Comparisons of Hydroperoxide Isomerase and Monooxygenase Activities of Cytochrome P450 for Conversions of Allylic Hydroperoxides and Alchohols to Epoxyalcohols and Diols: Probing Substrate Reorientation in the Active Site" Kupfner, R., Liu, S.Y., Allentoff, A.J., Thompson, J.A. *Biochemistry*, **2001** *40*, 11490.

"Copper(I) Iodide Enhanced Reactivity of Aryl Iodides with [^{14}C]KCN in Palladium-Catalyzed Cyanations." Allentoff, A., Markus, B., Wu, A., Ray, T. *Synthesis and Applications of Isotopically Labelled Compounds*, **2001** *7*, 209.

"Palladium-Catalyzed Aryl Cyanations with [^{14}C]KCN: Synthesis of ^{14}C-labeled Fadrozole, a Potent Aromatase Inhibitor." Allentoff, A.J., Markus, B., Wu, A.., Duelfer, T. *J. Labeled Compds and Radiopharmaceuticals*, **2000** *43*, 1075.

"Understanding the Cellular Uptake of Phosphopeptide Inhibitors of SH2 Domains." Allentoff, A.J., Mandyan, S., Liang, H., Yuryev, A., Vlattas, I., Duelfer, T., Sytwu, I., Wennogle, L.P. *Cell Biochemistry and Biophysics*, **1999** *31*, 129.

"Palladium Catalyzed Synthesis of Labelled Aromatic Nitriles: Application to Pharmaceuticals." Allentoff, A., Ciszewska, G., Markus, B., Pfefferkorn, H., Ray, T., Jones, L., Duelfer, T. *Synthesis and Applications of isotopically Labelled Compounds* **1998**, 185.

"Synthesis of ^{14}C-Labelled CGS 16949A (Fadrozole HCl), a Potent Aromatase Inhibitor." Markus, B., Allentoff, A.J., Desai, M., Chaudhuri, N.K., Duelfer, T. *J. Labelled Compds and Radiopharmaceuticals*, **1997**, *39*, 885.

"Synthesis of ^{14}C-Labelled CGS 19755, a Selective NMDA Antagonist." Allentoff, A.J., Desai, M., Duelfer, T., Markus, B. *J. Labeled Compds and Radiopharmaceuticals* **1996**, *36*, 989.

"Comparison of Recombinant Cyclooxygenase-2 to Native isoforms: Aspirin Labeling of the Active Site." Wennogle, L., Liang, H., Quintavalla, J., Bowen, B., Wasvary, J., Miller, D., Allentoff, A., Boyer, W., Kelly, M., Marshall, P., *FEBS Letters* **1995**, *371*, 315.

"Cytochrome P450-Dependent Heterolytic and Homolytic O-O Bond Cleavage of Organic Hydroperoxides: Influence of the Apoprotein." Correia, M.A., Yao, K., Wrighton, S.A., Allentoff, A.J., Thompson, J.A., *Archives of Biochemistry and Biophysics* **1995**, *317*, 471.

"Analysis of Trimethylsilylperoxy Derivatives of Thermally Labile Hydroperoxides by Gas Chromatography-mass Spectrometry." Turnipseed, S.B., Allentoff, A.J., Thompson, J.A. *Analytical Biochemistry* **1993**, *212*, 218.

"Metabolic Activation of Buylated Hydroxytoluene, by Mouse Bronchiolar Clara Cells." Bolton, J.L., Thompson, J.A., Allentoff, A.J., Miley, F.B., Malkinson, A.M. *Toxicology and Applied Pharmacology* **1993**, *119*, 245.

"Heterolytic Versus Homolytic Peroxide Bond Cleavage by Sperm Whale Myoglobin and Myoglobin Mutants." Allentoff, A.J., Bolton, J.L., Wilks, A., Thompson, J.A., Ortiz de Montellano, P.R. *J. Am. Chem. Soc.* **1992**, *114*, 9744.

"Synthesis of the Bicycle[5.3.1.] undecane Moeity (AB Ring System) of Taxanes." Snider, B.B., Allentoff, A.J. *J. Org. Chem.* **1991**, *56*, 321.

"Intramolecular [2 + 2] Cycloadditions of Dialkylketenes with Alkenes. regiochemistry of Intramolecular [2 + 2] Cycloadditions of Alkenes." Snider, B.B., Allentoff, A.J., Walner, M.B. *Tetrahedron* **1991**, *46*, 8031.

"Type III Intramolecular Cycloadditions of Vinylketenes." Snider, B.B., Allentoff, A.J., Kulkarni, Y.S. *J. Org. Chem.* **1988**, *53*, 5320.

PRESENTATIONS AT NATIONAL AND INTERNATIONAL MEETINGS:

"Iridium-Catalyzed Direct Tritium Labeling of Drug Candidates Used in Early Development Studies." Allentoff, A., Wu, A., Ray, T. Presented at the 222nd American Chemical Society National Meeting, Boston, MA, **2002**.

"Copper(I) Iodide Enhanced Reactivity of Aryl Iodides with [^{14}C]KCN in Palladium-Catalyzed Cyanations." Allentoff, A., Markus, B., Wu, A., Ray, T., Presented at the Seventh International Symposium on the Synthesis and Applications of Isotopes and Isotopically Labelled Compounds, Dresden, Germany, **2000**.

"Palladium-Catalyzed Aryl Cyanations in Radiosynthesis: Synthesis of ^{14}C-labeled Fadrozole, a Potent Aromatase Inhibitor." Allentoff, A.J., Markus, B., Wu, A., Jones, L., Ciszewska, G., Duelfer, T., Presented at the 218th American Chemical Society National Meeting, New Orleans, LA, **1999**.

"Palladium Catalyzed Synthesis of Labelled Aromatic Nitriles: Application to Pharmaceuticals" Allentoff, A., Ciszewska, G., Markus, B., Pfefferkorn, H., Ray, T., Jones, L., Duelfer, T., Presented at the Sixth International Symposium on the Synthesis and Applications of Isotopes and isotopically labeled Compounds, Philadelphia, PA, **1997**.

"Palladium-Catalyzed Cyanations in the Radiosynthesis of ^{14}C-Labeled Pharmaceuticals." Allentoff, A.J., Duelfer, T., Desai, M., Greenberg, G.E., Presented at the 212th American Chemical Society National Meeting, Orlando, FL, **1996**.

"Synthesis and Comparative Pharmacokinetics of ^{14}C-labeled CGS 19755 (Selfotel) and Its Active Enantiomer." Allentoff, A.J., Desai, M., Chovan, J.P, Kramp, R.B., Cassidy, J.P., Duelfer, T., Markus, B., Presented at the 210th ACS National Meeting, Chicago, IL, **1995**.

"Influence of Alkyl Substituents on Cytochrome P450-Catalyzed Isomerizations of 1,4-Peroxyquinols." Allentoff, A.J., Thompson, J.A., Presented at the 204th ACS National Meeting, San Francisco, CA, **1992**

Peroxygenase Activity of Cytochrome P450 2B Isomerizes Allylic Hydroperoxides to Epoxy-Alcohols." Thompson, J.A., Allentoff, A.J., Presented at the FASEB National Meeting, Anaheim, CA, **1992**.

"Intramolecular Cycloadditions of Ketoketenes. Synthesis of the Bicyclo[5.3.1]undecane Moeity of the Taxane Skeleton." Snider, B.B., Allentoff, A.J., Presented at the the 199th ACS National Meeting, Boston, MA, **1990**.

CURRICULUM VITAE

EX - 6

NAME Patrick L. Chow

BORN [redacted]

EDUCATION

(b)(6)

B.S. in Electrical Engineering and Computer Science, University of California at Berkeley, with an emphasis on Bioelectronics.

M.S. in Biomedical Physics, University of California at Los Angeles.

Ph.D. in Biomedical Physics, University of California at Los Angeles, with an emphasis on Biological Imaging.

EXPERIENCE

1999 Summer volunteer at the Physics Research Laboratory, University of California at San Francisco.

- Exposure to the field of medical imaging with SPECT and CT.

2000 Summer laboratory assistant at the Imaging Sciences Laboratory, Crump Institute for Molecular Imaging, UCLA School of Medicine

- Exposure to development of microPET II
- Assemble microPET II detector modules

2000-2005 Graduate student researcher at the Imaging Sciences Laboratory, Crump Institute for Molecular Imaging, David Geffen School of Medicine at UCLA

- Estimate radiation dose to subjects in microCT using Monte Carlo
- Optimize microPET transmission data acquisition
- Correct microPET images for attenuation using both microPET and microCT transmission scans
- Correct microCT images for beam hardening effect
- Estimate magnitude of scatter in cone-beam microCT
- Optimize microCT transmission data acquisition

2005-now Research investigator at the Bioimaging Laboratory, Pharmaceutical Research Institute, Bristol-Myers Squibb Company

- Biomarker development for therapeutic programs using microPET, microSPECT and microCT.
- Coordinator for setting up radiochemistry laboratory

AWARDS

2001	Molecular and Medical Pharmacology Graduate Student Travel Award
2002	Molecular and Medical Pharmacology Graduate Student Travel Award
2002	IEEE Nuclear Science Symposium and Medical Imaging Conference Student Travel Scholarship to attend 2002 IEEE Medical Imaging Conference
2003	Dr. Ursula Mandel Fellowship, UCLA Graduate Division
2003	Winner of the Top Basic Science Abstract at the 2003 AMI conference (co-author)
2003	Oral presentation awarded 2nd place at the annual Molecular and Medical Pharmacology Retreat
2004	Winner of Static Image of the Year from Concorde Microsystem's 2004 microPET Image of the Year competition (co-author)
2004	Honorable mention for Image of the Year from Concorde Microsystem's 2004 microPET Image of the Year competition (co-author)
2004	SMI Young Investigator Travel Grant to attend 2004 SMI Conference
2004	NIH Student Travel Award to attend the 2004 IEEE Medical Imaging Conference
2005	Winner of microPET Image of the Year from CTI Concorde Microsystem's 2005 microPET Image of the Year competition (co-author)
2005	Honorable mention for Multimodality Image of the Year from CTI Concorde Microsystem's 2005 microPET Image of the Year competition (first-author)
2006	"SciX Success Story" nomination at BMS's PRI Scientific Symposium (co-author)

MEMBERSHIPS

American Association of Physicists in Medicine (AAPM) 2000-2005

Institute of Electrical and Electronics Engineers (IEEE) 2000-2005

Academy of Molecular Imaging (AMI) 2002-2005

Society for Molecular Imaging (SMI) 2004-2007

American Association for Cancer Research (AACR) 2006-2007

PEER-REVIEWED PAPERS

1. Y.-C. Tai, A. Ruangma, D. Rowland, S. Siegel, D. F. Newport, P. L. Chow, and R. Laforest, "Performance evaluation of the microPET®-Focus™: a third-generation microPET scanner dedicated to animal imaging," Journal of Nuclear Medicine, vol. 46, p. 455-463, 2005.
2. P. L. Chow, F. R. Rannou, and A. F. Chatziioannou, "Attenuation correction for small animal PET tomographs," Physics in Medicine and Biology, vol. 50, p. 1837-1850, 2005.
3. R. Taschereau, P. L. Chow, and A. F. Chatziioannou, "Monte Carlo simulations of dose from microCT procedures in a realistic mouse phantom," Medical Physics, vol. 33, p. 216-224, 2006.
4. P. L. Chow, D. B. Stout, E. Komisopoulou, and A. F. Chatziioannou, "A method of image registration for small animal, multi-modality imaging," Physics in Medicine and Biology, vol. 51, p. 379-390, 2006.

5. R. Taschereau, P. L. Chow, J. S. Cho, and A. F. Chatziioannou, "A microCT x-ray head model for spectra generation with Monte Carlo simulations," Nuclear Instruments and Methods in Physics Research Section A, vol. 569, p. 373-377, 2006.
6. C. M. Deroose, A. De, A. M. Loening, P. L. Chow, P. Ray, A. F. Chatziioannou, and S. S. Gambhir, "Multimodality imaging of tumor xenographs and metastasis in mice with combined micro positron emission tomography, small animal computed tomography and bioluminescence imaging," Journal of Nuclear Medicine, in review.

INVITED PRESENTATIONS

1. "Workflow example: Multimodality Imaging, Part 2" 2005 Concorde Users' Meeting in Orlando, FL.

CONFERENCE PAPERS

1. P. L. Chow, A. L. Goertzen, F. Berger, J. J. DeMarco, and A. F. Chatziioannou, "Monte Carlo model for estimation of dose delivered to small animals during 3D high resolution X-ray computed Tomography," 2001 IEEE Nuclear Science Symposium and Medical Imaging Conference, San Diego, CA, 2001 IEEE Nuclear Science Symposium Conference Record, vol. 3, p. 1678-81, 2002.
2. P. L. Chow, B. Bai, S. Siegel, R. M. Leahy, and A. F. Chatziioannou, "Transmission imaging and attenuation correction for the microPET® P4 tomograph," 2002 IEEE Nuclear Science Symposium and Medical Imaging Conference, Norfolk, VA, 2002 IEEE Nuclear Science Symposium Conference Record, vol. 2, p. 1298-302, 2002.
3. B. Bai, P. L. Chow, A. F. Chatziioannou, and R. M. Leahy, "Fully 3D resolution-matched transmission and emission PET image reconstruction," 2002 IEEE Nuclear Science Symposium and Medical Imaging Conference, Norfolk, VA, 2002 IEEE Nuclear Science Symposium Conference Record, vol. 3, p. 1470-3, 2002.
4. P. L. Chow, N. T. Vu, and A. F. Chatziioannou, "Estimating the magnitude of scatter in small animal cone-beam CT," 2004 IEEE Nuclear Science Symposium and Medical Imaging Conference, Rome, Italy, 2004 IEEE Nuclear Science Symposium Conference Record, vol. 5, p. 2752-4, 2004.

PRESENTATIONS, ABSTRACTS

1. P. L. Chow, F. R. Rannou, and A. F. Chatziioannou, "Attenuation correction for a 3D small animal PET tomograph, using x-ray microCT," 2002 Academy of Molecular Imaging Annual Conference, San Diego, CA, Molecular Imaging and Biology, vol. 4, no. 4, p. S17, July/August 2002.
2. D. B. Stout, P. L. Chow, R. Silverman, R. Leahy, X. Lewis, S. S. Gambhir, and A. F. Chatziioannou, "Creating a whole body digital mouse atlas with PET, CT and cryosection images," 2002 Academy of Molecular Imaging Annual Conference, San Diego, CA, Molecular Imaging and Biology, vol. 4, no. 4, p. S27, July/August 2002.
3. A. L. Goertzen, P. L. Chow, A. F. Chatziioannou, and S. R. Cherry, "A study of image quality and dose vs. x-ray beam spectrum in small animal CT with an a-Se flat panel detector," 2002 IEEE Nuclear Science Symposium and Medical Imaging Conference, Norfolk, VA.
4. C. M. Deroose, A. De, A. M. Loening, E. A. Collisson, M. S. Kolodney, P. L. Chow, A. F. Chatziioannou, and S. S. Gambhir, "Small animal microPET/microCAT imaging studies of a tumor metastatic model," 2003 Academy of Molecular Imaging Annual Conference, Madrid, Spain, Molecular Imaging and Biology, vol. 5, no. 3, p. 104-5, May/June 2003.

5. D. B. Stout, P. L. Chow, A. Gustilo, S. Grubwieser, and A. X. Chatziioannou, "Multimodality isolated bed system for mouse imaging experiments," 2003 Academy of Molecular Imaging Annual Conference, Madrid, Spain, Molecular Imaging and Biology, vol. 5, no. 3, p. 128-9, May/June 2003 (Top Basic Science Abstract).
6. P. L. Chow, F. R. Rannou, and A. F. Chatziioannou, "Towards a beam hardening correction for a microCT scanner," 2004 Academy of Molecular Imaging Annual Conference, Orlando, FL, Molecular Imaging and Biology, vol. 6, no. 2, p. 77-8, March/April 2004.
7. P. L. Chow and A. F. Chatziioannou, "Optimization of CT acquisition parameters for microPET / microCT imaging," 2004 Society for Molecular Imaging Annual Meeting, St. Louis, MO, Molecular Imaging, vol. 3, no. 3, p. 259, July 2004.
8. V. Kohli, F. R. Rannou, P. L. Chow, and A. F. Chatziioannou, "Towards I-124 quantitation in small animal positron emission tomography," 2005 Academy of Molecular Imaging Annual Conference, Orlando, FL, Molecular Imaging and Biology, vol. 7, no. 2, p. 140, March/April 2005.
9. M. C. Kreissl, P. L. Chow, H. Wu, T. Schindler, X. Zhang, S. Huang, H. Schelbert, and D. Stout, "Vascular contrast imaging with microCT while maintaining attenuation correction capability with microPET imaging," 2005 Academy of Molecular Imaging Annual Conference, Orlando, FL, Molecular Imaging and Biology, vol. 7, no. 2, p. 140, March/April 2005.
10. D. Stout, S. Thamotharan, P. L. Chow, and S. U. Devaskar, "Mouse skull density and thickness during development as assessed by microCT: effects on optical Luciferin signals from mouse brain," 2005 Academy of Molecular Imaging Annual Conference, Orlando, FL, Molecular Imaging and Biology, vol. 7, no. 2, p. 157, March/April 2005.
11. R. Taschereau, P. L. Chow, and A. F. Chatziioannou, "Monte Carlo simulations of dose from computed tomography procedures in a realistic mouse phantom," 2005 Academy of Molecular Imaging Annual Conference, Orlando, FL, Molecular Imaging and Biology, vol. 7, no. 2, p. 158, March/April 2005.
12. J. Kim, P. Chow, D. Kukral, W. Ruediger, and B. Krishnan, "Practical measurements of object-dependent partial volume and spillover effects," 2006 Society for Molecular Imaging Annual Conference, Waikoloa, HI, Molecular Imaging, vol. 5, no. 3, p. 421, July 2006.
13. P. Chow, C.-P. Ho, D. Kan, K. Menard, F. Lee and B. Krishnan, "Application of SPECT imaging for functional biomarker development in oncology," 2006 PRI Scientific Symposium, Hopewell, NJ.
14. C.-P. Ho, Y. Callejas, B. Lehman, P. Chow, J. Kim, R. Denton, and B. Krishnan, "In vivo MR imaging of duodenum toxicity by gamma-secretase inhibitor, BMS-433796," 2006 PRI Scientific Symposium, Hopewell, NJ.
15. J. Kim, P. Chow, D. Kukral, C.-P. Ho, G. Dito, B. Henley, M. Jure-Kunkel, R. Attar, T. Wong, and B. Krishnan, "Noninvasive assessments for tumor glucose metabolism and proliferation for panAR and panHER programs by microPET imaging," 2006 PRI Scientific Symposium, Hopewell, NJ ("SciX Success Story").
16. M. C. Kreissl, P. L. Chow, and D. B. Stout, "MicroPET in mice: Is attenuation and scatter correction really necessary?" submitted to 2007 German society of Nuclear Medicine.
17. P. L. Chow, C.-P. Ho, D. Kukral, B. J. Henley, T. W. Wong, and B. S. Krishnan, "Evaluation of chemotherapeutic compound BMS-690514 in L2987 xenograph mouse model using microPET imaging," submitted for presentation at the 2007 AACR annual meeting.
18. J. Kim, P. Chow, D. Kukral, C.-P. Ho, G. Dito, B. Henley, M. Jure-Kunkel, R. Attar, M. Gottardis, and B. Krishnan, " MicroPET assessment of drug efficacy in prostate tumor model measured by glucose metabolism and cellular proliferation," submitted for presentation at the 2007 AACR annual meeting.

Curriculum Vitae

Name: Ramaswamy A. Iyer

Address: [redacted]

Education:

Postdoctoral Fellow (b)(6) Advisor: Prof. M. W. Anders, Chair of Dept. of Pharmacology and Physiology, University of Rochester.
Research Project: Metabolism and Toxicity of Halogenated Hydrocarbons

Ph. D. (b)(6) Advisor: Prof. P. E. Hanna, Dept. of Medicinal Chemistry, University of Minnesota.
Thesis Project: The Design and Evaluation of Benzolactams as Inhibitors of Serine Proteases.

B.S. (b)(6) B.S. Pharmacy, University of Bombay, Bombay, India.

Ex. 6

Professional Experience:

2003-present	*Group Leader*, Department of Biotransformation, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.
2001-2003	*Senior Research Investigator II*, Drug Disposition and Bioanalytical sciences, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.
2000-2001	*Senior Research Investigator I*, Clinical Discovery, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.
1998-2000	*Research Investigator II*, Dept. of Metabolism and Pharmacokinetics, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.
1995-1997	*Post-Doctoral Fellow*, Dept. of Pharmacology, University of Rochester, Rochester, NY.
1988-1989	*Pharmacy Intern*, Tablets Department, Hoechst India Ltd. Bombay, India.

Relevant Research Experience:

Experienced in both discovery and development area- related to drug metabolism and disposition. Designed and executed studies to understand the metabolism of drug candidates in discovery and development.

- Designed and conducted in vitro and in vivo metabolism-related studies during lead optimization to select compounds for development.
- Designed and conducted studies with C-14 and H-3 labeled compounds in development.
- In Vitro studies included- microsomes, S-9, hepatocytes, expressed enzymes.
- Type of studies- Metabolite profiling, inhibition, induction and reaction phenotyping studies.
- In vivo studies- Tissue Distribution, BDC studies in toxicology species, ADME studies in toxicology species and Human ADME studies.
- Vast experience in isolation and identification of metabolites with LC/MS (ion trap, triple quad, accurate mass analysis) and NMR technologies.

Leadership and strategic experience in leading cross-functional teams from MAP, Clinical Pharmacology and Drug Safety to address issues.

- Designed appropriate investigative metabolism studies to understand the issue and provided guidance to the team. Involved in project working groups and other initiatives within the company.
- Worked closely with Clinical Pharmacology to design Drug-Drug interaction studies based on in vitro and in vivo metabolism data.
- Provided support and guidelines to Clinical Pharmacology and Drug Safety when discussing metabolites in safety testing.

Prepared reports and documentation for discovery and development projects.

- Summarized metabolism results for numerous INDs.
- Summarized metabolism results in non-clinical and clinical summary documents for NDA submission for Vanlev® (Omapatrilat), Abilify® (Aripiprazole), Baraclude® (Entecavir) and Sprycel® (Dasatinib).
- Replied to regulatory agencies on metabolism-related questions raised during review of filing. and designed experiments to address FDA questions.

Supervisory Experience:

Currently heads a group of 8 scientist: 4 Ph.D. and 4 M.S. level scientist. Closely involved in their training, career development and promotion.

Poster/Podium Presentations:

Oct 2006 Poster Presentation entitled "Metabolism of [^{14}C]HPA in Rat, Monkey and Human Hepatocytes and in Bile-duct Cannulated Rats". Accepted for presentation at the ISSX Meeting, Rio Del Mar, Puerto Rico.

Oct 2006 Poster Presentation entitled "Identification of Enzymes Involved in the Oxidative Metabolism of [^{14}C]Dasatinib (BMS-354825)". Accepted for presentation at the ISSX Meeting, Rio Del Mar, Puerto Rico.
Oct 2005 Presented a poster entitled, "Metabolism and Excretion of Dasatinib (BMS-354825), a potent inhibitor of SRC and BCR-ABL kinases, in Cynomolgus Monkeys and Human Subjects" at the ISSX meeting, Maui, Hawai.
Oct 2005 Presented a poster entitled, "Biotransformation of [^{14}C]Dasatinib (BMS-354825) after Intravenous and Oral Administration to Bile Duct Cannulatesd Rats" at the ISSX meeting, Maui, Hawai.
Oct 2005 Presented a poster entitled, "Metabolism of [^{14}C]BMS-528215 (6-hydroxy-buspirone) after Oral Administration to Mice, Rats, Dogs, Monkeys and Humans" at the ISSX meeting, Maui, Hawai.
Oct 2005 Presented a poster entitled, "Disposition of [^{14}C]D4T in humans" at the ISSX meeting, Maui, Hawai.
Jun 2005 Presented a poster entitled, "Metabolism of [^{14}C]Entecavir: Disposition of Entecavir in Humans and Comparative Metabolism in Rats, Dogs and Monkeys" at the European ISSX meeting, Nice, France.
Oct 2002 Presented a poster entitled, "Biotransformation of ^{14}C-Gemopatrilat in rat, dog and human" at the ISSX meeting, Orlando, FL.
June 2000 Presented a poster entitled, "A multiple radio- and stable-labeling approach for evaluating the metabolism of omapatrilat in bile duct cannulated rats" at the ASMS meeting, Long Beach Island, CA.
October 1999 Presented a poster entitled, "Isolation and identification of human urinary metabolites of omapatrilat" at the ISSX meeting, Nashville, TN.
October 1999 Presented a poster entitled, "Biotransformation profiles of omapatrilat in plasma of mice, rats, dogs, and humans after oral administration of [^{14}C]omapatrilat" at the ISSX meeting, Nashville, TN.
March 1998 Presented a Poster entitled, "β-lyase-dependent metabolism of Compound A in human subjects anesthetized with Sevoflurane" at SOT meeting, Seattle, WA. Abstract in *Toxicol. Sci.* **1998**, *42 (1-S)*, 87.
March 1998 Presented a Poster entitled, "Fate and toxicity of 2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene (Compound A)-derived mercapturates in Male, Fischer 344 Rats" at SOT meeting, Seattle, WA. Abstract in *Toxicol. Sci.* **1998**, *42 (1-S)*, 87.
March 1997 Presented a Poster entitled, "Nephrotoxicity of glutathione and cysteine *S*-conjugates of 2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene (Compound A) in Male, Fischer 344 Rats" at the SOT meeting, Cincinnati, OH. Abstract in *Fund. Appl. Toxicol.* **1997**, *36 (1 part 2)*, 160.
August 1996 Presented a talk entitled, "Fate and toxicity of glutathione and cysteine *S*-conjugates of fluoromethyl 2,2-difluoro-1-trifluoromethylvinyl ether" at the ACS meeting, Orlando, FL.
April 1996 Presented a poster entitled, "β-Lyase-dependent biotransformation of the cysteine *S*-conjugates of the sevoflurane degradation product compound A in human, nonhuman primate, and rat renal cytosol and mitochondria" at the 11th World Congress of Anaesthesiologists meeting, Sydney, Australia.
March 1996 Presented a Poster entitled, "Cysteine conjugate β-Lyase-dependent biotransformation of the cysteine *S*-conjugates of the Sevoflurane degradation product Compound A in human, nonhuman primate and rat renal tissue" at the SOT meeting, Anahiem, CA. Abstract in *Toxicologist*, **1996**, *30*, 315.

Teaching Experience:

Lectured graduate students on drug metabolism as part of a Pharmacokinetic course: Farleigh-Dickinsen University (Spring 2001) and St. Johns University (Fall 2001-2005).
Post-doctoral Fellow, University of Rochester, 1994-1997: Lectured Surgical Interns in the Basic Principles of Pharmacology. Guided and Supervised Graduate Students and Undergraduates in research projects.
Teaching Assistant, University of Minnesota, 1989-1990: Medicinal Chemistry (3 quarters), Dept. of Medicinal Chemistry, University of Minnesota.

Scientific Symposium:

Chaired and organized the North Jersey Drug Metabolism Discussion Group (NJDMDG) Fall 2000 and Spring 2001 Symposium and is involved as a committee member in organizing the meeting.

Manuscripts in Preparation:

1. Iyer, R.; Zhang, D. Role of Metabolism Studies in the Drug development Process. *Book Chapter in preparation.*
2. Zhang, Z.; Narasimhan, N.; Porubcan, M. A.; Roongta, V. A.; Yan, J.; Rinehart, J. K.; Ogan, M. D.; Everett D. W.; Iyer, R. Metabolism of [^{14}C]Entecavir 1. In Vitro Biotransformation and In Vivo Metabolite Identification in Rat, Dog and Monkey. Manuscript to be submitted to *Current Drug Metab.*
3. Narasimhan, N.; Wang, L.; Rinehart, J. K.; Ogan, M. D.; Yan, J.; Bifano, M.; LaCreta, F.; Skiles, G. L.; Iyer, R. Metabolism of [^{14}C]Entecavir 2. Disposition of Entecavir in Humans and Comparative Metabolism in Rats, Dogs and Monkeys. Manuscript to be submitted to *Current Drug Metab.*

4. Iyer, R.; Ogan, M. D.; Rinehart, J. K.; Ryan, P.; Hawthorne, D.; Bai, S.A.; Zhang, D. Metabolism and Disposition of *N*-[5-[[[5-(1,1-dimethylethyl)-2-oxazolyl]methyl]thio] -2-thiazolyl]-4-piperidinecarboxamide (BMS-387032), a Cyclin Dependant Kinase 2 Inhibitor. Manuscript in Preparation for submission to *Current Drug Metab.*
5. Iyer, R; Zhu, M; Mitroka, J; Dominick, M; Sanderson, T; Roongta, V; Traeger, S. Identification of aripiprazole-related metabolites in gallsand, gallstones and bile of cynomolgus monkey after 39 weeks daily oral dosing of aripiprazole. *In preparation for submission to CRT.*
6. Cui, D.; Li, W.; Chistopher, L.J.; Barros, A.; Arora, V.; Zhang, H.; Wang, L.; Zhang, D.; Lago, M.; Bonacorsi, S.; Humpheys, W.G.; Iyer, R. In Vitro Studies on the Metabolism of Dasatinib in Rat, Monkey and Human. *In preparation for submission to Drug Metabolism and Disposition (currently under internal BMS review).*
7. L. J. Christopher, D. Cui, V. K. Arora, J. A. Manning, K. He, A. M. Fletcher, M. Ogan, S. J. Bonacorsi, R. A. Iyer, and W. G. Humphreys. Comparative Biotransformation and Mass-Balance of [^{14}C]Dasatinib in Rats and Monkeys. *In preparation for submission to Drug Metabolism and Disposition (currently under internal BMS review).*
8. R.A. Iyer, L. J. Christopher, D. Cui, J. A. Manning, W. G. Humphreys, R. Luo, C. Wu, A. Blackwood-Chirchir. Disposition of Dasatinib in Humans. In preparation for submission to Drug Metabolism and Disposition.
9. L. Wang, D. Zhang, L. Christopher, D. Cui, W. Li, A. Kamath, R. Luo, R. Iyer, and W. G. Humphreys. Oxidative Metabolism of Dasatinib by Human Cytochrome P450 and FMO enzymes. In preparation for submission to Drug Metabolism and Disposition.
10. C. Wu, L.J. Christopher J. A. Manning, R. Luo, B. McCann, J. Park, E. Elefant, F. Callegari, and A. Blackwood-Chirchir. Effect of Dasatinib on the Pharmacokinetics of Simvastatin. In preparation.
11. L. J. Christopher, H. Su, R. C. Dockens, R. C. Burrell, S. J. Bonacorsi, Jr., and R. Iyer. "Identification of Metabolites of BMS-528215 (6-Hydroxy-Buspirone) after Oral Administration to Mice, Rats, Dogs, and Monkeys." In preparation.
12. L. J. Christopher, H. Su, R. C. Dockens, D. M. Hollenbaugh, N. Zheng, J. Zeng, R. C. Burrell, S. J. Bonacorsi, Jr., and R. Iyer. "Comparative Biotransformation and Mass-Balance of [^{14}C]BMS-528215 (6-Hydroxy-Buspirone) after Oral Administration to Mice, Rats, Dogs, Monkeys and Humans." In preparation.
13. H. Su, L. J. Christopher, R. A. Iyer, K. Cao, S. Bonacorsi, Y. Deng, D. Boulton, and W. G. Humphreys. "Comparative Biotransformation and Mass-Balance of [^{14}C]Saxagliptin, a Potent Inhibitor of DPP-IV, after Oral Administration to Rats, Dogs, Monkeys and Humans. In preparation.
14. H. Su, L. Christopher, R. Iyer, S. Bonacorsi, K. Cao, M. Kirby, L. Hamann, R. Espina, H. Zhang, and W. Humphreys. "Identification of a Metabolite of Saxagliptin Formed by CYP2C11, a Male-Specific Rat Enzyme." In preparation.
15. S. Leili, C. Chen, W. Achanzar, N. Ordway, J. Kozlosky, D. Boulton, B. Komoroski, H. Su, L. Christopher, R. Iyer, W. Humphreys, R. Dalterio, J. Nielsen, D. Wang-Iverson, R. West, T. Davidson, and R. Wolf. "Gender and Species Comparison of Cyanide Release from Saxagliptin in Mouse, Rat, and Human." In preparation.

Publications:

1. Bonacorsi, J.; Burrell, R.; Luke, G.; DePue, J.; Rinehart, J.; Balasubramanian, B.; Christopher, L.; Iyer, R. Synthesis of the Anxiolytic Agent [^{14}C] 6-Hydroxy-Buspirone for Use in a Human ADME Study. Accepted for publication (2006) in *J. Labelled Comp. Radiopharm.*
2. Iyer, R. A.; Malhotra, B; Mitroka, J; Ndikum-Moffor, F; Kripalani, K. Microsomal thiol methyltransferase, not the cytosolic thiopurine methyltransferase, catalyse the *S*-methylation of omapatrilat. Submitted to *Current Drug Metabolism.*
3. Wait, J. C. M; Vaccharajani, N.; Mitroka, J.; Jemal, M.; Khan, S.; Bonacorsi, S. J.; Rinehart, J. K.; Iyer, R.A. Metabolism of [^{14}C]Gemopatrilat after Oral Administration to Rats, Dogs and Humans. *Drug Metab. Dispos.* **2006**, *34*, 961-970.
4. Lantum, H. B., Iyer, R. A., and Anders, M. W. Acivicin-induced alterations in renal and hepatic glutathione concentrations and in γ-glutamyltransferase activities. *Biochem. Pharmacol.* **2004**, *67*, 1421-1426.

5. Iyer, R. A.; Malhotra, B; Khan, S.; Mitroka, J.; Bonacorsi, S. Jr.; Waller, S. C.; Rinehart, J. K.; Kripalani, K. Comparative biotransformation of radiolabeled [^{14}C]omapatrilat and stable-labeled [$^{13}C_2$]omapatrilat after oral administration to rats, dogs and humans. *Drug Metab. Dispos.* **2003**, *31*, 67-75.
6. Malhotra, B. K.; Iyer, R. A.; Soucek, K. M.; Behr, D.; Liao, W.; Mitroka, J. G.; Kaul, S.; Cohen, M. B.; Knupp, C. A. Oral Bioavailability and Disposition of [^{14}C]Omapatrilat in Healthy Subjects. *J. Clin. Pharmacol.*, **2001**, *41*, 1-9.
7. Iyer, R. A.; Mitroka, J.; Malhotra, B.; Bonacorsi, S. Jr.; Waller, S.C.; Rinehart, J.K.; Roongta, V. A.; Kripalani, K. Isolation and identification of human urinary metabolites of omapatrilat a sulfhydryl-containing vasopeptidase inhibitor. *Drug Metab. Dispos.* **2001**, *29*, 60-69.
8. Luu, N. C.; Iyer, R. A.; Anders, M. W.; Ridge, D. P. Bioactivation mechanisms of haloalkenes cysteine *S*-conjugates modeled by gas-phase ion-molecule reactions. Manuscript accepted for publication in *Chem. Res. Toxicol.*, **2000**, *13*, 610-615.
9. Luu, N. C.; Iyer, R. A.; Anders, M. W.; Ridge, D. P. Fourier-transform ion cyclotron resonance mass spectrometric studies of elimination reactions of anionic bases with metabolites of a fluorinated anesthetic agent: towards modeling bioactivation in the gas phase. *International J. Mass Spect.*, **2000**, *195/196*, 203-213.
10. Uttamsingh, V.; Iyer, R. A.; Baggs, R. B.; Anders, M. W. Fate and toxicity of 2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene (Compound A)-derived mercapturates in Male, Fischer 344 Rats. *Anesthesiology*, **1998**, *89*, 1174-1183.
11. Iyer, R. A.; Frink, E. J. Jr.; Ebert, T. J.; Anders, M. W. Cysteine conjugate β-lyase-dependent metabolism of Compound A [2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene] in human subjects Anesthetized with Sevoflurane and in rats given Compound A. *Anesthesiology*, **1998**, *88*, 611-618.
12. Iyer, R. A.; Anders, M. W. Nephrotoxicity of the glutathione and cysteine *S*-conjugates of 2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene (Compound A) in Male, Fischer 344 Rat. *J. Pharmacol. Exp. Therap.* **1997**, *13*, 115-126.
13. Iyer, R. A.; Anders, M. W. Cysteine Conjugate β–lyase-cependent biotransformation of the cysteine *S*-conjugates of the Sevoflurane degradation product 2-(fluoromethoxy)-1,1,3,3,3-pentafluoro-1-propene (Compound A). *Chem. Res.Tox.* **1997**, *10*, 811-819.
14. Iyer, R. A.; Anders, M. W. Cysteine conjugate β-lyase-dependent biotransformation of the cysteine *S*-conjugates of the Sevoflurane degradation product Compound A in human, nonhuman primate and rat renal cytosol and mitochondria. *Anesthesiology*, **1996**, *85*, 1454-1461.
15. Roberts, K. P.; Iyer, R. A.; Prasad, G.; Liu, L. T.; Lind, R. E.; Hanna, P. E. Cyclic hydroxamic acid inhibitors of prostate cancer cell growth: selectivity and structure activity relationships. *The Prostate*, **1998**, *34*, 92-99.
16. Ojala, W. H.; Iyer, R. A.; Hanna, P. E.; Gleason, W. B. Heterocyclic N-acetoxyarylamines, models for the putative ultimate carcinogens of aromatic amines: 2-acetoxyamino-5-phenylpyridine and 2-acetoxyaminopyridine. *Acta Cryst.*, **1996**, *C52*, 634-637.
17. Iyer, R. A.; Hanna, P. E. *N*-(Carbobenzyloxy)isatin: A slow binding α-keto lactam inhibitor of α-chymotrypsin. *Bioorg. Med. Chem. Lett.* **1995**, *5*, 89-92.

Memberships:

Member of the American Chemical Society since 1990.

Member of the International Society for Study of Xenobiotics (ISSX) since 1999.

Reference:

Available on request

JONATHAN S. LIPPY

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[redacted]

Education

M.S. Molecular Biology, **Lehigh University**
B.S. Biology, **West Chester University**

(b)(6)

Ex. 6

Professional Experience

BRISTOL-MYERS SQUIBB CO. **Lawrenceville, NJ (part of Dupont Pharma Acquisition)**
Lead Evaluation, Pharmaceutical Research Institute Division
Sr. Research Scientist I (D6), 6/98 – Present

- Provided primary SAR support to various Oncology, Immunology, Neuroscience, and Metabolic Disease programs including BTK, DYRK4, SRPK1, Met, Trk, GSK-3β, GR, PPARα/γ Dual, PPARα, and LXR

  GSK3-β Program Contributions
  - Performed enzymatic QC/QA of various GSK3-β protein variants that were produced via outsourcing by Syngene, Inc.
  - Data generated from the Syngene evaluation allows the GSK3-β program to make decisions about which variants should be used for XRay crystallography.
  - QC/QA of Syngene samples allows for GE&PB to make decisions about the outsourcing of bulk protein production.

  Trk Program Contributions
  - Worked in collaboration with CE to develop a Caliper method to determine off-rates of lead compounds.
  - Data will be used to connect biochemical with cell-based data.

  Met Program Contributions
  - Performed experiments to demonstrate assay dynamic range to ensure accurate potency determinations of lead compounds

  GR Program Contributions
  - Developed automated cell-based assays for the identification of agonists and antagonists to GR

  LXRα/β Program Contributions
  - Developed automated cell-based assays for the identification of agonists and antagonists to LXRα/β
  - Optimized and automated red-shifted SPA binding assays to identify compounds that bind to LXRα/β

  PPARα/γ and PPARα Program Contributions
  - Optimized and automated HTS fluorescence polarization and red-shifted SPA binding assays to identify compounds that bind to PPARα/γ

- Member of a multidisciplinary team which evaluated and implemented a >40 member kinase panel utilizing the electrophoretic mobility shift technology from Caliper Life Sciences
- Responsible for the development and validation of various kinase assays to expand the BMS kinase panel to 50 by the end of 2006
- Collaborated with Discovery Technology to develop and validate an automation platform to increase the efficiency of the BMS kinase panel
- Collaborate with Chem. Enzymology to develop validated kinetic assay techniques for lead compound evaluation and optimization
- Collaborate with GE&PB to ensure efficient and seamless transfer of protein reagents to LE
- Collaborate with CMDD to continually improve compound flow and the timely delivery of compounds into the BMS Kinase Panel
- Collaborate with DTI to continually improve the efficiency of the HTSToolset and CurveMaster IT applications
- Member of the Lev. Tech. Initiative to evaluate various IT solutions for local compound storage and compound dispensation
- Provided assay data documentation for FDA regulatory inquiries, therapeutic program transitions, and patent applications

- Present data findings and assay updates to various Drug Discovery Working Groups
- Liaison for the on-going implementation of compound management and IT support for Lawrenceville Lead Evaluation
- Laboratory Manager for the Lawrenceville Lead Evaluation group
- Supervise an Associate Research Scientist
- Member of the Bristol-Myers Squibb Central New Jersey Radiation Safety Committee

Accomplishments

- Developed and validated the Met, TrkA, TrkB, p38a, p38b, GSK-3b, CDK5/p25, PKCa, Axl, Jak2,and Csk kinases assays for addition to the BMS Kinase Panel
- Established automated cell-based assays for the identification of agonists and antagonists to MCHR1/R2
- Optimized and automated HTS fluorescence polarization and red-shifted SPA binding assays to identify compounds that bind to MCHR1
- Conducted a cell-based screening assay for the identification of agonists and antagonists to PPARα,γ,δ
- Developed an HTS cell-based assay to identify functional antagonists to hMCHR1 and hMCHR2 utilizing FLIPR^{384}
- Developed various HEK-293 cell lines transiently expressing LXRα/β and CRFR1
- Established kinetic enzyme assay utilizing CCD imaging to identify compounds inhibiting the transamidation of a bacterial amidotransferase
- Developed a high-throughput assay to examine intracellular Ca^{++} mobilization in ADP stimulated platelets
- Developed various HEK-293 cell lines transiently expressing nuclear hormone receptors and Gs and Gq coupled GPCRs
- Designed the Lead Evaluation laboratories at the Bristol-Myers Squibb site in Lawrenceville, NJ

CEPHALON, INC., **West Chester, PA**
Enzymology and Leads Discovery Department
Research Associate, 8/96 – 6/98

- Developed and validated an automated high-throughput cell-based assay which quantitates the inhibition of NGF-stimulated receptor auto-phosphorylation in trkA transfected NIH3T3 cells
- Established a cell-based assay used to quantitate biologically available drug in human plasma samples
- Determined the effect human alpha-1-acidic-glycoprotein had on the inhibitory activities of compounds in a cell-based phosphorylation assay
- Characterized inhibitors of various purified receptor-linked tyrosine kinases in cell-based phosphorylation assays
- Purified antibodies from antiserum via affinity and protein A purification methods

Publications, Professional Experience, & Grants

- "Development and Validation of a Lead Evaluation Kinase Panel Assay" 2006 BMS BMS PRI Scientific Symposium – Poster Presentation.
- "Electorphoretic Mobility Shift Technology as a Detection Method for Inhibitors of Protein Kinases", Sept. 2005, Philadelphia Laboratory Robotics Interest Group Meeting - Oral Presentation.
- "Application of Electrophoretic Mobility Shift Technology to Lead Compound Characterization", Sept. 2005, Caliper Life Sciences LabChip3000 Users Group Meeting - Oral Presentation.
- "Electorphoretic Mobility Shift Technology as a Detection Method for Inhibitors of Protein Kinases", Sept. 2005, Society for Biomolecular Sciences - Poster Presentation.
- "Application of Electrophoretic Mobility Shift Technology to Kinase Kinetic Characterization", 2005 BMS BMS PRI Scientific Symposium – Poster Presentation.
- "Validation of an Automated Glucocorticoid Receptor Reporter Gene Assay", 2004 BMS BMS PRI Scientific Symposium – Poster Presentation.
- "Development of a High Throughput Screening Amenable membrane Binding Assay for melanin-Concentrating Hormone Receptor 1", 2003 BMS PRI Scientific Symposium – Poster Presentation.
- 2005 Applied Biotechnology Collaboration Award – Evaluation and Validation of the Caliper LC3000 Kinase Platform
- 2005 Applied Biotechnology Collaboration Award – NHR robot platform validation
- 2003 Applied Biotechnology Collaboration Award – Establishing LE CMDD support in HPW
- Liu J., Feldman, P.A., **Lippy, J.S.**, Bobkova E., Kurilla, M.G., Chung, T.D. (2001) "A Scintillation Proximity Assay for RNA Detection", *Analytical Biochemistry*. 289, 239-45.
- Angeles, T.S., **Lippy, J.S.**, Yang, S.X. (2000) "Quantitative, High-Throughput Cell-Based Assays for Inhibitors of trkA Receptor", *Analytical Biochemistry*. 278, 93-98.
- Marcinkeviciene, J., Rodgers, M.J., Kopcho, L., Jiang, W., Wang, K., Murphy, D.J., **Lippy, J.**, Link, S. Chung, T., Hobbs, F., Haque, T., Trainor, G.L., Slee, A., Stern, A.M., Copeland, R.A. (2000) "Selective Inhibition of Bacterial Dihydrooratate Dehydrogenases by Thiadizolidinediones", *Biochemical Pharmacology*. 60, 339-342.
- **Lippy, J.**, Knabb, M., Mbuy, G. (1997) "The effect of synthetic peptides containing the aginine-glycine-aspartic acid sequence on the attachment and internalization of Herpes Simples Virus type-II to Vero cells", *J. of the Pennsylvania Academy of Science*. 70, 180-181. Presented at the Annual meeting of the

NING LEE, Ph.D.

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Hopewell Discovery Biology
Bristol-Myers Squibb Pharmaceutical Research Institute
Pennington, NJ 08534
ning.lee@bms.com
609-818-4293 (office)

HOME ADDRESS
[redacted]

SUMMARY OF QUALIFICATIONS

- Ph.D. in Biochemistry, Cell Biology, and Molecular Biology with deep expertise in GPCR, enzyme, and the signaling pathways.
- 10+ years of Metabolic and Cardiovascular Disease drug discovery experience with 3+ years co-leading cross-functional research teams in the pharmaceutical/biotech industry.
- A working knowledge of in vitro assay development and modern structure-based drug discovery approaches and experience in moving internally discovered compounds along preclinical development.
- An integral role in drug discovery target selection and strategic positioning of drug discovery programs.

EX. 6

PERSONAL INFORMATION WAS REMOVED BY NRC. NO COPY OF THIS INFORMATION WAS RETAINED BY THE NRC.

EDUCATION

(b)(6)

Postdoctoral Fellow (in Lab of Biochemistry)
Harvard University, Department of Molecular and Cellular Biology, Cambridge, MA
Advisor: Dr. Jack L. Strominger (Member of National Academy of Science), Higgins Professor of Biochemistry, Harvard University, and Division Chief of Tumor Virology at Dana-Farber Cancer Institute, Harvard Medical School.

(b)(6)

Ph.D. (Graduate Program in Molecular and Cell Biology)
Brandeis University, Department of Biology, Waltham, MA
Thesis: "Structure and Function Study of the Human Short-wavelength Visual Pigment".
Advisor: Dr. Daniel D. Oprian, Louis and Bessie Rosenfield Professor of Biochemistry.

(b)(6)

B.S. (in Lab of Biochemistry)
National Taiwan University, Department of Agricultural Chemistry, Taipei, Taiwan
Thesis: "Purification and Characterization of a Protease from Leaves of *Agave sisalana*".
Advisor: Dr. Hsein-Yi Sung, Professor of Biochemistry.
Honor Graduates Scholarship from Chinese Agricultural Chemistry Society (1989).

PROFESSIONAL EXPERIENCE

Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton/Hopewell, NJ
07/07-present **Senior Research Investigator II**

- Biology co-chair, champion two Early Phase and one Exploratory Phase Obesity drug discovery programs.
- Coordinate and ensure progression of small molecule discovery efforts within a cross-functional research team including cellular resource group, high throughput screening (HTS), lead evaluation (LE), in vivo disease models, in vitro characterization, animal PK, computer-aided drug design (CADD), bioinformatics, applied genomics, and peptide synthesis.

06/04-04/07 **Senior Research Investigator I**

- For an Early Phase Obesity drug discovery program: Biology co-chair. Lead and strategized drug discovery efforts. Transitioned program from the Exploratory (DP0) to Early Phase with Chemistry support (DP1.5). Responsible for *in vitro* assay development, validation and screening.
- For a Full Phase Obesity drug discovery program: Lead mutagenesis/homology modeling efforts to assist in structure-function study. Reviewed and managed *in vitro* screening data. Strategized and coordinated biomarker efforts.

12/01-05/04 **Research Investigator II**

- For several Obesity/Diabetes Early/Full Phase drug discovery programs, including enzyme and GPCR targets: Developed and validated *in vitro* assays. Responsible for primary and secondary *in vitro* screenings and data managements. Lead mutagenesis study of protein target to assist in structural and functional analysis.
- Provided proof of concept and pharmacological characterization to support validation of therapeutic targets.
- Initiated novel adiponectin receptor variants cloning project.
- Championed genomic analysis of human quantitative trait loci (QTL) associated with Diabetes/Obesity.

05/98-11/01 **Research Investigator I**

- Extensively explored, analyzed and evaluated therapeutic targets in the area of Cardiovascular diseases.
- Investigated in novel gene discovery by sequence database-searching and database-mining. Secured gene patent position by coordinating company-wide collaboration with electrophysiology, animal pathophysiology, bioinfomatics, proteomics, functional genomics and CADD.
- Cloned, expressed and functional characterized ion channels, human TRPM3 and TRPM6 as novel members of Transient Receptor Potential (TRP) channels family. Demonstrated TRPM6 as a bi-functional ion channel with kinase function. TRPM6 is selectively expressed in gastrointestine and kidney, and linked to primary hypomagnesemia and secondary hypocalcemia. Demonstrated TRPM3, primarily expressed in kidney, as a Ca^{2+} concentration-dependent Ca^{2+}-permeable channel. This TRPM3-mediated Ca^{2+} entry can be further augmented by depletion of intracellular Ca^{2+} stores physically or pharmacologically.
- Developed cell/molecular biology reagents for an ion channel drug discovery program.

Chiron Technology, Chiron Corporation, Emeryville, CA

03/96-03/98 **Scientist**

- Established cell-based systems for studying Wnt/□catenin/APC/TCF induced gene expression profiling.
- Identified hPAK65 as an universal substrate of executioner proteases during apoptosis.

- Demonstrated the activated hPAK65 as an effector of morphological changes during apoptosis.
- Characterized the activation mechanism and downstream signaling pathway of the hPAK65 during apoptosis and cell proliferation.
- Supervisor: Dr. Lewis T. (Rusty) Williams (Member of National Academy of Science), CSO of Chiron Corporation, and Professor of University of California at San Francisco.

Harvard University, Department of Molecular and Cellular Biology, Cambridge, MA

11/94-02/96 **Postdoctoral Fellow**

- Designed and generated soluble Single Chain T Cell Receptors (scTCRs) with high refolding efficiency and examined their functionality in the eukaryotic expression system.
- Optimized the production of soluble scTCRs in the bacterial expression system.
- Performed functional and structural analysis of the large-scale purified scTCRs using SPR technique.

Brandeis University, Department of Molecular and Cell Biology, Waltham, MA

09/89-10/94 **Ph.D. Research/Teaching Assistant**

- Designed and chemically synthesized the full-length gene for the human blue visual pigment, a rhodopsin-like GPCR.
- Obtained the first absorption spectrum for the blue pigment by expressing it in mammalian cells, reconstituting it *in vitro*, and purifying it to homogeneity.
- Investigated biochemical properties of the blue pigment and its interaction with G-protein.
- Identified the protein moiety responsible for the color-tuning mechanism by site-direct mutagenesis/chimeric mutants.
- Studied the UV-absorbing pigment from zebra fish.
- Taught and supervised Biology Laboratories.

National Taiwan University, Lab of Biochemistry, Dept. of Agric. Chem., Taipei, Taiwan

09/87-06/89 **B.S. Thesis Research**

- Purified a 28 kD protease from a local plant *Agave sisalana* and characterized its biochemical properties.
- Isolated EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) from Squid.

EXPERTISE

Discovery/Assay Development

- Design and validate various *in vitro* cell-based/cell-free assays: LC/MS/MS, TLC, Scintillation Proximity Assay (SPA), FLIPR (Fluorometric Imaging Plate Reader), Aequorin, cAMP, DELFIA Europium-GTP/GTPγS-binding, radio-/Europium-labeled ligand-receptor binding, ERK, FRET, high content assays.

Novel Therapeutic Targets Identification & Validation

- Keep current with literatures and various sources of information, critically evaluate scientific feasibility, competitive advantages and intellectual property of therapeutic targets.

Receptor Biology/Signal Transduction/Structural-Functional Study

• GPCR/G protein, kinases, proteases, dehydrogenase, reductase.

Obesity/Diabetes

• Feeding biology/appetite control, fat metabolism.

Cancer Biology

• Apoptosis, cell cycle, cell proliferation, Wnt/β-catenin/APC/TCF.

Immunology

• T cell receptor/MHC biology.

Ion Channels/ Cardiovascular Diseases

• K^+, Na^+, Cl^-, Ca^{2+}, TRP channels.

Molecular Biology

• Genomics/protein database-mining and analysis.
• DNA manipulation, mutagenesis, novel gene cloning: Gene Trapper, Marathon, PCR.
• RNA handling, Northern, Ribonuclease Protection Assay, anti-sense knock-out.

Cell Biology

• Inducible/transient/stable bacterial/mammalian/insect cell culture systems.
• Immunohistochemical analysis, FACS, confocal microscope analysis, In-cell Western, Odyssey infrared imaging.
• Metabolic-radiolabeling, transcriptional reporter, immunoprecipitation, in-gel kinase assay.

Protein Biochemistry

• Biocore (Surface Plasma Resonance)/enzyme kinetics.
• Western blotting/ELISA/antisera generation, purification, and characterization.
• Preparation/reconstitution of recombinant/native membrane/soluble proteins.
• Protein purification: gel-filtration/ion-exchange/affinity chromatography/FPLC.

LIST OF PATENTS/ PIER-REVIEWED PUBLICATIONS

Lee, Ning ; Chen, Jian; Wu, Shujian; Blanar, Michael A.; Levesque, Paul C.; Sun, Lucy Polynucleotides encoding variants of the TRP channel family member, LTRPC3. Patent Number: US7344882 B2 US granted. Publication Date: 18-Mar-2008

Lee, Ning ; Chen, Jian; Feder, John N.; Wu, Shujian; Chang, Han; Le, Liana M.; Blanar, Michael A.; Bol, David. Polynucleotide encoding a novel TRP channel family member, TRP-PLIK2, and splice variant thereof. Patent Number: US7223557 B2 US granted. Publication Date: 29-May-2007.

Chen, J., Feder, J., Wu, S., **Lee, N.** Polynucleotides encoding a novel Aadiponectin receptor variants. U.S. Patent Application: 10/874,923 Date: 23-Jun-2004.

Lee, Ning ; Chen, Jian; Feder, John, N; Wu, Shujian; Lee, Lianan, M; Blanar, Michael A.; Bol, David; Levesque, Paul C.; Sun, Lucy Polynucleotide encoding a novel TRP channel family member, LTRPC3, and splice variants thereof. U.S. Patent Application: 10/405749. Date: 28-Mar-2003.

Lee, N., Chen, J., Sun, L., Wu, S., Gray, K.R., Rich, A., Huang, M., Lin, J.-H., Feder, J.N., Janovitz, E.B., Levesque, P.C., Blanar, M.A. (2003) Expression and Characterization of Human Transient Receptor Potential Melastatin 3 (hTRPM3). *J. Biol. Chem.* **278**, 20890-20897.

Fasick, J.I.*, **Lee, N*** and Oprian, D.D. (1999) Spectral Tuning in the Human Blue Cone Pigment. *Biochemistry* **38**, 11593-11596 (* equal contribution).

Lee, N., MacDonald, H., Reinhard, C., Halenbeck, R., Roulston, A., Shi, T. and Williams, L.T. (1997) Activation of hPAK65 by Caspase Cleavage Induces Some of the Morphological and Biochemical Changes of Apoptosis. *Proc. Natl. Acad. Sci. USA* **94**, 13642-13647.

Lee, N., MacDonald, H., Reinhard, C., Halenbeck, R., Roulston, A., Shi, T. and Williams, L.T. Activated Form of hPAK65 and Its Induction of Apoptosis. (1997) United States Provisional Patent Application, filed.

Oprian, D.D., Asenjo, A.B., **Lee, N.** and Pelletier, S. (1991) Design, Chemical Synthesis, and Expression of Genes for the Three Human Color Vision Pigments. *Biochemistry* **30**, 11367-11372.

PERSONAL DATA

[redacted]

Member of American Heart Association
Member of the Society of Chinese Biomedical Association
Member of American Society for Biochemistry and Molecular Biology
Member of the Endocrine Society

REFERENCES

Available upon request.

Bristol-Myers Squibb Company

Talk Inside First

Name: Pooler, J. Richard	Joined BMS: 1996
Title: Senior Staff Attorney	Current Position Since: 1996
Division/Department: Pharm Legal/Tech Ops Phone Number: 315-432-2774 Fax Number:315-432-2279	Description of Current Duties (brief): Assist Division Counsel in advising Tech Ops Management and Worldwide Manufacturing / Development Facilities; Environmental, Health, and Safety specialization.

Prior Position with Company & Description (if applicable):

Division/Location	Title/Description of Duties	Period

Experience Prior to Joining BMS

Firm / Company	Title/Description of Duties	Period
Weston; The Darien Group; BBL	Environmental, health, and safety management and compliance consulting; merger/acquisition support.	1988 - 1996
New York City Department of Environmental Protection	Enforcement Counsel (Industrial Pretreatment and Emergency Response)	1984 - 1986
ConEdison; New York Power Authority	Operational, compliance, and management systems auditing.	1982 - 1984; 1986 - 1988
Norwich-Eaton Pharmaceuticals	Assistant Regulatory Counsel (EPA, FDA, FTC)	1980 - 1982

Education

	Institution	Degree	Major
Law School	Syracuse University College of Law	J.D.	
College	Rensselaer Polytechnic Institute	B.S.	Environmental Engineering
Other			

Significant and Substantial Experience in the following areas:
Comfortable giving advice/acting as a resource in the following areas: (i.e., - those you would feel comfortable advising/discussing with others). *Some examples are set forth below, but please feel free to decribe your own expertise.*
** *Please describe in detail.*

Name: Marlene Loretta Rathmum
Home: [redacted]

Born: [redacted]
Citizenship: [redacted]

EX. 6

Business: Bristol-Myers Squibb
P.O. Box 4000
Princeton, New Jersey 08543-4000
(609) 252-5047

PERSONAL INFORMATION WAS REMOVED BY NRC. NO COPY OF THIS INFORMATION WAS RETAINED BY THE NRC.

Education: M.A. - Organic Chemistry - Smith College (b)(6)
B.A. - Chemistry -Queens College - City University of New York (b)(6)

Career Summary:
August 1988 to present:- Administrative role in Research Operations, encompassing staffing, strategic planning, management of research capital budgets, space allocation/reallocation, group consolidations and lab safety for the Discovery division of the BMS Pharmaceutical Research Institute. Responsibilities also include overseeing the Low Level Radioactive Waste (LLRW) budget for all BMS PRI.

October 1966 to July 1988:- Laboratory Chemist involved in (1) isolation, and structural determination of leads from antibacterial, antifungal, β-lactamase inhibition and inducing screens, tetracycline resistance inducing screens, ACE inhibitor screen, macrolide screen. Notable molecules isolated and characterized include peptide antibiotics EM49, janiemycin, cyanomycin; monobactams SQ 26,180 and the EM5400 family; monolactone SQ 26,517; carbapenem SQ 27,860; cephamycins A & B; izumenolide; cepacins A & B; xylocandins; EM5591; EM5601, polymyxin F; monocarbam SQ 83,360 (pirazmonam) and (2) research on HMG CoA inhibitors compactin, SQ 31,000 (pravastatin) and mevinolin as well as leads from other enzymatic screens.

Professional Detail

Aug.1999 – Present	Assoc. Director, Research Operations - Discovery & Exploratory Clinical Research Bristol-Myers Squibb
Aug 1993 – Jul 1999	Manager, Research Operations - Drug Discovery & Exploratory Research Bristol-Myers Squibb
Apr 1992-Jul 1993	Research Scientist 11, Research Operations - Exploratory & Drug Discovery Research Bristol-Myers Squibb
Apr 1991-Mar 1992	Research Scientist 11, Administration - Exploratory & Drug Discovery Research Bristol-Myers Squibb
Oct. 1989-Mar 1991	Laboratory Supervisor, Administration - Drug Discovery Research Bristol-Myers Squibb
Aug 1988-Sept 1989	Laboratory Supervisor, Administration - Cell & Molecular Biology E.R. Squibb & Sons
1987 - Jul 1988	Laboratory Supervisor, Special Projects - Chemistry/I & M Disease E.R. Squibb & Sons

1986-1987	Laboratory Supervisor, Natural Products - Microbial Biochemistry & Genetics E.R. Squibb & Sons
1976-1986	Asst. Research Investigator, Natural Products - Chemistry/I & M Disease E.R. Squibb & Sons
1967-1975	Research Associate, Natural Products - Chemistry E.R. Squibb & Sons
1966-1967	Scientist - Organic Chemistry E.R. Squibb & Sons

Current Responsibilities:

- Initiate, oversee and expedite all renovations and relocations for Discovery & Exploratory Clinical Research (DECR) staff in Central New Jersey with the goal of achieving maximum efficient use of available laboratory and office space. Ensure that all issues concerning laboratory environment and laboratory utilization are addressed and successfully concluded.

- Review all Capital Appropriation Requests for renovations requiring approval of the Senior Management for all DECR. Prepare supporting documentation as needed for approval.

- Review all Capital Appropriation Requests for major equipment to ensure optimal utilization of budgets and assets. Ensure compliance with BMS Corporate, GAAP and Sarbanes-Oxley requirements.

- Serve as initial contact to all departments that interact with DECR on matters of concern and importance to the division. Departments include Finance, Facilities Planning, Facilities Administration, Facilities Engineering, Facilities Maintenance, Human Resources, Administrative Resources (Site/Space, Instrument Design Group, SIS, O/P and Communications), Purchasing, Environmental Health & Safety, Health Physics, Transportation, Shipping & Receiving, Laboratory Services, Telecommunications, Security, Central Engineering, Public Affairs.

- Maintain accurate staffing data to assist the budget process and benchmarking reporting.

- Serve as resource to all DECR groups and their administrative staff on points of procedure in order to promote consistency across the division.

Major Accomplishments:

Several successful relocations and integrations of staff within E.R. Squibb, BM-S, and BM-S Wilmington into existing and new facilities for 1988 to present.

- 2004~2006 – Renovations at all sites to accommodate Radiochemistry, Medicinal Chemistry, Lead Evaluation robotic biology and compound handling.
- 2002 - BM-S Wilmington to CNJ and Wallingford.
- 2000: - CV and Metabolic Disease Biology and Chemistry to Hopewell labs
- 1988 ~1999: - Team member for new construction projects, build-outs, renovations and relocations aligned to strategic developments and restructuring. Notables were (1) 1993. Diagnostics Drug Discovery from New Brunswick and FMC to Lawrenceville (1993); (2) Relocation of Oncology Drug Discovery from Wallingford to Lawrenceville and Seattle within 6 months (1992); (3) Opening of Forrestal Greens for the establishment of the new department of Molecular Biology and expansion of Chemistry/Infectious & Metabolic Disease; (4) Relocation of Chemistry/Infectious & Metabolic Disease to Module H

Scientific Accomplishments:

1983: Presentation: "Cepacins A and B - Two new antibiotics from *Pseudomonas cepacia*", 23rd International Conference on Antimicrobial Agents and Chemotherapy, Las Vegas, NV.

Contributions to Major Research Programs:

Ex. 6

- Cholesterol Lowering Program - Collaborated with the fermentation group to improve the yield of compactin from fermentation media and on the microbial transformation of compactin to SQ31,000 (pravastatin or Pravachol). Isolated and purified mevinolin for comparative biological studies with SQ 31,000 (pravastatin).

- Member of the team that isolated and identified the simplest member of the monobactam family of compounds – SQ 26,180, precursor of aztreonam (Azactam).

- Member of the task force on cephalosporin modification that resulted in cephradine (Velosef).

Scholarships: Smith College (b)(6)

Participations: Q/P Networking Group
Q/P Resource Manager (unofficial)
BMS Institute Communications Improvement Task Force (ICITF)
Facilities Energy Task Force

Courses: *13C- NMR - ACS course for professionals given at Squibb Institute* - 1985
NMR Spectroscopy - ACS Short Course - Pittsburgh Conference - 1987
Understanding Business Performance - Squibb College - 1989
Radiation Safety Training - Sponsored by the Radiation Safety Committee - 1990

Memberships: American Chemical Society

Interests: Tennis, bowling, gardening

Publications

1. Parker, W.L., Rathnum, M.L., Johnson, J. H., Wells, J.S., Principe, P.A. and Sykes, R.B Aerocyanidin. A new antibiotic produced by *Chromobacterium violaceum*. J.Antibiotics, 41 (4): 454~460,1988.

2. Bisacchi, G.S., Hockstein, D.R., Koster, W.H., Parker, W.L., Rathnum, M.L. and Unger, S.E.; Xylocandin: A new complex of antifungal peptides. II Structural studies and chemical modifications. J. Antibiotics, 40 (11): 1520~1529,1987.

3 Parker, W.L., Rathnum, M.L., Seiner V., Trejo, W.H., Principe, P.A. and Sykes, R.B.: Cepacin A and Cepacin B, two new antibiotics produced by *Pseudomonas cepacia*. J. Antibiotics, 37 (5): 431~440,1984.

4. Parker, W.L., Rathnum, M.L. and Liu, W-C.: SQ 26,517 – A β-lactone produced by a *Bacillus* species. J. Antibiotics, 35 (7): 900~902,1982.

5. Parker, W.L., Rathnum, M.L., Wells, J.S., Trejo, W.H., Principe, P.A. and Sykes, R.B.: SQ 27,860, A simple carbapenem produced by species of *Serratia* and *Erwinia*. J. Antibiotics, 35 (6): 300~305,1982

6. Parker, W.L. and Rathnum, M.L; EM5400, A family of monobactam antibiotics produced by *Agrobacterium radiobacter*. II: Isolation and structure determination. J. Antibiotics, 35 (3): 653~660,1982.

7. Parker, W.L, Koster, W.H., Cimarusti, C.M., Floyd, D.M., and Rathnum, M.L ; SQ 26,180, A novel monobactam. II: Isolation, structure determination and synthesis. J. Antibiotics, 35 (2): 189~195,1982.

8. Parker, W.L, Cimarusti, C.M., Koster, W.H., Floyd, D.M., Liu, W-C., Principe, P.A., Rathnum, M.L. and Slusarchyk, W.A: Monobactams; isolation and structure determination. J. Antimicrobial Chemotherapy (1981) **8**, *Suppl. E*, 17~20.

9. Parker, W.L., Rathnum, M.L. and Funke, P.T.: Izumenolide - a novel β-lactamase inhibitor produced by *Micromonospora*. III. The structure of izumenolide. Tetrahedron, 37 (9): 275~279, 1981.

10. Sykes, R.B., Cimarusti, C.M., Bonner, D.P., Bush, K., Floyd, D.M., Georgopapadakou, N.H., Koster, W.H., Liu, W-C., Parker, W.L., Principe, P.A., Rathnum, M.L., Slusarchyk, W.A., Trejo, W.H. and Wells, J.S.: Monocyclic β-lactam antibiotics produced by bacteria. Nature, 291 (5815): 489~491, 1981.

11. Liu, W.C., Astle, G., Wells, J.S., Trejo, W.H., Principe, P.A., Rathnum, M.L., Parker, W.L., Kocy, O.R. and Sykes, R.B.: Izumenolide - a novel β-lactamase inhibitor produced by *Micromonospora*. I. Detection, isolation and characterization. J. Antibiotics, 33 (11): 1256~1261, 1980.

12. Parker, W.L., Rathnum, M.L., Dean, L.D., Nimeck, M.W., Brown, W.E. and Meyers, E.: Polymyxin-F, a new peptide antibiotic. J. Antibiotics, 30 (9): 767~769,1977.

13. Parker, W.L. and Rathnum, M.L.: EM49 - a new peptide antibiotic. IV. The structure of EM49. J. Antibiotics, 28 (5): 379~389, 1975.

14. Parker, W.L. and Rathnum, M.L.: EM49, a new peptide antibiotic. II. Chemical characterization. J. Antibiotics (Tokyo), 26 (8): 449~456, 1973.

15. Meyers, E., Brown, W.E., Principe, P.A., Rathnum, M.L. and Parker, W.L.: EM49, a new peptide antibiotic. I. Fermentation, isolation and preliminary characterization. J. Antibiotics (Tokyo), ZE (8): 444~448, 1973.

16. Meyers, E., Weisenborn, F.L., Pansy, F.E., Slusarchyk, D.S., Von Saltza, M.H., Rathnum, M.L. and Parker, W.L.: Janiemycin, a new peptide antibiotic. J. Antibiotics (Tokyo), 23 (10): 502~507, 1970.

17. Von Saltza, M.H., Last, J.A., Stapleton, P.G., Rathnum, M.L. and Neidleman, S.L.: Cyanomycin, its identity with pyocyanine. J. Antibiotics (Tokyo), 22 (2): 49~54, 1968

Abstracts

1. "Monobactams - Monocyclic β-lactam antibiotics produced by bacteria. Studies leading to SQ 26,776". Cimarusti, C.M. Sykes, R.B., Applegate, H. E., Bonner, D. P., Breuer, H., Chang, H. W., Denzel, T., Floyd, D.M., Fritz, A., Koster, W.H., Liu, W.C., Parker W.L, Rathnum, M.L., Slusarchyk, W. A., Treuner, U. and Young, M. G.
   - Published in J. Am. Chem. Soc. 1981.
   - Presented at the Proceeding of the American College of Clinical Pharmacology, August 1981.

2. "Unique Peptide antibiotic Produced by *Bacillus circulans*" Meyers, E., Parker, W.L., Rathnum, M.L., Pansy, F.E., McRipley, R.J., and Brown, W.E. Presented at the 4th International Fermentation Symposium, Kyoto, Japan, March 1972.

Dawn Stetsko
[redacted]

SUMMARY: Research Scientist with more than 25 years of expertise in cellular and molecular biology. Innovative, proactive team member concentrating on design and implementation assays in support of Drug Development.

PROFESSIONAL EXPERIENCE:
BRISTOL-MYERS SQUIBB, Lawrenceville NJ

Senior Research Scientist I (February 2003-Present)

Selected Accomplishments

Development and validation of assays, in both mouse and human, for the evaluation of CD28 and CD40 dAbs for the Domantis Alliance.

mRNA Cytokine profiles, using qRT-PCR , in mouse tissue, for the LFA-1 program.

Maintenance of the Knowledge Desktop for the LFA-1, MK2 programs and the Domantis Alliance.

Development of ex vivo and in vitro assays to study mechanism of action of MapKap K2 using KO and WT mice.

Design and implementation of adhesion and T cell based assays for selectivity studies of compounds for the LFA-1 program in several species.

Transfer of the PharmacoDynamic Real-Time PCR assay to the Bioanalytical Group

Research Scientist II (February 1998-February 2003)

Selected Accomplishments

Design and implementation of adhesion and T cell based assays in Human for evaluation of compounds for the LFA-1 program.

Development of a PharmacoDynamic assay using Real-Time PCR for evaluation of changes in cytokine profile in stimulated human whole blood for the LFA-1 program

Development and validation of an SPA assay for the CD40 program

Development of a protocol for the purification, growth and stimulation of NK cells to study the mechanism of action of 41BB on NK cells

Cell signaling and proliferation assays to look at the effect of 41BB on T cells and NK cells

Design and implementation of assays for the VCAM-VLA-4 program including adhesion and SPA

Development and validation of a cell based SPA assay for the anti-CD40 program

Generation of constructs and transfection of COS cells for antibody production for 41BB and anti CD40

McMASTER UNIVERSITY, Hamilton, Ont., Canada,

Selected Accomplishments

Research Assistant Department of Biomedical Sciences,1994-1998

Development of an ELISA to look at NGF levels in inflamed and control gut and the correlation to innervation density

Established a procedure to study the growth characteristics of gut and aorta primary smooth muscle cells from rodents

Studied the effect of c-myb anti-sense oligonucleotides on the effect of smooth muscle growth.

Research Assistant, Department of Medicine,1985-1994

Selected Accomplishments

Study of T Cell Receptor rearrangements in IEL's using RT-PCR and Northerns

Involved in the study of the Fc receptor using both proliferation assay and cytokine profiles looking at both protein and RNA

Supervision of Graduate Students and Co-op Students

Dawn K. Stetsko

Involved in cloning a novel IL-1 like molecule and determining its biological relevance by Northerns, in *situ* hybridization and receptor studies

Development of an *in vitro* assay for irritants using PCR

Research Assistant, Department of Biochemistry, 1981-1985

Selected Accomplishments

Study the mechanism of action of chemotherapeutic agents using drug resistance tests and strand breakage studies and mutagenesis studies

Study of microtubule associated proteins by mutagenesis using a variety of biochemical and immunological techniques.

Study the AK-/AK+ cell system to look at the effect of tumor promoters on metabolic cooperation between cells

Study of species differences in Cardiac Glycosides in relation to the level of Na^+/K^+ activity

EDUCATION: B.Sc., Biochemistry, University of Guelph, Guelph, Ont., Canada (b)(6)

Continuing Education

Learning to Lead
Graduate of the Dale Carnegie Course
Assertiveness Training Course
Public Speaking

Dawn K. Stetsko

PUBLICATIONS

1. *Potin D, Launay M, Nicolai E, Fabreguette M, Malabre P, Caussade F, Besse D, Skala S,* ***Stetsko DK****, Todderud G, Beno BR, Cheney DL, Sheriff S, Hollenbaugh D, Barrish JC, Iwanowicz EJ, Suchard SJ, Murali Dhar MG. de novo Design, Synthesis and in vitro Activity of LFA-1 antagonists based on a bicyclic{5.5} hydantoin scaffold.* **Bioorganic and Medicinal Chemistry Letters**. In press

2. *Gupta RS, Singh B and* ***Stetsko DK****. Inhibition of metabolic co-operation by phorbolesters in a cell culture system based on adenosine kinase deficient mutants of 9 cells.* **Carcinogenesis** *6:1359-66, 1985.*

3. *Gupta RS, Chopra A and* ***Stetsko DK****. Cellular Basis for the Species-Differences in Sensitivity to Cardiac-Glycosides (Digitalis).* **Journal of Cellular Physiology**, *Vol. 127(2):197-206, 1986.*

4. *Bell TV, Harley CB, Sauder DN and* ***Stetsko D****. Expression of Messenger-RNA Homologous to Interleukin-1 in Human Epidermal-Cells,* **Journal of Investigative Dermatology**, *Vol. 88(4):375-9, 1987.*

5. *Sauder DN, Orr FW, Matic S,* ***Stetsko DK****, Parker KP and Kilian P. Human Interleukin-1α is a Chemotactic for Normal Human Keratinocytes.* **Immunol. Lett.**, *Vol. 22:123-27, 1989.*

REVIEWS

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Dawn K. Stetsko

ABSTRACTS

1. *Sauder DN, Bell TV, Harley CB and* ***Stetsko D****. Human and Murine Keratinocytes Contain Messenger-RNA Homologous to Interleukin-1 (IL-1).* **Journal of Leukocyte Biology**, *Vol. 40(3):298, 1986.*

2. *Sauder DN, Arsenault TV,* ***Stetsko DK*** *and Harley CB. Isolation and partial characterization of a putative ETAF cDNA clone (k IL-1): ETAF is distinct from IL-1α or IL-1ß.* **Clinical Research**, *Vol. 35:714A, 1987.*

3. *Sauder DN, Wong D, McKenzie R,* ***Stetsko DK****, Harnish D, Tron V, Nickoloff B, Arsenault T and Harley, CB. The pluripotent keratincoyte: molecular characterization of epidermal cytokines.* **Clinical Research**, *Vol. 36(3):692A, 1988.*

4. *Sauder DN,* ***Stetsko DK****, McKenzie R, Howard M, Pearce MK and O'Garra A. Molecular and Functional Characterization of Keratinocyte Cytokine that Induces B Cell Growth.* **Clinical Research**, *Vol. 37(2):695A, 1989.*

5. *Sauder DN, Arsenault TV, Harley CB and* ***Stetsko D****. Isolation and Partial Characterization of a Putative Etaf cDNA Clone (Kil-1) - Etaf Is Distinct from IL-1-Alpha or IL-1-Beta.* **Journal of Investigative Dermatology**, *Vol. 88(4):515, 1987.*

6. *Sauder DN, Mckenzie R, Nickoloff B, Harnish D, Harley CB,* ***Stetsko D****, Wong D, Tron V and Arsenault T. The Pluripotent Keratinocyte - Molecular Characterization of Epidermal Cytokines.* **Journal of Investigative Dermatology**, *Vol. 90(4):605, 1988.*

7. *Sauder DN, Howard M, Ogarra A, Pearce MK,* ***Stetsko D*** *and Mckenzie R. Molecular and Functional-Characterization of Keratinocyte Cytokine and Identification of a Unique Keratinocyte Cytokine That Induces B-Cell Growth.* **Clinical Research**, *Vol. 37(2):A695, 1989.*

8. *Sauder DN, Pearce MK, Ogarra A, Howard M, Mckenzie R and* ***Stetsko D****. Molecular and Functional-Characterization of Keratinocyte Cytokine and Identification of a Unique Keratinocyte Cytokine That Induces B-Cell Growth.* **Journal of Investigative Dermatology**, *Vol. 92(3):512, 1989.*

9 *Shivji GM,* ***Stetsko DK*** *and Sauder DN. Epidermal Cytokine Gene Expression: An in vitro assay for Irritants and Allergans.* **Clinical Research**, *Vol 40(2):474A, 1992.*

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10. *Shivji GM,* ***Stetsko DK*** *and Sauder DN. Epidermal Cytokine Gene Expression: An in vitro assay for Irritants and Allergans.* **Journal of Investigative Dermatology**, *Vol 98(4):613, 1992.*

11. *Salih H, Davis P, Kosowski S,* ***Stetsko DK,*** *Starling G, Aruffo A and Kiener P. Modulation of Fas (CD95/APO-1) Ligand Surface Expression and Release on Tumor Cells.* ***Biological Therapy of Cancer****, October 27-30 1999*

12 *Salih H, Loo D, ,* ***Stetsko DK****, Kosowski S, Aruffo A and Kiener P. Tumor Cells Express the Ligand for the Tumor Necrosis Factor Receptor Family Member 4-1BB (CD137/ILA).* ***Biological Therapy of Cancer****, October 27-30 1999*

13. *Rillema J,* ***Stetsko D****, Turk L, Donaldson K, Ganguly S, O'Keefe D, Phelps L, DeVona D, Bigwarfe T, Iciek L, Haggerty H and Hollenbaugh D. A Humanized antibody to Human CD40 that Blocks in a Primate Model of Immune Response and Does Not Deplete B Cells. PRI* **Scientific Symposium at Lawrenceville**, 2000.

14 *Davis P,* ***Stetsko D****, Chen S, Dambach D, Murali TG, and Suchard S. A Pharmacodynamic Assay for Evaluating LFA-1 Compounds in the Clinic.* ***PRI Scientific Symposium at Wallingford,*** *May14-15 2003.*

15. ***Stetsko D****, Skala S, Yang X, McIntyre K, Potin D, Launay M, Maillet M, Murali TG and Suchard S. Cross Species Issue: How a Murine In Vitro Adhesion Assay Helped Identify Compounds for In Vivo Evaluation in the LFA-1 Program.* ***PRI Scientific Symposium at Wallingford****, May14-15 2003.*

16. *Davis P, Nadler S,* ***Stetsko D*** *and Suchard S. Abatacept (CTLA4Ig) Differentially Modulates Human B Cell- and Dendritic Cell-Stimulated T Cell Effector Function.* **PRI Scientific Symposium at Hopewell**, Nov 7-8 2005 .

17. ***Stetsko D****, Shalaby F, Susulic V, Taylor T, McIntyre K, and Suchard S. Cytokine Profiles in LPS Treated MAPKAP K2 Deficient and WT mice; The Effect of Priming* ***PRI Scientific Symposium at Hopewell****, Nov 7-8 2005.*

18. *Wang L, Panting L,* ***Stetsko D,*** *Suchard S, Weiner R and Barrett Y. Development and Validation of an qRT-PCR Assay for Quantitation of IL-2 mRNA in SEB-stimulated Human Blood.* **2006 AAPS Annual Meeting Poster Session, San Antonio Texas** , October 29 - November 2, 2006

Michael J. Vala, Jr., CHP
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Ex. 6

EDUCATION

Masters of Technology Management, (b)(6)
Stevens Institute of Technology, Hoboken, NJ
Major: Technology Management

Masters of Science, (b)(6)
Rutgers University, New Brunswick, NJ
Major: Radiation Science

Bachelor of Engineering, (b)(6)
Stevens Institute of Technology, Hoboken, NJ
Major: Bioengineering/Engineering Physics

EXPERIENCE

Radiation Safety Officer/Manager, EHS/Q
Bristol-Myers Squibb, New Brunswick, NJ

- Responsible for regulatory compliance and radiation safety at four R&D facilities with six direct reports and an operating budget of over $1 million.
- Responsible for operational support and regulatory compliance for hazardous waste at the New Brunswick facility which includes three pilot plants and two glass plants
- Responsible for DPCC/DCR spill prevention programs at the New Brunswick facility
- Conducted confidential due diligence review for Dupont Pharma (DPC) acquisition
- Supported both the PRI and Tech Ops DPC Integration, including license transfer, EHS Phase II assessments, and integration planning
- Participated in the Central Engineering team that developed the Engineering Guideline for Potent Compound Handling
- Knowledge of applicable FDA, NRC, DOT, EPA, OSHA and NJ DEP regulations
- Oversaw the termination of radiodiagnostic manufacturing operations and facilitated the initiation of D&D activities with the NRC, NJDEP, and site Engineering
- Review of R&D SOPs and clinical research protocols involving radiolabeled investigational drugs
- Provide technical expertise and support for Bristol-Myers Squibb Worldwide Medicines Group
- Represents Bristol-Myers Squibb on the PhRMA low level radioactive waste sub-committee
- Conducting facility compliance audits
- Develops and provides radiation safety training for research and support personnel
- Initiated monthly onsite platelet apheresis drives at the New Brunswick site and took on the role of Hopewell Blood Drive Coordinator when that position was suddenly vacated due to reorganization
- Was the New Brunswick Tech Operations lead for the 2001 United Way Campaign

EXPERIENCE (continued)

Health Physicist — March 1987 - March 1992
Teledyne Isotopes, Westwood, NJ

- Managed radioactive waste brokerage service
  - ◊ Regulatory compliance under NRC, DEP, EPA, OSHA, and DOT
  - ◊ Non-routine waste disposal
  - ◊ Facility decontamination and disposal
  - ◊ Supervised environmental and facility characterizations, remediations, and decontaminations
  - ◊ Radiation safety audits and evaluations for consulting clients

CERTIFICATION

American Board of Health Physics -
Comprehensive Certification in Health Physics, November 1993, Re-certified 1997, 2001

PROFESSIONAL SOCIETIES

- New Jersey Health Physics Society (President 1995)
- National Health Physics Society
- American Academy of Health Physics

PRESENTATIONS & PUBLISHED ABSTRACTS

- *Regulatory Requirements for an Interim Waste Storage Facility at a Pharmaceutical R&D Facility*, Midyear Topical Meeting of the Health Physics Society, Albany, NY, February, 1994
- *Waste Segregation Program for R&D Personnel*, Annual Meeting of the Health Physics Society, San Francisco, CA, June, 1994

Craig R. Woodard, CIH, CSP

SUMMARY

Extensive experience in establishing comprehensive and sustainable environmental, health and safety (EHS) programs across complex matrix organizations in the pharmaceutical, health and personal care products industries. Broad knowledge of government regulations covering occupational health and safety in the workplace, protection of the environment and public health.

EXPERIENCE

Director, Environment, Health and Safety, Research and Business Support, Bristol-Myers Squibb Company, April 2002 to present.

Providing Corporate EHS leadership and technical support to Convatec, Pharmaceutical Research Institute site-based EHS staff, Sales and Marketing, and Global Fleet Administration. Leading teams and directing resources to develop oversight compliance programs for biosafety, transportation of hazardous materials, fleet safety, radiation safety (Central NJ sites), global offices and distribution centers, and Sarbanes-Oxley 404. Developing corporate programs to promote environmental stewardship and establish business strategy to reduce greenhouse gas emissions and address emerging climate change issues.

Director, Environment, Health and Safety, Pharmaceutical Research Institute and Facilities Region, Bristol-Myers Squibb Company, 1996 to April 2002.

Manager, EHS, Corporate Technical Evaluation and Services, Bristol-Myers Squibb Company, 1986 to 1996.

Industrial Hygienist, Bristol-Myers Squibb Company Industrial Division, Syracuse, New York, 1981 to 1986.

Industrial Hygiene Associate, Institute of Agricultural Medicine & Occupational Health, University of Iowa, Oakdale, Iowa, 1980 to 1981.

Health Consultant, Johnson County Iowa Health Department, Iowa City, Iowa, April to December 1980.

EDUCATION

Master of Science, Preventive Medicine and Environmental Health (b)(6)
University of Iowa, Iowa City, Iowa

Bachelor of Science, General Science (b)(6) University of Iowa, Iowa City, Iowa

Ex. 6

CREDENTIALS

Certified Industrial Hygienist (CIH) - comprehensive practice (1987)
Certified Safety Professional (CSP) - comprehensive practice (1988)
American Industrial Hygiene Association - full member
American Society of Safety Engineers - professional member
American Academy of Industrial Hygiene - diplomat

Attachment #3 – Radiation Safety Officer Delegation of Authority

Michael J. Vala is the Radiation Safety Officer for the Lawrenceville, New Brunswick and Pennington facilities and is responsible for ensuring the safe use of radioactive material. The Radiation Safety Officer is responsible for managing the radiation safety program; identifying radiation safety problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; and ensuring compliance with regulation for the use of radioactive material. The Radiation Safety Officer is hereby delegated the authority necessary to meet these responsibilities.

The Radiation Safety Officer has the authority to immediately stop any operations involving the use of radioactive material in which health and safety may be compromised or may result in non-compliance with NRC, NJ DEP, or radioactive material license requirements.

Approved by;

Louis Fedele, Vice President
Facilities

This is to acknowledge the receipt of your letter/application dated

8/12/08, and to inform you that the initial processing which includes an administrative review has been performed.

Renew (29-00139-02)

☒ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 142708.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader