

Chapter 34

Biohazards

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1 Overview

Biohazardous materials include infectious agents and hazardous biological materials as described in this chapter and by the United States Department of Health and Human Services, Centers for Disease Control (CDC) for infectious agents¹ and by the National Institutes of Health (NIH) for recombinant DNA molecules.²

The Stanford University Administrative Panel on Biosafety (APB) reviews all applications involving biohazardous materials that pose a risk greater than that specified in the *Stanford University Biohazards Manual* and by the CDC,³ and all approved research must follow requirements and procedures in the Stanford manual.⁴ At the time of this publication, all such research conducted at SLAC is performed at the Stanford Synchrotron Radiation Laboratory (SSRL), and their requirements and procedures with regard to transportation, handling, and disposal are described in this chapter. Should any biohazardous work be undertaken by another SLAC operation, SSRL's procedures will be used until, and if, this chapter is modified.

1.1 Hazards/Impacts

Biohazardous materials present a potential risk to human and animal health and the environment. Of particular concern are *infectious agents*, as they are capable of replicating, and as the release of even a small number can give rise to large populations of organisms in the uncontrolled environment.

1.2 Exemptions

There are no exemptions to the requirements of this chapter.

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- 1 “BMBL Section III – Laboratory Safety Level Criteria”, <http://www.cdc.gov/od/ohs/biosfty/bmb14/bmb14s3.htm>
 - 2 “Guidelines for Research Involving Recombinant DNA Molecules”, <http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>
 - 3 “BMBL Section III – Laboratory Safety Level Criteria”, <http://www.cdc.gov/od/ohs/biosfty/bmb14/bmb14s3.htm>
 - 4 *Stanford University Biosafety Manual*, http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

2 Scope

The requirements of this chapter apply to all persons at SLAC who work with biohazardous materials or who may come in contact with them, including SLAC personnel, subcontractors, visitors, and users.

This chapter specifies work authorization procedures for biohazardous materials for *biosafety levels* 1 and 2 and required procedures once the experiment has been approved.

Note Due to the levels of engineering and administrative controls needed for biosafety level 3 and 4 hazards and select agents, use of these agents are currently **not** permitted at SLAC.

For more information on personal protective equipment and procedures for handling blood-borne pathogens, see Chapter 46, “Blood-borne Pathogens”.⁵ For information about policy and reimbursement for personal protective equipment, see Chapter 19, “Personal Protective Equipment”.⁶

For general work authorization policy, see Chapter 2, “Work Authorization”.⁷ For risk assessment guidelines, see Chapter 5, “Industrial Hygiene”.⁸

3 Standards

The SLAC biosafety program has adopted the following standards:

- Title 10, *Code of Federal Regulations*, “Energy”⁹
 - Part 851, “Worker Safety and Health Program”, Appendix A, “Worker Safety and Health Functional Areas”, Section 7, “Biological Safety” (10 CFR 851)¹⁰
- Title 29, *Code of Federal Regulations*, Part 1910, “Occupational Safety and Health Standards”¹¹
 - Section 1030, “Blood-borne Pathogens” (29 CFR 1910.1030)

5 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 46, “Blood-borne Pathogens”, http://www-group.slac.stanford.edu/esh/hazardous_substances/bloodborne/policies.htm

6 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 19, “Personal Protective Equipment”, <http://www-group.slac.stanford.edu/esh/general/ppe/policies.htm>

7 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 2, “Work Authorization”, http://www-group.slac.stanford.edu/esh/general/work_authorization/policies.htm

8 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 5, “Industrial Hygiene”, http://www-group.slac.stanford.edu/esh/hazardous_substances/industrial_hygiene/policies.htm

9 “Code of Federal Regulations: Main Page”, <http://www.gpoaccess.gov/cfr/>

10 Additional information on 10 CFR 851 and its implementation is available from the following site: “Worker Safety and Health Program Final Rule - 10 CFR 851”, <http://www.eh.doe.gov/health/rule851/851final.html>

11 “Code of Federal Regulations: Main Page”, <http://www.gpoaccess.gov/cfr/>

- Title 42, *Code of Federal Regulations*, Chapter 1, “Public Health Service, Department of Health and Human Services”¹²
 - Part 72, “Interstate Shipment of Etiological Agents” (42 CFR 72.1–7)
- *California Health and Safety Code*, Division 104, “Environmental Health”, Part 14, “Medical Waste” (HSC 117600–118360)¹³
- Title 8, *California Code of Regulations*, Chapter 4, “Division of Industrial Safety”, Subchapter 7, “General Industry Safety Orders”
 - Article 107, “Dusts Fumes Mists Vapors and Gases”, Section 5154.2, “Ventilation Requirements for Biological Safety Cabinets”¹⁴
 - Article 109, “Hazardous Processes and Substances”, Section 5193, “Blood Borne Pathogens”¹⁵

The SLAC biosafety program has incorporated the following guidelines:

- Centers for Disease Control and Prevention and National Institutes of Health (CDC-NIH), *Biosafety in Microbiological and Biomedical Laboratories*, fourth edition, 1999¹⁶
- Centers for Disease Control and Prevention and National Institutes of Health (CDC-NIH), *Primary Containment of Biohazards: Selection, Installation and Use of Biological Safety Cabinets*, second edition, 2000¹⁷
- Centers for Disease Control and Prevention (CDC), “HHS And USDA Select Agents and Toxins, 7 CFR Part 331, 9 CFR Part 121, and 42 CFR Part 73”¹⁸
- National Institutes of Health (NIH), *NIH Guidelines for Research Involving Recombinant DNA Molecules*¹⁹
- World Health Organization, *Guidelines for the Safe Transport of Infectious Substances and Diagnostic Specimens*²⁰
- *Stanford University Biosafety Manual*²¹

12 “Code of Federal Regulations: Main Page”, <http://www.gpoaccess.gov/cfr/>

13 “California Law”, <http://www.leginfo.ca.gov/calaw.html>

14 http://www.dir.ca.gov/Title8/5154_2.html

15 <http://www.dir.ca.gov/Title8/5193.html>

16 <http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm>

17 <http://www.cdc.gov/od/ohs/biosfty/bsc/bsc.htm>

18 <http://www.cdc.gov/od/sap/docs/salist.pdf>

19 “Guidelines for Research Involving Recombinant DNA Molecules”, <http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>

20 http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2005_22/en/index.html

21 http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

4 Definitions

Administrative Panel on Biosafety (APB). The Stanford University committee that reviews all university research and teaching activities involving the use of biohazardous agents and recombinant DNA molecules that require approval

Biohazardous materials. Hazardous biological materials and organisms, including

1. Infectious organisms (bacteria, fungi, parasites, prions, rickettsias, viruses, etc.) which can cause disease in healthy humans and/or significant environmental or agricultural impact
2. Human or primate tissues, fluids, cells, or cell culture
3. Recombinant DNA (rDNA)
4. Animals known to be vectors of zoonotic diseases

Biological safety cabinet. Ventilated cabinet intended to protect the user and environment from the hazards of handling infected material and other dangerous biological material but excluding radioactive, toxic and corrosive substances. Any air discharged to the atmosphere shall be filtered. Some types may also protect the material being handled in them from environmental contamination.

Biosafety level. Specific combinations of work practices and techniques, safety equipment, and facilities that are designed to minimize the exposure of workers and the environment to biohazards. Biosafety levels are based on the potential hazards imposed by the materials used and for the laboratory function and activity. Biosafety level 1 provides the least stringent containment conditions and biosafety level 4 the most stringent.²²

Blood-borne pathogens. Pathogenic microorganisms that can infect human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

Centers for Disease Control and Prevention (CDC). Health and Human Services agency heading disease prevention and control, environmental health, and health promotion and education efforts

Containment. Safe methods for managing infectious agents in the laboratory environment where they are being handled or maintained. The purpose of containment is to reduce or eliminate exposure of laboratory workers, other persons and the environment to potentially hazardous agents.

Etiologic agents. Substances known to contain, or reasonably expected to contain, pathogens. Pathogens are microorganisms (including bacteria, viruses, rickettsia, parasites, fungi) or recombinant microorganisms (hybrid or mutant) that are known or reasonably expected to cause disease in humans or animals.

Institutional biosafety committee (IBC). Committee set up by a research institution to review recombinant DNA research and ensure its legal use under the NIH "Guidelines for Research Involving Recombinant

22 "BMBL Section III – Laboratory Biosafety Level Criteria",
<http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm>

DNA Molecules”²³ to review recombinant DNA research and ensure its legal use. IBCs may also review other biohazardous research, including select agents. At Stanford and SLAC, this role is filled by the Stanford University Administrative Panel on Biosafety.

National Institutes of Health. Federal government agency that conducts and supports biomedical and behavioral research to create fundamental knowledge of living systems and reduce the burden of illness and disability

Near miss. Where no barrier or only one barrier prevented an event from having an [ORPS] reportable consequence

Recombinant DNA (rDNA). Recombinant DNA molecules are either: 1) molecules that are constructed in vitro outside living cells by joining natural or synthetic DNA segments to in vivo-competent DNA molecules 2) DNA molecules that result from the replication of those described in 1).

Select agent. Biological agent or toxin listed in 42 CFR Part 73, 7 CFR Part 331 and 9 CFR Part 121, or the HHS and USDA Select Agents and Toxins List.²⁴ Select agents are not permitted at SLAC.

5 Requirements

5.1 General

SLAC requirements conform to Stanford University’s policy on handling biohazardous material. SSRL safety requirements for biohazards will be used for all of SLAC.

Note The Stanford University Biosafety Manual represents the institutional practices and procedures for the safe use and handling of biological materials and recombinant DNA, and is a primary reference for work conducted at SLAC.²⁵

5.1.1 Approval and Review

5.1.1.1 Risk Assessment

All experiments involving biohazardous materials must be categorized according to the risk they pose. The relevant risk assessment resource depends on the type of biohazardous material under consideration.

- **Recombinant DNA (rDNA).** Risks involving rDNA must be categorized according to NIH guidelines.²⁶

23 “Guidelines for Research Involving Recombinant DNA Molecules”,
<http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>

24 Centers for Disease Control and Prevention (CDC), “HHS And USDA Select Agents and Toxins, 7 CFR Part 331, 9 CFR Part 121, and 42 CFR Part 73”, <http://www.cdc.gov/od/sap/docs/salist.pdf>

25 *Stanford University Biosafety Manual*,
http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

- **Infectious agents.** Risks must be categorized according to the CDC *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*.²⁷ Both the category (risk group) of the agent and the manner in which it will be used determine the biosafety level.
- **Select Agents.** No *select agents* are permitted at SLAC.

Biosafety Level

The *biosafety level* assignment is a function of the potential hazards of the material and how it will be used and determines the extent of required controls and review:

- Level 1 – no restrictions
- Level 2 – requires review by the Stanford University APB (see below)
- Levels 3 and 4 – not allowed at SLAC

5.1.1.2 Approval

SSRL

SSRL requires that researchers working with biohazardous material

- Submit a completed SSRL Proposal Form²⁸
- Submit a Hazards Form four weeks prior to the experiment date²⁹
- Comply with any requests for information and submit in written format those response procedures to be followed in the event of accidental spills of biohazardous material. The procedures should include sufficient detail and clarity so they can be carried out by laboratory-competent personnel.

All work or research with biohazardous materials must be performed by authorized personnel only.

Other SLAC Entities

SSRL safety requirements for biohazards will be used for all of SLAC.

5.1.1.3 APB Review

All biohazardous material with a determination of biosafety level 2 must be reviewed by the Stanford University APB. Researchers must submit the completed APB form to the SSRL safety coordinator who

26 “Guidelines for Research Involving Recombinant DNA Molecules”,
<http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>

27 “BMBL Section III – Laboratory Biosafety Level Criteria”,
<http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm>

28 “SSRL Proposal Form”, http://www-ssrl.slac.stanford.edu/users/user_admin/form_proposal.rtf

29 “Hazard Form”, http://www-ssrl.slac.stanford.edu/users/user_admin/form_hazards.html

will present the information to the APB, and communicate any special controls or requirements to the researcher.³⁰

5.1.2 Transport

All applicable federal and state regulations, including the International Air Transport Association (IATA), Department of Homeland Security (DHS), and Department of Transportation (DOT) regulations pertaining to the transport of biohazardous materials apply.

If regulations require that biohazardous material be sent via a carrier, it must be received by a shipper/handler with the proper training to handle that class of biohazardous material.

5.1.3 Work Practices

- Work practice requirements are determined by the biosafety level and the requirements associated with them as specified in the *Stanford University Biosafety Manual*.³¹
- Researchers must implement the appropriate work practices and equipment and facility requirements.
- Researchers must adhere to the approved protocol and notify the safety officer/safety coordinator before making any changes.

5.1.4 Storage/Disposal

- Biohazardous material may only be on-site for the duration of the experiment, and must be removed within one business day of experiment completion. If such material must temporarily be stored for one business day, requirements include limiting the biohazardous material to the minimum required amount, properly labeling all such material, and keeping it properly contained, as described in the *Stanford University Biosafety Manual*.³²
- At the conclusion of the experiment, researchers must properly pack any remaining biohazardous materials under the supervision of a trained SLAC handler/shipper. The researcher is responsible for arranging a carrier (if applicable under regulations) and ensuring that all biohazardous material is removed within one business day.

5.1.5 Reporting

The biohazards program manager must maintain an inventory and status of biohazardous agents, and provide an annual status report to the Department of Energy (DOE) Site Office describing the status and inventory of these agents and the biohazards program.

30 Stanford University Administrative Panel on Biosafety Request for Institutional Review/Approval for Research Involving Biohazardous Agents, Recombinant DNA, and USDA-regulated Materials, <http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/APBform.doc>

31 http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

32 http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

5.1.6 Accidents and Accident Reporting

Everyone working with biohazardous material must follow procedures involving blood-borne pathogens in Chapter 46, “Blood-borne Pathogens”.³³

All accidents and near misses must be reported to the safety coordinator for the affected area and the program manager in accordance with Chapter 28, “Incident Investigation”.³⁴

5.1.7 Equipment

- Equipment used in the storage, preparation, and examination must be purchased and used in the manner the manufacturer intended. Procedures described by the manufacturer for decontamination and sterilization must be followed.
- Biosafety cabinet purchases must be approved by a qualified safety coordinator.
- Facilities must be designed and maintained for the appropriate biosafety level.
- Ventilation must be constructed and operated per applicable regulations.³⁵
- Biosafety cabinets must be periodically inspected by a qualified inspector.

5.1.8 Personnel and Users

- All personnel and users must be trained as specified in the training section before working with biohazardous material.
- All personnel must wear personal protective equipment (PPE) appropriate to the biosafety level of the materials with which they are working

5.1.9 Roles and Responsibilities

5.1.9.1 Biohazards Program Manager

The program manager

- Attends APB meetings as a designee or alternate to consider experiments and safety issues involving biohazardous materials handled at SLAC
- Is available to provide input for biosafety level determination and other safety issues
- Compiles records of biohazardous materials entering and leaving the site submitted by safety coordinators and submits an annual summary report to the DOE Stanford Site Office

33 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 46, “Blood-borne Pathogens”, http://www-group.slac.stanford.edu/esh/hazardous_substances/bloodborne/policies.htm

34 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, “Incident Investigation”, <http://www-group.slac.stanford.edu/esh/general/incident/policies.htm>

35 Centers for Disease Control and Prevention and National Institutes of Health (CDC-NIH), *Primary Containment of Biohazards: Selection, Installation and Use of Biological Safety Cabinets*, second edition, 2000, <http://www.cdc.gov/od/ohs/biosfty/bsc/bsc.htm>

5.1.9.2 Medical Department

The Medical Department

- Provides immunizations for persons working with biological *etiologic agents* based on the evaluation of risk and benefit of immunization (as required)
- Treats personnel exposed to biohazards. Exposure can result from skin punctures from needles or other contaminated sharp objects, splashes, hand-to-self transfer, or exposure to inhalation of aerosols.

5.1.9.3 Safety Coordinators

Safety coordinators

- Assign risk categories to each proposed experiment with input from the researcher. The program manager can be consulted as needed.
- Ensure the *Stanford Biosafety Manual* is available to researchers
- Ensure that all personnel within their unit who may come in contact with biohazards receive appropriate training
- Ensure that researchers working with biohazards receive on-the-job training
- Track biohazardous materials and ensures that they are either destroyed in the experiment or properly packed by the researcher under the supervision of a trained SLAC shipper/handler.
- Submit tracking records to the program manager annually
- Consult with industrial hygienists on biohazard issues, as needed
- Report accidents and near misses to the appropriate persons

5.1.9.4 Stanford University Administrative Panel on Biosafety

The APB

- Reviews experiments that present biosafety level 2 hazard by means of the Stanford University Administrative Panel on Biosafety Request for Institutional Review/Approval for Research Involving Biohazardous Agents, Recombinant DNA, and USDA-regulated Materials³⁶
- Reviews SLAC's security and emergency management plans and procedures to ensure they adequately consider work involving biohazardous material

5.1.9.5 Researchers

Researchers

- Assign risk categories to each proposed experiment and review with safety coordinator
- Complete all required forms
- Complete all appropriate training before beginning work with biohazardous material

36 Stanford University Administrative Panel On Biosafety Request For Institutional Review/Approval for Research Involving Biohazardous Agents, Recombinant DNA, and USDA-regulated Materials, <http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/APBform.doc>

- Conduct all experiments and implement safety controls in accordance with the *Stanford University Biosafety Manual*
- Consult their safety coordinator before making changes in original experimental protocols
- Notify the Medical Department, the program manager, and the APB of any accident resulting in injury or release of biohazardous materials
- Keep records of all biohazardous materials brought on site and send copies of the records to the appropriate SSRL safety coordinator
- Ensure decontamination of any equipment and remove any biohazardous material within one business day after completion of the experiment

5.2 Procedures and Specific Requirements

5.2.1 Review and Approval

For a detailed procedure of the SSRL approval process, see Biohazards: SSRL Experiment Approval Procedure.³⁷

5.2.2 Transport

All biohazardous materials must be transported to and removed from SLAC in accordance with IATA, Department of Homeland Security, and DOT regulations.

5.2.3 Work Practices

Researchers must follow the safety practices specified in the *Stanford University Biosafety Manual*.³⁸

5.2.4 Storage/Disposal

Researchers must arrange for all biohazardous materials to be shipped from SLAC within one business day of the completion of the experiment.

5.2.5 Accidents and Accident Reporting

In the event of an accident, refer to the SLAC Medical Emergency Information web site for emergency contact information.³⁹

For SLAC's post-exposure procedure, see Chapter 46, "Blood-borne Pathogens".⁴⁰

37 Biohazards: SSRL Experiment Approval Procedure (SLAC-I-730-0A21C-021), <http://www-group.slac.stanford.edu/esh/eshmanual/references/biohazardsProcedApprovalSSRL.pdf>

38 *Stanford University Biosafety Manual*, http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

39 "SLAC Medical Emergency Information", <http://www-group.slac.stanford.edu/esh/medical/emer.html>

In case of injury, see Chapter 28, “Incident Investigation”.⁴¹

5.3 Training

SLAC does not offer any biohazard-specific training; all training requirements are met by completing Stanford University Environmental Health and Safety courses or their equivalent.⁴²

5.3.1 SLAC Personnel

Personnel who may come in contact with biohazardous materials must receive appropriate on-the-job training arranged by the safety coordinator. The content of the training will be specific to the nature of the material used, type of experiments being conducted, and the equipment used.

Personnel handling blood-borne pathogens (BBP) must complete the web-based course available through Stanford University entitled “tier two level” training.⁴³

Note In addition to any required courses, basic (tier one level) web-based training available through Stanford University is recommended for all personnel handling biohazardous materials.

5.3.2 Shippers and Handlers

SLAC shippers/handlers who supervise researchers packing their own biohazardous materials must have completed Stanford’s training for shippers (the people sending out the package of materials) and handlers (people who transport the package).⁴⁴

5.3.3 Users

All users must have the appropriate level of training to safely handle the biohazardous materials they bring on site. If trained at institutions other than Stanford University/SLAC, documentation certifying such training needs to be provided.

6 Exhibits

- Biohazards: Implementation Plan (SLAC-I-730-0A21M-005)⁴⁵

40 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 46, “Blood-borne Pathogens”, http://www-group.slac.stanford.edu/esh/hazardous_substances/bloodborne/policies.htm

41 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, “Incident Investigation”, <http://www-group.slac.stanford.edu/esh/general/incident/policies.htm>

42 “Research and Laboratory Safety - Practical”, <http://www.stanford.edu/dept/EHS/prod/researchlab/bio/practical.html>

43 “Training Home Page”, <http://www.stanford.edu/dept/EHS/prod/training/bbp/index.html>

44 “Shipping of Biohazardous Goods”, http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/Shipping_Infect_goods.pdf

- Biohazards: SSRL Experiment Approval Procedure (SLAC-I-730-0A21C-021)⁴⁶
- SSRL Proposal Form⁴⁷
- SSRL User Forms⁴⁸
- SSRL Biohazards Handling Agreement⁴⁹
- *Stanford University Biosafety Manual*⁵⁰
- Stanford University Administrative Panel on Biosafety Request for Institutional Review/Approval for Research Involving Biohazardous Agents, Recombinant DNA, and USDA-regulated Materials⁵¹

7 References

SLAC Environmental Health and Safety Manual (SLAC-I-720-0A29Z-001)⁵²

- Chapter 2, “Work Authorization”⁵³
- Chapter 3, “Medical”⁵⁴
- Chapter 5, “Industrial Hygiene”⁵⁵
- Chapter 19, “Personal Protective Equipment”⁵⁶
- Chapter 28, “Incident Investigation”⁵⁷
- Chapter 36, “Cryogenic and Oxygen Deficiency Hazard Safety”⁵⁸
- Chapter 46, “Blood-borne Pathogens”⁵⁹

45 <http://www-group.slac.stanford.edu/esh/eshmanual/references/biohazardsPlanImplement.pdf>

46 <http://www-group.slac.stanford.edu/esh/eshmanual/references/biohazardsProcedApprovalSSRL.pdf>

47 “SSRL Proposal Form”, http://www-ssrl.slac.stanford.edu/users/user_admin/form_proposal.rtf

48 “Hazards Form”, http://www-ssrl.slac.stanford.edu/users/user_admin/form_hazards.html

49 [forthcoming]

50

http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

51 <http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/APBform.doc>

52 <http://www-group.slac.stanford.edu/esh/eshmanual/>

53 http://www-group.slac.stanford.edu/esh/general/work_authorization/policies.htm

54 <http://www-group.slac.stanford.edu/esh/medical/chapter/policies.htm>

55 http://www-group.slac.stanford.edu/esh/hazardous_substances/industrial_hygiene/policies.htm

56 <http://www-group.slac.stanford.edu/esh/general/ppe/policies.htm>

57 <http://www-group.slac.stanford.edu/esh/general/incident/policies.htm>

58 http://www-group.slac.stanford.edu/esh/hazardous_substances/cryogenic/policies.htm

Other

- American Biological Safety Association, “Risk Group Classification for Infectious Agents”⁶⁰
- Public Health Agency of Canada, “Material Safety Data Sheets for Infectious Substances”⁶¹
- Stanford University, “Research & Laboratory Safety – Practical”⁶²
- World Health Organization, *Laboratory Biosafety Manual*, third edition, 2004⁶³

8 Implementation

The requirements of this chapter are either already in place or effective immediately, as set forth in Biohazards: Implementation Plan.⁶⁴

9 Ownership

Department: Chemical and General Safety

Program: Biohazards

Owner: Program Manager

59 http://www-group.slac.stanford.edu/esh/hazardous_substances/bloodborne/policies.htm

60 <http://www.absa.org/XriskgroupsX/index.html>

61 <http://www.phac-aspc.gc.ca/msds-ftss/index.html#menu?>

62 http://www.stanford.edu/dept/EHS/prod/researchlab/bio/practical.html#danger_goods

63 http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

64 Biohazards: Implementation Plan (SLAC-I-730-0A21M-005), <http://www-group.slac.stanford.edu/esh/eshmanual/references/biohazardsPlanImplement.pdf>

Biohazards: Implementation Plan

Department: Chemical and General Safety

Program: Biohazards

Owner: Program Manager

Authority: ES&H Manual, Chapter 34, Biohazards¹

The requirements of Chapter 34, “Biohazards”, will be phased in according to the following schedule.

Section Number	Section Title	Requirement Note	Status	Effective Date	Schedule Note
5.1	General				
5.1.1	Approval and Review		New	90 days after site acceptance	
5.1.2	Transport	Researchers and users review DOT and IATA training and requirements	New	90 days after site acceptance	
5.1.3	Work Practices		Existing	90 days after site acceptance	
5.1.4	Storage/Disposal		New	90 days after site acceptance	
5.1.5	Reporting	Annual to the DOE	New	To be determined	
5.1.6	Accidents and Accident Reporting		Existing	Immediate	
5.1.7	Equipment		Existing	Immediate	
5.1.8	Personnel		New	12/31/07	
5.1.9	Roles and Responsibilities		New	12/31/07	

¹ *SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)*, Chapter 34, “Biohazards”, http://www-group.slac.stanford.edu/esh/hazardous_substances/biohazards/policies.htm

Biohazards: Implementation Plan

Section Number	Section Title	Requirement Note	Status	Effective Date	Schedule Note
5.2	Procedures and Specific Requirements				
5.2.1	Review and Approval		New	12/31/07	
5.2.2	Transport		New	12/31/07	
5.2.3	Work Practices		Existing	Immediate	
5.2.4	Storage/Disposal		New	8/31/07	
5.2.5	Accidents and Accident Reporting		Existing	Immediate	
5.3	Training				
5.3.1	Personnel		New	12/31/07	
5.3.2	Shippers and Handlers		New	8/31/07	
5.3.3	Users		Existing	Immediate	

Biohazards: SSRL Experiment Approval Procedure

Department: Chemical and General Safety

Program: Biohazards

Owner: Program Manager

Authority: ES&H Manual, Chapter 34, Biohazards¹

This procedure lists required steps to gain approval to conduct experiments with biohazardous materials at the Stanford Synchrotron Radiation Laboratory (SSRL).

Step	Person(s)	Action
1.	Researcher	Submits SSRL Proposal Form ² to SSRL User Research Administration ³
2.	Appropriate SSRL Proposal Review Panel	Reviews proposal for scientific merit
3.	SSRL Safety Coordinator	Reviews approved proposals for applicable safety issues
4.	Researcher	<p>At least four weeks prior to the experiment date, submits all relevant user support forms from the SSRL “User Support Forms” page⁴</p> <p><i>Note</i> Submit a completed Hazards Form for each biohazardous material, as applicable according to the primary form (Macromolecular crystallography, X-ray or VUV)</p> <p><i>Note</i> Determine the biosafety level for the biohazardous material using the following resources and verify the determination with the safety officer.</p> <ul style="list-style-type: none">• Stanford University Biohazards Manual⁵• NIH biological classification⁶• CDC BMBL⁷

1 SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001), Chapter 34, “Biohazards”, http://www-group.slac.stanford.edu/esh/hazardous_substances/biohazards/policies.htm

2 “SSRL Proposal Form”, http://www-ssrl.slac.stanford.edu/users/user_admin/form_proposal.rtf

3 “User Forms”, http://www-ssrl.slac.stanford.edu/users/user_admin/ura_staff_new.html

4 “User Support Forms”, http://www-ssrl.slac.stanford.edu/users/user_admin/user_support.html

5 *Stanford University Biosafety Manual*, http://www.stanford.edu/dept/EHS/prod/researchlab/bio/Biosafety_Manual/Biosafety_Manual_complete.pdf

6 “Guidelines for Research Involving Recombinant DNA Molecules”, <http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>

7 “BMBL Section III – Laboratory Safety Level Criteria”, <http://www.cdc.gov/od/ohs/biosfty/bmb14/bmb14s3.htm>

Biohazards: SSRL Experiment Approval Procedure

Step	Person(s)	Action
5.	Researcher	If the biosafety level is determined to be 1, skip to step 7. If the biosafety level is 2: Completes the form required by the Stanford University Institutional Biosafety Committee (the Administrative Panel on Biosafety, APB) and submits this form to the SSRL safety coordinator ⁸
6.	Stanford University Institutional Biosafety Committee, APB	Reviews application as applicable and notifies SSRL safety coordinator
7.	SSRL Safety Coordinator	Implements APB recommendations by informing affected lab managers and functions
8.	Researcher	Before beginning work, completes and signs the SSRL Biohazards Handling Agreement. ⁹ The agreement describes response procedures to be followed in the event of accidental spills of biohazardous material.

8 Stanford University Administrative Panel On Biosafety Request For Institutional Review/Approval For Research Involving Biohazardous Agents, Recombinant DNA, And USDA-Regulated Materials, <http://www.stanford.edu/dept/EHS/prod/researchlab/bio/docs/APBform.doc>

9 [forthcoming]