

UC Irvine Environmental Health & Safety

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1. Program Description

The Institutional Biosafety Committee (IBC) is a committee created under mandate from the National Institutes of Health (NIH). The IBC is responsible for enforcing policies and guidelines related to university-related use of all potentially hazardous biological agents including but not limited to infectious agents, human and non human primate materials (including established cell lines and stem cells), CDC select agents, recombinant DNA, and studies involving human gene transfer. It is the policy of the University to provide a safe and healthy work environment. All persons involved in these activities at UCI must abide by the regulatory and policy requirements pertaining to the acquisition and use of these materials for research, teaching, or testing (hereto referred to as activities) as outlined in the:

- NIH Recombinant DNA Guidelines (2009)
- CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition, 2007
- Public Health Security and Bioterrorism Preparedness and Response Act of 2002
- All federal, state, and local laws
- The contents of this policy
- All other policies of the University of California, Irvine

2. Mission, Purpose, and Scope

This policy applies to all UCI faculty, staff, hosted visitors, students, participating guests, and volunteers working at locations where EH&S has management control of specific biohazards. UCI School of Medicine locations are covered by this policy. UCIMC clinical locations are under UCIMC EH&S requirements.

Mission

The charge of the Institutional Biosafety Committee (IBC) is to assure the safe acquisition, use, and disposal of all biological agents at the University of California, Irvine (UCI). It is the responsibility of the Committee to establish appropriate health and safety policies in accordance with federal regulations and guidelines that cover biological safety and to evaluate research being conducted at UCI for biological safety considerations.

Purpose and Scope

UCI acknowledges its responsibility to provide a program for the handling, storage, and disposal of biological agents; to provide emergency response to incidents involving biological agents; and to educate the UCI community about the safe use of biological agents in research, teaching, and public service

activities. The IBC reports to the Vice Chancellor for Research on matters related to the use of biological agents in research, teaching, and public service activities at UCI. Specific tasks include:

- Ensuring UCI compliance with:
 - All federal, state, and local regulations;
 - Procedures and principles relating to the prevention and/or control of infectious diseases;
 - The procurement, storage, use, and disposal of biological agents used in UCI research, teaching, and outreach facilities.
- Certifying investigators, their laboratories, and/or their practices for work at appropriate biological safety levels. Activities identified as Biological Safety Level 2 (BSL-2) and greater may not proceed without the written consent of the IBC prior to initiation of work.
- Overseeing the development and maintenance of written biohazard safety/infectious disease control plans that minimize exposures for all affected personnel through the use of proper engineering controls and work practices; to make the plan available to the institutional community; and to recommend updates to the plan as necessary. Additionally, overseeing the development and implementation of educational programs related to infectious diseases and biohazard safety.
- Overseeing the monitoring and follow-up of those persons testing positive for identified pathogens.
- Identifying tasks that carry the risk for transmission of the infectious agents and the occupational groups involved.
- Environmental Health & Safety (EH&S) implements IBC-approved programs.

3. Definitions

Animal Biosafety Levels (ABSL): ABSLs establish the defining characteristics of the work environment and required containment levels. Risk Groups, on the other hand, define the characteristics of individual agents.

1. ABSL-1: Animal Biosafety Level 1 (ABSL-1) is suitable for work involving well-characterized agents that are not known to cause disease in healthy adult humans, and that are of minimal potential hazard to laboratory personnel and the environment.
2. ABSL-2: Animal Biosafety Level 2 involves practices for work with those agents associated with human disease. It addresses hazards from ingestion as well as from percutaneous and mucous membrane exposure. ABSL-2 builds upon the practices, procedures, containment equipment, and facility requirements of ABSL-1.
3. ABSL-3: Animal Biosafety Level 3 involves practices suitable for work with animals infected with indigenous or exotic agents that present the potential of

- aerosol transmission and of causing serious or potentially lethal disease. ABSL-3 builds upon the standard practices, procedures, containment equipment, and facility requirements of an ABSL-2.
4. ABSL-4: Animal Biosafety Level 4 involves practices suitable for addressing dangerous or exotic agents that pose high risk of life-threatening disease, aerosol transmission, or related agents with unknown risk of transmission. ABSL-4 builds upon the standard practices, procedures, containment equipment, and facility requirements of an ABSL-3. Procedures must be developed locally to address specific operations of the Class III cabinet line or the suit laboratory required at ABSL-4.

Animal Husbandry: A branch of agriculture concerned with the production and care of domestic animals.

Adverse Events: Principal investigators conducting research using biohazardous agents are required to report any significant problem which includes violation of the *NIH Guidelines* or any research-related accidents and illnesses. The NIH Guidelines contain requirements for the reporting of significant problems, i.e. adverse events or violations by the Institution (Sec. IV-B-1-j), the IBC (Sec. IV-B-2-b-(7)), and the Principal Investigator [Sec. IV-B-7-e(2)]. At UCI, the Principal Investigator will report problems to the Biosafety Officer at ibc@uci.edu, by completing the Adverse Event and Non-Compliance to *NIH Guidelines* Reporting Form, who will then forward the report to the IBC for review. Incidents determined to require reporting to the NIH Office of Biotechnology Activities [NIH-OBA] will be transmitted on behalf of the University of California, Irvine by the Associate Vice Chancellor for Research.

In accordance with institutional requirements, the Principal Investigator provides a signed assurance that he/she will comply with IBC requirements for reporting adverse events/non-compliance to the Institutional Biosafety Committee. The assurance is signed with the final submission of the approved version of the IBC protocol.

An adverse event involving a biohazard is:

Any event (i.e. laboratory accident) that involves contamination of personnel and/or the environment with a biohazard that has the potential to cause illness or one that may cause significant concern to the general public.

An adverse event involving gene transfer is:

Any event involving risk to the subject or others, that is both unexpected and associated with 1) the use of the gene transfer product (i.e. there is reasonable possibility that the event may have been caused by use of the product); or 2) any finding from tests in laboratory animals that suggests a risk for human research participants including reports of mutagenicity, teratogenicity, or carcinogenicity.

Non-compliance is:

Failure of the principal investigator during the conduct of the research to: (1) supervise the safety performance of the laboratory staff to ensure that the required safety practices and techniques are employed; (2) investigate and report any significant problems pertaining to the operation and implementation of containment practices and procedures; (3) correct work errors and conditions that

may result in the release of biohazardous materials; and (4) ensure the integrity of the physical containment [e.g., biosafety cabinets] and the biological containment [e.g., purity and genotypic and phenotypic characteristics]; or 5) any violation of the *NIH Guidelines* that results in personal injury.

Biological Toxin: A colloidal proteinaceous poisonous substance that is a specific product of the metabolic activities of a living organism and is usually very unstable, notably toxic when introduced into the tissue, and typically capable of inducing antibody formation.

Biohazards: Biohazards are defined as biological agents and materials which are potentially hazardous to humans, animals, and other forms of life. They include known pathogens and infectious agents including bacteria and their plasmids and phages, viruses, fungi, and parasites; cell lines, animal remains, and laboratory animals including insects which might harbor such infectious agents; and primate body fluids. Also included are potentially biohazardous organisms used in procedures such as recombinant DNA and genetic manipulations. Biohazards are classified according to risk levels requiring appropriate containment.

Biohazardous Material: Biological agents and materials which are potentially hazardous to humans, animals, and other forms of life. They include (but are not limited to): bacteria and their plasmids and phages, viruses, fungi, mycoplasmas, parasites, prions, cell lines, human or animal fluids, tissues, remains, and laboratory animals (including insects) which may harbor such infectious agents.

Biosafety Level (BSL): A description of the degree of physical containment being employed to confine organisms containing recombinant DNA molecules and to reduce the potential for exposure of laboratory workers, persons outside of the laboratory, and the environment. In Appendix G of the *NIH Guidelines*, these are graded from BSL-1 (the least stringent) to BSL-4 (the most stringent, not available at UCI).

Containment Levels

1. **Biosafety Level (BSL-1):** This containment level is suitable for work involving agents of unknown or of a minimal potential hazard to laboratory personnel and the environment.
2. **Biosafety Level (BSL-2):** This level of containment is suitable for work involving agents of a moderate potential hazard to personnel and the environment. The agents are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are reliable.
3. **Biosafety Level 3 (BSL-3):** Applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal disease as a result of exposure by the inhalation route. Laboratory personnel have specific training in handling pathogenic and potentially lethal agents, and are supervised by competent scientists who are experienced in working with these agents.

Biological Safety Officer (BSO): An individual appointed by an institution to oversee

management of biosafety risks. The *NIH Guidelines* require that a BSO be appointed when the institution is engaged in large-scale research or production activities, or in research requiring containment at BSL-3 or BSL-4. The duties of the BSO are described in Section IV-B-3 of the *NIH Guidelines*.

Bloodborne Pathogens: Pathogenic microorganisms which present in human blood and can cause disease in humans. These pathogens include but are not limited to HBV, HCV, and HIV.

Categories of Potentially Infectious Materials:

1. Human, animal, and plant pathogens (bacteria, parasites, fungi, viruses);
2. All human blood, blood products, tissues, and certain body fluids (mucous, saliva, semen, vaginal fluids, etc) including established cell lines
3. Cultured cells and potentially infectious agents these cells may contain;
4. Clinical specimens; and
5. Infected animals and animal tissues.

CDC or Centers for Disease Control and Prevention:

The federal agency requiring registration before any transfer or use of select agents can occur. The EH&S Director and the Biological Safety Officer are UCI's Institutional Officials with the responsibility for registering Select Agents.

Class I Biosafety Cabinet: An enclosure with an inward airflow through the front opening. Provides protection for the worker and the laboratory environment but not to product being utilized in the cabinet.

Class II Biosafety Cabinet: An enclosure with an inward airflow through the front opening. Provides protection to the worker, the environment, and the product being utilized in the cabinet.

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

Dual Use Research: A general term that covers any research or technology that has a bona fide research purpose or use; but in the wrong hands, could be misused or used for military purposes.

Dual use research in biology encompasses biological research with legitimate scientific purpose that may be misused to pose a threat to public health and/or national security. Examples of dual use research include genetic manipulations of organisms that can result in:

- New pathogens;
- Increased pathogenicity;
- Resistance to an antibiotic used to control disease in humans, animals, or crops;
- Altered host range of a pathogen;
- Increased transmissibility of an infectious agent; and/or
- The ability to escape diagnosis/detection.

Dual use research could also encompass studies that yield information about how to increase the lethality of a toxin; manipulations of threat agents that might impair vaccine effectiveness; and ways to enable the weaponization of a biological agent.

The National Science Advisory Board for Biosecurity (NSABB) is the federal agency charged with providing advice, guidance, and leadership regarding biosecurity oversight of dual-use research. As policies and advice become available from NSABB, the IBC and ORC will develop appropriate policies, procedures, and guidance to respond to these requirements.

Environmental Health & Safety (EH&S): EH&S provides the following through the assignment and designation of qualified individuals, including the BSO:

1. Performance of periodic inspections to ensure that laboratory standards are rigorously followed.
2. Consultation with the IBC to plan, develop, and conduct training on biological safety practices and procedures relating to rDNA, infectious agents, and potentially hazardous biological materials.
3. Report to the IBC any significant problems, violations of the NIH Guidelines, and any significant research-related accidents or illnesses of which the BSO becomes aware, unless the BSO determines that a report has already been filed by the Lead Researcher.
4. Develop and implement emergency plans for handling spills and personnel contamination, and investigating laboratory accidents involving rDNA, infectious agents, and potentially hazardous biological materials.
5. Provide advice on laboratory security (access control procedures).
6. Implement decisions of the IBC.
7. Review the project facility construction/remodeling plans and specifications and inspect the site for compliance.
8. Provide technical advice to investigators and the IBC on research safety Procedures; to include the selection, installation, maintenance and use of laboratory equipment which provides or aids in containment of biological materials.

Host: Organism in which the rDNA replicates.

Infectious Biological Agents: Infectious biological agents or biologically-derived infectious materials present a risk or potential risk to the health of humans or animals, either directly through infection or indirectly through damage to the environment. Infectious agents have the ability to replicate and give rise to the potential for large populations in nature when small numbers are released from controlled situations.

Institutional Biosafety Committee (IBC): An institutional committee created under the *NIH Guidelines* to review research involving recombinant DNA. The role of the IBC has evolved over time, and many committees also review other forms of research that entail biohazardous risks as part of their institutionally assigned responsibilities.

Lead Researcher (LR): The person with primary responsibility for meeting all ethical,

scientific, and regulatory requirements for conduct of a UCI study protocol, whether or not acting as the Principal Investigator (PI) for the award that funds said study.

Lead Researchers are eligible to submit applications to the IBC for biological materials in research. A LR should not be confused with a PI.

- A. **Lead Researcher Eligibility:** Individuals who meet the criteria for PI by virtue of their University appointment status may also serve as LR on a research protocol. Individuals who do not meet the criteria for a PI may serve as a LR if they obtain a Faculty Sponsor for the activity.
- B. **The Faculty Sponsor:** The Faculty Sponsor must be eligible to be a PI. Refer to the Office of Research Administration (ORA) Website under, "Who is eligible." For exceptions, please consult the ORA website <http://www.research.uci.edu/ora/sp/pieligibility.htm#Who>. Individuals who do not meet the UCI appointment criteria for a LR may serve in that capacity with the addition of a Faculty Sponsor for project responsibility.

Eligibility Table

Series and Titles	Principal Investigator Eligibility ⁽¹⁾	Lead Researcher Eligibility
Tenure/Tenure Track Assistant, Associate, or Professor	Yes (includes Emeriti)	Yes (includes Emeriti)
In-Residence Assistant, Associate, or Professor		
Lecturer - Track & SOE Lecturer w/ Security of Employment (SOE)		
Clinical "X" Assistant, Associate, or Professor of Clinical _____ (Dept. Name)		
Clinical (With Salary) Assistant, Associate, or Clinical Professor	Yes, if salaried at 50% or more	Yes, if salaried at 50% or more. If less than 50%, Faculty Sponsor is required. ⁽²⁾
Adjunct Assistant, Associate, or Professor		
Professional Researcher Assistant, Associate, or Professor		
All other Series, Titles, Appointments	No ⁽¹⁾	No, except with a Faculty Sponsor. ⁽²⁾

⁽¹⁾ For exceptions, see Principal Investigator Eligibility on [Sponsored Projects webpage](#)

⁽²⁾ The Faculty Sponsor must be eligible to be a Principal Investigator.

National Institutes of Health (NIH): One of the world's foremost medical research institutions and the preeminent federal funder of medical research in the U.S. The NIH, comprised of 27 separate Institutes and Centers, is one of eight health agencies within the Public Health Service, which is an agency within the U.S. Department of Health and Human Services. The goal of NIH research is to acquire new knowledge to help prevent, detect, diagnose, and treat disease and disability. The NIH mission is to uncover new knowledge that will lead to better health for everyone.

Negative Airflow: Directional airflow from areas exterior to a laboratory into the laboratory.

NIH Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines): A document created in 1976 that outlines principles for the safe conduct of research employing recombinant DNA technology. The *NIH Guidelines* detail practices and procedures for the containment of various forms of recombinant DNA research, for the proper conduct of research involving genetically modified plants and animals, and for the safe conduct of human gene transfer research. As a "living" document, it is periodically revised to keep pace with the changing state of science.

Office of Biotechnology Activities (OBA): The NIH office responsible for developing, implementing, and monitoring NIH policies and procedures for the safe conduct of recombinant DNA activities, including human gene transfer.

Primary Containment: Methods to protect the internal laboratory environment.

Principal Investigator (PI): The scientist or scholar responsible for the conduct of research or other activity, described in a proposal for an award. The Principal Investigator is responsible for all programmatic and administrative aspects of a project or program. The scientist or scholar with primary responsibility for the scientific, technical, and administrative conduct of a funded research project.

Recombinant DNA(rDNA): DNA prepared by breaking up and splicing together constructed DNA or DNA from several different species of organism.

"In the context of the NIH Guidelines, recombinant DNA molecules are defined as either: (i) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) molecules that result from the replication of those described in (i) above. Synthetic DNA segments which are likely to yield a potentially harmful polynucleotide or polypeptide (e.g., a toxin or a pharmacologically active agent) are considered as equivalent to their natural DNA counterpart. If the synthetic DNA segment is not expressed in vivo as a biologically active polynucleotide or polypeptide product, it is exempt from the NIH Guidelines. Genomic DNA of plants and bacteria that have acquired a transposable element, even if the latter was donated from a recombinant vector no longer present, are not subject to the NIH Guidelines unless the transposable element itself contains recombinant DNA."
(From [Section I-B of the NIH Guidelines](#))

Recombinant DNA Advisory Committee (RAC): An NIH advisory committee whose

principal role is to provide advice and recommendations to the NIH Director on (1) the conduct and oversight of research involving recombinant DNA including the content and implementation of the *NIH Guidelines*, and (2) other NIH activities pertinent to recombinant DNA technology. A major element of this role is to examine the science, safety, and ethics of clinical trials that involve the transfer of recombinant DNA to humans. More details about RAC membership and responsibilities can be found on the RAC page of the OBA Website.

Recombinant DNA Insert: That (those) strand(s) of foreign DNA being inserted into the host/vector.

Recombinant DNA Molecules: These are molecules constructed outside of living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell or molecules that result from their replication.

Risk Group: A description of the degree of risk a biological compound poses according to its relative pathogenicity for healthy adult humans. Ranges are from no risk RG1 to extremely high risk (RG4) cannot be used at UCI.

1. Risk Group (RG1) This risk group contains agents that are not associated with disease in healthy adult humans.
2. Risk Group (RG2) This risk group contains agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available.
3. Risk Group (RG3) This risk group contains agents that are associated with human disease which can cause serious illness or death. Interventions are not often available.

Secondary Containment: Methods to protect the environment external to the laboratory.

Select agent: Biologics and toxins listed by HHS or USDA. See the Appendix to the IBC Charge which lists the following: HHS non-overlap select agents and toxins; high consequence livestock pathogens and toxins/select agents (overlap agents); USDA high consequence livestock pathogens and toxins (non-overlap agents and toxins); and listed plant pathogens. [Reference for list: 42 CFR 73, interim final rule; www.cdc.gov/od/sap.](http://www.cdc.gov/od/sap)

Sharps: Any object that can penetrate the skin, e.g., needle, scalpel, knife, etc.

Vector: Carrier used to introduce rDNA into the host system and that facilitates replication in the host.

4. The Institutional Biosafety Committee (IBC)

The IBC is comprised of at least, but not limited to, five members with collective experience and expertise in rDNA technology and the capability to assess the safety of rDNA research and identify any potential risk to public health or the environment.

IBC Committee Membership

The Institutional Biosafety Committee meets monthly. Fifty one percent of the voting membership is necessary to establish a quorum to conduct business. Committee members are selected from a pool of faculty and community members with expertise in the properties and safe use of human and non-human primate materials, infectious agents, carcinogens, select agents, recombinant DNA, and human gene transfer trials.

The Institutional Biosafety Committee shall consist of at least five voting members appointed by the Vice Chancellor for Research. Members shall serve for a term of three years, which may be renewed by the Vice Chancellor for Research. The Chair of the committee shall be designated by the Vice Chancellor for Research and selected from among the faculty members representatives on the Committee.

The membership of the IBC includes:

1. Two members who are not affiliated with the institution (apart from their membership on the IBC) and who represent the interests of the surrounding community with respect to health and protection of the environment such as officials of state or local public health or environmental protection agencies, members of other local government bodies, or persons active in medical, occupational health, or environmental concerns in the community;
2. A member representing the laboratory technical staff of the University;
3. A member with expertise in rDNA technology, biological safety, and physical containment;
4. Biological Safety Officer;
5. A individual with expertise in plant, plant pathogen, or plant pest containment principles when experiments involve plants and require prior IBC approval (See NIH Guidelines, Appendix P);
6. A scientist with expertise in animal containment principles when experiments involve animals and require prior IBC approval (See NIH Guidelines, Appendix Q);

When the institution participates in or sponsors rDNA research involving human subjects, the IBC will have adequate expertise and training or will appoint ad hoc consultants, as necessary, to ensure that the Committee has the professional competence necessary to review such research.

5. Responsibilities

The Institution

1. The responsibility for compliance with applicable regulations concerning rDNA (with or without etiologic agents) used in research rests with the Vice Chancellor for Research as the Institutional Official. The Vice Chancellor for Research shall be assisted in the discharge of this responsibility by the IBC.

2. The responsibility for compliance with applicable regulations concerning the use of biological materials, infectious agents, hazardous materials/hazardous waste management, radiation safety, environmental regulatory affairs, and other general institutional safety requirements rests with the Vice Chancellor for Administrative and Business Services. The Vice Chancellor for Administrative and Business Services is supported by EH&S and the BSO.
3. When the institution participates in or sponsors rDNA research involving human subjects, the institution must ensure that (a) the IBC has adequate expertise and training (using ad hoc consultants as deemed necessary) and (b) all aspects of applicable sections of the NIH Guidelines regarding experiments involving deliberate "gene transfer" derived from rDNA into one or more human subjects have been appropriately addressed by the Lead Researcher prior to protocol submission to NIH Office of Biotechnology Activities (OBA).

Chairperson, Institutional Biosafety Committee

1. Ensure that the Institutional Biosafety Committee is properly constituted and fulfills its requirements under the appropriate regulations, rules, etc.
2. Ensure that all members of the Institutional Biosafety Committee are adequately trained in appropriate containment practices, secondary containment procedures, and accidental spill containment procedures to fulfill their responsibilities as members of the Institutional Biosafety Committee. Per NIH guidelines: **Section IV-B-1-h.** *Ensure appropriate training for the Institutional Biosafety Committee Chair and members, Biological Safety Officer and other containment experts (when applicable), Principal Investigators, and laboratory staff regarding laboratory safety and implementation of the NIH Guidelines. **The Institutional Biosafety Committee Chair** is responsible for ensuring that Institutional Biosafety Committee members are appropriately trained. The Principal Investigator is responsible for ensuring that laboratory staff are appropriately trained. The institution is responsible for ensuring that the Principal Investigator has sufficient training; however, this responsibility may be delegated to the Institutional Biosafety Committee.*
3. Call and preside over meetings of the Institutional Biosafety Committee.
4. Review and insure compliance of all authorized researchers utilizing biohazardous materials.
5. Coordinate the review process of researchers seeking use of biohazardous material through research programs at the University.

Institutional Biosafety Committee

1. Advise the Vice Chancellor for Research, Deans, and Department Chairs on matters related to biohazards and biosafety within their respective areas of responsibility.
2. Develop, recommend, and implement policies and procedures for biological risk assessment and biological risk reduction throughout the University.
3. Oversee all research and teaching activities involving biohazardous agents including review and approval prior to initiation, annual reviews and updates,

- reviews of laboratory safety equipment and procedures, and certification of compliance with all applicable rules and regulations governing the use of biohazardous materials. Approve those research projects that are found to conform with the NIH Guidelines, OSHA, and the CDC including **(a)** an independent assessment of the containment levels required by the NIH Guidelines for the proposed research; and **(b)** assessment, if applicable, of the facilities, procedures, practices, and training and expertise of personnel involved in the proposed use of infectious biological agents.
4. Ensure that all principal investigators are sufficiently trained in appropriate containment practices, secondary containment procedures, accidental spill containment, and their responsibilities as principal investigators as they pertain to laboratory safety.
 5. Advise and provide technical expertise, whenever possible, to the Biosafety Officer on matters regarding biosafety.
 6. Conduct investigation of serious violations or problems and to make recommendations to the Vice Chancellor for Research for the resolution of continued non-compliance or serious infractions.

Biosafety Officer (BSO)

The institution will appoint a Biosafety Officer (BSO) if it engages in large-scale research or production activities involving viable organisms containing rDNA molecules, biological agents in RG-3 or 4, or Select Agents. The institution must appoint a BSO if it engages in rDNA research at BSL-3 or 4. The BSO will be a member of the IBC. Additional responsibilities are as follows:

1. Investigate laboratory accidents and report problems, violations, and injuries or illnesses associated with biohazardous research activities, to the Institutional Biosafety Committee.
2. Conduct periodic inspections of laboratories to ensure compliance with established procedures.
3. Provide advice and assistance to the Institutional Biosafety Committee and Principal Investigators concerning containment procedures and practices, laboratory security, recommended laboratory containment equipment, rules, regulations, and other matters as may be necessary.
4. Provide oversight and assurance that laboratory safety containment equipment is functioning properly.
5. Serve as a member of the Institutional Biosafety Committee.

IBC Administrator

The IBC Administrator is responsible for overall compliance and administrative oversight of UCI's Biosafety Program. The IBC Administrator works in cooperation with the IBC, the Biosafety Officer, and if necessary, other UCI departments to coordinate the

campus-wide Biosafety program including:

- Risk-based laboratory inspections
- Accident investigations
- Record keeping
- Assessment of University facilities to determine suitability for use in potentially hazardous biomedical research operations
- Advising professional and technical staff regarding Biosafety practices, procedures, and regulatory requirements.

Environmental Health and Safety

1. Provides industrial hygiene and safety support for all laboratory operations.
2. Transports and disposes of all infectious waste in compliance with all applicable federal, state, and local ordinances.
3. Assists, as necessary, in the emergency response, cleanup, and decontamination of biological spills and accidents.
4. Administers the campus Occupational Health program.

6. Committee Review and Decisions

The IBC is responsible for reviewing all protocols that involve the use of biohazardous materials. Two weeks prior to a scheduled meeting, the IBC member will be asked to confirm (via e-mail) his/her attendance to ensure a quorum of members will attend the meeting and to determine the pool of reviewers available to review protocols.

Meeting packets are mailed to IBC members one week prior to an IBC meeting. Packets will include the meeting agenda, all applications designated for full committee review received by the meeting deadline, minutes from the previous meeting and any other information for discussion. ***Members are expected to review and to be prepared to discuss all materials included in the packet at the time of the meeting.***

Each Application that will undergo full committee review will be assigned a primary and secondary reviewer. The responsibilities of the primary and secondary reviewer are as follows:

- 1) If requested by the committee, the primary reviewer might contact the Principal Investigator (PI) to discuss the questions and concerns of the committee members. NOTE: The PI will be required to respond in writing and/or submit a revised protocol if additional information is required to secure approval. It is possible additional comments and questions may be raised during the committee discussion.
- 2) The primary reviewer presents the protocol at the committee meeting. The secondary reviewer presents any additional concerns not raised by the primary reviewer.

- 3) Written comments from both the primary and secondary reviewers should be made on the review cover sheet. A space for comments from both the primary and secondary reviewers is provided at the bottom of the review cover sheet.
- 4) Both reviewers conclude the presentation of the protocol with one of the following recommendations:
 - Approval
 - Tabled Administratively
 - Tabled for Designated Review by Subcommittee
 - Resubmission
 - Disapproval

Protocols Tabled for Designated Review by Subcommittee

When protocols are tabled for subcommittee review and approval, the PI will be required to address the IBC's concerns in writing. When a response is received, the IBC Administrative Office will perform a preliminary administrative review to assure all the information requested is included in the response. An e-mail of the response is then sent to the primary and secondary reviewer (and any other member who is a part of the subcommittee) and each member of the subcommittee must indicate his/her approval of the protocol via e-mail. Once all required votes are received by e-mail, the IBC Administrator will proceed with the approval process.

Experiments at BSL-1 Level of Containment or Exempt Protocols:

Certain studies are prohibited by the guidelines; other studies are exempt from review. However, such exemptions must be determined by the IBC after the application is submitted by the principal investigator. The committee chairperson shall review all exempt protocols.

All work involving recombinant DNA that is subject to the current *NIH Guidelines* must be reviewed and approved by the Institutional Biosafety Committee before such work can begin. If the application requires a BSL-1 level of containment, the application may be exempt. However, such exemptions can only be determined by the IBC.

IBC Administrator Preliminary Review and IBC Exemption Determination:

Upon receipt of application, the IBC Administrator will assess the proposal for completeness of information and provide a preliminary assessment based on NIH, CDC, and USDA requirements. If the Activities are eligible for an exemption from IBC review, the exemption will be issued at that time. If the activities require review, then the application and preliminary review will be forwarded to full committee review.

The IBC member will evaluate the project's protocol, equipment, work space, and other pertinent information for safety. The PI will be advised concerning the acceptability of the proposal and any modifications, additions, etc. required.

Criteria for IBC Approval

The IBC will determine if the research proposal conforms to the institution's NIH Assurance and meets the following Criteria:

- The hazards and risks associated with the project or activity are appropriately minimized by safe procedures
- The risk to personnel, students, or visitors is reasonable in relation to the threats and hazards associated with use of the materials
- The risk to the community's health and environment is reasonable
- The facilities are adequate to minimize the risks of using the materials
- Preventative medical measures are taken to minimize risks associated with breaches in safety procedures. This includes any required occupational health consultations
- Appropriate IACUC, IRB, hSCRO, RAD approvals are in place

Notification of IBC Decisions

All communications regarding committee actions will be sent to the PI by the IBC Administrative Office in writing within 5 working days following the full IBC meeting.

Approvals by subcommittee will be acknowledged at the next convened full IBC meeting and will be appended to the minutes.

Notifications must be signed by the IBC Chair before they become effective.

Revised Applications

Changes in the proposal will require an **IBC Modification Form**. This completed form must be submitted to the IBC Administrative Office. Examples of changes are (a) a significant change in hosts or vectors; (b) a significant change in the physical location of the experiments; or (c) a change in personnel. The IBC administrator will forward the materials to the Committee for review and approval.

- Submit a IBC Modification form to the IBC Administrative Office.
- The IBC administrator will forward the form to the Committee for review and approval.

Medical Surveillance

The committee will also determine the need for Medical Surveillance based on the discussion of the risk assessment presented via the submitted protocol. All personnel working with BSL-3 agents will be required to complete medical surveillance. The need for other personnel working with infectious agents to complete medical surveillance will be determined by the committee. Prior to working in a laboratory where infectious agents will be used, personnel must complete the following:

1. Personnel must complete a Risk Assessment form tailored to their job duties, written in collaboration with the Principal Investigator and submitted to the

- Occupational Health Nurse in EH&S. See Appendix A.
2. Personnel must complete the medical surveillance components as prescribed by the Occupational Health Nurse. Personnel will be provided a written medical clearance statement.
 3. In consultation with the Biosafety Officer, personnel must provide written consent acknowledging their understanding of the risks associated with their job duties at UC Irvine.

Further details for medical surveillance can be found in the document titled "Medical Surveillance for Personnel Working With Infectious Agents" which is attached as Attachment A.

7. Administration of the Biosafety Program and Technical Support of the IBC

EH&S will provide management and administrative support to the IBC. Staffing of the IBC and the Biosafety program will be proportional to the volume of activity and levels of risk associated with rDNA and Biological Agent Activities at UCI. As part of its general staffing duties, EH&S will prepare and maintain records of IBC activities for at least 3 years and records related to protocols and user authorization for at least 30 years after the completion/termination of the research per UC EH&S Directors Consensus. EH&S will keep written IBC records of the following items:

- Copies of all IBC Applications and supporting materials that are reviewed;
- Minutes of the IBC meetings with sufficient detail to show attendance, actions taken at the meeting, and votes on actions, the basis for requiring changes in research, and a summary of the IBC discussion of controversial issues and their resolution;
- Records of initial reviews and continuing review activities
- Copies of lab safety reviews, surveys, and security protocols
- Copies of all correspondence between the IBC, PIs and the IBC Administrator;
- A list of IBC members and their qualifications for serving on the board
- Written IBC policies and procedures
- Statement of significant new findings on the safety of biological activities at UCI
- Standard Operating Procedures approved by the IBC
- Biosafety training materials, dates, and names of all persons who have completed required training.

Records

The IBC, through Environmental Health and Safety, will maintain for a period of at least five years; minutes of IBC meetings including records of attendance, activities of the committee, and committee deliberations. Environmental Health and Safety will also maintain for a period of thirty (30) years past the termination of each project, all records of applications, proposals, and proposed significant changes in activities involving recombinant DNA or other biological materials. All records shall be accessible for inspection and copying by authorized institutional officials.

Meetings and Meeting Summaries

1. Agenda

EH&S sets the IBC meeting agendas in cooperation with the IBC Chair. The agenda must include a review of the previous meeting's summary, a summary of activities reviewed or exempted since the last meeting, and administrative updates.

2. Meeting Summaries

A meeting summary will be written and provided to all IBC members after the completion of each IBC meeting. The summary will include date, attendance, absentee members, motions, and a synopsis of meeting activities and discussions. The summary is for official documentation purposes only and not intended for general distribution or public access.

Upon written request, the IBC will make available to the public meeting minutes and/or any other public access documents. These other documents can include:

- Committee roster submitted to the NIH
- Biographical sketches of Committee members
- Documents that would be public access under the Freedom of Information Act
- Other information as required by federal or state law.

Attendance

Members of the IBC are responsible for attending all convened meetings and staying until business has been completed, whenever possible. When attendance is not possible, IBC members must notify the IBC Administrator at ibc@uci.edu or 824 –8024 as soon as possible.

A member who will be unable to attend a meeting but not contact the IBC Administrator prior to the mailing out of packets, will be expected to review any protocols he or she is assigned. It is this member's responsibility to contact the other reviewer with his/her comments so that the other reviewer can present both reviewers' comments and recommendations to the IBC.

Confidentiality

Members of the IBC are responsible for maintaining all committee proceedings and documents in strict confidence. Such information may not be used for any purpose other than IBC review and may not be disclosed to anyone outside of the IBC unless permission is granted in writing by the Vice Chancellor for Research.

Conflict of Interest Disclosure

It is the expectation of the University that committee members will voluntarily recuse

themselves from situations that create, or appear to create, a conflict of interest. Members of the IBC are responsible to disclose to the IBC Chair or IBC Administrator any conflict of interest that may arise in the review of research or compliance matters for the IBC. In a meeting of the full committee, recused members must leave the room during discussions and voting. A similar expectation for disqualification exists for members on subcommittees.

1. Members who are primary investigators, faculty sponsors, or other investigators in the project under review, or whose spouse or child is a project investigator or faculty sponsor, must recuse themselves from committee action.
2. Members who have a significant financial or management interest as defined by federal policy¹ in the extramural sponsor or provider of the drug, device, or test product, or whose spouse or dependent child has same, must recuse themselves from committee action.
3. Members who believe existing circumstances may directly affect their objectivity may request that they be recused from committee action.

Regulatory Compliance

Members of the IBC are responsible for keeping abreast of and being in accordance with all applicable federal regulations and policies, state law, and UC and UCI policies as provided by the IBC Administrator that pertain to rDNA.

8. Institutional Biosafety Committee Basics of Protocol Review

The primary responsibility of the IBC is to review and assess the following:

- Research involving recombinant DNA technology;
- Research involving Select Agents identified by the CDC and USDA as posing a severe threat to public health and safety to animal and plant health or animal or plant products.
- Any other research involving biohazardous materials.

The Office of Biotechnology Activities at NIH delegates responsibility to the Institutional Biosafety Committee for evaluating the potential hazards of the work (risk assessment), assigning appropriate physical containment and safety practices, and evaluating the relevant experience and training of the research staff to perform the work.

When reviewing protocols and applications, the IBC should consider:

1. Begin by reviewing Section II (Safety Considerations) of the NIH Guidelines for risk assessment and biological containment level. [NIH Guidelines - April 2002](#)
2. Any strain that is known to be more hazardous than the parent (wild-type) strain should be considered for handling at a higher containment level than the parent strain.
3. Certain attenuating strains or strains that have been demonstrated to have

¹ Federal guidelines define “significant financial interests” as income > \$10,000 for 12 months prior or into the future; equity interests > \$10,000 or >5%; or any intellectual property rights to the individual, his/her spouse, or dependent children.

irreversibly lost known virulence factors may qualify for a reduction of the containment level compared to the Risk Group assigned to the parent strain.

At times, risk assessment of infectious agents and recombinant agents should be completed prior to beginning work with that agent. Below are some guidelines:

1. Virulence – Review the Risk Group Classifications in Section II and Appendix B of the NIH Guidelines.
2. Pathogenicity – Consider the wild-type agent itself and how genetically engineering the agent affects its disease-causing potential.
3. Infectivity – Consider the host range, availability of vaccine or treatment, and the possibility of reverse mutations and recombinations.
4. Route of Spread and Communicability – Consider how the agent is transmitted.
5. Operations (e.g., creation of aerosols) – Consider whether operations in the lab will affect the virulence, pathogenicity, infectivity, route of spread, and communicability of the agent.
6. Quantity – Consider the amount of virus to be manipulated and its concentration.
7. Gene product (e.g., toxicity or physiologic activity) – Consider what is being inserted into the agent and whether it affects virulence, pathogenicity, infectivity, route of spread, and communicability.

Biosafety levels consist of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities appropriate for the operations performed and are based on the potential hazards presented by the agents used and by the laboratory functions and activities.

1. Circumstances requiring an increase in the level of containment:
 - i. When animals are used as a host, recombinant agents could result in infection of other animals
 - ii. Operations that create increased infectivity (e.g., inoculation, aerosolization)
 - iii. Viral chimeras
2. Use of Primary and Established Cell Lines:
 - i. Primary human or non-human primate cell lines should be considered potentially infectious and handled using BSL-2 containment practices.
 - ii. Established human or non-human primate cell lines (e.g., purchased from ATCC) should be considered potentially infectious and handled using BSL-2 containment practices, unless the vendor providing the cell line certifies that the cell line is pathogen-free.

9. Application Process

Environmental Health and Safety is responsible for coordinating the review process for applications to possess and use rDNA and other potentially infectious agents at UCI.

Submit two (2) copies: 1 electronic copy – to ibc@uci.edu and 1 copy of your application materials with the appropriate signatures to the IBC to the attention of:

Alice Lee
IBC Administrator
Email Address: ibc@uci.edu
Department: Environmental Health & Safety
Address: 4600 Health Sciences Road
Zot Code: 2725
Phone: (949) 824-8024
Fax Number: (949) 824-1325

Proposals must be received two weeks in advance of a proposal deadline to permit time for Committee review. Approval to use biohazardous materials and recombinant DNA must be obtained prior to initiation of any research project using these materials. Upon receipt of a proposal, the IBC Administrator will prepare an official record file and forward the documents to the Chairperson of the Institutional Biosafety Committee for final signature.

10. Protocol Components

There are several important components of the protocols. In addition to the information below, refer to the [UCI Biological Safety Manual](#) for general biosafety information.

Regulatory Compliance

1. Recombinant DNA activities - The NIH *Guidelines for Research Involving Recombinant DNA Molecules* governs all rDNA activities including those exempt by the guidelines.
2. Educational Activities and Non-rDNA research involving microorganisms and exempt rDNA – Activities involving these agents are not federally regulated but it is the position of the IBC that the procedures and containment levels outlined in the CDC publication *Biosafety in Microbiological and Biomedical Laboratories* will govern such activities.
3. Biological Toxins - These agents are not governed by NIH or CDC regulations or guidelines. Although Material Safety Data Sheets (MSDS) are available for most of these agents, specific exposure levels, to our knowledge, have not been established. EH&S will work with the PI to interpret the MSDS and to establish work and disposal procedures which will protect the users of the materials and the environment outside the laboratory.

4. Exposures to Bloodborne Pathogens, Blood, and Other Body Fluids - OSHA's standard for bloodborne pathogens will govern any activity involving human blood or other potentially infected body fluids. Compliance with this standard is administered by EH&S. Information on UCI's Bloodborne Pathogens Program can be obtained by contacting the Biosafety Officer.
5. Disposal of Infectious Materials - Governed by the Environmental Protection Agency and administered by EH&S.

Laboratory Safety Training

All laboratory personnel must be informed of the hazards associated with the work and proper safety precautions. Such training is a continuing process that begins before a person starts laboratory work and requires regular supervision and emphasis. Each person identified on the protocol is required to complete safety training. Laboratory Core Safety and Hazardous waste training are required to be completed every three years. Bloodborne pathogens training, when necessary, is required annually. Based on the nature of the work performed in the study, specialized training such as Select Agents and Viral Vectors may be required.

Risk Assessment

The Committee will evaluate the potential risk of exposure based on the use of the infectious agent(s) proposed in the protocol. Approval of a protocol will be contingent upon the Principal Investigator's follow through of the Committee's recommendations for Medical Surveillance. As part of the Medical Surveillance program, the Principal Investigator and each person listed on the protocol must complete the Risk Assessment form. The risk assessment will include requirements for engineering controls, personal protective equipment, health assessment, prophylactic immunizations, titers, and serum surveillance recommendations. Based on the completed Risk Assessment, the BSO along with the Licensed Health Care Provider will determine the appropriate health assessment.

Specimen Transport

Human specimens and diagnostic samples are frequently transported between locations on the campus or from the campus to off-campus locations. A properly labeled (biosafety sticker indicating agent identity) leak-proof transport carrier should be used during transport. Examples of acceptable containers include a Playmate® cooler or a Nalgene® Bio Transport Carrier. If materials are being transported outside the United States, you will need to contact the Export Control Administrator at 949-824-0445 to determine if the shipment is allowed and if a permit is required.

Packaging and Shipment of Biological Materials

The importation or shipment of biological materials is governed by the Centers for Disease Control. Information required of the PI for receipt or shipment is contained in Appendix C of CDC's 5th Edition of the [*Biosafety in Microbiological and Biomedical Laboratories \(BMBL\)*](#).

Use of Animals

The requirements governing the use of animals with biohazardous agents are similar to, but not identical to, the requirements for the use of the same agent in laboratory situations. The PI, in conjunction with the Institutional Animal Care and Use Committee (IACUC), is responsible for determining the appropriate Animal Biosafety Level (ABSL) for the specific agent being utilized. NIH's *Guidelines for Research Involving Recombinant DNA Molecules* or CDC's *Biosafety in Microbiological and Biomedical Laboratories* should be consulted for the appropriate classification and requirements for the use of the proposed agent.

11. Reporting Requirements

In accordance with Section IV-B-7-c-(3) of the NIH Guidelines, all changes to a protocol that occur subsequent to IBC approval must be promptly reported to the IBC. Any revised documents must be submitted to the IBC for review and approval prior to initiation of these changes. The amendment form used to inform the IBC of any such changes is located on the IBC [website](#).

Review Process for Research Involving Animals or Human Subjects

Reviews by the Institutional Animal Care and Use Committee (IACUC) and the Institutional Review Board (IRB)/ Human Stem Cell Research Oversight Committee (hSCRO) can take place either before or concurrently with IBC review. However, the IACUC or IRB/hSCRO cannot grant final approval until IBC approval has been granted. Data concerning the IBC protocols are shared with the Office of Research database on a regular basis. Upon request, the IBC Administrator will provide the IACUC or IRB/hSCRO Administrator with a copy of the IBC approval letter.

The IBC will notify the IACUC or IRB/hSCRO if they note any concerns. In addition, the IACUC or IRB/hSCRO can invite an IBC member to the meeting where the continuing report is reviewed if they have concerns about the protocol.

Whenever a protocol is resubmitted to the IACUC or IRB/hSCRO as a new protocol, that protocol must also be resubmitted for IBC review even if the study procedures have not changed.

For human gene transfer studies, please note that IBC approval cannot be granted until [Recombinant DNA Advisory Committee](#) (RAC) review has been completed. IRB/hSCRO review *can* occur before or after RAC review.

Special Notes for Research Involving Human Subjects

Investigators conducting research that involves the transfer of recombinant DNA molecules into one or more human research subjects must review [Appendix M, Requirements for Protocol Submission, Review, and Reporting – Human Gene Transfer Experiments](#), of the NIH Guidelines:

1. Any adverse events experienced by participants in Human Gene transfer trials that are serious, unexpected and related, or possibly associated with the gene transfer product should be reported to OBA within 15 calendar days of sponsor notification, unless they are fatal or life threatening; in which case, they should be reported within 7 calendar days. Other serious adverse events should be reported to OBA as part of the Principal Investigator's annual report to OBA. These are found in Appendices [M-1-C-3](#) and [M-1-C-4](#) of the [NIH Guidelines](#).
2. If adverse events are experienced by faculty, staff, students, and volunteers while working around or with biohazardous materials involved in Human Gene transfer trials, the Principal Investigator will report problems within 24 hours by submitting a completed [Adverse Event and Non-Compliance to NIH Guidelines Reporting Form](#) to the Biosafety Officer at ibc@uci.edu who will then forward the report to the IBC for review.

The IBC and the Associate Vice Chancellor for Research will determine whether a report must be sent to the Office of Biotechnology Activities, NIH, 6705 Rockledge Drive, Suite 750, MSC 7985, Bethesda, MD 20892-7985 within 30 days after the occurrence.

Some useful resources to refer to when assessing containment levels can be found in the Appendices of the [NIH Guidelines](#):

- [Appendix B](#) - Table 1: Basis for the Classification of Biohazardous Agents by Risk Group (RG)
- [Appendix G](#) – Physical Containment
- [Appendix I](#) – Biological Containment
- [Appendix K](#) – Physical Containment for Large Scale Uses of Organisms Containing Recombinant DNA Molecules
- [Appendix P](#) – Physical and Biological Containment for Recombinant DNA Research Involving Plants
- [Appendix Q](#) – Physical and Biological Containment for Recombinant DNA Research Involving Animals

12. RELEVANT LINKS

[NIH Guidelines](#)

[Office of Biotechnology Activities Recombinant DNA and Gene Transfer](#)

[CDC and NIH Biosafety in Microbiological and Biomedical Laboratories](#) (BMBL)

[American Biological Safety Association Risk Group Classification for Infectious Agents](#)

[Select Agents Toxins List](#)

[Recombinant DNA and Gene Transfer Frequently Asked Questions](#)