



# **Stratton VA Medical Center SUBCOMMITTEE ON RESEARCH SAFETY AND BIOSAFETY (SRS&B) Standard Operating Procedure (SOP)**

## **PURPOSE:**

The purpose of the Subcommittee on Research Safety & Biosafety (SRS&B) is to review all research activities involving biological, chemical, physical, security and radiation hazards for compliance with all applicable regulations, policies, and guidelines.

The document is comprised of three main parts:

- 1) SRS&B Policy & Procedures
- 2) Chemical Hygiene Plan
- 3) Research Lab Security Plan
- 4) Appendices & Attachments (Form/s)

All principal investigators with a protocol approved by the SRS&B must familiarize themselves with this document. Once reviewed, the PI must sign the final attachment of this document, which is titled "Attestation of Review of Stratton VAMC Subcommittee for Research Safety and Biosecurity (SRS&B) Policies, including Chemical Hygiene Plan."

\* For practical purposes, it is recommended that users of this document utilize the search functions of PDF reader software on a personal computer to seek out information needed for specific issues addressed here.

## **PART 1. SRS&B POLICY & PROCEDURES**

### **RESPONSIBILITY**

The SRS&B is responsible to the Medical Center Director through the ACOS/R&D and the Research and Development Committee for ensuring compliance with all applicable regulations, policies, guidelines, and standards of safety.

### **Chemical Hygiene Plan and Safety & Security Plan Review:**

The SRS&B is responsible for annually (once per calendar year) reviewing the Stratton VAMC R&D Program Chemical Hygiene Plan(attached to this document – Part 2), the Research Lab Security Plan (attached to this document – Part 3), and make revisions as needed.

### **Membership of the SRS&B Committee**

Composition:

#### **Voting Members**

- The SRS&B will have at least five members, exclusive of ex-officio members, and will include two members not affiliated with the Institution to serve as representatives from the community. These two members are required when the research reviewed involves rDNA not exempt from the current National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA Molecules.
- The SRS&B will include member(s) from the facility safety committee, such as the Safety Officer or the Facility Infection Control Committee; the Institutional Animal Care and Use Committee (IACUC); and the Radiation Safety Officer.
- SRS&B members should possess expertise in one or more of the following:
  - Etiologic agents, including bloodborne and airborne pathogens
  - Recombinant DNA technologies
  - Chemical carcinogens and other chemical hazards
  - Physical and radiation hazards

#### **Ex-Officio Members**

- A liaison member from the local Research and Development (R&D) Committee (voting).
- The Chemical Hygiene Officer, appointed by the R&D Committee (voting).
- The Administrative Officer for Research (AO/R&D) or other representative from the R&D office (non-voting).
- Stratton VAMC Research Compliance Officer (non-voting).
- An employee union safety representative or other union designee (non- voting).

#### **Appointment of Members**

- Recommendations for SRS&B membership are made by the SRS&B Committee and R&D Committee according to the needs of the SRS&B. All CVs of potential members are reviewed by the Chair and/or Vice-Chair to ascertain the background and qualifications of the potential member. The SRS&B Committee and R&D Committee must concur on the recommendation to appoint the member. The Medical Center Director officially appoints the members in writing. The length of the appointments should be specified in the letter.
- The SRS&B Chair will be appointed by the Medical Center Director for a term of 1 year and may be re-appointed by the Medical Center Director without any lapse in service.

- The SRS&B Chair may not simultaneously chair the R&D Committee or another research subcommittee.
- The Vice-Chair will be appointed by the Medical Center Director for a term of 3 years and may be re-appointed by the Medical Center Director without any lapse in service. The Vice-Chair will serve in the absence of the Chair.

### **Training**

- Please see the Stratton VAMC R&D SOP Initial and Continuing Education Requirements and Tracking for RD Personnel” document for SRS&B training requirements of SRS&B member, and research staff involved with the SRS&B Committee.
  - Investigators, staff, volunteers, students, committee members (for research conducted on-site):
    - Mandatory Training (to be completed once):
      - Review of the SRS&B Document including SRS&B SOP, Chemical Hygiene Plan and Research Lab Security accompanied by a signed affirmation of review form
      - Information Security 201 for Research and Development
      - Biosecurity Course from Collaborative Institutional Training Initiative (CITI) <https://www.citiprogram.org/default.asp>.

All other training specific to procedures being done in each individual laboratory is the responsibility of the Principal Investigator including coordinating hazardous waste training with the Facility’s Safety Office before the start of research, when applicable.

### **VA research staff conducting research at off-site (non-VA facilities)**

When VA research is conducted off-site by VA employees or non-VA employees, the Principal Investigator must provide a copy of the relevant off-site institutional training policies to the SRS&B committee in the initial research submission packet.

## **FUNCTIONS OF THE COMMITTEE:**

### **Research Review Activities**

Review all research protocols involving biological, chemical, physical, and radiation hazards for compliance with all applicable regulations, policies, and guidelines prior to submission for R&D funding. This includes a review of all research applications for funding that will be conducted at the VA facility or by VA personnel with VA funding located off-site.

The review of the Research Protocol Safety Survey (RPSS) (see VA Form 10-0398, Attachment A) must include a risk assessment of the facilities, level of containment, laboratory procedures, practices, training and expertise of personnel involved in the specific research conducted including recombinant DNA research.

### **Notification of SRS&B results:**

SRS&B will provide written notification of the results of reviews to the R&D Committee and the Principal Investigator.

**Conflict of Interest:**

In general, members are considered to have a conflict of interest if they are participating in a proposed study as a principal or collaborating investigator, or if a financial arrangement, situation, or action affects or is perceived to exert inappropriate influence during the review of the research. Members with a conflict of interest relating to a study under review may not participate in any review involving that protocol except to provide information as requested by the SRS&B Committee. They are required to disclose such interests, recuse themselves from deliberations and voting, and should leave the meeting room during the protocol discussion and vote and will not then be counted towards quorum.

**Risk Assessment:**

The PI will provide initial risk assessment for projects involving infectious agents or recombinant DNA based on consultation with guidelines in Biosafety in Microbiological and Biomedical Laboratories 5<sup>th</sup> Edition and National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules. The Chair and committee members confirm the appropriateness when they review the SRS&B Biosafety Information Form. The Chemical Hygiene Officer reviews the Chemical Listing section of the form to assure that the PI has listed appropriate precautions to be taken with chemicals used in the project.

**OPERATIONS OF THE COMMITTEE:**

**Meetings:**

The SRS&B meets monthly when necessary and at least quarterly to discuss all research activities involving biological, chemical, physical, and radiation hazards. The meetings require a quorum (majority of voting members present) and quorum must be maintained for each vote to occur.

**Attendance requirements:**

Committee members are required to attend at least 50% of meetings per year.

**Agenda:**

An agenda is developed by the Chair and SRS&B Coordinator and distributed to members at least 1 week before the meeting. At a minimum, the agenda will include the following:

- Conflict of Interest
- Approval of minutes of the previous meeting (date)
- Old Business (list pending items and individual(s) responsible)
- New Business (list items and individual(s) responsible)
- Miscellaneous items that warrant review/discussion by the committee
- Research reviews (as applicable)
- Minutes:
  - At a minimum, the minutes will include the following:
    - Documentation of members present, absent, and excused, including the name of the presiding Chair.
    - A statement regarding quorum being met.
    - Identification of all conflicts of committee members at the beginning of the meeting, including any members who may arrive late.
    - Review of business items, including discussion, action, responsibility, and status, as appropriate.

- Copies of any internal or external reports or correspondence with outside agencies referenced.
- Minutes will be written and distributed for review by the SRS&B Coordinator and approval by the SRS&B Chair or designee and ACOS/R&D within 2 weeks of the meeting.
- Once the minutes have been approved by the SRS&B committee, preferably at a fully convened meeting, they will be forwarded to the R&D committee for review and approval. Recommendations for changes or improvements in SRS&B procedures may be made, but the R&D committee may not alter the SRS&B minutes.
- Minutes will be filed in the Research Office and made available to VA Central Office upon request.
- In the event that an urgent situation arises that is not outlined in this SOP, the committee agrees that the Chair or designee will have the immediate responsibility to correct the situation. The Chair or designee will then report the situation to the committee at the next meeting and the committee will determine if a change to a current policy is needed to handle the specific situation in the future. This SOP and the included plans are available on the R&D SharePoint site. If necessary, the Chair or designee will enlist additional personnel (ex. Infection Control) to advise in resolving the emergent situation.

#### **Voting:**

For research proposals and amendments to be reviewed and approved at a convened full committee meeting, the vote will include the number for, against, abstaining, recused, and excused.

The SRS&B Chair can make a motion and votes. The SRS&B committee may vote for the following actions:

- Approved – approval granted by the committee
- Approved with contingencies – the committee will specify what is required for final approval of the protocol.
- Tabled – an item may be tabled without review or discussion due to lack of quorum or for other reasons, as outlined in the minutes.
- Disapproved – the proposal may be disapproved for major safety concerns. The PI will be notified of the reasons for disapproval, and will be given an opportunity to respond in writing to the SRS&B by a given deadline.

#### **Reporting Procedures**

The SRS&B, as well as the Stratton R&D Program Staff, Investigators and Stratton VAMC staff associated with research, must assure that unexpected events (accidents, fires, exposures, environmental events, etc.) and matters of noncompliance are reported. Reports must be directed to the proper individuals, departments and/or agencies. The following procedures are to be followed.

##### **Reporting Requirements Related to Research Safety**

- *Work-Related or Research-Related Injuries.* Within 5 business days of becoming aware of any apparent work-related injury to VA research personnel (or any apparent research-related injury to any other person) that requires more than minor medical intervention (i.e., basic first aid), requires extended surveillance of the affected individual(s), or leads to serious

- complications or death, members of the VA research community are required to ensure that the injury has been reported in writing to the SRS.
- *Work-Related Exposures or Injuries.* Within 5 days of becoming aware of any apparent work-related exposure of VA research personnel (or apparent research-related exposure of any other person) to hazardous, toxic, or infectious materials at greater than routine levels (i.e., Permissible Exposure Limits or Infection Threshold) or any exposure or injury that requires more than minor medical intervention (i.e., basic first aid), requires extended surveillance of the affected individual(s), or leads to serious complications or death, members of the VA research community are required to ensure that the exposure or injury has been reported in writing to the SRS.
  - *Reportable Incidents Under Applicable Federal Standards.* Within 5 business days of becoming aware of any incident reportable under applicable Federal standards, including but not limited to VHA Handbooks on research safety, NIH OBA guidelines, Occupational Safety and Health Administration requirements, CDC requirements, Department of Transportation requirements, and Nuclear Regulatory Commission (NRC) requirements, members of the VA research community are required to ensure that the incident has been reported in writing to the SRS. Examples include, but are not limited to:
    - Any finding of noncompliance with research safety requirements by any VA office (other than ORO) or any other Federal or state entity. Subsequent reports to ORO based on findings made by entities external to the facility must include a copy of the official findings.
    - Initiation of VA research requiring safety review without written notification from the ACOS for Research that the project may begin.
    - Conduct of research requiring safety review without required approval by the SRS or other relevant research review committees.
    - Continuation of research beyond the expiration date established by the SRS without appropriate renewal of the protocol, even if the research is a continuation of work that was previously approved by all relevant research review committees.
    - Failure to implement changes required by the SRS as a condition of approval.
    - Unauthorized deviation from an SRS-approved protocol. NOTE: The SRS must be consulted in advance of implementing changes to determine if a protocol modification requires prior SRS approval.
    - Failure to comply with continuing review requirements of the SRS or other relevant research review committees.
    - Conduct of official SRS business by an improperly constituted committee or with less than a quorum of voting members present.
    - Failure to correct identified programmatic or facility deficiencies within the periods specified at subparagraphs in this SOP, and in the absence of the justification described in this SOP.
    - Conduct of research by unauthorized personnel or personnel who lack appropriate training.
    - Any noncompliance or other deficiency that substantively compromises the effectiveness of a facility's research safety programs.
  - *SRS Review of Reported Events.* The SRS must review at its next convened meeting any report involving an incident or event described in the items listed

above. NOTE: If the significance of a reported event is not clear, the SRS Chair, or designee, must consult the ORO (Office of Research Oversight) RO (Regional Office) and the ORO Associate Director for Research Safety and Animal Welfare.

- Incidents that present a significant risk to the safety of research personnel or the environment may require immediate attention and result in the need to convene an emergency session of the SRS prior to the next scheduled meeting.
- Should the SRS determine that a reportable incident or event as described above occurred, the SRS Chair must report the determination directly (without intermediaries) to the facility Director within 5 business days after the SRS's determination.
  - The report must be made in writing, with a simultaneous copy to the ACOS for Research, the R&D Committee, and any other relevant research review committee.
  - The facility Director must report the SRS's determination (i.e., that a reportable incident or event occurred) to the appropriate ORO RO, with a simultaneous copy to the VISN Director and the ORD within 5 business days after receiving such notification.
  - An initial report of an SRS determination is required regardless of whether the determination is preliminary and still under review or final disposition of the matter has been resolved at the time of the report.

NOTE: The SRS must reach a determination that a reportable event did (or did not) occur within 30-45 days after receiving a relevant report. According to subparagraph 5d, remedial actions involving a specific study or research team must be completed within 90-120 days of the SRS's determination. Remedial actions involving programmatic noncompliance must be completed within 120-180 days after the SRS's determination, unless remediation requires substantial renovation, fiscal expenditure, legal negotiation, etc.

- *Suspensions or Terminations.* Any suspension or termination of research (e.g., by the SRS or other research review committee, or by the ACOS for Research or other facility official) related to concerns about research safety must be reported directly (without intermediaries) to the facility Director within 5 business days after the suspension or termination occurs.
  - The report must be made in writing with simultaneous copies, as applicable, to the ACOS for Research, R&D Committee, the SRS, and any other relevant research review committee.
  - The facility Director must report such suspension or termination of research to the appropriate ORO RO within 5 business days after being notified.
- *Laboratory Decommissions.* The PI or Laboratory Director must obtain authorization (i.e., permission) from the SRS and the ACOS for Research prior to reassigning, vacating, converting to non-laboratory use, or otherwise decommissioning existing laboratory space that requires identification and disposal of hazardous materials, infectious agents, or equipment between uses.
  - The request for authorization to decommission laboratory space must be made in writing at least 1 month prior to implementation. Upon receiving

such a request, the ACOS for Research must notify the VISN Safety Office to coordinate inventory and removal of hazardous materials, infectious agents, or equipment.

- Within 5 business days of discovering, receiving a credible report of, or otherwise becoming aware of any decommissioning implemented without the required authorization, the ACOS for Research must report the incident directly (without intermediaries) to the facility Director and the VISN Safety Office.
- The facility Director must report any unauthorized decommissioning to the appropriate ORO RO within 5 business days after being notified.
- Reports to ORO Central Office. Within 5 business days after being informed of any substantive change in an MOU with an affiliate institution (or other entity) related to research safety arrangements, the facility Director must report the change to ORO Central Office, with a simultaneous copy to the appropriate ORO RO.

### **Review Policy:**

Review of the SRS&B Biosafety Information Form

(<http://vaww.visn2.med.va.gov/research/albforms.cfm#19>) is performed electronically according to the procedure outlined below (unless the Chair determines otherwise). All research projects involving biological, chemical, and physical hazards must be approved by the SRS&B and then by the R&D Committee prior to initiation of the research.

Based on the terms of a Memorandum of Understanding between two Institutions, the Stratton VA SRS&B may vote to accept Inspection Reports from the respective affiliate committee(s). The PI has the responsibility to obtain, from the host institution, at least one copy of the host institution's safety, inspection, and training policies prior to approval of any Biosafety Information Form.

If the standards for inspection are not the equivalent to those required for VA facilities, an Inspection team composed of Stratton VA SRS&B members will carry out Inspections of Affiliate laboratories.

### **INITIAL REVIEW OF PROTOCOL SUBMISSIONS:**

The Principal Investigator submits an electronic copy of the abstract and hard copy of appropriate documents to the Research Office per the Biosafety Checklist (<http://vaww.visn2.med.va.gov/research/albforms.cfm#19>). All protocols/forms will be submitted to the SRS&B Coordinator, and the SRS&B Chair or designee will determine if the study qualifies for Expedited Review or Full Committee review.

### **Full Committee Review:**

All new protocol submissions will receive full committee. Once the SRS&B Coordinator has reviewed the submission for accuracy and completeness, the SRS&B Chair or designee assigns 2 primary reviewers (members of the SRS&B committee) to review the entire protocol submission. Reviewers receive the abstract, Research Protocol Safety Survey, and a reviewer form electronically. The Facility Safety Officer or designee will review the protocol abstract and Research Protocol Safety Survey to assure that the

Chemical Listing is consistent with studies proposed by the Investigator. In cases where electronic review is not possible for some members, hard copies of all documents will be provided to them. Reviewers are encouraged to provide comments to PIs before the convened meeting to facilitate the process of review, submission and approval. The following steps are typical:

1. The PIs have 5 calendar days to respond with comments.
2. The SRS&B Chair or designee will review comments from all reviewers. If reviewers have concerns that need to be addressed, the PI will be notified detailing the concerns of the Reviewers.
3. The PI responds to the Chair, in writing, addressing each individual item of concern.
4. The SRS&B Chair or designee will review the response and if found to be satisfactory, will inform the R&D program committee coordinator and the protocol is then ready for full committee review. Once the committee approves the protocol, the following steps take place:
  - The appropriate signatures will be obtained on the Research Protocol Safety Survey after the SRS&B Chair or designee has signed the approval letter.
  - The signed approval letter and a copy of the signed Research Protocol Safety Survey will be sent to the Investigator. The approval letter will include the statement: "Research may not begin until you have received FINAL WRITTEN APPROVAL from the ACOS/R&D and all applicable subcommittees." A copy of the signed approval letter and the original Research Protocol Safety Survey will be filed in the protocol file in the Research Office.

The SRS&B Committee will review comments from all reviewers at the fully convened meeting. The Principal Investigator will be invited to attend the meeting to address concerns by the committee. If there are concerns that cannot be addressed by the Principal Investigator or the PI does not attend the meeting, a Notification of Contingencies letter will be sent to the PI detailing the concerns; this is considered a contingent approval. Contingent approvals must be agreed upon by the committee. The Principal Investigator responds to the Chair, in writing, addressing each individual item of concern. If the submission is found acceptable or all concerns have been addressed an approval letter will be sent to the Principal Investigator.

**Amendments:**

The addition of hazardous chemicals, human or primate cell lines, or major changes to an approved research protocol will necessitate the submission of an amendment to the Research Protocol Safety Survey using the Protocol Amendment Submission Form. These steps will then be followed:

1. The request will be reviewed by the SRS&B Chair or designee to determine the type and extent of the changes and whether or not approval will be contingent upon full review and approval by the R&D Committee.
2. If the SRS&B Chair or designee determines the amendment to be minor it may be reviewed by Expedited Review, the SRS&B Chair or designee will assign a reviewer. The signed approval letter and a copy of the revised Research Protocol Safety Survey, if applicable, will be sent to the Principal Investigator. A copy of the

signed approval letter and the original Research Protocol Safety Survey will be filed in the protocol file in the Research Office. The SRS&B is notified of the approval in the agenda of the next scheduled SRS&B meeting.

3. In cases of complex or difficult protocols, the SRS&B Chair or designee, or individual members may request full Committee discussion at a fully convened SRS&B meeting with the Principal Investigator present to respond to Committee concerns. If there are pressing concerns about a particular protocol, the SRS&B Chair or designee may set up an additional committee meeting if the regularly scheduled meeting might delay the final approval of the proposal.
4. The PI will receive the final approval letter and a copy of the revised approved Research Protocol Safety Survey
5. A copy of the approval letter and the original signed Research Protocol Safety Survey will be filed in the Research Office.
6. SRS&B Committee members will be notified of the amendment in the agenda of the next scheduled SRS&B meeting.

**Annual / Continuing Review of research:**

The SRS&B reviews information for all research involving biological, chemical, physical, and radiation hazards on an annual basis.

The date of continuing review will be based on the date of SRS&B approval. Research protocol changes not included in the original application must be documented on an amended Research Protocol Safety Survey (see VA Form 10-0398, Attachment A) and must be submitted to and reviewed by SRS&B prior to the implementation of the changes.

The SRS&B Coordinator distributes a cover sheet listing educational training requirements, the SRS&B Continuing Review Submission Form, and a list of completed educational training related to the protocol to the Principal Investigator(s).

The SRS&B Chair or designee selects a committee member to review and approve the Continuing Review submission by Expedited Review. If there are any questions, the Principal Investigator will receive a Contingent Approval letter with a deadline for response.

The committee is informed of the continuing review approval in the agenda of the next scheduled SRS&B meeting.

**Closure of studies:**

The closure of a study involving biological, chemical, or physical hazards will be initiated by the submission of a request to close the entire study by the PI.

The request will be reviewed by the SRS&B Chair or designee, who will review the RDIS final progress report and current Research Protocol Safety Survey.

An acknowledgement of the request to close the SRS&B portion of the study will be sent to the Principal Investigator from the SRS&B Chair or designee.

A copy of the acknowledgement closure letter will be filed in the Research Office.

### **Expedited Review and Designated Review**

Expedited review and/or Designated Review cannot be used for initial submissions, but can be used for amendments, continuing reviews and closures. Once the SRS&B Coordinator has reviewed the annual/continuing review, or amendment submission for accuracy and completeness, the SRS&B Chair or designee along with the Facility Safety Officer or the Chemical Hygiene Officer will review the submission. The reviewer forms, abstract, Research Protocol Safety Survey, and the chemical list are sent electronically to the reviewers. Once the reviewers completes the review and delivers the findings to the R&D program office and the PI, the following steps must then be taken:

1. The PIs have 5 calendar days to respond with comments.
2. The SRS&B Chair or designee will review comments from all reviewers. If reviewers have concerns that need to be addressed, the PI will be notified detailing the concerns of the Reviewers.
3. If there are NO concerns by the reviewers, an approval letter will be issued.
4. The PI responds to the Chair, in writing, addressing each individual item of concern.
5. The SRS&B Chair or designee will review the response and if found to be satisfactory, will sign the approval letter.
6. The appropriate signatures will be obtained on the Research Protocol Safety Survey after the SRS&B Chair or designee has signed the approval letter.
7. The signed approval letter and a copy of the signed Research Protocol Safety Survey will be sent to the Investigator. A copy of the signed approval letter and the original Research Protocol Safety Survey will be filed in the protocol file in the Research Office.
8. The SRS&B is notified of the approval in the agenda of the next scheduled SRS&B meeting.
9. The submission will be reviewed and approved by the SRS&B Chair or designee. The fact that this protocol has been approved by expedited review will be documented in the minutes of the next SRS&B meeting.
10. In cases of complex or difficult protocols, the SRS&B Chair or designee, or individual members may request full Committee discussion at a fully convened SRS&B meeting with the Principal Investigator present to respond to Committee concerns. If there are pressing concerns about a particular protocol, the SRS&B Chair or designee may set up an additional committee meeting if the regularly scheduled quarterly meeting might delay the final approval of the proposal.
11. If a Grant with identical scientific content (hypothesis and specific objectives) but different title is submitted to another granting agency, the PI will provide the SRS&B coordinator with a cover letter stating that the grant is identical to Grant "X", along with the required documents as listed in the Biosafety checklist for new submissions.

### **Laboratory Inspections**

All research laboratories at Stratton VA Medical Center, including those in the Animal Research Facility, will be inspected annually for biohazards, and chemical and physical hazards.

Members of Inspection teams will include SRS&B members with expertise appropriate for the types of hazards to be inspected in each laboratory.

Deficiencies noted during the inspections will be listed in a letter to each Principal Investigator or responsible party. The PI or responsible party must respond with a written corrective action plan by the deadline identified in the letter.

The list of deficiencies and the PI/responsible party responses to these deficiencies are included in the agenda of the next scheduled SRS&B meeting. The report in the SRS&B minutes is reviewed by the R&D Committee.

**Accident Reporting:**

Injuries/accidents that occur in the research laboratory setting are reported to the immediate supervisor immediately. After taking emergency steps recommended, medical attention should be obtained from Personnel Health or the Emergency Room. In accordance with medical center policy, a supervisor must accompany the employee to Personnel Health.

If the injury involves radioisotopes, the Radiation Safety Officer (RSO) should be notified also – an attempt to notify the RSO, by phone or email, must be made as soon as the emergent issues related to the injury have been remedied.

Work-related health/safety issues such as latex allergies or ergonomic problems are reported to Personnel Health and the Safety Office within five days of discovery.

Reports of incidents involving research personnel are reported to the SRS&B prior to the next scheduled meeting.

The SRS&B is responsible for reviewing and evaluating accidents occurring within the Service and makes recommendations to the ACOS/R&D to prevent accidents from recurring.

**Compliance:**

Compliance Violations - The following list describes most frequent compliance violations:

- Failure to file a complete and accurate Biosafety Information Form.
- Violations of safe laboratory practices (i.e. ignoring PPE requirements, improperly disposing of hazardous wastes, and eating in laboratories)
- Failure to address deficiencies discovered during laboratory inspections.
- Failure to submit and complete and accurate Continuing Review request.

**Notification of Compliance Violations:**

A written warning regarding the compliance issue will be sent to the PI. The letter will request a written corrective action plan be sent to the SRS&B Chair or designee by the deadline indicated (maximum 10 days).

**Penalties for Noncompliance:**

If a corrective action plan is not received by the deadline identified, penalties commensurate with the severity of the violation could result in:

- Restriction of types of chemicals or biological agents that an investigator is authorized to use.

- Suspension of the research performed in the investigator's laboratory.
- Restriction of personnel activities.
- Laboratory closures

**Routine Laboratory closures:**

In addition to properly closing out all active research studies, the PI must create a list of hazardous chemicals, biohazards, radioactive substances, freezer, refrigerator, and liquid N2 freezer contents.

The PI must send a letter to the SRS&B Chair indicating that:

- all experimental samples and laboratory solutions were properly disposed of
- arrangements have been made with the Safety Office to have all hazardous waste removed
- arrangements were made with the Radiation Safety Officer for a final laboratory check
- arrangements were made to disperse usable chemicals, cell lines, laboratory ware, and equipment to other on-site investigator laboratories.

**SRS&B Emergency Plan:**

The SRS&B Emergency Preparedness and Response Plan follows the Facility's Emergency Plan which addresses fires; explosions; spills; release of chemicals, biological agents, toxins or radioactive materials; bomb threats; severe weather and other natural disasters or emergencies. Additionally, The Research Chemical Hygiene Plan addresses research lab specific emergency contingencies, including personnel roles, training, escape procedures and emergency alerting and response procedures, emergency medical treatment and procedures for all employees during an emergency.

**REFERENCES:**

SAFETY OF PERSONNEL ENGAGED IN RESEARCH. VHA HANDBOOK 1200.8.

Centers for Disease Control and Prevention (CDC)/National Institutes of Health (NIH). Biosafety in Microbiological and Biomedical Laboratories 5<sup>th</sup> Edition. CDC/NIH, Washington, DC, 2001.

42 C.F.R. Part 72, Interstate Shipment of Etiologic Agents (including, among others, 42 C.F.R. Part 72.6, Additional requirements for facilities transferring or receiving select agents).

29 C.F.R. Part 1910, Occupational Safety and Health Standards; Part 1910.38, Employee Emergency Plans and Fire Prevention Plans; Part 1910.134, Respiratory Protection; Part 1910.139, Respiratory protection for m. tuberculosis; Part 1910.269, Electric Power Generation, Transmission, and Distribution; Part 1910.1000, Subpart Z, Toxic and Hazardous Substances; Part 1910.1020, Access to employee exposure and medical records; Part 1910.1030, Bloodborne pathogens; Part 1910.1450, Occupational exposure to hazardous chemicals in laboratories.

10 C.F.R. Chapter 1, Nuclear Regulatory Commission, Parts 0-199 (including, among others, 10 C.F.R. Part 19, Notices, instructions and reports to workers; inspections and investigations; Part 20, Standards for protection against radiation; and Part 35, Medical use of byproduct material).

40 C.F.R. Chapter 1, Environmental Protection Agency (including, among others, Part 260, Hazardous waste management system; Part 261, Identification and listing of hazardous waste; Part 262, Standards applicable to generators of hazardous waste).

“National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules,” NIH Guidelines. National Institutes of Health, Bethesda, MD, May 11, 1999  
<http://www4.od.nih.gov/oba>.

## **PART 2. CHEMICAL HYGIENE & SAFETY PLAN FOR RESEARCH LABORATORIES**

### **TABLE OF CONTENTS**

- Purpose
- Policy
- Scope
- Definitions
- Biohazards
- Chemical Hazards
- Physical Hazards
- Responsibilities
  - Medical Center Director
  - Associate Chief of Staff for Research & Development
  - Research & Development Committee
  - Research Chemical Hygiene Officer
  - Subcommittee on Research Safety and Biosafety
  - Principal Investigator or Lab Director
  - Laboratory Staff
  - Safety Office
- General Laboratory Practices
- Special Laboratory Procedures
- Exposure Control Plan
- Biosafety Precautions
- Chemical Procurement, Use And Storage
- Chemical Spill Response
- Emergency Actions
- RACE
- Spill-Control Kits
- General Spill-Control and Clean-Up
- Radiation Spills
- Waste Disposal
- Use of Laboratory Hoods and Lab Equipment Safety
- Exposure Monitoring and Medical Surveillance
- Radiation Exposure
- Housekeeping , Maintenance and Inspections
- Blood Borne Pathogens
- Medical Surveillance
- Emergency First Aid Procedures
- Protective Apparel and Equipment
- Record Keeping
- Signs and Labels
- Employee Information and Training

## EMERGENCY PHONE NUMBERS

EMERGENCY REQUIRING IMMEDIATE RESPONSE	X62911
FACILITY SAFETY OFFICER	X66937
GEMS COORDINATOR (Kenneth Tannen)	X66940
EMERGENCY ROOM	X66630
PERSONNEL HEALTH	X66714
RADIATION SAFETY OFFICER (Kristine Cipperley)	X65586
CHEMICAL HYGIENE OFFICER (William Ritz)	X65670

### PURPOSE

To provide a plan for the protection of all staff and visitors from hazards associated with chemicals and other hazardous materials utilized within Research and Development Service.

### POLICY

The Research Service maintains a program to educate employees on a continuous basis and to protect them from health hazards associated with hazardous chemicals in the laboratory by keeping exposure to below permissible limits and ensuring compliance with pertinent Federal, State and local regulations. Protection is secured for patients, research personnel, visitors, property and the environment.

### SCOPE

Under this Chemical Hygiene & Safety Plan, Research laboratory personnel will be trained regarding the hazardous chemicals and materials to which they may be exposed, by means of a hazard communication program, product labeling, Material Safety Data Sheets(MSDS), training and monitoring compliance of the personnel by the SRS&B and/or SRS&B Coordinator.

### DEFINITIONS

#### **Biohazards**

Biohazards include, but are not limited to, the following:

- Pathogens and/or etiologic agents, human and animal tissues including blood and body secretions, and human cell lines corresponding to BSL 1-4 ("Biosafety in Microbiological and Biomedical Laboratories," 5<sup>th</sup> Edition, CDC-NIH, Feb. 2007);
- Toxins produced by microbial organisms (see Centers for Disease Control and Prevention (CDC)-National Institutes of Health (NIH). Biosafety in Microbiological and Biomedical Laboratories 5<sup>th</sup> Edition).
- Poisonous, toxic, parasitic and venomous animals or plants.
- Recombinant DNA molecules (see "NIH Guidelines for Research Involving DNA Molecules," September 2009).
- Select agents, as specified in Title 42 Code of Federal Regulations (see Title 42 CFR Part 72, Interstate Shipment of Etiologic Agents).
- Animals experimentally or naturally exposed to any of the above (see CDC-NIH. Biosafety in Microbiological and Biomedical Laboratories 5<sup>th</sup> Edition February 2007).

#### **Chemical Hazards**

Chemical hazards include any substance or mixture of substances with properties capable of producing adverse effects on the health and/or safety of

humans (see Title 29 CFR Part 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories). Chemical hazard categories include, but are not limited to, the following:

- Corrosives
- Toxic substances (poisons, irritants, asphyxiates)
- Sensitizers
- Carcinogens, mutagens and/or teratogens
- Flammables

### **Physical Hazards**

Physical hazards include, but are not limited to, the following:

- Ionizing and non-ionizing radiation (Handbook 1200.8, App. E)
- Noise
- Vibration
- Extremes of temperature and pressure
- Explosive hazards
- Electrical hazards, and
- Mechanical hazards.

## **RESPONSIBILITIES**

### **Medical Center Director**

- Ensuring that the safety program is staffed adequately and that resources are available to maintain full compliance with all applicable regulations and standards of safety.
- Ensuring that all Research personnel are included in the facility Occupational Safety and Health program and that research space is included in annual workplace inspections. NOTE: Research personnel are covered by all other facility safety programs (e.g., respiratory protection program, fire safety program, etc.)
- In cooperation with the Associate Chief of Staff (ACOS) for Research and Development (R&D), ensuring that measures for the security of the research laboratories and surrounding space is appropriate.

### **Associate Chief of Staff (ACOS) for R&D**

- Ensuring that safety related communications from the Chief Research and Development Officer (CRADO) are disseminated to appropriate personnel in a timely manner after receipt.
- Overseeing all phases of the Chemical Hygiene & Safety Plan (CH&SP).
- Ensures continuous development of procedures on the use, storage, spill control and disposal of hazardous chemicals utilized.

### **R&D Committee:**

- Acknowledging the adequate review of all R&D proposals.
- Establishing a Subcommittee on Research Safety and Biosafety(SRS&B)
- Ensuring the SRS&B review of those protocols and/or submissions for funding that involve safety hazards to personnel and/or the environment.
- When required, acting upon SRS&B recommendations for approval or non-approval of reviewed proposals for submission to VA Central Office, e.g. Just-in-Time (JIT) submissions for Merit Review applications
- Reviewing and acting upon SRS&B minutes.

- Ensuring the development and implementation of the laboratory Chemical Hygiene & Safety Plan, including appointing a **Research Service Chemical Hygiene Officer (RSCHO)**, to provide technical guidance on the implementation of the Plan. The Research Chemical Hygiene Officer should be a voting member of the SRS&B.

#### **Research Service Chemical Hygiene Officer (RSCHO)**

- Providing technical guidance on the implementation of the Chemical Hygiene & Safety Plan.
- Investigates incidents or unsafe conditions concerning hazardous chemicals and reports to the Subcommittee on Research Safety & Biosafety any significant findings.
- Assists with inspections of the Research Service laboratories.
- Recommends less hazardous chemicals to be substituted, where possible, for more hazardous chemicals to minimize hazardous waste.
- Coordinates waste disposal with the Medical Center Safety Office.

#### **Subcommittee on Research Safety and Biosafety (SRS&B)**

- Reviewing all research activities involving biological, chemical, physical and radiation hazards for compliance with all applicable regulations, policies and guidelines prior to initiation of the project. This includes a review of all research applications for funding that will be conducted at the VA facility or by VA personnel with VA funding located off-site.
- Annually reviewing all research protocols involving biological, chemical, physical and radiation hazards, regardless of funding status or source.
- Ensuring that a complete list of all products containing chemicals designated or identified by OSHA and /or EPA as “hazardous” (see Title 29 CFR Part 1910.1200, Hazardous Communications or Title 40 CFR Part 261, Protection of Environment and/or applicable state requirements) has been submitted to the Safety Officer for review.

#### **Principal Investigator**

- The implementation and oversight of this policy in his/her laboratory and assurance of adherence of his/her laboratory staff to any and all applicable parts of this policy. This includes providing students and staff with specific information and practical laboratory training beyond this plan on the unique hazards of their lab work.
- The PI is responsible for the day-to-day health and safety management of their laboratories and ensuring compliance with facility waste disposal requirements.
- The PI or Laboratory Technician and all laboratory staff are responsible for research activities conducted in assigned space, including:
  - submitting a completed Research Protocol Safety Survey (RPSS) (VA Form 10-0398) to the medical center research office along with each research proposal to be submitted for funding.
  - the complete research proposal must accompany the survey.
  - the research office arranges for review of the proposal and evaluation by SRS&B.
  - within (or attached to) the SRS&B safety protocol review form, a complete list of chemicals defined as “hazardous” to be used must be submitted. NOTE: Not submitting such a list will result in

failure to obtain approval by the facility Safety Officer. Review and approval by the Safety Officer is required prior to local review of protocols by the SRS&B Committee.

- Ensuring that active protocols and new pilot projects have been reviewed by SRS&B, regardless of funding status or source.
- If a Principal Investigator proposes work to involve rDNA classifications other than those in Class III-F, prior approval must be obtained from: (i) NIH Office of Biotechnology activities (OBA), (ii) Recombinant DNA Advisory Committee (RAC), and (iii) VA Subcommittee on Research Safety and Biosafety (SRS&B).
- Identifying laboratory specific hazards, and:
  - Ensuring that all personnel receive training specific to the hazard(s)
  - Advising laboratory personnel of any potential risk to themselves or the research environment
  - Establishing and enforcing standards of practice which minimize employee exposures to biological, chemical, physical, and radiation hazards.
- Supervising the performance of the laboratory staff to ensure the correct use of required safety practices and techniques (including Personal Protective Equipment).
- Ensuring that all accidents are reported to the Employee Health Office the Research Office and the facility safety office using appropriate VHA forms.
- Securing approval of the SRS&B for any significant changes made in the original research plan.
- Coordinating with appropriate safety staff such as the Safety Office or the Radiation Safety Officer for removal or disposal of all chemicals, biological agents, radioisotopes, and waste generated by these materials.
- When vacating an R & D lab, the PI shall leave the laboratory in compliance with all VA safety and OSHA hazardous waste and disposal requirements. The facility will take action against laboratories left in a condition requiring station assistance to meet these compliance standards. All chemicals must be labeled in accordance with OSHA standards.
- Ensuring that a copy of the laboratory's SRS&B SOP, including the Chemical Hygiene & Safety Plan, is readily available to all employees in their work area, or made available electronically, and that employees have been trained in the contents of the Plan and that all provisions of the Plan are implemented in all laboratories under the PI's supervision.
- Maintaining and monitoring employee exposure to hazardous chemicals in laboratory activities at the lowest reasonable levels. At no time may employee exposures to chemicals exceed the Permissible Exposure Limits established by OSHA .
- Maintaining an up-to-date inventory and Material Data Safety Sheets of all hazardous chemicals located in the laboratory.
- Ensuring that all laboratory personnel know the location of this Inventory including the location of the Material Data Safety Sheets for each chemical listed on the inventory.
- Providing a chemical inventory to the SRS&B semi-annually and updating that chemical inventory whenever new chemicals are brought into the lab. Such updates must occur within one week of the addition of a chemical to a lab.
- Ensures that all laboratory hazardous chemicals are stored, labeled and disposed of in compliance with Federal, State and Local regulations.
- Have the chemical inventory list readily available for audits or staff reference.

- Managing all biological and chemical waste in accordance with Federal, State, and Local regulations and all VA, VHA, and facility policies.
- Seeking technical assistance when needed to ensure proper waste management.
- Implementing waste reduction techniques where appropriate.
- Investigating and correcting deficiencies cited during all inspections of work areas. Submitting a written abatement plan for all deficiencies cited during inspections to SRS&B within the specified time limits.
- Planning and conducting each operation in accordance with the procedures as outlined in the Chemical Hygiene & Safety Plan (of the SRS&B SOP)
- Reading, becoming familiar with, and complying with the CH&SP and other applicable policies in the Medical Center and Research & Development Service Safety Manuals.
- Knowing where the Material Safety Data Sheets are located in the laboratory.
- Wearing and utilizing appropriate Personal Protective Equipment (PPE) as required for the operation being conducted. Lab coats must be worn when working in the lab. Lab coats worn in the laboratory are not to be worn elsewhere. Designated garments will be provided for wear in the animal facility. The appropriate lab coat is to be worn while in the area ONLY. Hooks will be provided so that any other garment may be hung on a hook outside and the required lab coat can be put on. The wearing of open toed shoes and sandals is prohibited in the laboratory.
- Adhering to appropriate work practices/engineering controls for the operation being conducted. All staff must review all new procedures with the laboratory supervisor and be aware of potential hazards that might result when performing any procedure.
- Never attempt to operate any equipment without prior instruction from someone who knows how to use it.
- Promptly report unsafe conditions or unsafe use of hazardous chemicals to their supervisor.
- Staff are required to participate in workplace monitoring and/or medical surveillance as appropriate.
- All staff must know where the fire extinguishers, eyewashes, emergency showers and exits are located in the building. Hallways must remain unobstructed. All staff must participate in annual safety training and are required to abide by the policies set forth in this Chemical Hygiene & Safety Plan.
- Food, drink, cosmetics and medication for consumption or use are prohibited inside laboratories. Never dispose of food wrappers or containers in laboratory waste receptacles.
- Certain procedures necessitate the wearing of gloves outside the lab, usually when accessing common lab areas. However, be certain NOT to wear gloves potentially contaminated with hazardous materials outside the lab.
- WASH HANDS OFTEN, even if all work has been performed wearing gloves.
- If working with human blood or blood products, see Appendix A.
- Mouth pipetting of any kind is forbidden.
- ALL injuries (needle sticks, cuts, abrasions) and accidents are to be reported to the supervisor IMMEDIATELY. Never assume an injury or exposure is insignificant. Report it to your supervisor, or the AO/R&D or ACOS/R&D, and have it evaluated by Employee Health or the VA Emergency Room. Accident,

- Injury and/or Illness forms (as applicable), will be initiated by Employee Health or Emergency Room staff.
- In the event the eyes are contaminated, wash exhaustively at the eye wash station, report the incident to the supervisor immediately and have the effected personnel report to Employee Health or the VA Emergency Room.
  - Minimize all chemical exposures. Skin contact with chemicals should be avoided. Dried, cracked and broken skin on hands and arms MUST be covered with gloves at all times.
  - Maintain adequate ventilation when working with dry ice or cryogenic solutions. Exposure to dry ice gases in an enclosed space for an extended period may be lethal.
  - Appropriate gloves and face shields are provided and must be used when working with liquid nitrogen. Wearing an additional pair of safety goggles under the face shield is recommended.
  - Be sure to keep flammables and combustibles from flames, Bunsen burners and hot plates.
  - Keep work area clean and uncluttered. Chemicals and equipment should be properly labeled and stored. Clean up the work space upon the completion of each task or at the end of the day.

**Safety Office:**

- Reviewing the SRS&B SOP, including Chemical Hygiene and Security Policies and Procedure sections for implementation to ensure conformity with the requirements of OSHA and other regulatory agencies.
- Providing guidance on standard operating procedures (SOPs) developed by Principal Investigators (PIs) for the safe handling and use of "Laboratory Standard" substances (i.e., substances with highly acute toxicity, select carcinogens, mutagens, and reproductive toxins).
- Arranging for proper disposal of hazardous waste from Research.
- Conducting / arranging for personal exposure monitoring (air sampling) when there is reason to believe that exposures may exceed the OSHA Action Level.
- Conducting/coordinating hazardous waste disposal from satellite storage areas in research laboratories.

**GENERAL LABORATORY PRACTICES**

- Each lab is required to keep a written chemical inventory. This is submitted to the Safety Office semi-annually (twice per year or 12 month period). Additionally, any chemical ordered for use the first time, must be reported to the Safety Office.
- Each chemical in the lab must have a Material Safety Data Sheet (MSDS) available. Before work using a certain chemical begins, read the MSDS for hazards and precautions associated with use and disposal. Minimize all chemical exposures. General precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals.
- The following documents must be present in the laboratory or be easily accessible as an electronic record: Chemical Hygiene & Safety Plan, chemical inventory and MSDS sheets. Every person in the lab must be able to locate each of these documents.

- Each common room has a Principal Investigator in charge of the room. That person is in charge of general operation safety and security of that area. Common areas and PI responsible labs should abide by the following:
  - Post a message on the outside of the door of a common area indicating any use of the room that is of potential hazard to others entering.
  - Keep the area neat and clean. Wipe up area before you leave.
  - Dispose gels containing ethidium bromide as a chemical hazard (ie. collect for hazardous waste pick-up).
  - If you have used radiochemicals in a common room that is signed and approved by the Radiation Safety Committee for radioactive materials (RAM), then a swab survey and survey meter reading must be done after each experiment. Complete necessary paperwork and provide documentation to others that the area is “cold.” Paperwork must be submitted to the Radiation Safety Officer (RSO) on a monthly basis for review. The common use area signed for RAM use will remain on the official list of radioactive materials use areas until the RSO does an official close-out survey.
  - If equipment fails in a common area, contact the Research Biomedical engineer, put a sign on the piece of equipment and email the research lab groups.
  - Do not store combustibles within 18” of the ceiling.
  - Do not store gallon containers above eye level.
  - Signage to be affixed to laboratory door:
    - Radioactive materials
    - Biological hazard sign
    - Emergency phone numbers
  - Children and other unauthorized personnel are NOT permitted in the laboratory areas without the prior approval of the lab supervisor.

## **SPECIAL LABORATORY PROCEDURES**

### **Compressed Gases**

- Cylinders must be secured at all times to prevent accidents.
- Valve safety covers should be left on until pressure regulators are attached.
- Containers must be clearly labeled with the name of the contents in accordance with Hazard Communication and OSHA regulations.
- Hand trucks or dollies with a securing device installed must be used when moving cylinders.
- Cylinders should be kept away from any source of ignition and should be closed at the main cylinder valve when not in use.

### **Flammable Gases**

- No more than two cylinders should be manifolded together. When more than one cylinder of a highly flammable gas is to be used in one room, special approval by the Medical Center Safety Office must be attained.
- Standby cylinders (full or empty) should not be stored in the laboratory.
- Valves on all flammable gas cylinders must be shut off when the unit is unattended.

### **Radioisotope Procedures**

- Permission to use isotopes and approval of the protocol must be obtained through the Radiation Safety Office (ext 65586) before use of radioisotopes. After these

approvals are obtained, strict adherence to the guidelines set forth in the Medical Center's Radiation Safety Manual (SL-11-09) will be followed.

- Each laboratory authorized to use radioactive materials will maintain a complete inventory of radioactive materials using the "Radioisotope Receipt, Use and Disposal" form issued by the Radiation Safety Office when isotopes are received. Laboratory inventories are audited periodically by the Radiation Safety Officer using the "Principal Investigator Radiation Safety Inventory" form also provided by the RSO. All of these forms are subject to inspection by the RSO.
- All radioactive waste will be placed in an appropriate waste receptacle and labeled "Radioactive Waste." A record of disposal will be entered on the "Radioisotope Receipt, Use and Disposal" form. Radioactive Waste can only be disposed of through the Radiation Safety Office. Liquid and solid waste must be separated. If authorized, there are some materials that may be disposed of through the sewer in an authorized "Radioactive Materials Sink." Record of this disposal is also entered on the above form.

### **Acidic/Caustic Materials**

- If strong acids or alkalis are being used a shield or barrier should be used to control spills.
- Wear aprons, proper gloves and eye protection when handling highly corrosive materials.
- Do not mouth pipette or sniff reagents.
- Use great care when diluting reagents. When diluting acids slowly add acid to water and mix slowly.
- Transport acids using heavy plastic secondary containment carriers with at least twice the volume of the acid being transported.
- Maintain adequate ventilation.
- Special precautions should be taken for oxidizing agents.

### **Formaldehyde**

- All operations/procedures using formaldehyde must be evaluated to determine the potential exposure to formaldehyde.
- Employees at risk of potential over exposure to formaldehyde will be monitored as specified by OSHA. The Safety Office will schedule monitoring under these circumstances.
- Compliance with the OSHA formaldehyde compliance standard will be required.
- Areas identified as exceeding permissible exposure limits must be signed with the following warning:

**DANGER: IRRITANT AND POSSIBLE CANCER HAZARD.  
FORMALDEHYDE AUTHORIZED PERSONNEL ONLY**

### **Perchloric acid**

- Do not attempt to heat perchloric acid if you do not have access to a properly functioning perchloric acid fume hood. Perchloric acid can only be heated in a hood specially equipped with a wash down system to remove any perchloric acid residue. The hood should be washed down after each use and it is preferred to dedicate the hood to perchloric acid use only. No organic material should be stored in the hood containing perchloric acid.

- Perchloric acid can be stored in a perchloric acid fume hood, only keep the minimum amount necessary for your work. Another acceptable storage site is on a metal shelf or in a metal cabinet away from organic or flammable materials. No more than two 1 lb bottles of perchloric acid should be stored in the laboratory. The bottles should be stored in a glass secondary container to contain any leakage.
- Do not allow perchloric acid to come in contact with strong dehydrating agents such as sulfuric acid.
- Do not order or use anhydrous perchloric acid or perchloric acid solutions greater than 70% concentration. These can be unstable at room temperature.
- Examine perchloric acid periodically, and do not use if the solution has turned brownish. Contact the Facility Safety Office to arrange safe disposal of discolored perchloric acid.

### **Carcinogens**

The latest Report on Carcinogens can be found at <http://ntp.niehs.nih.gov/?objectid=035E57E7-BDD9-2D9B-AFB9D1CADC8D09C1> and contains a listing of known and suspected carcinogens.

- Use of carcinogens requires the following:
  - Designation of specific work areas with restricted access.
  - Listing of personnel authorized to work in the area.
  - Inventory of types and quantities of reagents on hand.
  - Personnel must be trained in safe handling procedures for the specific carcinogenic chemicals used.
  - Records of exposure must be maintained.
  - Procedures for monitoring storage, decontamination, disposal and emergency procedures must be established.
  - Medical surveillance of personnel.
  - Protective clothing must be provided.
  - Hand washing is required immediately after handling.

### **Allergens, Reproductive Toxins and Highly Hazardous Chemicals.**

#### **Allergens**

- Wear suitable protective clothing, gloves or masks to prevent contact with allergens and substances of unknown allergenic activity (consult MSDS).

#### **Reproductive Toxins**

A link to a list of reproductive toxins can be found at <http://www.cdc.gov/niosh/topics/repro>

- Employees must be advised of substances that act as reproductive hazards.
- Use should be reviewed for particular hazards by the investigator to see if special procedures are warranted or warning signs should be posted. The investigator should determine if any additional information or monitoring is warranted.
- Embryotoxins requiring special control should be stored in a well ventilated areas. The container should be labeled in a clear manner such as:

### ***EMBRYOTOXIN: READ SPECIFIC PROCEDURES FOR USE***

- If the container is breakable, it should be kept in an impermeable, unbreakable secondary container large enough to hold 2x the material in case the primary container leaks or breaks.
- Women of childbearing age should take adequate precautions to guard against spills or splashes.
- Appropriate apparel (consult MSDS), particularly gloves, should be worn.
- All hoods, glove boxes and other essential engineering controls should be inspected for adequate airflow before starting an operation.
- Investigators must be notified of all exposures or spills of embryotoxins requiring special control.

### **Highly Hazardous Chemicals (HHCs)**

- HHCs are stored separately from other chemicals, in a designated area where such chemicals will be used. This area should be appropriately marked so that personnel unfamiliar with the laboratory will be informed of the potential hazard.
- Special warning signs should be posted such as:  
CAUTION: CANCER-SUSPECT AGENT or CAUTION: HIGH CHRONIC TOXICITY AGENT
- Always use a hood, Biological Safety Cabinet or other containment device for all procedures. See Appendix D for a list of examples of HHCs.
- Wear proper personal protective equipment (PPE) when working with these chemicals. Wash hands immediately after working with these chemicals.
- Containers should be stored in a ventilated, limited access area in labeled, unbreakable, chemically resistant, secondary containers.
- Any contaminated equipment or glassware will be decontaminated in the hood prior to removing them from the designated area.
- Maintain records that include the amount of material and names of workers.
- If using significant quantities of HHCs on a regular basis, consult a qualified physician concerning regular medical surveillance.

#### *Animal Work with HHCs*

- Warning signs and safety protocols need to be posted on the animal room door and the cage cards.
- The name of the agent, hazard, and the name and telephone number of the individual to contact in the event of an emergency involving the agent should be included.
- The administration of the HHCs will be by injection or gavage when possible rather than by diet.
- When diet is used, a caging system under negative pressure or under laminar airflow directed toward HEPA filters should be used.
- Procedures should be followed to reduce aerosolization during removal of contaminated bedding.
- Animals receiving HHCs need to be housed separately from other animals.

## **EXPOSURE CONTROL PLAN**

The Safety Office, will provide guidance in determining what level of protection is required for procedures being performed in the various labs. PIs will be responsible for ensuring that PPE is available and that the workers are trained in use of this equipment.

The Subcommittee for Research Safety & Biosafety will work with the Facility Safety Office, Principal Investigator and lab technicians to develop and implement safety training appropriate to each lab group.

- Your first line of protection against exposure when working in the lab is wearing a lab coat and gloves and washing hands often. Lab coats are obtained from and returned to the VA laundry room.
- It is the lab supervisors' responsibility to provide gloves that afford the protection needed. When choosing gloves, it is essential that employees use gloves designed for the hazards, chemicals and tasks found in their workplace. See Appendix F for a table of types of gloves protective against specific chemicals.
- Appropriate gloves should be worn when working in hot or freezing situations. For example:
  - Non-asbestos autoclave gloves are available and should be used to handle hot glassware.
  - Large cryo-protective gloves are available for retrieving liquid nitrogen vials.
- Wear eye and face protection that properly fits and is appropriate to the work being performed. Some of the most common types of eye and face protection include: safety spectacles, goggles, laser safety goggles and face shields.
- Wear protective goggles when working with corrosive chemicals, homogenizing samples, using sonicator or when retrieving liquid nitrogen vials. Hazards from vortexing can be minimized by wearing goggles.
- Wear a UV-protective full-face shield when using the transilluminator.
- Personal protective equipment (PPE) in the form of lab coats, gloves, goggles or similar eye protection and respirators are available to laboratory workers.
- Exhausting fume hoods will be checked and certified annually for proper function. Laminar flow/biosafety cabinets will be certified annually.
- VA Facilities Management Service (FMS) will be responsible for maintenance of eyewashes, emergency showers and fire extinguishers.
- Proper storage rooms/cabinets for flammable chemicals and chained stantions for pressurized gases will be provided in the buildings.
- The Investigators are responsible for providing proper storage for chemicals kept in their labs

## **BIOSAFETY PRECAUTIONS**

- When using either the laminar flow or fume hood, work within the back half of the hood so as not to disrupt the laminar flow of air within the hood.
- Avoid use of needles to disrupt potentially hazardous cell suspensions.

- Eject tips from mechanical pipettors gently and directly into a receptacle.
- Needles should never be recapped and should be disposed of in the sharps container.
- Self-sheathing needles should be used whenever possible.
- All human specimens shall be considered potentially infected with hazardous agents. Direct handling of these substances is to be avoided.
- Gloves, forceps, or other protective guard will be used as appropriate.
- Decontaminate incubators on a regular basis with soap and water, followed by autoclaving of shelves or spraying and wiping down surfaces with 70% ethanol.
- Spilled virus, homogenate or other potentially infectious samples must be contained with paper towels and immediately covered with a solution of 10% bleach or HB Quat 25 for 15 minutes. The area should then be thoroughly cleaned with water and the spill reported to the supervisor.
- Pipettes that have been contaminated with virus or viral products are to be soaked in a 10% bleach solution and drained, before being disposed of in a biohazard bag. Pipettes that contain any potentially biohazardous material are disposed of in red plastic biohazard containers.
- Biohazardous waste bags/containers are removed by the facility.
- The U.V. light within a laminar flow hood will be activated only when there is proper shielding and when there is no danger of excessive exposure to laboratory personnel. Protect skin from exposure to the UV light source.
- The hood should be cleaned out at the end of each procedure. The surface shall be cleaned with a HB Quat followed by 70% ethanol.
- Refrigerators, culture incubators and any other place where biohazardous agents are used must be identified with a **BIOHAZARD** sticker.

## CHEMICAL PROCUREMENT, USE AND STORAGE

### General

- No chemical is to be received in the laboratory without a Material Safety Data Sheet (MSDS), unless a current MSDS is already on file.
- Wear proper personal protective equipment (PPE) when working with all lab chemicals. Refer to the most recent MSDS to see what is appropriate.
- Chemicals should be stored by reactive class (i.e. flammables with flammables, oxidizers with oxidizers). Incompatible chemicals should not be stored together. Secondary containment tubs may be used to segregate by chemical compatibility.
- Stored chemicals should be examined periodically for deterioration and container integrity.
- Amounts permitted in the laboratory work area should be as small as possible and practical.
- Every effort should be made to find less hazardous substitutes for more hazardous chemicals.
- Exposure of chemicals to heat sources or direct sunlight should be avoided.
- Each lab using HHCs must designate a work area where such chemicals will be used. This area should be appropriately marked so that personnel unfamiliar with the laboratory will be informed of the potential hazard.

- Non-disposable glassware and equipment that comes into contact with HHC should be appropriately marked, and set-aside for use only when wearing proper PPE.
- Use absorbent bench coverings to contain incidental spills.
- Please refer to Appendix E for chemical compatibility storage practices. The best storage practice is to have incompatible chemicals in secondary containment and store them in physically separate locations (in other words, not in the same cabinet).
- Fume hoods should not be used as long-term storage areas for chemicals. It is permissible to designate a portion of the fume hood as a hazardous waste satellite accumulation area.
- Disposal of outdated, unusable or spent chemicals and hazardous waste will be arranged with the GEMS Coordinator or Safety Officer, who will pick up the waste at the labs.
- A hazard determination must be made for all **chemicals produced exclusively for the lab's use** (i.e. custom synthesized chemicals).
- All appropriate training, labeling, and MSDS requirements must be met.

### **Flammables**

- Flammable liquids in quantities greater than 4 liters must be stored in flammable cabinets located in each research wing. These areas and laboratory chemical storage cabinets should be inspected annually by the SRS&B Committee. The inspection should focus on container integrity, proper chemical segregation, and the use of secondary containment. The research chemical inventory will be updated on a semi-annual basis by each Principal Investigator and forwarded to the Stratton R&D program office, and will be communicated to the Research Chemical Hygiene Officer and Facility Safety Manager or GEMS Coordinator by way of the SRS&B meeting agendas and minutes.
- Small quantities of flammable liquids sufficient for the day's use may be kept out on the open bench in properly labeled containers.
- Flammables should be stored away from caustics, oxidizing acids and oxidizers.
- Flammables requiring refrigeration must only be stored in explosion- proof refrigerators (such refrigerators should be labeled as being safe to store flammable liquids).

### **Acids**

- Large bottles of acids should be stored on a low shelf or in an acid cabinet in secondary containment.
- Oxidizing acids are to be segregated from organic acids, flammable and combustible materials.
- Acids must be separated from caustics and from active metals such as sodium, magnesium and potassium.
- Acids must be segregated from chemicals that can generate toxic gases on contact.
- Spill control pillows or acid neutralizers are available for acid spills.
- Perchloric acid should only be used in the perchloric acid hood which is equipped with special water wash down capability. No more than two 1 lb

bottles of perchloric acid should be stored in the laboratory. No organic material should be stored in the hood containing perchloric acid. Do not allow perchloric acid to come in contact with strong dehydrating agents. Examine perchloric acid periodically, and do not use if the solution has turned brownish. Contact the GEMS Coordinator and/or the Safety Office to arrange safe disposal of discolored perchloric acid.

- Peroxide forming chemicals (e.g. diethyl ether and tetrahydrofuran) should be stored in airtight containers in a dark cool place. Each bottle of flammable chemicals prone to peroxide formation shall be labeled with the date of receipt, the user initials and the date the container was opened. An inspection of the chemical should be performed at monthly intervals. Use or dispose of peroxide forming chemicals prior to their expiration dates or the time recommended in the National Safety Council document *Recognition and Handling of Peroxidizable Compounds*, whichever is shorter.
- Cans of ether must be used completely once opened, to avoid peroxide formation. Ether use is restricted to explosion proof fume hoods. Animal carcasses and gauze saturated with ether must be ventilated in the explosion proof hood before disposal. Appendix C codifies the policy for use of volatile flammable reagents on this station.

#### **Water-Reactive Chemicals**

- Water-reactive chemicals are to be kept in a cool, dry place.
- In case of fire use an ABC fire extinguisher.
- Labeled with NFPA label (with the white square filled in).

#### **Oxidizing Chemicals**

- Oxidizing chemicals are to be stored away from flammables, combustibles, and reducing agents (e.g. zinc, alkaline metals).

#### **Toxic Compounds**

- Toxic compounds are to be stored according to the nature of the chemical with appropriate security employed where necessary.
- The Poison Control Center telephone number (1-800-222-1222) should be posted in each laboratory.

### **CHEMICAL SPILL RESPONSE:**

**To summon emergency assistance:**

**Pull fire alarm.**

**Call 62911 (VA Police/AOD)**

**All spills (more significant than *incidental spills/releases*) must be reported to the Medical Center Safety Office (518) 626-6937.**

**Spill kits (including mercury spill kits) are located in all laboratories.**

- An ***incidental spill or release*** is defined (consistent with OSHA language) as:
  - “Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of the release by employees in the immediate release area, or by maintenance personnel, are not

- considered emergency responses within the scope of this standard (29 CFR 1910.120). Responses to releases of hazardous substances where there is not potential safety or health hazard are not to be considered emergency responses.”
- “An incidental release is a release of a hazardous substance which does not pose a significant safety or health hazard to the employees in the immediate vicinity or to the worker cleaning it up, nor does it have the potential to become an emergency. For example, a small amount of a substance considered low in toxicity and released from a valve during a maintenance operation would be considered an incidental release, not an emergency.”
  - Similarly, the release of a small quantity of a relatively low toxicity chemical during routine laboratory operation, that can be safely cleaned up by the laboratory personnel without significant health or safety hazard, would be considered an incidental spill and would not constitute an emergency.
  - Laboratory personnel can respond to incidental spills/releases. Additional training (under the OSHA *Hazardous Waste and Emergency Response Standard*, 29 CFR 1910.120), would be required for responses to more serious or emergency spills.

***PLEASE NOTE: This facility does not have an on-site emergency response team for chemical spills. In the event of an emergency spill, external responders would be called upon by the facility’s Emergency Manager or designee.***

In the event of a spill or airborne release of a chemical agent in the laboratory, the primary concern is the safety of the employees who might be exposed. The two most likely routes of exposure are skin contact and inhalation. DO NOT attempt to control or clean up chemical spills unless the spill is limited to an incidental spill or release.

**Follow the RACE concept:**

- **Rescue or remove personnel from the spill area.**
  - Rescue or remove personnel from the immediate area of the spill (only when it is safe to do so). DO NOT BECOME A VICTIM YOURSELF. Exposure to some chemicals may impair your ability to escape the spill area or require the response of a specially trained emergency response team. Emergency medical treatment of victims should begin as soon as they are clear of the area where the chemical was released.
- **Alarm and dial 62911 to report the spill.**
  - The dispatcher will initiate an emergency response sequence. Tell your supervisor and other techs in the area that there has been a spill or release, warning them to stay clear of the area to avoid further exposure.
- **Contain the spill, only if it is safe to do so.**
  - Contain the chemical from contaminating other areas, only when safe to do so. In the event of a small spill of a non-toxic or low toxicity non-volatile liquid, use the spill control pillows from the spill control kits to prevent spread. Volatile or gas/vapor-producing chemicals pose a potential immediate health threat. Spills occurring within fume hoods can be easily isolated by drawing the sash down to allow the hood to exhaust to protect the workers from gas or vapor exposure. Only facility

employees included in the Respiratory Protection Program are authorized to use respiratory protection.

- **Evacuate the area.**

**Spill control and clean-up (general):**

- Never attempt to clean up any spill larger than can be accommodated by the spill kits or those spills that produce noxious or toxic fumes.
- Wear the appropriate PPE during spill response. Consult the most recent Job Hazard Analysis and/or the released chemical's MSDS.
- Spills of HHCs can pose significant risk to health and safety both for the user and for those working in the area. Absorption of liquids may be achieved with solid absorbents, spill pads or spill control pillows. Fumes are best allowed to vent through the fume hoods. Shut off all electrical devices if the material is flammable, and use non-sparking tools.
- Spills involving acids or caustics can be absorbed with the appropriate neutralizing powders available in the spill control cabinets.
- The lab worker can manage spills involving non-hazardous chemicals (such as buffer salts). Absorb spill onto pillow or toweling.
- Spills involving powder or solids can be contained by wetting a clean absorbent pad and carefully placing it over the area of the spill. Never spray a chemical in powder form with a misting device - this will only generate hazardous particulate aerosol! Wrap the wet powder in the absorbent pad and place in a thick plastic bag along with gloves.
- Spills outside the designated work area (e.g. on the floor): use absorbent pillow to control spread of contamination. Working from the outside edges of the spill inward, adsorb liquid on the absorbent pillow. The spill area must be clearly marked to keep traffic away from the area until decontamination can be verified.
- Contact the GEMS Coordinator if hazardous waste has been generated. Notify the R&D Chemical Hygiene Officer if any items are used from the lab spill kits

**Radiation spills:**

- All accidents involving radioactive materials must be immediately reported to the Radiation Safety Office, 518-626-5586. If accident is serious in nature and occurs at night, contact VA Police, 518-626-2911.
- Procedures for decontamination and spill cleanup can be found in the Radiation Safety Manual, which is available in areas where radioactive chemicals are used.

**WASTE DISPOSAL**

- Always consult the MSDS for manufacturer's recommended disposal method.
- Disposal of liquid wastes through the sewer system must comply with all Federal, State and Local regulations and ordinances. Check with the Safety Office when in doubt as to whether a chemical can be disposed of via the sewer system.

- Some radioactive materials may be disposed of through the sewer. Authorization must be obtained from the Radiation Safety Office. Disposal must be through an approved “signed” sink.
- All pipettes, sharps, needles and scalpel blades shall be disposed of in red plastic sharps containers labeled with a “biohazard” sticker. Biohazardous waste containers are picked up by the facility.
- Hazardous waste satellite accumulation areas can be set up in the laboratories with the Facility Safety Office approval.
  - The containers must each be clearly marked with the words “Hazardous Waste” and the identity of the contents.
  - Containers must be sound and compatible with the contents. They must remain closed except when adding material. Only one container per waste stream is permitted.
  - Containers should be stored in secondary containment and in flammable storage cabinets as necessary.
  - When the container becomes full, or when the waste is no longer generated, contact the GEMS Coordinator for disposal.
- Waste from tissue culture procedures, microbiological waste, acrylamide gels and waste containing trace amounts of toxic materials will be bagged in red bags and put in the regulated medical waste containers in each lab.
- Gels containing ethidium bromide are collected and disposed of as hazardous waste. A container for these wastes is located in room B626.
- All unused, expired or spent chemicals must be evaluated to determine if the waste is an EPA or NYS hazardous waste. Contact the GEMS Coordinator for assistance. Hazardous chemicals stored for disposal will be in compatible groups, in appropriate containers, labeled clearly to indicate hazard warning and otherwise comply with applicable fire and safety warning.
- Unlabeled containers of chemicals and solutions should undergo prompt disposal, with notification to the safety office. If partially used, they should not be opened to identify the contents.
- Radioactive waste disposal will be coordinated through the Radiation Safety Office and accomplished in accordance with an approved protocol and the Radiation Safety Manual.

## USE OF LABORATORY HOODS AND LAB EQUIPMENT SAFETY

### Fume Hoods

- All exhausting fume hoods and biosafety (laminar flow) cabinets will be monitored for proper operation before use. The acceptable velocity range for a lab fume hood is 80 – 120 feet/minute. Hood sashes should be marked to indicate appropriate working heights. Laminar flow hoods are equipped with magnehelic gauges to record the performance of the HEPA filters. Hood users should be familiar with the proper range of readings for the magnehelic so they may detect deteriorating performance of the hood filters. All hoods and cabinets will be checked and certified by an outside contractor annually. Before starting work in a fume hood, check that the hood is working properly by observing

flutter strip for movement and direction of flow. If a hood fails, close the sash and call Facilities Management at X61178. Do not use the hood until it has been checked out and repaired.

### **Specialty Fume Hoods**

- There is a fume hood available in B613 for use in protocols involving perchloric acid. This is a specially designed hood, which allows for the wash-down of dried perchloric acid crystals, eliminating the potential for explosion.

### **Other Equipment and Related Safety Issues**

- Be sure any safety shields, filters, or similar devices are present on laboratory equipment before operating. Keep all laboratory machinery in good repair. Examine all electrical equipment frequently for worn or broken wires and take all such defective items out of service until they can be repaired. If defective or inoperable laboratory equipment is found, please notify your Biomedical Maintenance Department for repair. Provide proper ventilation for any equipment that emits hazardous or noxious fumes (Ex: ozone produced by some types of spectrophotometer lamps).
- Avoid placing heat sources (Bunsen burners, hot plates, etc.) in the same area where flammable materials or chemicals will be handled. Do not leave heating elements operating and unattended in the lab. Electrophoresis equipment is an exception. This, however, should be double-checked before leaving the equipment running over night.
- Wherever possible, try to use plastic rather than glass for vessels, storage containers and pipettes to reduce the possibility of breakage and injury.
- When centrifuging, inspect tubes before and after use. When centrifuging hazardous or biohazardous materials, the post-centrifugation inspection should be conducted in a fume hood. Wear personal protective equipment such as gloves, mask, face shield, and lab coat and exercise care when opening tubes containing hazardous material to avoid spills or aerosol formation. If a sample leak occurs within a centrifuge, make sure it is adequately cleaned up and sanitized for future operations.

### **EXPOSURE MONITORING**

- It is the policy of this Medical Center to monitor chemical exposures to ensure staff is not exposed to concentrations of contaminants in excess of the Permissible Exposure Limit (PEL) and in compliance with OSHA regulations. For some substances, exposure limits published by organizations such as the American Conference of Government Industrial Hygienist (ACGIH) may also be used.
- The Facility Safety Office is the initial point of contact for such monitoring.
- The Supervisor is charged with the responsibility for contacting the Safety Office concerning possible chemical over-exposures for which monitoring may be appropriate.

- Initial monitoring must be conducted in response to several OSHA substance-specific standards (e.g., formaldehyde) and where there is reason to believe unhealthy exposures may occur. Monitoring may need to be repeated each time there is a change in procedure, equipment, personnel or control measures such that an increased exposure is suspected.
- Employees and their supervisors will be notified of the results within 15 days of Safety Office receipt. Monitoring results will also be provided to Employee Health when measured concentration(s) are greater than or equal to the Threshold Limit Value (TLV).
- If the employee exposure is found to be over the permissible exposure limit, the employee should NOT continue to perform that work which produced the exposure until control measures can be put in place to reduce the exposure to less than the permissible exposure limit. If control measures are not effective at reducing the exposure to a level below the permissible exposure limit, the employee must be provided with sufficient personal protective equipment to minimize their exposure.

## **RADIATION EXPOSURE AND MONITORING**

Employees shall follow all safety procedures and guidelines noted in the Radiation Safety Manual. Employees contaminated by radioactive materials will follow the procedures outlined in the Radiation Safety Manual, with regard to proper reporting and investigation of the incident. All exposures will follow guidelines of the Stratton VAMC Radiation Safety Program.

Exposure levels are monitored quarterly through testing of radiation badges and rings. Monitoring requirements are specified in the Stratton VA Medical Center Radiation Safety SOP. It is available from the Radiation Safety Office (RSO).

## **HOUSEKEEPING, MAINTENANCE AND INSPECTIONS**

### **Housekeeping:**

- Facilities Management Service is responsible for routinely cleaning all floors within Research Service areas.
- All Research personnel are responsible for cleaning of all bench tops and other work areas such as fume hoods and laminar flow hoods.
- FMS does not respond to chemical spills.

### **Maintenance**

- Biomedical Engineering Service is responsible for all routine maintenance on laboratory equipment except for those pieces that are covered by a maintenance contract.
- Biomedical Engineering coordinates the inspection, cleaning and certification of all laminar flow hoods and fume hoods on a yearly basis. Staff will not use hoods lacking certification or where certification has expired.
- Eye wash fountains will be inspected on the frequency required by the facility, as defined in the related Stratton VAMC Safety SOPs. Any problems will be reported to Facilities Management Service. Interim safety measures will be used in the event of malfunctions.

- Emergency drench-type showers will be inspected regularly by Facilities Management Service.
- Fire Extinguishers will be inspected by the Medical Center Safety Office on a monthly basis. Un-inspected or non-operational extinguishers will be reported to the Safety Officer.

### **Inspections**

- Members of the Medical Center Environment of Care Committee will perform a formal inspection of Research areas at least every six months.
- Members of the SRS&B will perform an annual inspection of Research areas.

### **Passageways:**

- Stairwells and hallways will not be used as storage areas.
- Access to emergency exits, emergency equipment and utility controls will never be blocked.
- Emergency exit routes will be posted.

## **BLOOD BORNE PATHOGENS**

All Blood Borne Pathogens (BBP) activities are required to refer to the Stratton VAMC Blood Borne Pathogen Policy and staff are strongly encouraged to receive the Hepatitis B Vaccine.

## **MEDICAL SURVEILLANCE**

The Personnel Health Physician administers the medical surveillance programs, as outlined by OSHA regulations for all employees who handle or are exposed to hazardous materials.

- The following are monitored by Personnel Health Service and/or the Medical Center Safety Office:

Formaldehyde	Noise
Ionizing Radiation	Nitrous Oxide
Blood-borne disease agents	Ethylene Oxide
Heat	Chemotherapeutic Agents
Asbestos	Anticholinesterases/insecticide
- All employees who work with hazardous chemicals will receive medical attention, including follow-up examinations when necessary, under the following circumstances:
  - Whenever an employee develops signs and symptoms associated with exposure to a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.
  - Where exposure monitoring reveals an exposure level routinely above the action level( or in the absence of an action level, the PEL) for an OSHA level regulated substance for which there are exposure monitoring and medical surveillance requirements, a medical surveillance shall be established for the affected employee as prescribed by the particular standard.
  - Whenever an event takes place in the work area such as a spill, leak explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for medical consultation.

- Such consultation shall be for the purpose of determining the need for medical examination.
- All medical examination and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

#### **Information provided to the physician**

The employer shall provide the following information to the physician:

- The identity of the hazardous chemical to which the employee may have been exposed.
- Description of the conditions under which the exposure occurred, including quantitative exposure data, if available.
- Description of the signs and symptoms the employee is experiencing, if any.

#### **Physician's written opinion.**

For examination or consultation, the employer shall obtain a written opinion from the examining physician which shall include the following:

- Any recommendation for further medical follow-up.
- Results of the medical examination and any associated tests.
- Any medical condition, which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace.
- A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
- The written opinion shall not reveal specific finding of diagnoses unrelated to occupational exposure.

### **EMERGENCY FIRST AID PROCEDURES**

All injuries must be reported to your immediate supervisor. After taking emergency steps recommended below, medical attention should be obtained from Personnel Health or the Emergency Physician. In accordance with medical center policy, a supervisor must accompany the employee to the Personnel Health Unit. If the injury involves radioisotopes, the RSO should also be notified. The accident should be documented.

#### **Eye Contact:**

- In the event of a chemical splash to the eyes ask co-workers to help you wash the eyes thoroughly using the nearest source of clean tepid water such as an eye wash station. Lift eyelids to avoid pooling of chemicals under the eyelids. Flush with water for a full 15 minutes.
- Seek medical attention from Personnel Health or the Emergency Room immediately and ensure that a copy of the MSDS is provided to the medical caregiver.

#### **Skin contact:**

- Corrosives can cause second or third degree burns. These chemicals include alkalis such as sodium hydroxide and common acids such as hydrochloric, sulfuric and nitric.

- Chemicals should be diluted and washed off with copious amounts of water.
- Minor splashes and spills can be flooded in a sink. Larger splashes and spills require the use of the emergency drench-type laboratory shower. Enlist the help of co-workers. Some chemical powders should be brushed off the skin before flooding with water to avoid further skin and tissue damage. Always consult the MSDS for emergency first aid procedures BEFORE working with any chemical.

#### **Inhalation**

- Move personnel to fresh air and seek medical attention.

#### **Ingestion**

- Seek medical attention.

#### **Radiation Contamination**

- Employees contaminated by radioactive materials will follow the procedures outlined in the Stratton VAMC Radiation Safety SOP
- The Radiation Safety Officer (RSO) is to be notified immediately if personnel contamination occurs. A written report is to be filed with the Radiation Safety Office describing the incident and steps taken to decontaminate. A copy of this record should be kept in the Radiation Safety records for the lab as well.

### **PROTECTIVE APPAREL AND EQUIPMENT**

Personal Protective Equipment (PPE) includes gloves, goggles, face shields, aprons, fluid resistant/impervious gowns, masks and respirators. The use of such equipment is generally the least desirable way to control workplace hazards, as it places the burden of protection on the worker. The equipment must be available for situations when an unexpected exposure to chemical substances, physical agents or biological materials could have serious consequences.

The Medical Center Safety and Health Office may be called upon for guidance in selection of PPE.

#### Types of Personal Protective Equipment

- **General**
  - Protective apparel must be compatible with the required degree of protection for the substances being handled.
  - An easily accessible drench-type safety shower and eye wash station must be available.
  - An easily accessible fire extinguisher must be available (consult MSDS to verify the type required).
- **Eye**
  - Chemical splash goggles and/or face shields, rather than safety glasses should be used when pouring any hazardous chemicals as they have been proven to be the best protection. Safety glasses provide only minimal splash protection.
  - Protective eyewear must be available in all areas where hazardous substances are utilized.
  - Protective eyewear should be easy to clean and disinfect.
  - For those employees who wear glasses, goggles must fit over the glasses. Prescription lenses can often be incorporated into protective eye wear.

- **Gloves**
  - Gloves (latex, vinyl or nitrile) will be provided for all employees. Appropriate gloves should be worn for the specific hazard
  
- **Other Personal Protective Equipment**
  - Rubber, acid-resistant aprons should be worn when pouring concentrated chemicals.
  - Respirators: Follow the Facility Respirator Protection Program
  - Respirators must be chosen as to the hazard for which they are intended.
  - The Facility Safety Office administers the respirator program.

## **RECORD KEEPING**

### **Accident Reporting**

- Supervisor must take the employee to Personnel Health. The supervisor must complete VA Form 2162, Report of an Accident.
- The Safety Office will present all accident data to the Accident Review Board.
- All employee-related incidents, in which there is even a remote possibility of employee overexposure, should be thoroughly investigated in accordance with this plan. Events or circumstances which might reasonably constitute overexposure include:
  - A hazardous chemical leaked, spilled or otherwise rapidly released in an uncontrolled manner.
  - A laboratory employee has direct skin or eye contact with a hazardous material.
  - A laboratory employee manifests symptoms such as headache, rash, nausea, coughing, tearing, irritation or redness of the eyes, irritation of the nose to throat, dizziness, loss of motor dexterity or judgment, etc. and some or all of the symptoms disappear when the person is taken away from the exposure area and breathes fresh air, and the symptoms reappear soon after the employee returns to the work with the same hazardous chemical.
  
- All complaints and their dispositions, no matter what the ultimate dispositions must be documented. If no further assessment of the event is deemed necessary, the reason for that decision should be included in the documentation. If the decision is to investigate then a formal Exposure assessment will be initiated.

### **Medical Record Keeping**

Medical records will be retained by Personnel Health.

### **Chemical Exposure Monitoring**

Records will be maintained by the Medical Center Safety Office. Results are communicated to the employee, employee's supervisor and if appropriate, the Personnel Health Office.

### **Fume Hood Testing/Maintenance Records**

Biomedical Engineering coordinates testing of all fume hoods. The date of certification will be applied to the fume hood and a copy of the results of testing forwarded to the

Research Office, where they will be kept on file for a minimum of 2 years. Copies of fume hood records will be provided to the affected service.

### **Chemical Inventory**

Each laboratory will maintain a complete inventory of all chemicals utilized by each investigator. All inventories should contain the chemical name, location of storage, and quantity. A copy of the complete chemical inventory will be sent to the Medical Center Safety Office on a semi-annual basis by way of submission to the SRS&B.

An MSDS for each chemical will be maintained in each laboratory and be readily accessible to employees that may come into contact with the chemical. The Medical Center Safety Office has electronic access to all MSDS.

### **SIGNS AND LABELS**

#### **Signs to be Posted Prominently**

- Telephone numbers of emergency personnel, supervisors and laboratory workers.
- Location signs for safety showers, eyewash stations, other safety and first aid equipment.
- Location of emergency exits.
- Location of spill kits.
- Location of MSDS.
- Warnings at areas where unusual hazards exist, such as x-ray equipment, lasers, etc.
- "Radioactive Materials Use Area" if applicable on the outer door of the lab. If it is a Radioactive Materials use area, then the lab must also post "NRC Form 3;" "Emergency Procedures," "Minor and Major Spills," and "Radiation Safety Posting."

#### **Chemical Labeling**

Each chemical must be labeled with the following information:

- Complete names are required, i.e. ETOH vs. Ethyl Alcohol. Chemical identity, abbreviations will not be accepted.
- Appropriate Hazard (i.e. caustic, corrosive, poison, irritant, flammable, carcinogen, etc.)
- Date received.
- Date opened.
- Expiration date, if any.
- Any special storage requirements.

### **EMPLOYEE INFORMATION AND TRAINING**

Prior to assignment where hazardous chemicals are present, employees will be provided with information and training regarding the hazards of chemicals in their work area, by their lab supervisor. Training updates and new safety information will be made available at research staff meetings, online trainings opportunities, by email and at annual reviews. All training requirements are described in detail in the Stratton VAMC Research and Development Committee SOP for Education and Credentialing.

- **Information provided to all new employees**
  - This document, with the SRS&B SOP, the Chemical Hygiene Plan and the Laboratory Security Plan sections as well as this information (here and in the form of Appendices to this document):
    - The Research Chemical Hygiene & Safety Plan (CH&SP) will be readily available to all employees and students.
    - OSHA permissible exposure limits or the American Conference of Governmental Industrial Hygienists TLV limits, and signs and symptoms associated with exposure to hazardous chemicals used in the laboratory, which can be found here:  
<http://www.osha.gov/SLTC/healthguidelines/index.html>
    - Location and availability of reference materials on hazards and safe handling storage and disposal of hazardous substances, in addition to MSDS.
    - Contacting Employee Health in the event of an accident or exposure to a hazardous substance.
  
- **Training provided to employees**
  - Personnel with a potential for exposure to hazardous substances will be trained in the safe handling practices to avoid exposure. **Principal Investigators bear the primary responsibility to ensure that proper training is provided and explained to all employees on all shifts.** This should include:
    - Methods and observations utilized to detect the presence and release of hazardous chemicals to include continuous monitoring devices and visual appearance or odor of hazardous chemicals when being released.
    - The physical and health hazards of chemicals in the laboratory.
    - Measures employees can take to protect themselves from chemical and radiation exposure by following emergency procedures and using proper personal protective equipment.
    - Spill cleanup.
    - Signs and symptoms associated with chemicals utilized by the Research Service.
    - Safe handling and disposal of hazardous materials.
  
- **Mandatory Training**

Biosecurity Course from Collaborative Institutional Training Initiative (CITI)  
<https://www.citiprogram.org/default.asp>. A copy of the Completed Certificate should be provided to the Research Services Office.
  
- **Modes of Training**
  - All training records pertaining to what is described under the “Employee Information and Training” section shall be properly maintained to include at a minimum:
    - Training Title.
    - Employee attendance and signature or electronic evidence of completion.
    - Date(s) of training.

## **PART 3 - SECURITY FOR RESEARCH LABORATORIES**

### **PURPOSE**

To establish policy regarding the security of the laboratories of the Research & Development Service.

### **POLICY**

Research laboratories and inventory will be secured in keeping with the intent and scope of VHA Handbook 1200.06, dated October 1, 2005. The policy applies to all individuals entering the secured area, to include VA employees, without compensation (WOC) employees, contract employees, oversight entities, vendors, employees from other VA services, and visitors.

### **RESPONSIBILITY**

- **Hospital Director** – the Medical Center Director is the Responsible Official and may appoint one or more Alternate Responsible Official(s) to assist in administering this program.
- **The Associate Chief of Staff for Research (ACOS/R&D)** - by and through the
- **Administrative Officer for Research (AO/R&D)** - will maintain security policies in keeping with VA directives and policy and ensure compliance with established policies.
- **Research & Development Committee** – will serve as the Security Committee.
- **Human Resources** - will communicate the results of background checks to the ACOS/R&D or AO/R&D in a timely manner.
- **Police & Security Service** - will conduct an independent security vulnerability assessment annually and act as a resource to Research in the creation and monitoring of security policies.

### **DEFINITIONS**

For purposes of these guidelines, the following definitions shall apply.

- Security Committee. The Research and Development (R&D) Committee shall serve as the “Security Committee,” as needed, and is responsible for oversight of matters relating to the secured areas of Research Service.
- Secured Area. The secured area refers to research laboratories located on 6A, 6B, and rooms 607/608 Core of Building #1, and the Animal Research Facility (ARF) in Building #3, at the Stratton VA Medical Center.
- Approved Individual. An approved individual is a VA employee appointed on a full-time, part-time, intermittent, fee basis, or without compensation (WOC), that has undergone credentialing and a background check required for appointment to a Title 5 position, Title 38 position, or as a WOC. An approved individual may also be a contractor who has undergone the required credentialing and background check.
- Authorized Individual. An authorized individual is a VA employee appointed on a full-time, part-time, intermittent, fee basis, or WOC, that has undergone credentialing and a background check required for appointment to a Title 5 position, Title 38 position or as a WOC. In addition, the individual has an approved security risk assessment as required in 42 CFR 73.8, 7 CFR 331.10, or 9 CFR121.11. An authorized individual may also be a contractor who has undergone the required credentialing and background check as well as having an approved security risk assessment.
- Visitor. A visitor is a person allowed entry into the secured research area, with a sponsor, for the purpose of conducting activities related to active research projects, or

for facility and/or administrative matters. All visitors must follow procedures as outlined in paragraph 6d of this document. At the Stratton VAMC, certain students (who are on-station for a short period of time) may be classified as visitors for security purposes. See section 6d for additional information.

- Hazardous Agent. A hazardous agent is a biological material including, but not limited to, the Centers for Disease Control (CDC) List of Select Agents, (<http://www.bt.cdc.gov/agent/agentlist.asp>, Stratton VAMC Research Laboratory Hazardous Agents Certification) and products of such a biological material, i.e., toxins. (The term also includes highly toxic chemicals or gases that have the potential for being used as weapons of mass destruction, as well as radioactive materials and/or radioactive sources.)
- Select Agent. A Select Agent is one of a group of agents (viruses, bacteria, rickettsiae, fungi, toxins, and recombinant deoxyribonucleic acid (DNA) designated by the CDC as requiring registration with the CDC Laboratory Registration Program. The regulation of Select Agents is codified in Title 42 Code of Federal Regulations (CFR) Part 72, Additional Requirements for Facilities Transferring or Receiving Select Agents. All Select Agents are included in the list of hazardous agents listed in <http://www.bt.cdc.gov/agent/agentlist.asp>. (Select Agents and Hazardous Agents are synonymous, and are to be handled at the same level of security.)
- Sensitive Materials. Sensitive materials include, but are not limited to, any hazardous agents as defined and identified in Appendix A of VHA Handbook 1200.6, as well as research equipment and/or supplies used to store, test, destroy or otherwise handle hazardous agents, and laboratory notebooks or other written or computerized records documenting possession of and/or research using hazardous agents.
- Weapons of Mass Destruction. Weapons of mass destruction include any of the classes of hazardous agents as defined and identified in paragraph 2.d (2) of Appendix A of VHA Handbook 1200.6, or combinations of these agents that are capable of inflicting morbidity and mortality on a widespread basis.
- Terrorist Event. A terrorist event is the unauthorized removal or theft of hazardous agents capable of being used as weapons of mass destruction from Stratton VA Medical Center
- research laboratories, including leased and off-site space, and/or the unlawful use of such hazardous agents. It specifically encompasses the illicit and unauthorized use of laboratory facilities (including equipment, supplies, computers, faxes, phones, etc.) for the production, purification, or dissemination of any hazardous agent. The term also refers to the illegal transfer of agents into or out of research laboratories and other research space such as the ARF, storage areas, and offices.
- Toxin. According to 42 CFR 73.1, a toxin is the toxic material or product of plants, animals, microorganisms (including, but not limited to, bacteria, viruses, fungi, rickettsiae, or protozoa), or infectious substances, or a recombinant or synthesized molecule, whatever their origin and method of production, and includes any poisonous substance or biological product that may be engineered as a result of biotechnology, produced by a living organism; or any poisonous isomer of biological product, homolog, or derivative of such a substance.
- Exempt Quantities. Permissible amounts of toxins that an investigator is allowed to store or use that are not subject to regulations found in 42 CFR Part 73 and 9 CFR Part 121. The toxins and the exempt quantities of toxins may be found at [www.CDC.gov/od/sap](http://www.CDC.gov/od/sap).
- USA Patriot Act. The USA Patriot Act, Public Law 107-56, October 26, 2001, was passed by Congress in response to the terrorist attacks of September 11, 2001. The

purpose of the Act is to unite and strengthen America by providing appropriate tools to intercept and obstruct terrorist acts. The law includes provisions to deter and punish terrorist acts, enhance law enforcement investigatory tools, and other purposes such as aid to victims of terrorism. The Act also prohibits certain restricted persons from possessing biological agents or toxins that are identified as select agents in 42 CFR Part 72.

- **Prohibited Person.** As defined by the USA Patriot Act of 2001 (Sec 175b), prohibited persons are (1) individuals under indictment for a crime punishable by imprisonment exceeding 1 year; (2) individuals convicted of a crime punishable by imprisonment exceeding 1 year; (3) individuals in fugitive status from any local, state, national, or international law enforcement agency; (4) unlawful users of any controlled substance, as defined in 21 USC 802, Section 102; (5) illegal aliens or persons unlawfully in the United States; (6) persons who have been adjudicated as mentally defective or committed to any mental institution; (7) aliens (other than an alien lawfully admitted for permanent residence) who is a national of a country that has repeatedly provided support for acts of international terrorism; and, (8) persons that have been discharged from the United States Armed Services under dishonorable conditions.

## **PENALTIES**

Failure to conform to the requirements may result in immediate withdrawal of VA research funding, suspension from the research program, and/or denied access of the secured area. Individuals who knowingly fail to follow the provisions of this policy are subject to disciplinary action proportionate to the severity of the violation, up to and including termination of VA employment or without compensation (WOC) status. Failure to comply with Title 42 Code of Federal Regulations (CFR) Part 73, 7 CFR Part 331, 9 CFR Part 121, and other Federal regulations may also result in criminal or civil penalties.

## **REPORTING REQUIREMENTS RELATED TO RESEARCH LABORATORY SECURITY**

- **Research Laboratory Security Incident Reports.** Within 5 business days of becoming aware of any situation described below, members of the VA research community are required to ensure that the situation has been reported in writing to the ACOS for Research:
  - **Physical Security Problems.** Any break-in, physical security breach, or other physical security problem affecting VA research that involves any of following:
    - Injury or harm to a human individual or laboratory animal
    - A Biosafety Level 3 (BSL-3) research laboratory.
    - Loss of any quantity of a select agent or toxin.
    - Loss of any quantity of a highly hazardous agent. NOTE: For VA research, highly hazardous agents include select agents or toxins; agents, toxins, or other biological materials requiring handling at BSL-3 or higher containment; highly toxic chemicals and gases that have the potential for readily causing widespread harm if misused; and high risk radioactive materials and/or radiation sources.
    - Substantial damage to the facility.
    - Substantial loss of equipment, physical resources, or research animals.

NOTE: Loss of any equipment that holds electronic data or documents must be reported in accordance with paragraph 10 below.

- **Findings of Noncompliance.** Any findings of noncompliance related to research laboratory security by any VA office (other than ORO) or any Federal or state entity (e.g., Department of Homeland Security). Subsequent reports to ORO

- based on findings made by entities external to the facility must include a copy of the official findings.
- Other Deficiencies. Any other deficiency that substantively compromises the effectiveness of the facility's research laboratory security program.
  - Suspensions or Terminations. Any suspension or termination of research (e.g., by the ACOS for Research or other facility official) related to concerns about research laboratory security.
  - Reports to the Facility Director and ORO ROs. Within 5 business days of discovering, receiving a credible report of, or otherwise becoming aware of any situation described at subparagraph 10a, the ACOS for Research must report the incident directly (without intermediaries) to the facility Director.
    - The report must be made in writing with simultaneous copies to the R&D Committee, any relevant research review committee, and the VA Police Service.
    - Within 5 business days of being notified of them, the facility Director must report the research laboratory security incidents listed in subparagraph 10a to the appropriate ORO RO.
    - Reports to ORO Central Office. Within 5 business days after being informed of any substantive change in an MOU with an affiliate institution or other entity regarding research laboratory security arrangements, the facility Director must report the change to ORO Central Office, with a simultaneous copy to the appropriate ORO RO.

## PROCEDURES

### Laboratory Access

- Access to research laboratories is controlled and limited as stipulated in this policy. **No research laboratories are open to the public.** All laboratory areas, including the ARF and storage areas, include a state-of-the-art system that generates permanent, dated records with identification of persons entering the area and times of entry. Entry is controlled on a 24-hour/7-day per week schedule.
- Current VA Identification (ID) badges will be worn at all times.
- A record of key assignments and key-pad code assignments must be current at all times.
- Personnel leaving Stratton VAMC employment or no longer working in the research laboratory must adhere to full clearance and checkout procedures to include turning in all identifications, keys, keycards, and other access items. Terminated keycards are the property of the Police unit. If a keycard is lost, the Research Office must be notified immediately so that access can be terminated and a new card issued.
- Authorized health and safety inspectors, emergency response staff, Police Service, inspectors from regulatory agencies, and personnel from VHA oversight offices will have access to the secured area. The nature of that access will be determined by the ACOS/R&D or AO/R&D on a case-by-case basis, based upon the frequency of access needs, the potential urgency of access needs, and the potential for after-hours access needs. The VA Police have 24 hour access to the entire facility.
- As Stratton VAMC research labs and the ARF do not contain hazardous agents (as previously defined), personnel from Facilities Management Service, Engineering Service, Safety Office, Warehouse, or others, either obtain approval to access VA research laboratories or are escorted and monitored by an approved individual to complete their duties.

**Requirements of Individuals Granted Secured Access.**

- All personnel must obtain formal approval from the ACOS/R&D or AO/R&D before entering the secured laboratory area. Personnel are considered approved when the employee is provided an access card to enter the secured areas.
- All approved individuals must wear their VA ID badge so that it is visible at all times.
- Personnel may enter the secured area only to perform required duties.
- Persons entering the secured area in violation of this security policy will be reported to Police Service by the ACOS/R&D or AO/R&D within five business days of discovering the violation, when discovery occurs after the violation has occurred (vs. witnessing a violation, which would require immediate report to the Police Service).
- Approved individuals must use their own access card to enter the secured area. Multiple individuals, even when each person has authorization to enter the area, may not enter on one person's access card.

It is the responsibility of each approved individual to:

- Use his/her access card only for personal entrance into the secured area.
- Use his/her access card on each entry into the secured area.
- Not allow any individual to follow them through the door.
- Report any security violations, including unauthorized individuals, to the ACOS/R&D, AO/R&D, or Police Service within five business days.
- Notify the ACOS/R&D or AO/R&D immediately when laboratory access is no longer necessary and clearance procedure is completed.

Careful attention to these procedures is required to ensure that inappropriate or illegal non-citizens are not permitted in VA research laboratories. Discrepancies must be reported to the local Federal Marshal through the VA Police Service, and to the VA OIG. The deadline for reporting these types of incidents will be determined by the Stratton VAMC Police Service.

**Responsibilities of Principal Investigator (PI) or Other Area Supervisor**

- Submit requests to the Stratton R&DC Program office for access to secure and non-secured areas as appropriate to the needs of the related protocol.
- Ensure that research laboratory staff and all other staff with approved access follow all safety and security procedures, including those of the ARF when applicable.
- Notify the ACOS/R&D or AO/R&D immediately when any research laboratory staff member or other approved individual no longer has a work-related need for authorized access, to include leaving Stratton VAMC employment.
- Review and certify the accuracy of chemical and biological inventory to the facility Safety Office on an annual basis (usually due in May each year) by the following process:
  - Certification of "Hazardous Agents" as defined at <http://www.bt.cdc.gov/agent/agentlist.asp> must be completed by the PI annually and submitted to the R&D office/Subcommittee on Research Safety and Biosafety (<http://www.bt.cdc.gov/agent/agentlist.asp>). This process is initiated by the Stratton VAMC Police Service requests verification of any hazardous items listed on the website above, from the R&D Program Office. This internet link is then sent to all investigators with a protocol approved by the SRS&B. Those investigators are asked to review the list, indicate which agents they possess (if any) along with the quantity, and email this information to the R&D Program Office. The more potentially hazardous items may require more frequent review

and certification. The identified need for the agents, as presented by the PI, and the review/certification standards for such agents, will be reviewed and adjudicated by the SRS&B and communicated to the PI.

### **Visitors**

- Visitor's access is limited to hours when approved individuals are present. These individuals must have a sponsor; the sponsor will be responsible for the visitor. The sponsor must have approved access to the secured area.
- Visitors must sign in and out in the Research Administration Office, specifying name, affiliation, purpose for visit, time in and out, and the name of the approved individual (sponsor). These logs will be maintained in the Research Office.
- In rare instances, it may be necessary for a sponsor to bring a visitor to the secured area after regular business hours. In these rare instances, the sponsor is solely and fully responsible for the visitor and on the next business day that the research office is open, the approved sponsor must log in that activity on the visitor log.

### **Process to Obtain Approved Entry Secured Access Card**

- The ACOS/R&D or AO/R&D, will grant approved access. The R&D Committee is responsible for the review of policy and processes in relation to security of the Stratton VAMC research laboratories.
- The process of obtaining approval to enter the secured area begins with the Principal Investigator or area supervisor. The PI or area supervisor must make a formal request to the ACOS/R&D or AO/R&D to identify each staff member that requires access to the secured area. The request is initiated either during the initial protocol approval process, or after approval of the Stratton VAMC R&DC and subcommittees. It is initiated by approaching or emailing the R&D Program Office, at which time appropriate facility identification request forms will be completed. Those forms will then be signed by the ACOS/R or the AO/R and forwarded through the Stratton VAMC approval process.
- The ACOS/R&D or AO/R&D is responsible for approving security access according to policy. Criteria and elements to be considered when granting approval: acceptable and work-related need to be in secured area; certification that individual is not a prohibited person; employee's application and supervisor request completed; statement of U.S. citizenship OR copy of current and legal permission to be in U.S. on file with Human Resources; positive results from criminal record check; and verification that required training has been completed. Security access will then be provided by the VA Police.
- The ACOS/R&D or AO/R&D must review the continued status of staff access based upon the routine review and assurance of active Stratton VAMC appointments (either WOC or employee). The review will include a determination as to whether specific staff requires continued access to the secured area. Factors that may be considered when addressing requested renewal include (1) the number and nature of security exceptions by the individual; (2) whether required training is current; and, (3) security-related information deemed pertinent to the R&D Committee.

### **Administration**

- The ACOS/R&D or AO/R&D will complete and document a review of access records on a weekly basis. Any security exceptions will be reported to the R&D Committee and Police & Security. Notification to the Police service will occur within five business days and notification to the R&DC will occur at the next scheduled R&DC meeting. The ACOS/R&D or AO/R&D or designee must immediately update the keycard access, which includes deactivation of the keycard as well as indication of the date and reason for keycard access termination if deemed necessary.

- The R&D Committee shall review the security plan annually and after each incident, should an incident occur.
- Irregularities in security access will be reported to the Police Service and the ACOS/R&D or AO/R&D, who will make recommendations for action to the R&D Committee and/or the Stratton VAMC Director.
- In the event an individual with secured access inexplicably disappears, is suspected to have violated procedures, or committed a security breach, the ACOS/R&D or AO/R&D and Police Service must be notified immediately. The ACOS/R&D or AO/R&D and VA Police will determine whether further action is necessary.
- Security Standards: Physical security must meet appropriate standards determined by the Office of Security and Law Enforcement, regulatory agencies, and/or applicable VA oversight offices. Police Service will conduct an annual vulnerability assessment of the Research Laboratory area. The ACOS/R&D or AO/R&D is responsible for informing Police Service of any issues affecting security.
- Safety Standards: All individuals given approved access to the laboratory area must abide by all safety standards as mandated by Occupational Safety and Health Administration, Veterans Health Administration, and Stratton VAMC.
- Emergency Preparedness Standards: All individuals given approved access to the laboratory area must be knowledgeable of the information in the following documents: "Research and Development Service Safety Plan," and the "Chemical Hygiene for Research Laboratory" documents.
- All suspicious persons or activities, loss or theft, or alteration of inventory records shall be reported immediately to the ACOS/R&D, AO/R&D and Police Service. Unauthorized persons shall be removed by Police & Security Service. The ACOS/R&D or AO/R&D and VA Police will determine whether further action is necessary such as an investigation or disciplinary action.
- WOC appointments for those individuals who have been granted approval to enter VA research laboratories must be reviewed annually by the Research Office to determine the appropriateness of their WOC appointment. The results must be submitted to the R&D Committee for its concurrence, and its concurrence must be recorded in the minutes of the meeting where the issue was reviewed.

### **Accepting Packages**

All packages will be inspected upon entry to and exit from the area (see 42 CFR 73.11(d)(4), 7 CFR 331.11(a)(2)(IV)(D), and 9 CFR 121.12(a)(2)(IV)(D)). Package means a wrapped or boxed object, parcel, or container in which something is packed. Special caution needs to be taken for all unexpected or suspicious packages and these need to be inspected by visual or non-invasive techniques. Guidelines or procedures for suspicious packages developed by VA Police Service or other police services having jurisdiction are to be followed. At minimum, if the package is suspicious or unexpected:

1. The sender must be contacted to verify that it is legitimate.
2. When a suspicious package is seen being removed from the laboratory then the appropriate authority needs to be immediately notified.
3. The United States Postal Service Guidelines for recognizing suspicious packages need to be followed as applicable. The Guidelines may be found at <http://www.usps.com>.

### **Inventory Control Standards**

All individuals given approved access to the laboratory area must follow all inventory control procedures. Research laboratory inventories must be kept current, submitted to the Subcommittee on Research Safety and Biosafety as requested, and forwarded to the facility Safety Office annually (or as requested). Refer to the Chemical Hygiene Plan section for

more information regarding inventory controls. If select agents are to be used in research labs, additional inventory requirements must be met per VHA Handbook 1200.06. Chemical purchase orders are reviewed by the ACOS/R&D or AO/R&D and checked against the select agents list before approval to order is granted.

### **Training Requirements**

- All individuals (VA employees appointed as full-time, part-time or intermittent paid employees, WOC, and fee basis employees, as well as contractors) working in VA research laboratories, those working with hazardous agents including select agents or toxins, those working within BSL-2 laboratories, and all individuals directly administering these VA research laboratories must be appropriately trained to ensure both safety and security within research laboratories and the safe handling of and security of select agents, toxins or other hazardous agents, if applicable.
- Information and training on safety and security must be provided to individuals visiting areas where select agents and toxins are handled or stored (Not applicable at Stratton VAMC since no select agents are housed or used in the research labs).
- Training requirements for those working in VA research laboratories, on VA-approved research activities, are addressed in the R&DC SOP Initial & Continuing Education Requirements and Tracking.

### **REFERENCES**

- a. VHA Handbook 1200.6, Control of Hazardous Agents in VA Research Laboratories
- b. VHA Handbook 1200.8, Safety of Personnel Engaged in Research.
- c. VA Handbook 0730, Security and Law Enforcement.
- d. MS-04-05 Clearance Procedures
- e. 42 CFR Parts 72 and 73
- f. 7 CFR Part 331
- g. CFR Part 121
- h. VISN 2 Research Website – Albany

<http://vaww.visn2.med.va.gov/research/albany.html>

## **PART 4 – APPENDICES**

### **APPENDICES**

- A - Biosafety/Biological Materials
- B - Biosafety in Microbiological and Recombinant DNA Laboratories
- C - Flammable Chemical Guidelines
- D - Examples of Highly Hazardous Chemicals (HHCs)
- E - Chemical Compatibility Storage Guidelines
- F - Chemical Resistance Selection Chart for Protective Gloves

### **FORMS**

- Attestation of Review of Stratton VAMC Subcommittee for Research Safety and Biosecurity (SRS&B) Policies, including Chemical Hygiene Plan

## **APPENDIX A** **BIOSAFETY / BIOLOGICAL MATERIALS**

### **A. General Information:**

Microbes present in clinical or animal materials can produce an infection in a laboratory worker. Some of these infections can be life threatening, while others can be sub clinical and remain latent for long periods. Treatment may not be available for all pathogens transmissible to humans.

Every employee must assume that microbes with the potential to produce infectious disease are present in human and animal material handled in the laboratory, and must protect themselves, work associates, the public and family members from accidental infection.

Everyone must avoid accidental exposure or unprotected contact with these materials in the work place. This is accomplished with proper Biosafety training, practices, and through the proper use of protective equipment such as gloves, lab garments, eye, mouth and nose protection. When these precautions are properly used, safe work with biohazardous materials and pathogens can be achieved.

### **B. Biohazardous Substances:**

1. It should be assumed that ALL human and primate blood, plasma, serum, body fluids (e.g., saliva, tears, cerebrospinal fluid, semen, and cervical secretions) unfixed tissues, and cell lines are contaminated with pathogenic agents that are transmissible to humans. Any human or primate material that contains even small amounts of blood is included in this category. Handle using BSL 2 precautions.

In addition any human or animal material artificially exposed to infectious microbes is a biohazardous substance and should be handled with appropriate precautions.

2. Industry produced reagents derived from human and animal sources (e.g., serum, antibodies, reagents, and cell lines) must be handled in the appropriate setting with appropriate protective equipment.
3. Cultures of known agents are hazardous substances and should be handled with appropriate precautions. Refer to <http://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html> .
4. Non-exempt recombinant microbes, especially those with pathogenic qualities may also be biohazardous.

### **C. Responsibilities of research staff:**

1. Gain knowledge about the biohazardous material in the laboratory before initiating work. Ask the lab supervisor to explain any procedures or concepts that are not clear BEFORE beginning work
2. Understand the principles of good microbiological practice BEFORE working with biohazardous materials. This includes the use of aseptic technique, proper decontamination procedures, emergency biohazard spill management and the proper use of biosafety equipment.

#### **D. Responsibilities of the Principal Investigator:**

The Principal Investigator is responsible for carrying out the biosafety program in the laboratory. The laboratory director or designated supervisor should establish the biosafety level for each component of the work to be done and should ensure the facilities and equipment are adequate and in good working order, that initial and periodic training is provided to the staff, and that the recommended practices and procedures are strictly followed.

#### **E. Laboratory Biosafety Practices:**

1. All biohazardous work must be reviewed and acknowledged by the R & D Committee and the Subcommittee on Research Safety & Biosafety prior to its use.
2. The Principal Investigator or laboratory supervisor is responsible for:
  - a. Assuring that all biohazardous work is registered and approved by the institution.
  - b. Assuring that all biohazardous work is conducted in accordance with CDC or OSHA Biosafety Guidelines or regulations
  - c. Assuring that all personnel strictly follow the recommended biosafety practices in the lab at ALL times and are informed of these practices.
3. The service chiefs are responsible for:
  - a. Assuring that all PIs and laboratory supervisors in the department register their biohazardous work by following institutional procedures.
  - b. Assuring that they are aware of all biohazardous work in their departments and that compliance is monitored.
4. All Laboratory personnel MUST:
  - a. Wear appropriate personal protective clothing when handling biohazardous materials (gloves, lab coats / scrubs, glasses, shoe covers, sleeve protectors, etc.)
  - b. NEVER mouth a pipette. Use automatic pipettors equipped with filters when appropriate.
  - c. Sterilize ALL biological materials, either by autoclaving or chemical treatment prior to disposal OR place in red bags in biohazard containers. Non-sterilized biohazardous materials are not to be placed into sewers.
  - d. Become familiar with all laboratory and institutional biosafety materials describing the required precautions.
  - e. Become familiar with the standard operating procedures for shipping and receipt of packages containing biological and biohazardous materials.
  - f. Report all accidents, occurrences and unexplained illnesses to the work supervisor, infection control nurse or employee health physician immediately upon discovery of the accident, occurrence or unexplained illness. Understand the pathogenesis of the biohazards, which are being used or are present in the lab.
  - g. Protect fellow workers and the public from the pathogens used or present in laboratory materials.

#### **F. Laboratory Biosafety Level Criteria:**

##### **Biosafety Level 1: Standard Microbiological Practices:**

- a. Access to the laboratory is restricted at the discretion of the laboratory director when experiments are in progress.
- b. Refrigerators, incubators and any other places where biohazardous agents are used must be identified with a BIOHAZARD sticker.
- c. Work surfaces are decontaminated daily and after any spill of viable material. 70% ETOH, 2% SDS (sodium dodecyl sulfate) or a microbicidal agent is recommended.
- d. All contaminated liquid or solid wastes are decontaminated before disposal. Cell culture and supernates should be inactivated by mixing with a solution of 10% bleach before discarding.
- e. Only mechanical pipetting devices are to be used. Tips should be ejected gently and directly into a biohazard receptacle.
- f. Eating, drinking, smoking, and applying cosmetics is not permitted in the work area. Food storage is allowed only in designated (labeled) cabinets / refrigerators located outside the laboratory area.
- g. Hand washing is done immediately after handling any material and before leaving the laboratory. Only clean gloves should be worn outside the lab to transport materials and should not touch common surfaces.
- h. All procedures will be performed carefully to minimize the formation of aerosols.
- i. The wearing of laboratory coats, gowns, or uniforms is recommended to prevent contamination or soiling of street clothes.

**Biosafety Level 2: Includes All Level One Procedures ANDs:**

- a. Contaminated waste that is to be decontaminated away from the lab is to be placed in a durable leak-proof container.
- b. The lab director limits access to the lab.
- c. Hazardous warning signs that identifying the infectious agent, listing the names and telephone numbers of responsible personnel, and indicate the special requirements for entering the lab are to be placed on the access door to the lab.
- d. Lab coats, gowns, smocks, and outer protective wear are to be worn inside the lab. All protective clothing used in the lab should be removed or covered by a clean gown before exiting the lab for non-laboratory areas.
- e. Gloves must be worn to prevent skin contact with infectious material or when handling infectious animals.
- f. All wastes from laboratories or animal rooms must be decontaminated before disposal.
- g. The use of sharps (needles, scalpels) should be avoided whenever possible. Extreme caution should be used to prevent autoinoculation if sharps must be used. **Needles should not be bent, sheared, recapped or replaced following use.**
- h. Spills and accidents that result in overt exposure to an infectious agent must be reported immediately to the lab director or to the Emergency room if during off-hours. Appropriate medical evaluation, surveillance, and treatment will be provided at no charge to the employee, and written records are maintained.
- i. All personnel must read and understand the biosafety manual adopted by the lab, be advised of special hazards, and are expected to follow specified procedures and practices at all times.

**No Biosafety Level 3 Procedures conducted at this time.**

**G. Special Containment Equipment: Recommended Precautions for Laboratory Work with Human Samples and Pathogens** Table taken from Biosafety in Microbiological and Biomedical Laboratories; 5<sup>th</sup> Edition, Pub. 2007

**TABLE 1  
SUMMARY OF RECOMMENDED BIOSAFETY LEVELS FOR INFECTIOUS AGENTS**

<b>BSL</b>	<b>AGENTS</b>	<b>PRACTICES</b>	<b>PRIMARY BARRIERS AND SAFETY EQUIPMENT</b>	<b>FACILITIES (SECONDARY BARRIERS)</b>
1	Not known to consistently cause diseases in healthy adults	Standard Microbiological Practices	None required	Open bench and sink required
2	<ul style="list-style-type: none"> <li>Agents associated with human disease</li> <li>Routes of transmission include percutaneous injury, ingestion, mucous membrane exposure</li> </ul>	BSL-1 practice plus: <ul style="list-style-type: none"> <li>Limited access</li> <li>Biohazard warning signs</li> <li>"Sharps" precautions</li> <li>Biosafety manual defining any needed waste decontamination or medical surveillance policies</li> </ul>	Primary barriers: <ul style="list-style-type: none"> <li>Class I or II BSCs or other physical containment devices used for all manipulations of agents that cause splashes or aerosols of infectious materials</li> </ul> PPEs*: <ul style="list-style-type: none"> <li>Laboratory coats; gloves; face protection as needed</li> </ul>	BSL-1 plus: <ul style="list-style-type: none"> <li>Autoclave available</li> </ul>
3	<ul style="list-style-type: none"> <li>Indigenous or exotic agents with potential for aerosol transmission</li> <li>Disease may have serious or lethal consequences</li> </ul>	BSL-2 practice plus: <ul style="list-style-type: none"> <li>Controlled access</li> <li>Decontamination of all waste</li> <li>Decontamination of laboratory clothing before laundering</li> <li>Baseline serum</li> </ul>	Primary barriers: <ul style="list-style-type: none"> <li>Class I or II BSCs or other physical containment devices used for all open manipulation of agents</li> </ul> PPEs*: <ul style="list-style-type: none"> <li>Protective laboratory clothing; gloves; respiratory protection as needed</li> </ul>	BSL-2 plus: <ul style="list-style-type: none"> <li>Physical separation from access corridors</li> <li>Self-closing, double-door access</li> <li>Exhaust air not recirculated</li> <li>Negative airflow into laboratory</li> </ul>
4	<ul style="list-style-type: none"> <li>Dangerous/exotic agents which pose high risk of life-threatening disease</li> <li>Aerosol-transmitted laboratory infections have occurred; or related agents with unknown risk of transmission</li> </ul>	BSL-3 practices plus: <ul style="list-style-type: none"> <li>Clothing change before entering</li> <li>Shower on exit</li> <li>All material decontaminated on exit from facility</li> </ul>	Primary barriers: <ul style="list-style-type: none"> <li>All procedures conducted in Class III BSCs or Class I or II BSCs in combination with full-body, air-supplied, positive pressure personnel suit</li> </ul>	BSL-3 plus: <ul style="list-style-type: none"> <li>Separate building or isolated zone</li> <li>Dedicated supply and exhaust, vacuum, and decontamination systems</li> <li>Other requirements outlined in the text</li> </ul>

\* PPE – Personal Protective Equipment

**H. Spill Procedure for Biological Agents-** listed in order of priority.

**1. Protection of Personnel**

- Notify all personnel in the immediate area. Evacuate the area and keep personnel clear for at least 30 minutes.
- Remove any contaminated clothing and leave contaminated area. All exposed portions of the body should be washed with soap and water for 15 minutes. If eyes are involved they are to be flushed for 15 minutes. Medical advice should be sought for possible prophylaxis.
- Post notices on entrance alerting people not to enter the contaminated area; Specify type of accident, organism involved, date and time of accident.

- d. Notify the principal investigator or administrative unit and the Safety Office and/or GEMS Coordinator.

**2. Protection of Research Lab and Building Facility**

- a. Allow 30 minutes for aerosols to settle before beginning decontamination.
- b. Wear personal protective gear including gloves, mask, shoe protection, and lab coat.
- c. Place absorbent towels over spilled substance and flood towel from the outside inward with a 10% solution of freshly diluted bleach. Leave towel down for at least 10 minutes. Wash down all surfaces in lab. Place all waste in biohazard bag and autoclave before disposal.

**APPENDIX B**  
**BIOSAFETY IN MICROBIOLOGICAL AND RECOMBINANT DNA**  
**LABORATORIES**

**A. Responsibility of the Principal Investigator**

The Principal Investigator is responsible for complying fully with the guidelines in conducting any recombinant DNA research. As part of general responsibility the PI shall:

1. Laboratory work cannot commence without prior approval of the Committees required by the VA and NIH guidelines.
2. Be adequately trained in good microbiological techniques.
3. Instruct and train staff in the practices and techniques required to ensure safety and in the procedures for dealing with accidents.
4. Supervise the safety performance of the staff to ensure that the required safety practices and techniques are employed.
5. Investigate and report in writing to the Committee and the Research Safety Officer any significant problems pertaining to the operation and implementation of containment practices and procedures.
6. Correcting work error conditions that may result in the release of recombinant DNA materials.

**B. Establishment of a Designated Area**

In general, procedures involving microorganisms or recombinant DNA will be performed in the individual Investigator's laboratories.

**C. Use of Containment Devices and Personal Protection Equipment**

1. For any use where the potential exists for spillage of liquid microbiological culture, the bench should be covered with blue absorbent cloth.
2. When manipulating liquid cultures eye protection should be worn if eyeglasses are not.
3. A lab coat must be worn at all times.
4. Gloves must be worn at all times.
5. Bench top must be washed with any commercially available germicide such as 70% ethanol at the completion of procedures involving live organisms.

**D. Procedure for Safe Removal of Contaminated Waste**

1. Add a liquid disinfectant (bleach, ethanol, iodine) to liquid cultures. Let solution sit at room temperature for 10 minutes. Dispose of decontaminated liquid directly into drain in which water is already running. Flush drain with additional water.

2. Soak any non-disposable glassware in fresh 10% bleach for 10 minutes and rinse thoroughly with water before washing as usual.
3. Contaminated disposable glassware, plastics and other supplies must be contained in a red bag in a Biohazard containment can located in each laboratory. These bags will be disposed of by FMS.
4. Rotors used for centrifuging liquid culture material must be soaked in dilute 7X detergent for 10 minutes and rinsed thoroughly with tap, then Nanopure water and air-dried. If a spill has occurred in the rotor, follow Decontamination Procedures below.
5. Culture plates containing live organisms must be autoclaved for 20 minutes or disposed of in red bags, for incineration.

#### **E. Decontamination Procedures**

1. Anytime a spill has occurred, the area must be decontaminated with 10% bleach for 10 minutes. This includes the interior of the shaking incubators, spills inside rotors, centrifuges and bench tops.
2. Following the application of bleach, the area must be thoroughly flooded with water and dried to avoid rusting.
3. If a contamination occurs which cannot be corrected, such as contamination or potential contamination of another person's experiment or contamination of equipment, which cannot be cleaned, the Safety committee must be notified.

#### **F. Recombinant DNA Experiment Classification Guidelines**

1. Non-exempt rDNA experiments require oversight by the following:

NIH Office of Biotechnology activities (OBA): This NIH office has responsibility for reviewing and coordinating all activities of NIH relating to the Guidelines.

Recombinant DNA Advisory Committee (RAC): The public advisory committee that advises the Secretary, the Assistant Secretary for Health, and the Director, NIH, concerning recombinant DNA research.

2. NIH-defined experimental guidelines for working with rDNA can be provided by the Stratton VAMC R&D program office, or can be found at this NIH website:

[http://oba.od.nih.gov/rdna/nih\\_guidelines\\_oba.html](http://oba.od.nih.gov/rdna/nih_guidelines_oba.html)

**APPENDIX C**  
**FLAMMABLE CHEMICAL GUIDELINES**

**A. DEFINITIONS:**

1. Flammable chemicals refer to those having a boiling point at or below 100 degrees Fahrenheit, and a flash point below 73 degrees F.
2. "Large volume" refers to a volume of more than 125 milliliters (e.g.: performing an extraction with 250cc of ether at once).

**B. POLICY:**

1. Laboratories following these procedures shall not be obliged to obtain any separate approval for any use (including anesthesia) of volatile flammable reagents. Exceptions:
  - a. The use of ethyl ether in the Veterinary Medical Unit for animal anesthesia is generally not permitted. An exemption may be granted by filing a Request to Use Explosive Anesthetic Agent(s) with the Sub-Committee for Research Safety & Biosafety (SRS&B).
  - b. The use of large volumes of flammable chemicals at any one time for a single experiment must be approved by the SRS&B.

**C. GENERAL PROCEDURES**

1. Container size shall be limited to 1 gallon if glass, and 5 gallons if the container is an approved metal or plastic safety can.
2. Ethyl ether for anesthesia shall be obtained in ¼-pound safety cans or 100 ml bottles. All ether shall be stored in designated flammable storage (explosion-proof) refrigerators or freezers and only used in explosion proof fume hoods.
3. Storing open containers of flammable /volatile reagents is prohibited.
4. Be familiar with the station fire prevention policies. Know the escape routes from the laboratory. All labs planning to use volatile flammable reagents must be equipped with appropriate dry chemical fire extinguishers and lab personnel must be trained in the proper use of this equipment.

**APPENDIX D**  
**EXAMPLES OF HIGHLY HAZARDOUS CHEMICALS (HHCS)**

- Chemicals regulated in an OSHA Substance-Specific Standard (e.g. methylene chloride or formaldehyde)
- Carcinogens (confirmed and suspected) as defined by any of the following organizations – International for Research on Cancer (IARC), the National Toxicology Program (NTP) or OSHA
- Chemicals that are described by their manufacturer as being “highly toxic”, “poisonous”, or “corrosive”
- Sensitizers
- Mutagens
- Reproductive toxins
- Teratogens
- Neurotoxins (for example, mercury)
- Chemicals that are described by their manufacturer as “highly” or “extremely flammable”, “light sensitive”, “peroxidizable”, “pyrophoric”, “unstable”, “reactive” or “shock sensitive”
- Chemicals with an NFPA Fire or Reactivity Rating of 3 or greater
- Chemicals with an NFPA Special Hazard Rating of “Water Reactive”
- DOT Hazard Class of “Dangerous When Wet” (Class 4)
- DOT “Explosive” Hazard Class (Class 1)
- DOT “Flammable Gas” Hazard Class (Class 2)
- DOT “Flammable Liquid” Hazard Class (Class 3)
- DOT “Flammable Solid” Hazard Class (Class 4)
- DOT “Spontaneously Combustible” Hazard Class (Class 4)
- DOT “Organic Peroxide” Hazard Class (Class 5.2)

**APPENDIX E**  
**CHEMICAL COMPATIBILITY CHART**

Below is a chart adapted from the CRC Laboratory Handbook which groups various chemicals in to 23 groups with examples and incompatible chemical groups. This chart is by no means complete but it will aid in making decisions about storage. For more complete information please refer to the MSDS for the specific chemical.

Group	Name	Example	Incompatible Groups
Group 1	Inorganic Acids	Hydrochloric acid Hydrofluoric acid Hydrogen chloride Hydrogen fluoride Nitric acid Sulfuric acid Phosphoric acid	2,3,4,5,6,7,8,10,13,14,16,17,18,19,21,22,23
Group 2	Organic acids	Acetic acid Butyric acid Formic acid Propionic acid	1,3,4,7,14,16,17,18,19,22
Group 3	Caustics	Sodium hydroxide Ammonium hydroxide solution	1,2,6,7,8,13,14,15,16,17,18,20,23
Group 4	Amines and Alkanolamines	Aminoethylethanolamine Aniline Diethanolamine Diethylamine Dimethylamine Ethylenediamine 2-Methyl-5-ethylpyridine Monoethanolamine Pyridine Triethanolamine Triethylamine Triethylenetetramine	1,2,5,7,8,13,14,15,16,17,18,23
Group 5	Halogenated Compounds	Allyl chloride Carbon tetrachloride Chlorobenzene Chloroform Methylene chloride Monochlorodifluoromethane 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane Trichloroethylene Trichlorofluoromethane	1,3,4,11,14,17
Group 6	Alcohols	1,4-Butanediol Butanol (iso, n, sec,	1,7,14,16,20,23

	Glycols Glycol Ether	tert) Diethylene glycol Ethyl alcohol Ethyl butanol Ethylene glycol Furfuryl alcohol Isoamyl alcohol Methyl alcohol Methylamyl alcohol Propylene glycol	
Group 7	Aldehydes Acetaldehyde	Acrolein Butyraldehyde Crotonaldehyde Formaldehyde Furfural Paraformaldehyde Propionaldehyde	1,2,3,4,6,8,15,16,17,19, 20,23
Group 8	Ketones	Acetone Acetophenone Diisobutyl ketone Methyl ethyl ketone	1,3,4,7,19,20
Group 9	Saturated Hydrocarbons	Butane Cyclohexane Ethane Heptane Paraffins Paraffin wax Pentane Petroleum ether	20
Group 10	Aromatic Hydrocarbons	Benzene Cumene Ethyl benzene Naphtha Naphthalene Toluene Xylene	1,20
Group 11	Olefins	Butylene 1-Decene 1-Dodecene Ethylene Turpentine	1,5,20
Group 12	Petroleum Oils	Gasoline Mineral Oil	20
Group 13	Esters	Amyl acetate Butyl acetates Castor oil Dimethyl sulfate Ethyl acetate	1,3,4,19,20
Group 14	Monomers Polymerizable Esters	Acrylic acid Acrylonitrile	1,2,3,4,5,6,15,16,19,20, 21,23

		Butadiene Acrylates	
Group 15	Phenols	Carbolic acid Cresote Cresols Phenol	3,4,7,14,16,19,20
Group 16	Alkylene Oxides	Ethylene oxide Propylene oxide	1,2,3,4,6,7,14,15,17,18, 19,23
Group 17	Cyanohydrins	Acetone cyanohydrin Ethylene cyanohydrin	1,2,3,4,5,7,16,19,23
Group 18	Nitriles	Acetonitrile Adiponitrile	1,2,3,4,16,23
Group 19	Ammonia	Ammonium Hydroxide Ammonium Gas	1,2,7,8,13,14,15,16,17, 20,23
Group 20	Halogens	Chlorine Fluorine	3,6,7,8,9,10,11,12,13,1 4,15,19,21,22
Group 21	Ethers	Diethyl Ether THF	1,14,20
Group 22	Phosphorus	Phosphorus, Elemental	1,2,3,20
Group 23	Acid Anhydrides	Acetic anhydride Propionic anhydride	1,3,4,6,7,14,16,17,18,1 9

**APPENDIX F**  
**CHEMICAL RESISTANCE SELECTION CHART FOR PROTECTIVE GLOVES**

**VG = Very Good, G = Good, F = Fair, P = Poor (Not Recommended)**

Chemical	Neoprene	Latex/Rubber	Butyl	Nitrile
Acetaldehyde*	VG	G	VG	G
Acetic acid	VG	VG	VG	VG
Acetone*	G	VG	VG	P
Ammonium hydroxide	VG	VG	VG	VG
Amy acetate*	F	P	F	P
Aniline	G	F	F	P
Benzaldehyde*	F	F	G	G
Benzene*	P	P	P	F
Butyl acetate	G	F	F	P
Butyl alcohol	VG	VG	VG	VG
Carbon disulfide	F	F	F	F
Carbon tetrachloride*	F	P	P	G
Castor oil	F	P	F	VG
Chlorobenzene*	F	P	F	P
Chloroform*	G	P	P	F
Chloronaphthalene	F	P	F	F
Chromic acid (50%)	F	P	F	F
Citric acid (10%)	VG	VG	VG	VG
Cyclohexanol	G	F	G	VG
Dibutyl phthalate*	G	P	G	G
Diesel fuel	G	P	P	VG
Diisobutyl ketone	P	F	G	P
Dimethylformamide	F	F	G	G
Diocetyl phthalate	G	P	F	VG
Dioxane	VG	G	G	G
Epoxy resins, dry	VG	VG	VG	VG
Ethyl acetate*	G	F	G	F
Ethyl alcohol	VG	VG	VG	VG
Ethyl ether*	VG	G	VG	G
Ethylene dichloride*	F	P	F	P
Ethylene glycol	VG	VG	VG	VG
Formaldehyde	VG	VG	VG	VG
Formic acid	VG	VG	VG	VG

Freon 11	G	P	F	G
Freon 12	G	P	F	G
Freon 21	G	P	F	G
Freon 22	G	P	F	G
Furfural*	G	G	G	G
Gasoline, leaded	G	P	F	VG
Gasoline, unleaded	G	P	F	VG
Glycerin	VG	VG	VG	VG
Hexane	F	P	P	G
Hydrazine (65%)	F	G	G	G
Hydrochloric acid	VG	G	G	G
Hydrofluoric acid (48%)	VG	G	G	G
Hydrogen peroxide (30%)	G	G	G	G
Hydroquinone	G	G	G	F
Isooctane	F	P	P	VG
Kerosene	VG	F	F	VG
Ketones	G	VG	VG	P
Lacquer thinners	G	F	F	P
Lactic acid (85%)	VG	VG	VG	VG
Lauric acid (36%)	VG	F	VG	VG
Lineolic acid	VG	P	F	G
Linseed oil	VG	P	F	VG
Maleic acid	VG	VG	VG	VG
Methyl alcohol	VG	VG	VG	VG
Methylamine	F	F	G	G
Methyl bromide	G	F	G	F
Methyl chloride*	P	P	P	P
Methyl ethyl ketone*	G	G	VG	P
Methyl isobutyl ketone*	F	F	VG	P
Methyl methacrylate	G	G	VG	F
Monoethanolamine	VG	G	VG	VG
Morpholine	VG	VG	VG	G
Naphthalene	G	F	F	G
Napthas, aliphatic	VG	F	F	VG
Napthas, aromatic	G	P	P	G
Nitric acid*	G	F	F	F
Nitric acid, red and white	P	P	P	P

fuming				
Nitromethane (95.5%)*	F	P	F	F
Nitropropane (95.5%)	F	P	F	F
Octyl alcohol	VG	VG	VG	VG
Oleic acid	VG	F	G	VG
Oxalic acid	VG	VG	VG	VG
Palmitic acid	VG	VG	VG	VG
Perchloric acid (60%)	VG	F	G	G
Perchloroethylene	F	P	P	G
Petroleum distillates (naphtha)	G	P	P	VG
Phenol	VG	F	G	F
Phosphoric acid	VG	G	VG	VG
Potassium hydroxide	VG	VG	VG	VG
Propyl acetate	G	F	G	F
Propyl alcohol	VG	VG	VG	VG
Propyl alcohol (iso)	VG	VG	VG	VG
Sodium hydroxide	VG	VG	VG	VG
Styrene	P	P	P	F
Styrene (100%)	P	P	P	F
Sulfuric acid	G	G	G	G
Tannic acid (65)	VG	VG	VG	VG
Tetrahydrofuran	P	F	F	F
Toluene*	F	P	P	F
Toluene diisocyanate (TDI)	F	G	G	F
Trichloroethylene*	F	F	P	G
Triethanolamine (85%)	VG	G	G	VG
Tung oil	VG	P	F	VG
Turpentine	G	F	F	VG
Xylene*	P	P	P	F

**VG = Very Good, G = Good, F = Fair, P = Poor (Not Recommended)**

Note: When selecting chemical-resistant gloves be sure to consult the manufacturer's recommendations, especially if the gloved hand(s) will be immersed in the chemical.

**Attestation of Review of Stratton VAMC Subcommittee for Research Safety and Biosecurity (SRS&B) Policies, including Chemical Hygiene Plan**

With my signature, I attest that I have received a copy of the Stratton VAMC Safety and Biosecurity Policies, including the Chemical Hygiene Plan, in hard copy and/or electronic format, and have thoroughly read and familiarized myself with all research related safety and chemical hygiene practices.

I am aware of how to access all of the latest safety policies and handbooks (hard copy and electronic), as well as whom I may contact in the Stratton VAMC R&D Program Office and Stratton VAMC Safety Office if I have any further questions or concerns. The positions that may be contacted are the Stratton VAMC Safety Office, the Stratton VAMC R&D Administrative Officer, or the R&D Program Analyst for the Subcommittee for Research Safety and Biosecurity (SRS&B).

\_\_\_\_\_  
Name (printed)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature