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Experiment Safety Review Form
Review Number: PS-ESR-1-162-2012

PRINCIPAL INVESTIGATOR: Lisa Miller
GROUP: NSLS, Life & Env. Sc
EXT: 2091 **E-MAIL: lmiller@bnl.gov** **LIFE NUMBER: 22045**

Project Title: 1) Cell Culture 2) Microtoming & Cryotoming 3) Spectroscopy of Proteins 4) Pollen Grain Germination 5) Crystallization of inorganic porous materials
Location(s): 0725
Area(s): 0725-FIRST-1-162
Proposed Start Date and Duration: 3/1/2012 - 1 years

SIGNATURES:

Principal Investigator: Lisa Miller	**Date: 4/2/2012**
Experiment Review Coordinator: Lori Stiegler	**Date: 4/2/2012**
Reviewer: Mary Anne Corwin	**Date: 3/7/2012**
Reviewer: Christopher Weilandics	**Date: 3/20/2012**
Reviewer: Deborah Bauer	**Date: 3/20/2012**
Reviewer: Brian Heneveld	**Date: 3/7/2012**
Approval: Lori Stiegler	**Date:**
Review/Approval (ERC) Comments: 04/02/2012 8:45 AM	
Walkthrough Signature:	**Date:**
Expiration Date (max 1 yr.): 4/2/2013	
FUA Change Required? No	
Fire Rescue Run Card Changes Required? No	
Has a NEPA Review been Performed for this Project? No	
Required Approvals (i.e., IACUC, IBC, etc.):	
Project Termination Acceptance Signature: **Comments:**	**Date:**

I. Define the Scope of the Work

A. Description

1) **Cell Culture:** This experiment involves the culturing of human melanoma (SK-MEL-28) cells, IRB#123 (attached) and mouse osteoblast cells (MC3T3-E1), SH-SY5Y cells from rat neuroblastoma and human embryonic kidney cells (HEK293 purchased from ATCC) and Chinese hamster ovary cells (CHO-K1). Cells are grown and seeded for infrared and x-ray imaging. Additionally, in some cases the cell culture contains a secondary antibody labeled with a bound nanoparticle. The addition of these engineered nanoparticles to the cell culture is performed in the HEPA-filtered hood in Lab 1-128. The excess nanoparticle solution in the cell culture will be removed by washing the cells, also in the HEPA-filtered hood in Lab 1-128. The wash solution will be disposed of as hazardous waste according to the waste management requirements (as outlined in NSLS Nano-science Safety Requirements LS-RPM-1.3.5a Section 7, Rev 4.) Once the cells are washed, the nanoparticles are considered “bound” and the cells will be returned to Lab 1-162.

All sterile cell culture work is performed in the HEPA hood. Cell culture media, fetal bovine serum (FBS), penicillin-streptomycin, amphotericin β, phosphate buffered saline (PBS) and trypsin are the primary solutions used during culturing. A pipetteman is used for all solution transfers and waste solutions are vacuum aspirated out of petri dishes and into a waste flask. At the close of each cell culture session (2-3 times per week) the hood is cleaned with a 70% ethyl alcohol spray and wiped down and an automated UV disinfection is run as part of the HEPA hood function.

Other solutions and chemicals that are sometimes used are: trypan blue stain and dimethyl sulfoxide (DMSO).

Some cells are grown directly onto infrared substrates however, in other cases the cells are trypsinized and transferred to infrared reflective slides using a Cytofuge (also called a cytospin). The cytofuge acts similar to a centrifuge except that the solutions of cells are spun onto a microscope slide.

For staining purposes, the cells are sometimes fixed with 4% formaldehyde. The formaldehyde is mixed with Phosphate Buffered Saline (PBS), a total of 8 mL of the 4% formaldehyde in PBS solution is used in one day, and the max use per week would be 16 mL of the solution. The dilution of the formaldehyde and the fixing of the cells occurs in the fume hood.

Cells are also transfected using LipoD-293 (Sigma-Gen) and DNA plasmids. This work occurs in the HEPA hood. The volume of material used varies depending on the number of cells but is no more than 20 uL. After a 24 hour experiment, the transfection reagents are disposed of with the normal media, which is then bleached/sterilized.

HEPA hood maintenance will be performed in accordance with the operations manual it came with.

Task	Frequency
Replace Pre-filter	Every 3 months
Replace HEPA filter	At least every 2 years pr as required by qualification
Replace UV bulb	Annually or as needed
Replace white bulb	as needed
Recertify	Annually

2) **Microtoming & Cryomicrotoming Tissue:** The Leica CM1900 cryotome will be used to prepare thin sections of frozen plant and biological (both animal and human) tissue. The Leica RM2135 microtome will be used to prepare thin sections of biological tissues at room temperature. The cryotome and microtome are used to cut the sections which are then deposited onto slides. Only those who are given permission by Lisa Miller may use the cryotome or microtome and this is limited to members of the research group that have been instructed on how to use the instrument.

3) **Spectroscopy of Proteins:** This project is aimed at characterizing the structure of proteins using Circular Dichroism (CD) and Fourier-Transform Infrared (FTIR) spectroscopic techniques. As described below, the activities involve sample preparation for both CD and FTIR, and data acquisition for CD.

3a) *Sample preparation*: The proteins are dissolved in potassium phosphate buffer, pH 7.0. For FTIR spectroscopy, D2O is often used as a solvent. The buffer is prepared by weighing solid potassium phosphate on the Mettler Toledo AB135-S balance and by dissolving the solid in distilled water (or D2O). The pH is then monitored using the Accumet BASIC AB 15 pH Meter (Fisher Scientific). The proteins are of different nature (some are enzymes, some are not) and from different sources (animals, plants, microorganisms, human origin) but all are commercially available and registered in the CMS. Once the protein solutions are adequately prepared, their secondary structures are determined using CD and FTIR.

3b) *Circular Dichroism (CD) spectroscopy*: For CD, 40 µl of protein solutions are loaded into a quartz cell with a 0.2 mm pathlength. CD spectra are then collected using a Jasco 715 spectrometer. The instrument is purged with dry nitrogen gas to eliminate ozone produced by the instrument.

3c) *Fourier-Transform Infrared (FTIR) Spectroscopy*: For FTIR, 30-40 µl of protein solutions are loaded into CaF_2 cells and the spectra are then collected using a Nicolet-IR 560 Spectrometer.

3d) *Spotlight (FTIR-Microspectroscopy):* Approximately, 1 µl of protein solution is loaded on a CaF_2 slide and allowed to dry. FTIR spectra are collected from the dried drops using a Perkin Elmer Spectrum Spotlight FTIR microscope.

4) Pollen Grain Germination

This experiment involves the germination of plant pollen grains for infrared imaging. Pollen from *Arabidopsis* or *Tobacco* mature plants are isolated in the BNL Biology Department (Bldg 463) and placed in a small aliquot of germinating medium (50 ul) consisting of sucrose and other salts. These cells undergo the germination process over night, which is natural for pollen. They are next isolated using nylon filters and washed with water. The cells are then transferred onto a calcium fluoride window for drying in ambient conditions. Plant cells are then be observed under the optical microscope. No building modifications are necessary. Dried samples are stored in a desiccator.

5) Crystallization of inorganic porous materials

In this experiment, preparations are made for crystallization of porous materials, in particular, metal-organic frameworks. Inorganic component (metal salt, such as aluminium nitrate, zinc chloride, 10-500 mg) is dissolved in water or DMF (1-5 ml). Then organic part (terephthalic acid, imidazole, 500 mg-1g) is dissolved in water, DMF or mixture thereof (1-5 ml). Diethylamine may also be added depending on synthetic procedure. Two solutions are mixed together in desired proportions and experimental reaction cell is loaded with the resulting solution. The cell is transferred to the beamline.

Equipment manuals or procedures that are controlled documents:

1) Cell Culture: Fisher Scientific PCR Workstation.pdf (Manual)

2) Microtome and Cryotoming Tissue: Lecia CM1900 Instruction manual and Lecia RM2135 Instruction manual

3) Spectroscopy of Proteins: Jasco J-715 CD Instruction Manual, Nicolet-IR 560 Spectrometer Instruction Manual, and Perkin Elmer Spotlight Instruction Manual

4) Pollen Grain Germination: No equipment necessary

5) Crystallization of inorganic porous materials: no equipment necessary

B. Human Performance Factors

1) **Cell Culture:**

The main concern is the growth of fungus and bacteria in the cell cultures. This fungus/bacteria have no affect on humans, it just kills our cells. Most fungal/bacteria contamination actually comes from human interaction with the cells.

Several measures are taken to ensure a sterile environment as to prevent the growth of fungus and bacteria. First, cell culture work is performed in a sterile HEPA hood, and sterile equipment is used when handling cell cultures. Second, anti-fungal and anti-bacterial sera are used in cell culture experiments. The occurrence of fungus and/or bacteria is treated by discarding the affected cell cultures and sterilizing all equipment that may have been in contact with the affected cell cultures. When working in the HEPA hood and with cells, users are to wear nitrile gloves. Any bottles or items that are to be placed in the hood are sprayed down with 75% ethyl alcohol. If a user is moving from inside and outside of the hood, they should also spray down their nitrile gloves.

All mentioned controls depend on human action. Omission of either of these controls increases the risk of fungus and bacteria in cell cultures, and/or the spreading of fungus/bacteria from affected cultures to unaffected cultures.

The main precursor for the lack of controls is the unscheduled use of the cell culture hood. Well planned experiments should include the reservation of the cell culture hood, such that no conflicts arise between different users. A scheduling system is in place and maintained to avoid such issues.

2) **Microtoming & Cryomicrotoming Tissue:**

The largest concern here is being cut by the blade. Cut-resistant gloves are worn beneath nitrile gloves to prevent accidental cuts. There is also a glass plate which covers the blade when it is not in use. In addition, when the microtomes are not in use but contain a blade a cautionary sign is placed on the instrument. Carelessness is the most likely cause of being cut by the blade. This chance can be reduced by constantly being aware of the blade with respect to oneself, and adherence to protocols.

When human tissue samples are cut with the microtome, disposable lab coats, face masks to cover the nose and mouth, and goggles will be worn in addition to the normal PPE.

3) **Spectroscopy of Proteins:**

The proteins used in the project do not present risk to human health. However, lab coat and nitrile gloves are used to prevent sample contamination.

4) Pollen Grain Germination

Only plant cells are used which pose no risk to human health. Cells are only exposed to air for very limited time and are composed of normal plant tissue. The only possible concern is contamination of samples from the experimenter's hands or clothing. A sterile environment is not necessary. Experiments are generally performed with nitrile gloves to prevent contamination of the samples. The use of nitrile gloves is the major control to prevent contamination from occurring.

5) **Crystallization of inorganic porous materials**

Organic solvent used in this work, DMF is a carcinogen, reproductive toxin, and hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion,of inhalation. Diethylamine is an irritant when ingested or in case of eye or skin contact. Benzimidazole is mild irritant when ingested or in case of eye or skin contact. All the experiments will be performed in the fumehood with the sash kept as low as practical. Nitrile gloves will be used during experiments.

C. Waste Minimization/Pollution Prevention

1) The smallest amount of solutions will be used for cell culturing. All solutions exposed to living cells will be diluted to 30% bleach before disposal down the drain. 2) The waste generated by this experiment is extremely minimal and cannot be further reduced. For human disuse, all disposable PPE and waste will be placed in a biohazard bag inside a box, which will be put inside another biohazard bag for disposal. To minimize this waste, one should consider consolidating the number of times needed to cut human tissue for an experiment. 3) To perform the above mentioned methods we only need very small amounts of solutions. We only prepare as much solution as needed.

D. Materials Used /Waste Generated

Materials Used	Disposal Method	Amount per Use	Amount per Year	Comments
Minimum Essential Media Eagles	Sanitary	20.00 ml	5000.00 ml	Disposed of after dilution with 30% bleach
Alpha Minimum Essential Media	Sanitary	20.00 ml	5000.00 ml	Disposed of after dilution with 30% bleach
Fetal Bovine Serum	Sanitary	2.00 ml	500.00 ml	Disposed of after dilution with 30% bleach
Phosphate Buffered Saline (PBS)	Sanitary	10.00 ml	2000.00 ml	See attached LEEF
Trypsin	Sanitary	4.00 ml	800.00 ml	Disposed of after dilution with 30% bleach
Trypan Blue stain	Hazardous	0.00 ml	0.50 ml	
Penicillin-streptomycin	Sanitary	1.00 ml	300.00 ml	Disposed of after dilution with 30% bleach
Amphotericin B	Sanitary	1.00 ml	300.00 ml	Disposed of after dilution with 30% bleach
D2O	Sanitary	1.50 ml	63.00 ml	
Sodium phosphate (monobasic)	Sanitary	0.30 ml	150.00 ml	Disposed of after dilution with 30% bleach
Ascorbic Acid	Sanitary	0.00 ml	15.00 ml	Disposed of after dilution with 30% bleach
1% Alizarin Red S stain in water	Sanitary	1.00 ml	450.00 ml	Disposed of after dilution with 30% bleach - See attached LEEF

Formaldehyde	Hazardous	1.00 ml	450.00 ml	
SrCl2	Hazardous	10.00 ml	100.00 ml	
Tissue Tek (H2O Soluble polymer embedding material	Trash	0.00 lb	0.20 lb	
Plant material	Trash	0.00 g	1.00 g	
Biological material	Trash	0.00 g	3.00 g	
Human tissue and PPE	Medical	10.00 g	50.00 g	
Buffer (e.g. potassium phosphate ph7 and 7.5)	Sanitary	0.50 ml	1000.00 ml	See attached LEEF
Proteins	Sanitary	0.00 g	0.20 g	
HCl, KOH to adjust pH	Sanitary	0.10 ml	20.00 ml	after neutralization
ZnCl2	Hazardous	0.00 ml	0.10 ml	
CuCl2	Hazardous	0.00 ml	0.10 ml	
Cell culture rinse with nanomaterials	Hazardous	10.00 ml	50.00 ml	
Organic solvents (DMF, diethylamine, benzimidazole)	Hazardous	5.00 ml	100.00 ml	
		0.00	0.00	

II. Identify and Analyze Hazards Associated with the Work

The following hazards were identified:

Physical Hazards:

- Sharps (non medical)
- Cryogens (any substance or device capable of producing temperatures <= 170K) (Area: 0725-FIRST-1-162)
- Compressed gases (lecture bottles, cylinders, gas lines) (Area: 0725-FIRST-1-162)
- Flammable liquids (Area: 0725-FIRST-1-162)
- vacuum pump, sharp cutting blade, cold material temperatures (Other)

Chemical Hazards:

- Chemicals, Hazardous (General)
- Carcinogens (Area: 0725-FIRST-1-162)
- Reproductive toxins (Area: 0725-FIRST-1-162)
- Corrosives
- Flammable liquids (Area: 0725-FIRST-1-162)
- Nano-material bound in a solid matrix or fixed substrate (Area: 0725-FIRST-1-162)

Ionizing and Non-ionizing Radiation Hazards:

- Ultraviolet sources >1 W (Area: 0725-FIRST-1-162)
- HEPA Hood-UV bulb for sterilization purposes: The UV cycle can only be turned on when the lower window is latched in place. Having the window in place prevents access to the hood during the sterilization process. If the window is removed during the UV cycle the cycle will stop. The UV cycle lasts ~15 minutes. (Other)

Biological Hazards:

- Human blood/components, human tissue/body fluids (Area: 0725-FIRST-1-162)
- proteins of different sources (animals, humans, microorganisms), plant cells (Other)

Offsite Work:

- None

Other Issues (Security, Notifications, Community, etc.):

- None

Significant Environmental Aspects

- Any amount of hazardous waste generation (Area: 0725-FIRST-1-162)
- Any amount of Regulated Medical Waste
- Production or use of, or waste containing, engineered nanomaterials

III. Develop and Implement Hazard Controls and Assess Risk

A. Physical Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Sharps (non medical)** **Default Controls:** Sharps including needles, razor blades and syringes (plastic and glass) must be disposed of in sturdy, rigid, sharps containers. Sharps containers cannot be more than 2/3 full.	**Negligible (0-20)**
Hazard: **Cryogens (any substance or device capable of producing temperatures <= 170K)** **Default Controls:** General Requirements: • Evaluate location oxygen deficiency • Store/transport only in approved containers (i.e. DOT/ASME or BNL LESHC) • Never pour from above chest level • PPE: Long Sleeve Shirt (or Lab Coat), long pants (or skirt covering ankles) and closed shoes Pressurized transfer to open (vented) container; Or-Pouring > 5 liter volumes of LN2 between open containers: • Face shield along with either Safety Glasses (w/side shields) or Goggles • Gloves (Cryo or Heavy Leather) Pouring small (5 liters or less) volumes of LN2 between open containers: • Safety Goggles (face shield recommended if possible) • Gloves (Cryo or Heavy Leather) Work with samples immersed in LN2 in small (~1 liter) dewars: • Use Tongs (tools) to manipulate/handle cryogenic samples (do not touch with gloves)• Use insulated non-absorbent gloves with dexterity (cotton/nylon gloves under disposable nitrile gloves) • Safety Goggles	**Acceptable (21-40)**
Hazard: **Compressed gases (lecture bottles, cylinders, gas lines)** **Default Controls:** • Any systems >15psi must be SME Approved • Transport cylinders using a cylinder cart • Secure cylinders to a fixed object/wall • Use regulator, hoses, and components compatible with gas • Use hoses and clamps rated for maximum regulator output or use pressure relief device • Wear safety glasses with side shields when installing/removing/or adjusting regulator • Label piping/tubing	**Negligible (0-20)**
Hazard: **Flammable liquids** **Default Controls:** As for chemicals, plus Store large quantities in Flam. cabinets as required	**Negligible (0-20)**
Hazard: **vacuum pump, sharp cutting blade, cold material temperatures (Other)** **Default Controls:** **Task Specific Info:** Only instructed personnel with permission from Lisa Miller may use the cutting blade.	**Negligible (0-20)**

Cut proof gloves required. Post machine if left unattended with blade inside. Lock Sample Arm Crank if required to reach inside with blade. Cut proof gloves also provide protection from cold material temperatures.	

B. Chemical Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Chemicals, Hazardous (General)** **Default Controls:** • All operations with large (>250ml, health hazard 3) quantities of hazardous chemicals (pouring, mixing, evaporation, etc) in hood, or use snorkel when hood is impractical • Register Commercial Chemicals in CMS • Work alone after hours only if permitted by supervisor or ESR • Identify containers so contents are identifiable unless being actively used (ex. 1 shift) • Food, beverage, smoking, and cosmetics are prohibited • Handle glassware properly: no mouth suction, no drinking from labware. **Task Specific Info:** Put chain across lab entrance when working with chemicals to indicate lab coats required.	**Negligible (0-20)**
Hazard: **Carcinogens** **Default Controls:** Use hazardous chemicals controls plus: Establish and post a "designated area" where used Note location on fire run card and hazard info. placard. Exposure monitoring to assure that action levels not exceeded Establish procedures for work area cleanup and decontamination	**Negligible (0-20)**
Hazard: **Reproductive toxins** **Default Controls:** Use hazardous chemicals controls plus: Establish and post a "designated area" where used Note location on fire run card and hazard info. placard for storage of solids, greater than 40 pounds; liquids, greater than 5 gallons; gases, greater than 10 pounds Exposure monitoring, determined by SHSD Rep, to assure that action levels not exceeded Prior to decommissioning, establish procedures for sampling and decontamination	**Negligible (0-20)**
Hazard: **Corrosives** **Default Controls:** Use hazardous chemicals controls plus: - Unobstructed access to Emergency Eyewash and Shower **Task Specific Info:** Keep lab door open for access to Emergency EyeWash and shower in corridor.	**Negligible (0-20)**
Hazard: **Flammable liquids** **Default Controls:** Use hazardous chemicals controls. Review large quantity storage with Fire Protection Engineer Note location on fire run card and hazard info. placard for storage of solids, greater than 40 pounds; liquids, greater than 5 gallons; gases, greater than 10 pounds	**Negligible (0-20)**
Hazard: **Nano-material bound in a solid matrix or fixed substrate**	**Negligible (0-20)**

Default Controls: PPE Requirements for Handling: Standard PPE required for the work area. No additional requirements. Handling Requirements • No Mechanical abrasion. • No thermal stresses. • No etching Laboratory Posting Requirements - No Posting Requirements Waste Handling: • Solids containing nanomaterials which have a potential to be released must NOT be disposed in the regular trash. See SBMS Hazardous Waste Management for more information. • Collect solid UNP waste in a bag (6 mil thick minimum zip-lock type or J-sealed) or other sealing container (i.e. jar with threaded lid). • Spell out the chemical name (do not use formulas or trade names) on the RED Hazardous Waste Label. • The contents line on the label must contain the chemical composition and the word “NANO” • A second label, in addition to the Red Hazardous Waste Label, is required on the outside other container/bag stating “CONTAINS NANOMATERIALS” see ES&H Coor. or 90-Day area manager for labels.	

C. Environmental Hazards, Tasks and Controls (include on/off site transportation and products/services)

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Any amount of hazardous waste generation** **Default Controls:** Engineering Controls • Waste will be accumulated in chemically compatible containers that appropriately contain/protect the waste. • Waste containers will be closed in a tray (secondary containment) in the Satellite Accumulation Area (SAA). Administrative Controls • All hazardous waste containers will have a (red) “Hazardous Waste Label” that has the generator’s name and the chemical contents (trade name/formula not acceptable). • All waste will be accumulated in closed containers and kept in an established and posted SAA until ready for transfer to the 90-Day Haz Waste Area for pick-up by Waste Management. • For pick-up by Waste management, complete the Nonradioactive Haz Waste Control Form and consult the 90-Day Area Manager to gain access/transfer the waste to the 90Day Area. Training: Hazardous Waste Gen. (HP-RCRIGEN3). PPE: When handling waste materials follow PPE requirements specified for the specific materials. Comply with the SBMS Subject Area: “Hazardous Waste Management”.	**Negligible (0-20)**
Hazard: **Any amount of Regulated Medical Waste** **Default Controls:** Engineering Controls • Label with a Biohazard Label. • Place solid RMW (non-sharps) in a single biohazard bag (BB) or inside a pre-labeled, BB-lined ice cream container (ICC), or inside an appropriate U.S. DOT-approved container with a BB liner. • Collect RMW and biohazardous sharps in a rigid, red, biohazard container • Segregate and place individual containers of liquid waste (anything with free-standing liquid) into rigid, pre-labeled, leak-proof secondary containers (wide-mouth, plastic screw-capped jars or larger plastic screw-top pails that are tightly lidded (will not spill any contents), and place these into a D.O.T.-approved screw-top container (e.g., 5-gallon white bucket P/N: #K-60632/equivalent).	**Negligible (0-20)**

Administrative Controls: • Do not overfill sharps container • Complete Regulated Medical Waste Control Form (RMWCF) and Orange Waste Tag. • Contact the Medical Waste Supervisor to arrange transfer to the Medical Dept staging area for disposal. • Do NOT leave RMW containers unattended outside of the staging area. Comply with the SBMS Subject Area: “Regulated Medical Waste	
Hazard: **Production or use of, or waste containing, engineered nanomaterials** **Default Controls:** • All waste in contact with nanomaterials must be disposed as hazardous waste e.g., (gloves, lab coats, swabs, Kimwipes, blotter paper, beakers, flasks, tape, sample holders). Chemicals containing nanomaterials must NOT be released to the sink or disposed in the regular trash. See SBMS Hazardous Waste Management for more information. • Liquids must be stored in a rigid leak proof container. • Particulates must be stored in a rigid leak proof containers “OR” =/> 6 mil plastic bags. • Spell o	**Negligible (0-20)**

D. Radiation Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Ultraviolet sources >1 W** **Default Controls:** Task and source specific. Evaluate below. **Task Specific Info:** Survey has been done, no controls required.	**Negligible (0-20)**
Hazard: **HEPA Hood-UV bulb for sterilization purposes: The UV cycle can only be turned on when the lower window is latched in place. Having the window in place prevents access to the hood during the sterilization process. If the window is removed during the UV cycle the cycle will stop. The UV cycle lasts ~15 minutes. (Other)** **Default Controls:** **Task Specific Info:** Source has been evaluated by SHSD.	**Negligible (0-20)**

E. Biological Hazards, Tasks and Controls

Hazard, Default Controls, Task Specific Info	Risk Level
Hazard: **Human blood/components, human tissue/body fluids** **Default Controls:** Engineering Controls • As is practical, use (needles, phlebotomy blood devices) with sheaths, self retraction, and other “sharps injury” control design. Administrative Controls • Container labeling • Use universal precautions. • Document work practices in an “Exposure Control Plan”. (template in subject area) Training: • Bloodborne Pathogens Awareness (TQ-BBP) • Bloodborne Pathogen Medical Surveillance	**Negligible (0-20)**

PPE: • Safety glasses w/ side shields. • Lab coat based on area. • Latex or Nitrile exam gloves for incidental contact/splash protection. Comply with the SBMS Subject Area: “Bloodborne Pathogens”. **Task Specific Info:** Follow requirements in Exposure Control Plan, PRM 2.7.0.	
Hazard: **proteins of different sources (animals, humans, microorganisms), plant cells (Other)** **Default Controls:**	**Negligible (0-20)**

F. Offsite Work Hazards, Tasks and Controls
None

G. Other Issues (Security, Notifications to Other Organizations, Community Involvement, etc.)
None

H. Recommended Exposure Monitoring

- None

Description or comments:

I. EPHA Determination

Chemical Name	Quantity (lbs, gal)	Location (Bldg/Room#)

IV. Perform Work Within Controls

A. Recommended Training and Medical Surveillance Summary

- NSLS R2A2 for Lab Steward (LS-R2A2-LAB-STWD)
- NSLS R2A2 for Deputy Lab Steward (LS-R2A2-LAB-STWD-DEP)
- Laboratory Standard (HP-IND-220)
- Cryogen Safety (HP-OSH-025)
- Hazardous Waste Generator (HP-RCRIGEN3)
- Bloodborne Pathogens Awareness (TQ-BBP)
- Compressed Gas Safety (TQ-COMPGAS1)
- Regulated Medical Waste Management (TQ-RMWM)

B. Personnel Training, Qualification, and Authorization List

Employee/Guest Name	Life/Guest#	Dept	Required Training Course(s)	Signed
Megan Bourassa	E7679	LU	Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 7/28/2012] Laboratory Standard (HP-IND-220) [EXPIRES: 1/18/2014] Bloodborne Pathogens Awareness (TQ-BBP) [EXPIRES: 12/7/2012] Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 7/15/2012] Regulated Medical Waste Management (TQ-RMWM) [EXPIRES: NEVER]	

			NSLS R2A2 for Deputy Lab Steward (LS-R2A2-LAB-STWD-DEP) [EXPIRES: 1/13/2013]	
Lisa Miller	22045	PS	Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 10/3/2013] Laboratory Standard (HP-IND-220) [EXPIRED: 2/8/2012] Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] NSLS R2A2 for Lab Steward (LS-R2A2-LAB-STWD) [EXPIRED: 2/4/2010]	
Randy Smith	22973	PS	Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 3/2/2015] Laboratory Standard (HP-IND-220) [EXPIRES: 3/2/2013] Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 11/10/2012]	
Eli Stavitski	24671	PS	Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 9/15/2013] Laboratory Standard (HP-IND-220) [EXPIRES: 9/14/2012] Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 9/19/2012]	
Alvin Acerbo	J8092	LU	Compressed Gas Safety (TQ-COMPGAS1) [EXPIRES: 2/17/2013] Laboratory Standard (HP-IND-220) [EXPIRES: 2/6/2014] Cryogen Safety (HP-OSH-025) [EXPIRES: NEVER] Hazardous Waste Generator (HP-RCRIGEN3) [EXPIRES: 4/15/2012] Regulated Medical Waste Management (TQ-RMWM) [EXPIRES: NEVER]	

C. Emergency Procedures

1) If any cell solutions are spilled they should be promptly disinfected (if exposed to cells) and cleaned up. 2) If a person is cut, while using the cryotome, they will be transported to the OMC. No other procedures are necessary for this experiment. 3) In case any acid or bases are spilled into the eye go to the eye showers outside the lab and rinse thoroughly. After purging the eyes go and see a doctor. Spill kit is located outside Lab 1-166

D. Transportation

None

E. Logistical Interactions

None

F. Termination/Decommissioning

1) At the end of the day the HEPA hood will be wiped with 70% ethanol and the UV cleaning cycle will be run. All solutions and plasticware will be disposed in the proper receptacles until full, and then they will be decontaminated as mentioned above. 2) When finished for the day, the cryotome will be wiped clean with ethanol. Human tissues and disposable PPE will be placed in a biohazard bag, in a box, and then in a second biohazard bag. When the project is complete the waste will be disposed of in the medical building. 3) After finishing work check if there is protein spilled in the balance or on the work benches. If this should be the case wipe it away cautiously with a paper towel dampened with water (wear gloves). If the proteins are not a bio hazard and do not pose a danger to health any solutions leftovers can be thrown into the trash can.

V. Provide Feedback

Work has progressed smoothly in this lab. (2/2012) Due to the work with human brain tissue, evaluation was done for safer work methods. No improved methods were identitifed. Crystallization of inorganic porous materials has been added.

VI. Attachments

Attached Files:

06-04-07 LEEF LS.pdf

PCR_hood_UV_FNL.doc