

University of California, Irvine

**Integrated Nanosystems Research Facility and  
Bio-Organic Nanofabrication Facility**

**Standard Operating Procedure to Perform Low Level Entry  
Preventative Maintenance Repairs**

#### PURPOSE:

This document describes the procedure for entering the Integrated Nanosystems Research Facility (INRF) and Bio-Organic Nanofabrication Facility (BiON) using low level personal protective equipment (PPE). Low level PPE includes disposable gown over street clothes, disposable booties over shoes, 1 pairs of latex gloves and safety glasses.

#### SCOPE:

This SOP (standard operating procedure) applies to all entries by Facilities management requiring low level of PPE.

This SOP applies to entry by authorized personnel or individual(s) escorted by authorized personnel.

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#### AUTHORITY and RESPONSIBILITY

The Laboratory Manager of the Integrated Nanosystems Research Facility (INRF) and Bio-Organic Nanofabrication (BiON) Facility and EH&S safety officer (Christian Ritter ) in accordance with the University of California, Irvine Lab Chemical Hygiene Officer and INRF/ BION Lab safety Manual

The Laboratory Manager is responsible for implementing the SOP and ensuring that all entering the two facilities follow the SOP procedure. It is the responsibility of all personnel to read and understand and be able to perform the SOP

Facilities Management personnel is responsible for following the practices and procedures listed in this document. Failure to follow the required procedures may place workers and researchers at risk for injury. A serious or consistent failure to follow these guidelines must to be reported to the INRF Director, Professor GP Li, EH&S Deputy Director, Scott Bourdon, and Assistant Vice Chancellor of Facilities Management, Marc Gomez.

#### INTRODUCTION

Integrated Nanosystems Research Facility and Bio-Organic Nanofabrication Facility are applicable to teaching research and production facilities that work with corrosive, combustible, toxic, and exotic materials which could cause short and long term illnesses and acute health effects such as burns from skin contact and mucous membrane burns and irritation from inhalation. All these materials are contained in chemical

cabinets, flammable cabinets and laminar flow chemical flow hoods. Laboratory staff have specific training in handling these various types of materials

**DEFINITIONS:**

**SOP:** Standard Operating Procedure

**CHO:** Chemical Hygiene Officer

**LFCH:** Laminar Flow Chemical Hood

**CWH:** Chemical Wet Hood

**SGC:** Safety Gas Cabinet

**PPE:** Personal Protective Equipment

**CDO:** Control Decomposition / Oxidation

**PM:** Preventive Maintenance

**MATERIALS and REAGENTS:**

Disposable gown  
Head cover  
Shoe covers  
Latex gloves  
Safety glasses

**INSTRUMENTATION:**

HF monitor  
Chemical monitoring  
Ph paper  
Exhaust indicator

**NOTES:**

All personnel entering the lab should be gowned before entering the facility and should wear the necessary PPE before beginning work, where required.

**PROTOCOL:**

Entry into cleanroom during normal hours

1. Contact INRF/BION front office with nature of work to be performed or the emergency in the lab. This includes work on the roof or above lab ceiling and cat walk area so they can inform lab staff to make sure that the area is in a safe condition.
2. Front office will contact staff to escort facilities management personnel to gowning area.
3. Staff will log in facilities personnel computer tracking system and review proper gowning procedure.
4. Don disposable gown
5. Don shoe covers
6. Don head cover
7. Wear safety glasses

8. Wear nitrile gloves
9. Staff will discuss safety do's and don'ts of working in the area of interest.
10. Log out of computer track system and inform front office of the state of the work.

## **PROTOCOL:**

### Entry into cleanroom during off hours

For emergency cases go down the list of contacts which at this time would be:

Jake Hes

G.P. Li

Mo Kabaili

Note: Preventive maintenance items can be coordinated at an earlier time to arrange after hour access

1. Contact front office for the INRF/BiON with nature of work to be performed or the emergency in the lab. This includes on the roof or above lab ceiling and cat walk area so they can inform lab staff to make sure that the area is in a safe condition.
2. Depending on nature of work, staff may have to be present while work is being performed to perform a shut down or restart of lab equipment.
3. If work needs performed within lab premises gowning procedure is the same as during regular working hours.
4. Once work has been completed and staff is not on location notify front office through e-mail that normal lab work can proceed.

## **REFERENCES:**

INRF / BiON Lab Safety Manual

INRF / BiON Lab Safety Data Sheets

## **ADDENDUM TO LAB SAFETY MANUAL**

Life Safety and Building Equipment Notification:

Upon failure of the equipment FM or staff will notify front office of INRF /BiON the area impacted so work can cease in that area.

## **HVAC SUPPORT**

In the HVAC area that supports the Storage gas cabinets, Laminar flow chemical wet benches, Chemical wet hood inform front office the nature of type of work, such as repair or preventive maintenance. Preventive maintenance will be scheduled at an earlier time before work is started.

Staff will inform FM of the type of materials used within the system. If materials are hazardous, EH&S will perform a swipe test (see Appendix for Statement of Readiness form).

### **Procedure**

1. Shut down system
2. Lockout/tagout disconnect switch by trained FM lead person
3. Perform wipe test if needed by EH&S
4. FM must wear PPE (Safety glasses, latex gloves with leather gloves over them, particulate mask or appropriate respirator, if required).
5. On completion of work FM lead person will remove lock-out/tag-out, turn on disconnects and start up system
6. In the lab area, staff will verify system is operating properly by verifying monitoring devices are not alarming

## **ELECTRICAL and MECHANICAL**

For electrical and plumbing repairs on items, such as Laminar Flow Chemical Hood, chemical wet hoods, emergency eye washes and showers, FM will report to the front office to arrange for lab staff escort.

Lab staff is responsible for removal of hazardous materials from within and around the area where work is to be performed. Staff is responsible for decon of the unit. EH&S will check unit and verify hazard level safe before FM starts work, if needed. After work is completed and FM releases unit from repair, staff will check the unit and return hazardous material to the proper storage area.

Procedure

1. Shut down or secure unit
2. Lockout/ tagout by trained FM lead person if needed
3. Staff to remove hazardous material to temporary location
4. Staff responsible for decon of unit
5. EH&S to verify hazard level is safe, if needed
6. FM must wear PPE if required.
7. On completion of repairs FM will inform staff
8. Staff will verify repairs complete and return hazardous materials to proper storage area (if any).

**APPENDIX  
STATEMENT OF READINESS FORM**

The purpose of the clearance testing and following decommissioning procedures is to ensure that no one moving the equipment or working /cleaning in or near the laboratory space is exposed to hazardous materials or conditions.

Prior to clearance testing, all accessible surfaces must be free of contamination. If biological agents have been in contact with the equipment, disinfect with a suitable disinfectant (e.g., a 10% bleach solution freshly made). If radioactive materials are or have been used, decontaminate the surface/item or contact the RSO at EH&S. Contact EH&S if you need additional information about proper disinfection procedures.

This *Statement of Readiness for Clearance Testing and/or Decommissioning* form must be completed by the Principal Investigator/laboratory manager/or representative before any cleaning, maintenance, moving, or renovation work will be performed.

**All applicable items must be checked "Yes" before approval to proceed is given by EH&S.**

**Biological / Chemical / Radioactive Material Status:**

I/WE removed all cultures and stocks of microorganisms and regulated medical waste from the premises.  Yes  N/A

I/WE removed all radioactive waste, materials and clean lead pigs from the area.  Yes  N/A  
The area/item(s) is/are free from radiation contamination.  Yes  N/A

I/WE cleaned and decontaminated contamination-prone equipment (refrigerators, centrifuges, water baths, GC, HPLC, incubators etc.) that will be removed from the laboratory.  Yes  N/A

**Equipment and ID#** \_\_\_\_\_

I/WE removed chemicals requiring disposal as hazardous waste.  Yes  N/A

I/WE guarantee that all benches have been cleaned and decontaminated.  Yes  N/A

I/WE guarantee that the fume hood has been cleaned and decontaminated.  Yes  N/A  
**ID#** \_\_\_\_\_

I/WE guarantee that the biosafety cabinet has been cleaned and decontaminated by an NSF 49-certified contractor/vendor.  Yes  N/A  
**ID#** \_\_\_\_\_

COMMENTS:

\_\_\_\_\_

Location: \_\_\_\_\_ Date: \_\_\_\_\_

PI/Lab Manager/Rep (PRINT): \_\_\_\_\_ Signature: \_\_\_\_\_

**Caution! Please notify EH&S of possible contamination in drain systems, vacuum and similar closed systems that may contain hazardous materials.**