Appendix D

Standard Operating Procedure (SOP)

Safety considerations will be included in initial experimental design. SOPs will be developed and documented for hazardous chemicals when the chemical is used routinely in the laboratory. Sections 4 and 5 provide information regarding SOPs. SOPs are lab specific and are required for ALL **carcinogens**, reproductive toxins, acutely poisonous/toxic agents, explosives, and pyrophoric materials. The material's original container label from the vendor will communicate if the substance has one of these properties. EH&S maintains and SOP Library at **http://www.ehs.uci.edu/programs/sop_library/**. These SOPs must be tailored to the specifics of each lab to be most effective. Visit the **Frequently Asked Questions (FAQs) about SOPs** page at the **EH&S Laboratory & Research** web area.

ALWAYS READ AND REVIEW THE MSDS BEFORE USING ANY MATERIAL FOR THE FIRST TIME.

Elements to be addressed when designing experiments or procedures are:

- Material hazards
- Availability of alternative safer materials
- Engineering controls
- Personal protective equipment (PPE) required
- Spill or release potential and possible consequences
- Other special considerations such as extreme reactivity

SOP's are developed for:

- Process, such as distillation, peptide synthesis
- Each extremely hazardous chemical, such as cyanogen bromide
- Class of hazardous chemicals, such chemotherapy or antineoplastic drugs
- Highly hazardous operations (template available at: **http://www.ehs.uci.edu/programs/sop_library/High Hazard Operations SOP.doc**)
- Animal protocols involving highly hazardous substances requiring specialized handling and waste management to protect people and the environment (template available at: **http://www.ehs.uci.edu/programs/sop_library/Animal_SOP.doc**

SOP elements may be addressed in the laboratory notebook as part of the experiment or process description, or using the format provided on the SOP form.

Suggested Strategy for Getting SOPs in Place and Improving Them Over-Time

1. Size up the situation (some labs use none, others many)

   a. At next lab meeting, ask staff to review labels of chemicals they use now, looking for PHS keywords. Have them make a list of the PHSs they use. Here is a suggested format for the list.

User Name	PHS Name	Type (C,R,HP, U)[1]	Article 110[2] or Select Agent [3](Y/N)	Max % Conc. handled	Typical working % Conc.	Location used	Waste Stored	Protocol Name

1. Compile master list for lab.

2. Check the EH&S SOP Library for published SOPs related to your needs.

3. If no SOP is available, user can proceed to develop an SOP using the **Generic ISEM SOP template**. User can seek assistance from the EHS Coordinator.

4. During periodic lab meetings and lab audits, ask around whether new PHS use has begun (prompt users with PHS keywords to look for). If so, begin with Step 3 by asking EHS Coordinator if SOP exists.

5. Encourage users to pencil improvement suggestions on side-page of current SOPs.

6. Email your SOPs to the EH&S Chemical Hygiene Officer to add it to the Campus SOP Library.

A sample SOP for formaldehyde use during animal perfusion can be found on the next page.

[1] **(C) Carcinogen**; (R) Reproductive Toxin; (HP) Highly Poisonous; (U) Unstable, Explosive, Pyrophoric, Water Reactive.
[2] **Article 110 carcinogens** are a subset of carcinogens with special Cal-OSHA requirements.
[3] **Select Agents** are biological agents restricted by United States Department of Human Health Services.

READ AND REVIEW ANY APPLICABLE MANUFACTURER/VENDOR SAFETY INFORMATION BEFORE DEVELOPING STANDARD OPERATING PROCEDURE AND PERFORMING WORK.

PI Name: _____

Name of Work Unit:_____

Generic Integrated Safety & Environmental Management (ISEM)
Standard Operating Procedure (SOP)

#1	Scope of Work/Activity: State the process/operation/equipment that the SOP concerns.
#2	Specific Safety and Environmental Hazards: State the specific hazard and consequences if procedure not followed to person, environment, or property. Carcinogen. Combustible Liquid, Corrosive, Sensitizer. All users must complete formaldehyde online training at: www.ted.uci.edu All tasks having potential for exposure (dose preparation, injection) are to be performed by trained staff and must have read the Material Safety Data Sheet www.ucmsds.com
#3	Engineering Controls: Formaldehyde containing solutions and preserved samples should be dispensed and used only in a properly operating fume hood. Routine use outside of a fume hood is acceptable only when formaldehyde levels are monitored and are below 0.5 ppm. Know location of closest eyewash/shower.
#4	Designated Area: Indicate the designated area for performing this process in the laboratory. Conduct all work in Room ____.
#5	Personal Protective Equipment (PPE): State the personal protective equipment selected and required. Use nitrile gloves. If disposable gloves are used, discard after use. Consult with glove manufacturer to determine breakthrough times. Wear chemical goggles or safety glasses and lab coat. Adhere to strict hygiene controls. Contact EH&S for proper fit testing and selection prior to respirator use, if needed.

#6	Important Steps to Follow: List the specific sequence staff should follow to avoid hazard. Make sure all containers are labeled with the name of the material and with a warning label. Animals should be restrained or sedated prior to injecting animals. Syringes for injection must be safety engineered (self-sheathing syringes). Use disposable bench paper with impervious backing during preparation of toxic agents to limit surface contamination.
#7	Emergency Procedures: a. Describe immediate medical treatment required in case of personnel exposure. 1. If skin is exposed, wash immediately with soap and water. Flush eyes and mucous membranes with large amounts of water. Use emergency drench shower in case of extensive contamination. 2. Ingestion: Seek medical attention. 3. Inhalation: Remove victim to fresh air and obtain medical attention. 4. Remove all sources of ignition from the spill area. 5. Respiratory protection is required to clean up spills outside of the fume hood. Contact EH&S for respirator certification. **-Complete online incident report form at www.ehs.uci.edu**
#8	Control Procedures for animal care and housing requirements: a. Will animals excrete toxic levels of chemicals? - If so, identify waste streams under Section 9, including bedding. If ULAR staff will be handling animal care, explain any special handling procedures that may be required for bedding and cage handling, e.g., dust respirators, lab coats, etc.

#9	Identify waste stream and disposition of animal carcass, waste, and unused stock of chemicals (Identify if waste is biohazardous, pathological waste, or hazardous waste, etc.) Please note that any drugs identified as a human carcinogen or pose a hazard to human health or environment because of its **carcinogenicity** must be managed as hazardous waste. Additional guidelines regarding hazardous waste and pathological waste can be found at **http://www.ehs.uci.edu/programs/enviro/** • Surplus chemicals will be disposed of as hazardous chemical waste. • Disposable lab ware, bench paper, personal protective equipment, contaminated carcasses for the duration of the experiment as "pathology waste" for incineration. Containers available in the vivarium. • Sharps will be disposed of in "Sharps" container. • At Irvine locations, utilize the on-line system for requests by requesting a "Chemical Waste" Pickup via the Internet: a. Visit **http://www.ehs.uci.edu/programs/enviro/** • At UCIMC locations, contact Mealii Seanoa at **kseanoa@uci.edu** for pathology waste incineration barrels
#10	Decontamination and spill clean-up procedures 1. Absorb small liquid spill with absorbent paper. 2. Use respiratory protection if cleaning up spill outside of the hood. Wash work surfaces with soap and water. 6. Use absorbent pads or vermiculite to clean up small fume hood spills or to dike spill area. Clean up spill area with additional pads or Kim Wipes. 7. Call **911** in the event of a spill beyond lab's capability. 8. After clean-up, room air must be monitored by EH&S prior to occupancy. 9. Dispose of waste through EH&S. Use appropriate PPE.

As the Principal Investigator, it is your responsibility to ensure that all individuals listed in this protocol is taught correct procedures for the safe handling of hazardous materials involved in this study. It is also your responsibility to assure that your personnel attend Lab Core Safety Training and other applicable safety training courses.

Both PI and all persons associated with the protocol must sign the following acknowledgement: ***I have read, asked questions, and understand the hazards of and safe working procedures for the activity/materials described herein.***

PI Signature: DATE

Other Personnel:

Name/ Signature DATE