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OFFICE OF ENVIRONMENT, HEALTH AND SAFETY
UNIVERSITY HALL, 3rd FLOOR

BERKELEY, CALIFORNIA 94720-1150

April 26, 2006

Edward H. Hammond
Director
The Sunshine Project
PO Box 41987
Austin, TX 78704

Re: IBC Minutes

Dear Mr. Hammond:

Thank you for your correspondence of March 15, 2006. As you requested, we have enclosed copies of the minutes for the University of California, Berkeley's Institutional Biosafety Committee ("IBC") meetings held after May 1, 2003 (approved copies of minutes were available for the inclusive dates May 8, 2003 to February 2, 2006.)

In accordance with the National Institutes of Health (NIH) Guidelines on Research Involving Recombinant DNA Molecules, the NIH guidance document "Minutes of Institutional Biosafety Committees" dated May 14, 2004, and the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the University has made certain redactions on the copies of the IBC minutes provided. Specifically, we have redacted information necessary to protect the privacy and security interests of the affected parties.

In answer to your question regarding the National Academies of Science's report "Biotechnology Research in an Age of Terrorism" published by the National Academies Press in 2004, please refer to the IBC's discussion of that topic in the minutes dated November 1, 2004.

If you have any questions, feel free to contact me at (510) 643-6562 or srosen@berkeley.edu.

Sincerely,

Sonia Rosenberger, DVM
Biosafety Officer

Attachments: 13

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
February 2, 2006

10:00 AM - 11:00 AM — 370 University Hall/Teleconference

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia, M.P.H.	California Department of Health Services
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety

Members Absent

Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

1. Administrative

Attendance at this meeting was by teleconference or in-person.

The January 2006 meeting minutes were approved.

The Biosafety Officer reported the following:

- the Committee's annual report to the National Institute's of Health (NIH) was submitted on January 11th;
- NIH interpretation letter, dated January 11th, on which classes of transgenic animal experiments are covered by the NIH Guidelines; some experiments with knock-out animals are covered; some experiments the Committee was reviewing are not; the transgenic animal section of the BUA form was revised accordingly;
- NIH interpretation guidance, dated January 18th, on reporting recombinant DNA incidents

2. Biological Use Authorization (BUA) review

a. BUA No. 2 — PI: [redacted]

Material(s): *Borrelia burgdorferi, Bartonella* spp. (*B. henselae, B. vinsonii arupensis, B. vinsonii berkhoffii, B. washoensis*), West Nile virus, human blood, and wild-caught rodents

This BUA amendment proposed the use of potentially West Nile virus-infected ticks *in vivo*. The Committee also reviewed the existing work with *Borrelia burgdorferi,*

Bartonella spp. (*B. henselae, B. vinsonii arupensis, B. vinsonii berkhoffii, B. washoensis*), human blood from *Borrelia burgdorferi*-infected patients, and wild-caught rodents to renew the BUA.

Professor [redacted]'s laboratory is evaluating how Lyme disease and related tick-borne pathogens are maintained and distributed in the western United States, and whether ticks play a role in the transmissibility of *Bartonella* spp. and West Nile virus to humans and animals.

The Committee approved the protocol subject to the following conditions:

- provide job classifications for S. Byrne and C. Wu;
- provide agents and materials for S. Byrne and B. Slikasi;
- ensure the person who transports blood samples, procured in the West Nile virus study, to the University of California, Davis transports them in accordance with Department of Transportation regulations for infectious substances;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." An online course will be available in the future for the principal investigator to attend;
- ensure that laboratory personnel read the following publications as part of their initial and refresher training:
  - *Borrelia burgdorferi*
    - *Borrelia* section, *Tryponema, Borrelia, and Leptospira* IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p 384-390.
    - Public Health Agency of Canada MSDS for *Borrelia burgdorferi.*
  - *Bartonella* spp.
    - Clinical Features – Humans IN: Boulouis HJ et al. Factors associated with the rapid emergence of zoonotic Bartonella infections. *Vet Res* 2005 May-Jun;36(3):383-410.
    - Chomel BB et al. Cat scratch disease and other zoonotic *Bartonella* infections. *JAVMA* 2004 Apr;224(8):1270-1279.
  - West Nile virus
    - Hayes EB et al. Virology, pathology, and clinical manifestations of West Nile virus disease. *Emerg Infect Dis* 2005 Aug;11(8):1174-9.
    - Hayes EB et al. Epidemiology and transmission dynamics of West Nile virus disease. *Emerg Infect Dis* 2005 Aug;11(8):1167-73
  - Wild-caught rodents: Guidelines for Handling Animal Reservoirs of Hantaviruses - Recommended Field Research Practices for Employees of the University of California, Berkeley. Aug 2005.

b. BUA No. 67 PI: Raulet
Material(s): Human Immunodeficiency Virus (HIV)-based vector

This BUA amendment proposed the use of an HIV-based viral vector *in vitro* as part of the laboratory's efforts to study the role of natural killer cells in innate immune responses.

The Committee last performed a complete review of Professor Raulet's work in [redacted], and approved the protocol with conditions.

The Committee approved the protocol amendment subject to the following conditions:

- ensure the proposed assay for replication competence is a marker rescue assay; and
- report to CLEB any generation of replication-competent retrovirus.

c. BUA No. 170 PI: Mathies

Agent(s): nontoxigenic *Escherichia coli* O157:H7, *Staphylococcus aureus*, human blood, tissues, and cells

This new BUA proposed the use of nontoxigenic *E. coli* O157:H7 and *S. aureus* strains from the American Type Culture Collection (ATCC.) The Biosafety Officer previously approved the use of human blood, tissues, and cells before a BUA was required for these materials.

Professor Mathies' laboratory is proposing to use these bacteria to develop novel pathogen detection systems for bioterrorism defense and food processing applications.

The laboratory proposed working with the nontoxigenic *E. coli* O157:H7 strain at Biosafety Level 1, consistent with ATCC's classification. A literature review revealed one study (Allerberger F. et al., reference below) that reported two outbreaks of diarrhea +/- hemolytic uremic syndrome associated with nontoxigenic *E. coli* O157 and supported the hypothesis that Shiga toxin production is not obligatory for the pathogenicity of *E. coli* O157 for humans. As the laboratory will be following Biosafety Level 2 for *S. aureus*, and given the literature results, the Committee decided that the laboratory should also follow Biosafety Level 2 for the *E. coli* strain.

The Committee approved the protocol subject to the following conditions:

- successful completion of a laboratory inspection;
- *E. coli* (nontoxigenic O157:H7) will be handled at Biosafety Level 2;
- provide currently missing information on the BUA:
  - emergency information for the principal investigator and lab contact;
  - complete the laboratory equipment, procedures and containment section for *E. coli*;
  - shaker flask containment; and
  - research goals and objectives for the use of human source materials.
- all personnel listed on the BUA are required to attend the Office of Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens" before working with either bacteria. An online course will be available in the future for the principal investigator.
- ensure that applicable laboratory personnel read the following publications as part of their training:
  - *Escherichia coli* (nontoxigenic O157:H7)
    - Allerberger F et al. Nontoxigenic sorbitol-fermenting *Escherichia coli* O157:H-associated with a family outbreak of diarrhoea. *Wein Klin Wochenschr* 2000 Oct;112(19):846-850 (abstract)
    - Public Health Agency of Canada MSDS for *Escherichia coli*, entertoxigenic.
  - *Staphylococcus aureus*
    - *Staphylococcus aureus* section,IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p 202-213.
    - Public Health Agency of Canada MSDS for *Staphylococcus aureus*.

3. Discussion items

a. [redacted] Animal Facility Biocontainment Facility online training

The Committee was asked to review a new online refresher training that was designed to meet the annual requirement for annual Biocontainment Facility training.

The Committee felt that the pace was adequate, and that the procedural review was good to have on a refresher basis. The Committee had only one suggestion: replace the existing web link color to the more conventional blue for clarity.

b. Professor [redacted]'s response to a Committee request

In October, the Committee reviewed Professor [redacted]'s BUA, and expressed some concern that the use of antibiotic resistance genes may develop *Listeria monocytogenes* resistant to a therapeutic antibiotic. Professor [redacted]'s laboratory performed an experiment to evaluate that potential outcome, and submitted the results to the Committee for review, that demonstrated that the laboratory will not be generating *Listeria monocytogenes* resistant to a therapeutic antibiotic.

c. *In vivo Toxoplasma gondii* studies outside of the Biocontainment Facility

In May 2003, the Committee reviewed a request from Professor [redacted] to perform *in vivo* experiments with *T. gondii* in the [redacted] animal facility. The Committee denied the request at the time.

Professor [redacted] has renewed the request. As rodents are end-stage hosts for *T. gondii*, they should not shed oocysts in their feces or any other secreta or excreta, and should only retain bradyzoites in muscle tissues. Therefore, since rodents should not shed the infectious agent in their bedding, the request to perform experiments with *T. gondii* in rodents outside of the Biocontainment Facility, but using Biosafety Level 2 procedures, is plausible.

A literature review revealed a recent study on the peroral infectivity of *T. gondii* in immunocompetent and immunodeficient mice (Piao LX et al. *Microbiol Immunol* 2005, 49(3):239-243.) On days 7-8 after peroral infection, the immunocompetent mice did not have oocysts in their feces, but the immunodeficient (interferon-gamma knock-outs) mice did have evidence of shedding the organism. Interferon-gamma is reported to be a key factor in the immunity against *T. gondii* infection.

Professor [redacted] currently performs experiments with mice that are knocked out for thymocyte-specific proteins in an effort to study the role of T-cells in infections.

The Committee decided that, pending approval by the Office of Laboratory Animal Care (OLAC) and the Animal Care and Use Committee, that *T. gondii* experiments in rodents could be performed in the Life Sciences Addition animal facility provided that:

- all injections, sampling, and necropsies occur in a certified biological safety cabinet;
- animal care staff receive training on *T. gondii* from either an OLAC veterinarian or the Biosafety Officer;
- cages/wastes from immunodeficient mice may require handling and treatment more consistent with Biocontainment Facility procedures depending on the likelihood that the knock-out mice in use are immunodeficient in a way that would allow shedding in

the feces. The Committee would like to discuss this last point further with Professor [redacted] before approving the use of *T. gondii* in knock-out mice in the Life Sciences Addition animal facility.

d. Committee's role in laboratory design

The Biosafety Officer asked the Committee what role they would like to have in the design or retrofit of biological laboratories on campus. This role is not in the current bylaws for the Committee.

The Committee decided that they would like the opportunity to review and provide comments on design plans for biological laboratories on campus. As the Committee has had to decline approval of some experiments for facility design issues, the Committee felt that their review of designs would be beneficial for future principal investigators.

e. Training for the [redacted] laboratory

As a follow up to the Committee's review in October of Professor [redacted]'s proposed work with pXO2 positive strains of *Bacillus anthracis* (work still pending CDC registration), the Biosafety Officer wanted to add the following approval condition: personnel who will be working with these strains should get hands-on training from personnel who work with the intact agent. The Committee concurred.

f. Procedure request from Professor Welch

Professor Welch requested the use of microscopy equipment in [redacted], which is not currently on the BUA. He would like to study the movement of live *Rickettsia parkeri* infecting insect cells. The cells will be in a plastic tissue culture plate with a coverslip built into the bottom, the plate will be wrapped in parafilm, and the plate will not be opened during the procedure. Approval to use the space has been granted by the space's owners.

The Committee approved the request. The plates must be placed in a leak-tight container labeled with the biohazard symbol during transport across campus.

g. Deviation from standard training requirements for Professor Kumar

The Biosafety Officer asked the Committee for a special deviation from the requirement that all personnel on a BUA must attend the EH&S course "Biosafety for Human, Animal, and Plant Pathogens." A new faculty member in the Bioengineering department will be working with human cell lines. The laboratory will also have rotating students, and the principal investigator inquired whether the rotating students would be required to attend the EH&S course.

If the students are likely to work with biohazardous materials during their other rotations, similar to public health students, they should attend the EH&S course. However, if they aren't, then either the principal investigator, an MD, or the lab contact can give and document Bloodborne Pathogens training in the laboratory.

h. BUA needed for field research in China?

The Biosafety Officer received a call from a graduate student who will be performing field work in China analyzing water samples from reservoirs for algae, and if the algae counts are significant, algal toxins using a colorimetric assay. Is a BUA required?

The Committee decided that an SOP or a BUA may be warranted. The Biosafety Officer will follow up with the graduate student to determine the likelihood that the student may be exposed to additional pathogens while sampling.

i. Toxin protocol reviews

The BUA instructions indicate that the Biosafety Officer reviews and approves work with toxins. The Biosafety Officer asked the Committee whether certain toxin protocols should also be reviewed and approved by the Committee. The Committee decided that the Biosafety Officer can perform an initial assessment and bring protocols to the Committee that require additional assessment. Some protocols may only require additional review by the Occupational Health Physician.

4. Next meeting

The March 2nd conference call meeting is scheduled for 10:00 – 11:00 AM. A concurrent in-person meeting will be held in 370 University Hall.

Deferred to a future meeting:

- Frequency of in-person meetings

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
January 5, 2006

10:00 AM - 11:00 AM — Teleconference

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia, M.P.H.	California Department of Health Services
Steven Lindow, Ph.D.	Plant and Microbial Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Diane Liu, M.D., M.P.H.	University Health Services

Guest

G. Steven Martin, Ph.D.	Molecular & Cell Biology

1. Administrative

Attendance at this meeting was by teleconference.

The December 2005 meeting minutes were approved.

The Biosafety Officer reported to the Committee that the Committee's recommended changes to the Biological Use Authorization form have been completed for the following sections: "Toxins—Characterization and Handling", "Toxins—Additional Precautions" and "New Use—Characterization." The Biosafety Officer also reported that a new section has been added: "Nonhuman Primate Materials—Characterization and Handling."

2. Biological Use Authorization (BUA) review

a. BUA No. 162 PI: [redacted]

Material(s): Transgenic mice, transgenic zebrafish, human cell lines, nonhuman primate cell lines

This BUA renewal proposed the continued generation and use of transgenic mice and zebrafish (transgene: odorant receptor genes and other sequences normally expressed in the olfactory system and other parts of the nervous system.)

Professor [redacted]'s laboratory is evaluating the ligand binding specificities of olfactory receptors.

The committee approved the protocol in its current form.

The Biosafety Officer approved the use of human and nonhuman primate cell lines subject to the following conditions:

- correct items noted during the laboratory inspection:
  - For the shared space room 244 Life Sciences Addition, update the Chemical Inventory and include biohazards; and
  - Verify appropriate centrifuge containment. If cell lines are spun at less than 1,000g, then normal centrifuge tubes are adequate. If not, then either screw-top tubes with o-rings or a biosafety-lidded rotor should be used.
- all personnel listed on the BUA are required to attend the Office of Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens."

b. BUA No. 167 PI: [redacted]
Material(s): Transgenic mice, human cell lines

This new BUA proposed the use of transgenic mice (transgene: green fluorescent protein, dysfunctional Smad3, dysfunctional transforming growth factor-beta1) and human cell lines *in vivo*.

Assistant Professor [redacted]'s laboratory is studying the biochemical pathways that regulate the behavior of adult stem cells.

The committee approved the protocol in its current form.

c. BUA No. 165 PI: Martin
Agent(s): Amphotropic Moloney Murine Leukemia Virus (MMLV)-based vector, human cancer cell lines, nonhuman primate cell lines

This BUA amendment proposed the use of oncogenes in amphotropic MMLV-based vectors. The Committee also reviewed the existing work with MMLV vectors expressing oncogene suppressors, and human and nonhuman primate cell lines to renew the BUA.

Professor Martin's laboratory is studying the role of oncogenes and signaling protein pathways in the malignant phenotype of human cancer cells.

The committee postponed approval of oncogene expression in amphotropic MMLV-based vectors pending options for Biosafety Level 2 with Biosafety Level 3 work practices in the current shared laboratory space. The Chair and Biosafety Officer will consider options with the principal investigator and the other shared space principal investigators.

The committee approved the remainder of the protocol subject to the following conditions:

- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." An online course will be available in the future for the principal investigator to attend;

- ensure that laboratory personnel read the following publications as part of their refresher training:
  - Murine retroviruses. IN: Chapter 9 – Overview of the Retrovirus Transduction System. Current Protocols in Molecular Biology, 1996;
  - Mosier D. Safety Considerations for Retroviral Vectors: A Short Review, The Scripps Research Institute; and
  - Kaiser J. Gene therapy. Panel urges limits on X-SCID trials. Science. 2005 Mar 11;307(5715):1544-5.
- report to CLEB any generation of replication-competent retrovirus.

3. Discussion items

a. Wallet cards

At the December 2005 meeting, the Committee recommended the following for personnel working with tetrodotoxin: "ALL exposure incidents must be reported to 911, and the person affected transported to a hospital (e.g., Alta Bates) for observation. Personnel should bring information on what they were exposed to with them."

One method of bringing information is a wallet card. The Biosafety Officer noted that during the 2005 American Biological Safety Association annual meeting that wallet cards were discussed by a speaker. Several institutions have and do use them. Consolidated recommendations were:

- do not include medical advice;
- do not include the campus logo;
- include the agent/material name, anticipated effects, diagnostic information, etc.; and
- have the cards reviewed by counsel.

b. Committee bylaws

The Committee reviewed the revised bylaws discussion draft proposed by the Biosafety Officer. A full discussion of the bylaws will be postponed pending additional guidance from the Research Compliance Advisory Committee. In the interim, the Committee has been asked to generate questions regarding what should be addressed in the bylaws. For instance, the discussion draft included provisions for stopping work and facility review that will require review for compliance with applicable campus policy.

c. Plant project review

The Committee reviewed the proposed BUA section(s) for plant projects that require the Committee's approval under the NIH Guidelines for Research Involving Recombinant DNA Molecules.

Professor Lindow recommended:

- clarify the line item regarding "bench work" to more clearly refer to plants maintained on the laboratory bench; and
- make the Decontamination and Disposal sections more plant-specific, i.e., include specific information for seeds, soil, etc.

The Biosafety Officer has not received recommendations yet from the Greenhouse Manager, but will incorporate any comments received.

4. Committee training

The NIH Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines) state that "(t)he Institutional Biosafety Committee Chair is responsible for ensuring that Institutional Biosafety Committee members are appropriately trained... regarding laboratory safety and implementation of the NIH Guidelines."

In addition to project-specific supportive literature routinely included with the BUAs, the following items were included in the Committee's pre-meeting materials:

- Animal and Plant Health Inspection Service (United States Department of Agriculture) – Biotechnology Regulatory Services, permitting lecture from the October American Biological Safety Association conference (transgenic plant permits); and
- Kaiser J. Panel urges limits on X-SCID trials. *Science* 307:1544-5, 2005 (MMLV vector-induced leukemia in human gene therapy.)

5. Next meeting

The February 2nd conference call meeting is scheduled for 10:00 – 11:00 AM. A concurrent in-person meeting will be held in 370 University Hall.

Deferred to the next meeting:

- Frequency of in-person meetings

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
December 2, 2005

10:00 AM - 11:00 AM 370 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Diane Liu, M.D., M.P.H.	University Health Services
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Jennifer Hsia, M.P.H.	California Department of Health Services
Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Steven Lindow, Ph.D.	Plant and Microbial Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
David Schaffer, Ph.D.	Chemical Engineering

1. **Administrative**

Attendance at this meeting was in-person or by teleconference. Two members were unable to attend the meeting and provided input by e-mail: Professor Ellen Robey provided protocol review comments, and community member Jennifer Hsia provided protocol approvals with conditions.

The November 2005 meeting minutes were approved.

The Biosafety Officer updated the Committee on a future membership change: Associate Professor David Schaffer will have served the five year minimum commitment on the Committee as of January 2006, and will be leaving this Committee in order to participate on a nationwide committee for the National Institutes of Health.

2. **Biological Use Authorization (BUA) review**

a. BUA No. 164 PI: Kaufer
Agent(s): Herpes simplex viral vector

This new BUA proposed the use of HSV-1 based viral vectors *in vitro*.

Assistant Professor Kaufer's laboratory is evaluating the molecular events that underlie the plasticity of the brain in face of stress and neurological insults. Dr. Kaufer is a new

Principal Investigator and will be working in Associate Professor David Schaffer's laboratory initially.

The committee approved the protocol subject to the following conditions:

- document the principal investigator's previous breadth of experience in infectious disease work on the "New Use – Characterization" page (to supplement the scientific paper provided electronically - Kaufer D. et al. Restructuring the neuronal stress response with anti-glucocorticoid gene delivery *Nat Neurosci* 2004 7(9):947-53): breadth and years of Biosafety Level 2 experience, and list of research protocols to be used with the agent;
- all personnel listed on the BUA are required to attend the Office of Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens"; and
- ensure that laboratory personnel read the following publications:
  - Gogev S, Schynts F, Meurens F, Bourgot I, Thiry E. Biosafety of herpesvirus vectors. *Curr Gene Ther.* 2003, 3(6):597-611; and
  - Public Health Agency of Canada MSDS and agent summary from CDC's Biosafety in Microbiological and Biomedical Laboratories for Herpes simplex virus.

b. BUA No. 139 PI: [redacted]

Agent(s): Semliki Forest virus-based vector, HIV-based vector, nonhuman primate cell line, human cell line, transgenic mice

This BUA amendment proposed the use of transgenic mice (transgene: wild-type and mutant glutamate receptors.) The Committee has previously approved work with the other agents listed, and reviewed the work to renew the BUA.

Assistant Professor [redacted]'s laboratory is studying the role of glutamate receptors in the development and regulation of neural circuits in the brain.

The committee approved the protocol subject to the following conditions:

- correct items noted during the laboratory inspection:
  - recertify the biological safety cabinet;
  - dispose all of the above materials as medical waste;
  - use double-thick bags for plastic serological pipet disposal;
  - document that the emergency eyewash is tested monthly; and
  - pending information from the campus ergonomist, obtain a non-fabric covered chair for use at the biological safety cabinet.
- update the laboratory's location (moved September 2005);
- continue to test vectors for replication-competence and report the generation of any replication-competent vectors to the Committee;
- screw cap tubes without o-rings can be used with the above materials for low-speed centrifugations (less than 1000G) as long as tubes are not over-filled;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens;" and
- continue to ensure that laboratory personnel read the following publications as part of their refresher training:
  - Semliki Forest virus vectors

- Lundstrum K. (2003) Semliki Forest Virus Vectors for Large-Scale Production of Recombinant Proteins. Methods in Molecular Medicine 76: 525-543;
- Willems WR, Kaluza G, Boschek CB, Bauer H, Hager H, Schutz HJ, Feistner H. (1979) Semliki forest virus: cause of a fatal case of human encephalitis. Science. 203(4385):1127-9; and
- CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for Semliki Forest virus.

- Human Immunodeficiency virus (HIV)-based vectors
  - Segall H., Sutton RE (2003) Detection of Replication-Competent Lentiviral Particles. *Methods in Molecular Biology* 229: 87-94;
  - Delenda C, Audit M, Danos O. (2002) Biosafety issues in lentivirus production. *Current Topics in Microbiology and Immunology* 261: 123-141;
  - Kappes JC, Wu X. (2001) Safety considerations in vector development. *Somatic Cell and Molecular Genetics* 26(1/6): 147-158; and
  - Public Health Agency of Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summaries for HIV.

c. BUA No. 90 PI: [redacted]
Agent(s): Sindbis virus vectors, tetrodotoxin

This BUA amendment proposed the use of tetrodotoxin *in vitro* and *in vivo*. The Committee has previously approved work with the other agent listed, and reviewed the work to renew the BUA.

Associate Professor [redacted]'s laboratory is researching the neuronal basis of visual sensory processing.

The maximum amount of toxin to be used per injection is 6.4ug in 5ul. The LD_{50} is 8-14 ug/kg by injection in mice, dogs, and rabbits. Using inter- and intra-specific safety factors of 10 each, an extrapolated LD_{50} for a person would be 80-114 ng/kg, equivalent to 5.6-8ug in a 70kg person.

The committee approved the protocol subject to the following conditions:
- the laboratory will not possess greater than 100mg of tetrodotoxin at any time;
- tetrodotoxin by inhalation is extremely potent, therefore, amounts of toxin greater than 1 human LD_{50} by inhalation (100ug) will be stored in a lock box;
- all toxin work will occur during routine work hours to maximize the number of people present in the laboratory who can respond to exposure incidents;
- ALL exposure incidents must be reported to 911, and the person affected transported to a hospital (e.g., Alta Bates) for observation. Personnel should bring information on what they were exposed to with them;
- reconstitution of the toxin and making aliquots from the original vial are considered high-risk events;
  - a second person in line of sight must be present during these events;
  - this work will occur in a fume hood with a minimum face velocity of 100 lfpm;
  - personnel performing the work will wear face protection for splashes; and
  - personnel will post a sign to notify the other members of the lab when these procedures are performed.

- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." An online course will be available in the future for the principal investigator to attend; and
- ensure that laboratory personnel read the following publications:
  - Sindbis virus vectors
    - Wahlfors JJ, Zullo SA, Loimas S, Nelson DM, Morgan RA. (2000) Evaluation of recombinant alphaviruses as vectors in gene therapy. *Gene Ther* 7:472-480; and
    - Public Health Agency of Canada MSDS and CDC Biosafety in Microbiological and Biomedical Laboratories agent summary for sindbis virus.
  - Tetrodotoxin
    - Tetrodotoxin entry IN: Potential Military Chemical/Biological Agents and Compounds, Army Field Manual No 3-9, 1990; and
    - Isbister GK, Kiernan MC. Neurotoxic marine poisoning *Lancet Neurol* 2005 4(4):219-28.

d. BUA No. 98 PI: [redacted]
Agent(s): Pseudorabies virus

This BUA amendment proposed the use of pseudorabies virus *in vivo*. The Committee has previously approved work with pseudorabies virus *in vitro*, and reviewed the work to renew the BUA.

Professor [redacted]'s laboratory is researching the visual response.

The Committee determined that this work requires Biosafety Level 2 and Animal Biosafety Level 2 containment.

The committee approved the protocol subject to the following conditions:
- Mouth-pipetting, even with a diaphragm or filter in-line, can be obviated by the use of a microsuction pipettor, and this device must be used instead.
- the principal investigator attends the online version of the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens", when it is available; and
- ensure that laboratory personnel read the following publication as part of their refresher training: Mravak s, Bienzle U, Feldmeier H, Hampl H, Habermehl KO. Pseudorabies in man. *Lancet* 1987 1(8531):501-2.

e. BUA No. 88 PI: Chan
Agent(s): Large scale *Escherichia coli*

This BUA amendment proposed the large-scale growth of recombinant *Escherichia coli* expressing human Abl kinase 1a, YoPH tyrosine phosphatase, and chaperone proteins for protein folding.

The committee approved the protocol at the last meeting subject to the condition that the culture could be classified as Good Large Scale Practice (GLSP).

From the NIH Guidelines for Research Involving Recombinant DNA Molecules, "Good Large Scale Practice is recommended for large-scale research or production involving

viable, non-pathogenic, and non-toxigenic recombinant strains derived from host organisms that have an extended history of safe large-scale use."

Additional details from e-mails exchanged by Committee members since the last meeting are provided below in addition to the Committee's discussion at this meeting.

The host organism (*E. coli* BL21), plasmids, marker genes, and proteins of interest all met the definition of GLSP with the potential exception of YoPH tyrosine phosphatase.

YoPH, from *Yersinia pseudotuberculosis*, is one of the required virulence factors for *Yersinia* spp. It is included in the culture to reduce the toxicity of the protein of interest and obtain greater protein yields.

A literature review of YoPH tyrosine phosphatase resulted in the following information:

- YoPH is a highly active protein tyrosine phosphatase, part of the type III secretion system of bacteria, targets an array of signaling pathways important for innate and adaptive immunity, and also impairs macrophage phagocytosis (Viboud GI et al., *Annu Rev Microbiol*, 2005, 59:69-89.)
- YoPH shows partial homology to eukaryotic protein tyrosine phosphatases and one of *S. typhimurium*'s type III secretion proteins (not required for virulence), but not to the other type III secretion systems in pathogenic bacteria (Hueck CJ, *Microbiol Mol Biol Rev*, 1998, 62:379-433). It also must be transported into the host cell's cytosol to act.
- YoPH's effect on eukaryotic cells: Hueck (1998) also referred to data from other researchers that "[i]n HeLA cells, YoPH was demonstrated to specifically dephosphorylate focal adhesion kinase and the focal adhesion-associated protein p120cas, and dephosphorylation of these proteins appears to inhibit bacterial uptake by HeLa cells via inhibition of peripheral focal complex formation."

The Committee considered the likelihood and impact of YoPH expression on other bacteria or fauna gut cells upon release using the following factors:

- GLSP is an uncontained system, although waste is treated;
- the GLSP organism *E. coli* K12 can survive in the gut and non-sterile water for up to 7 days. However, K12 does not colonize the gut.
- Yancey RJ et al. (*J Ind Microbiol*, 1993, 11:259-271) tested a K12 strain containing antibiotic resistance markers and a plasmid expressing bovine somatotropin in response to an FDA request to monitor the potential transfer of genetic material to indigenous flora. In healthy mice, no plasmid transfer was detected in the gut.
- YoPH would not confer anything not existing in current pathogenic *Yersinia* spp.;
- YoPH likely would not increase the virulence of other bacteria as they have their own type III secretion systems; and
- YoPH must be transported into the cytosol of eukaryotic cells to impair bacterial phagocytosis.

The Committee decided that:

- While the likelihood of YoPH expression in fauna gut cells is low, and the impact would probably be insignificant if expression did occur, the majority opinion was to take the more conservative approach for expression of a virulence factor, and this fermentation was determined to be BSL1-LS (Biosafety Level 1 Large Scale).
- Professor Kuriyan can perform the fermentation at Biosafety Level 1 in his laboratory as long as no single culture vessel contains more than 10 liters.

3. Discussion items

a. *Pseudomonas aeruginosa* biosafety level

Professor [redacted] currently performs *in vivo* work with *Pseudomonas aeruginosa* at Biosafety Level 1 in [redacted]. The Committee discussed the biosafety level of this work as a precursor to renewing the BUA in an upcoming meeting.

Additional details from prior meetings, BUA reviews, the Centers for Disease Control and Prevention (CDC)'s Biosafety in Microbiological and Biomedical Laboratories (BMBL) publication, and the scientific literature are provided below in addition to the Committee's discussion at this meeting.

Historical use of *P. aeruginosa* on campus:

- In 1994, Dr. Fleiszig's work was determined to be Biosafety Level 1 by the Biosafety Officer. No BUA was required at the time.
- In 1996, the Committee reviewed the work, and because *P. aeruginosa* was not included in the BMBL, the Committee also determined that *P. aeruginosa* required Biosafety Level 1 containment. However, the Committee decided that personnel should be apprised of the potential hazards of this opportunistic pathogen and be offered additional personal protective equipment should they feel it was necessary.
- In late 2004, the Committee approved the use of *P. aeruginosa* in frogs at Animal Biosafety Level 2. Animal Biosafety Level 2 was required due to 1) potential for aerosol generation from animals housed in water in containers with perforated lids, 2) the classification of *P. aeruginosa* as Risk Group 2 by many countries (still not mentioned in the BMBL), and 3) cases of *P. aeruginosa* infection in healthy adults reported in the literature (although infrequent.) A BUA condition for the frog work was that if reusable animal cages were used, that they be treated according to Animal Biosafety Level 2 procedures followed in the [redacted] Animal Facility unless otherwise approved by the Committee. This meant that cages would be washed in a mechanical cage washer with a final rinse temperature of at least 180°F as specified in the BMBL.
- In late 2004, the Biosafety Officer reviewed *in vitro* and short-term *in vivo* work with *P. aeruginosa* in Dr. [redacted]'s laboratory, and those procedures met Biosafety Level 2 requirements. Research personnel wear laboratory coats, gloves, and safety glasses with sideshields. Animals are infected with *P. aeruginosa* topically to the eye. Animals are disposed of as medical waste. Animal cages are bagged, transported by staff from the Office of Laboratory Animal Care (OLAC) to the [redacted] Animal Facility, and washed in a mechanical cage washer that meets the temperature requirements in the BMBL. Long-term (greater than 12 hours) animal experiments required cage changes by researchers and marking of cages with infected animals/notification of the OLAC manager.

Biosafety level definitions (BMBL):

- Biosafety Level 1
  - "...appropriate for...laboratories in which work is done with defined and characterized strains of viable microorganisms not known to consistently cause disease in healthy adult humans"
  - "Animal Biosafety Level 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."

- Biosafety Level 2
  - "...applicable to...laboratories in which work is done with the broad spectrum of indigenous moderate-risk agents that are present in the community and associated with human disease of varying severity. With good microbiological techniques, these agents can be used safely in activities conducted on the open bench, provided the potential for producing splashes or aerosols is low."
  - "...agents of moderate potential hazard to personnel and the environment. It differs from BSL-1 in that (1) laboratory personnel have specific training in handling pathogenic agents and are directed by competent scientists; (2) access to the laboratory is limited when work is being conducted; (3) extreme precautions are taken with contaminated sharp items; and (4) certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment."
  - "Animal Biosafety Level 2 involves practices for work with those agents associated with human disease."
- Risk assessment
  - "Agent summary statements are presented for agents which meet one or more of the following criteria: the agent is a proven hazard to laboratory personnel working with infectious materials (e.g., hepatitis B virus, *M. tuberculosis*); the potential for laboratory-associated infections is high, even in the absence of previously documented laboratory-associated infections (e.g., exotic arboviruses); or the consequences of infection are grave."
  - "Risk assessments and biosafety levels recommended in the agent summary statements presuppose a population of immunocompetent individuals."
- *P. aeruginosa* is not described in the agent summary statements.

Literature review of *P. aeruginosa* infections in healthy adults:

- Garau J, Gomez L. Pseudomonas aeruginosa pneumonia *Curr Opin Infect Dis* 2003 16(2):135-43
  - "*P. aeruginosa* community acquired pneumonia is rare but can occur in previously healthy patients. It can be rapidly progressive with a 33% mortality rate....
  - Community acquired *P. aeruginosa* respiratory tract infections are increasingly recognized and this etiology has to be considered in patients with risk factors for *P. aeruginosa* infection, namely, structural lung disease, previous hospital admission and recent exposure to antimicrobials."
- Hatchette TF, Gupta R, Marrie TJ. Pseudomonas aeruginosa community-acquired pneumonia in previously healthy adults: case report and review of the literature *Clin Infect Dis* 2000 31(6):1349-56
  - "The role of *P. aeruginosa* as a lower respiratory tract community pathogen is less well-known but there is growing evidence that it can cause infection even in previously healthy persons."
- *Pseudomonas dermatitis*/folliculitis associated with pools and hot tubs—Colorado and Maine, 1999-2000. *MMWR Weekly* 2000 49(48):1087-1091.
- Pseudomonas and related organisms. IN: Murray PR et al. Medical Microbiology. Mosby: St. Louis. 2002.
  - "External otitis is frequently caused by *P. aeruginosa*, with swimming ("swimmer's ear") an important risk factor."
  - "*P. aeruginosa* is also the cause of a variety of other infections...underlying conditions required for most infections are (1) the presence of the organism in a moist reservoir and (2) the circumvention or elimination of host defenses (e.g.,

cutaneous trauma, elimination of normal microbial flora as a result of antibiotic usage...)"

Laboratory-acquired infections:
- None identified in the scientific literature;
- Single (possible) occupational case of community-acquired pneumonia described in a nursing assistant (Hatchette TF et al., 2000, below);
- The risk of occupational infection for hydrotherapy pool workers was evaluated in Penny PT. Hydrotherapy pools of the future--the avoidance of health problems. *J Hosp Infect* 1991 18 Suppl A:535-42. The conclusion was that "pathogenic species of *Pseudomonas aeruginosa* in pools...rarely cause body rashes (pseudomonas folliculitis) unless there has also been prolonged skin wetting."

The organism is ubiquitous. From "*Pseudomonas* and related organisms. IN: Murray PR et al. Medical Microbiology. Mosby: St. Louis. 2002":
- "...ubiquitous organisms found in soil, decaying organic matter, vegetation, and water."
- "...uncommon for carriage to persist in humans as part of the normal microbial flora..."
- "Pseudomonads are opportunistic pathogens present in a variety of environments...The ability to isolate these organisms from moist surfaces may be limited only by the efforts to look for the organism. Pseudomonads have minimal nutritional requirements, can tolerate a wide range of temperatures (4°C to 42°C), and are resistant to many antibiotics and disinfectants. Indeed, the recovery of *Pseudomonas* from an environmental source (e.g., hospital sink or floor) means very little unless there is epidemiologic evidence that the contaminated site is a reservoir for infection."

Conclusions:
- *P. aeruginosa* is a risk group 2 organism, one that can cause disease in healthy adults, although rarely.
- The risk of laboratory-acquired infection is minute.
- Existing enhanced Animal Biosafety Level 1 practices have been effective. The Committee will review a BUA for Dr. [redacted]'s work in an upcoming meeting and review the existing procedures.

b. Toxin review procedures

The Committee reviewed the proposed toxin sections of the BUA application and the General Exposure Control Methods.

The Committee approved the new sections with the following changes:
- request the latin and trivial name of the toxin;
- for animal toxicity data, include the route of the LD_{50};
- request human toxicity data;
- change the "Disinfection" section title to "Decontamination"; and
- include recommendations for when a biological safety cabinet should be used with toxins.

c. Centrifuge containment

The Biosafety Officer requested the Committee's opinion on appropriate centrifuge containment for Biosafety Level 2 materials that are not cultures of infectious agents, i.e. human blood from 'healthy' donors, viral vectors that should be or are known to be replication deficient.

The Committee decided that biosafety-lidded rotors and o-rings on centrifuge tubes are not required for centrifuging the above materials at low speed (less than 1000G). The BUA must include the instruction, however, that tubes are not to be over-filled.

4. **Next meeting**

The January 5th conference call meeting is scheduled for 10:00 – 11:00 AM. A room with a speaker phone is not available for a concurrent in-person meeting.

Deferred to the next meeting:

- Frequency of in-person meetings

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
November 3, 2005

2:00 PM - 3:00 PM 370 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia, M.P.H.	California Department of Health Services
Diane Liu, M.D., M.P.H.	University Health Services
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Steven Lindow, Ph.D.	Plant and Microbial Biology
David Schaffer, Ph.D.	Chemical Engineering

Guests

Fred Delebecque, Ph.D.	Molecular and Cellular Biology-Biochemistry and Molecular Biology

1. Administrative

Attendance at this meeting was in-person or by teleconference.

The October 2005 meeting minutes were approved.

The Biosafety Officer reviewed the updated Infectious Substances section of the International Air Transport Association's Dangerous Goods Regulations. Some patient specimens are now exempt from the regulations as long as they are shipped in accordance with the packaging requirements for "Exempt human specimen"s. The Committee requested that the Biosafety Officer notify Principal Investigators with Biological Use Authorizations of this update.

2. Biological Use Authorization review

a. BUA No. 67 PI: [redacted]

Agent(s): Herpesviruses (recombinant murine cytomegalovirus, mouse herpesvirus-68 (MHV-68), cytomegalovirus, herpes simplex virus-1), Human immunodeficiency virus (HIV)-type 1 (strain nl4-3), *Listeria monocytogenes,* Lymphocytic choriomeningitis virus, Amphotropic mouse stem cell virus vector (MSCV), Abelson murine leukemia virus (A-MuLV), *Toxoplasma gondii,* Vaccinia virus, human cell line

This BUA amendment proposed the use of HIV (strain nl4-3 and deletion mutants) *in vitro* and A-MuLV *in vitro* and *in vivo*. The Committee has previously approved work with the other agents listed, and reviewed the work to renew the BUA.

Professor [redacted]'s laboratory is evaluating the role that natural killer cells play in innate immune responses and tumor surveillance, the role that T lymphocytes play in innate immune responses, and the immune response to intracellular bacteria.

The committee deferred approval of the HIV-1 work until the following issues are addressed:

- attempt to obtain negative airflow into the tissue culture space ([redacted]) from both the corridor and the main laboratory;
- use a shaker incubator in the laboratory rather than the shared warm room in [redacted];
- add a specific post-exposure protocol;
- provide information on the virulence of the NL4-3 strain, and the deletion mutants;
- predict what, if any, effects the strains may have on the cell lines to be infected (293, primary human lymphocytes) i.e. could virulent virus be produced, changes in culture genotype or phenotype?

The committee approved the remainder of the protocol subject to the following conditions:

- delete rooms [redacted] from the BUA as only fixed, non-viable materials are used in these spaces;
- correct items noted during the laboratory inspection:
  - use 'double-thick' biohazard bags for disposal of plastic pipet tips;
- all personnel listed on the BUA are required to attend the Office of Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens";
- Ensure that laboratory personnel read the following publications:
  - previously recommended articles for MHV-68, L. monocytogenes, T. gondii, and vaccinia virus;
  - Herpesviruses
    - Public Health Agency of Canada MSDS for cytomegalovirus and HSV-1.
    - CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for human herpesviruses.
    - Human herpesviruses IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p475-484, 492-496
  - *Listeria monocytogenes*
    - Roberts AJ, Wiedmann M. Pathogen, host and environmental factors contributing to the pathogenesis of listeriosis. *Cell Mol Life Sci.* 2003 May;60(5):904-18.
    - Public Health Agency of Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary
  - Lymphocytic choriomeningitis virus
    - Public Health Agency of Canada MSDS
    - Arenaviruses IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p615-616
  - Retroviruses (Xenotropic MSCV-vector, A-MuLV)
    - Murine retroviruses. IN: Chapter 9 – Overview of the Retrovirus Transduction System. Current Protocols in Molecular Biology, 1996

- Mosier D. Safety Considerations for Retroviral Vectors: A Short Review, The Scripps Research Institute

b. BUA No. 160 PI: Schlissel

Agent(s): Amphotropic mouse stem cell virus vector, human cell lines

This new BUA proposed the use of xenotropic mouse stem cell virus vectors and human cell lines *in vitro*. This experiment is part of an effort to understand receptor editing during negative selection in immature B lymphocytes.

The committee approved the protocol subject to the following conditions:

- Correct items noted during the laboratory inspection:
  - Recertify the biological safety cabinets. Until then, Biosafety Level 2 work cannot be performed in them.
  - Update your chemical inventory to include the biohazard symbol on the sign.
  - Obtain a secondary container for medical waste.
  - Use double-thick bags for plastic serological pipet disposal.
  - Ensure that glass pipets used with Biosafety Level 2 materials are placed in red sharps containers. If they're used with Biosafety Level 1 materials, they can go in the broken glass container.
- All personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens."
- Ensure that laboratory personnel read the following publications as part of their refresher training:
  - Murine retroviruses. IN: Chapter 9 – Overview of the Retrovirus Transduction System. Current Protocols in Molecular Biology, 1996
  - Mosier D. Safety Considerations for Retroviral Vectors: A Short Review, The Scripps Research Institute

c. BUA No. 157 PI: [redacted]

Agent(s): *Salmonella typhimurium*, amphotropic MSCV-based viral vector, human cell line, transgenic mice

This new BUA proposed the use of *Salmonella typhimurium in vitro* and *in vivo,* amphotropic MSCV-based vectors and human cell lines *in vitro*, and MSCV-transformed murine cells *in vivo*. These experiments are studying the role of Toll-like receptors in the immune response. Professor [redacted] is currently renovating [redacted] laboratory to meet Biosafety Level 2 requirements.

The committee approved the protocol subject to the following conditions:

- final approval is contingent on a successful laboratory inspection;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." An online course will be available in the future for the principal investigator to attend;
- ensure that laboratory personnel read the following publications:
  - Salmonella section, Enterobacteriaceae IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p 266-268, 273-275.
  - Health Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for non-typhi *Salmonella spp.*;

d. BUA No. 134 PI: Li

Agent(s): Adenovirus vectors, Moloney murine leukemia virus (MMLV) vectors, human cell lines

This BUA amendment proposed the use of MMLV-based vectors *in vitro*. Adenovirus vectors are currently in storage only. The Biosafety Officer has previously approved the use of human cell lines *in vitro*.

The committee approved the protocol subject to the following conditions:

- The principal investigator attends the online version of the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens", when it is available.
- Ensure that laboratory personnel read the following publications as part of their refresher training:
  - Murine retroviruses. IN: Chapter 9 – Overview of the Retrovirus Transduction System. Current Protocols in Molecular Biology, 1996
  - Mosier D. Safety Considerations for Retroviral Vectors: A Short Review, The Scripps Research Institute

e. BUA No. 88 PI: Chan

Agent(s): Large scale *Escherichia coli*

This BUA amendment proposed the large scale growth of recombinant E. coli expressing human Abl kinase 1a, YoPH tyrosine phosphatase, and chaperone proteins for protein folding.

The committee approved the protocol subject to the following condition:

- Classification as Good Large Scale Practice

3. Discussion items

a. In vivo use of human source materials

The Committee discussed handling and disposal requirements for the use of human cells and cell lines *in vivo*.

The Committee decided that:

- All personnel and animal handlers will fall under Cal/OSHA' Bloodborne Pathogens standard.
- Animals can be maintained under Animal Biosafety Level 1 conditions.
- Since animal bedding may contain sloughed human cells, dispose of animal bedding as medical waste. The bedding does not need to be autoclaved prior to disposal.

Additional questions to ask the Office of Laboratory Animal Care (OLAC):

- Are cage changes currently being performed in a biological safety cabinet?
- Does OLAC require any testing of cell lines prior to *in vivo* use?
- Does OLAC have any restrictions on the sources of cell lines?

b. Toxin review procedures

The Committee discussed handling and disposal procedures for toxins. The Committee decided that principal investigators will complete the BUA agent section for each toxin to be used. In addition, the Biosafety Officer will draft a toxin section to add to the general exposure control plan, and that section will be based on the toxin handling guidelines in the current edition of the Centers for Disease Control and Prevention's Biosafety in Microbiological and Biomedical Laboratories.

4. Next meeting

The December 1st conference call meeting is scheduled for 10:00 – 11:00 AM.

Deferred to the next meeting:

- BUA form – nonhuman primate materials
- Swiss recombinant DNA risk assessment document

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
October 14, 2005

10:00 AM -12:15 PM — 714C University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia, M.P.H.	California Department of Health Services
Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D.	Chemical Engineering
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology

Guests

[redacted], Ph.D.	Molecular and Cellular Biology-Biochemistry and Molecular Biology
[redacted], Ph.D.	Molecular and Cellular Biology-Biochemistry and Molecular Biology
Bruce King	Lawrence Berkeley National Laboratory
[redacted], Ph.D.	Molecular and Cellular Biology-Biochemistry and Molecular Biology

1. Administrative

Attendance at this meeting was in-person.

The September 2005 meeting minutes were approved. As a follow up to the meeting, the Office of Laboratory Animal Care found a colony, in existence since the 1960s, of *Peromyscus maniculatus* that has been tested for hantaviruses. In addition, the recommended changes to the Biological Use Authorization (BUA) form have been implemented.

The Committee has been asked to replace the student member. The Committee would like to review the applications from students in biology departments. If none possess the required technical expertise, the Chair will poll students working in School of Public Health and Molecular & Cell Biology laboratories.

The Biosafety Officer was recently invited to review coordination of the Biosafety Program with the Office for the Protection of Human Subjects (OPHS) by the new Director, Rebecca Armstrong, D.V.M., Ph.D. OPHS will be sending the Biosafety Officer a report of principal investigators on campus that are obtaining human blood, body fluids, tissues or cells so that the Biosafety Officer can verify a BUA is in place.

2. Biological Use Authorization review

a. BUA No. 52 PI: [redacted]

Agent(s): *Dengue virus, Coxsackie B virus, poliovirus (Mahoney type 1), rhinovirus, influenza virus, sindbis virus, human blood and cell lines, nonhuman primate cell line*

This BUA amendment proposed the use of Coxsackie B virus in conjunction with dengue virus in order to study dengue virus pathogenesis. The Committee has previously approved work with the other agents listed, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:

- address the feasibility of implementing a suggestion from the "Laboratory Containment of Wild Poliovirus in the United States": "The Mahoney strain...(is) wild and should be replaced with authentic OPV vaccine strains from CDC or ATCC."
- address the feasibility of a question from one of the Committee members: "since poliovirus is a rapidly mutating virus, could cap-independent translation be tested by using plasmid constructs to express the polio or rhino 2Apro to cleave eIF4F instead of using live virus?";
- all personnel working with the poliovirus must have documented polio vaccination or documented evidence of immunity to all three poliovirus types;
- consider the use of scalpels with engineered sharps injury protection for animal necropsies (e.g. Becton-Dickinson Bard-Parker Protected Blade System for stainless steel or disposable handles, Fisher Scientific disposable #02-688-78);
- contact the Biosafety Officer for containment recommendations prior to purchasing new cell sorter;
- all personnel listed on the BUA are required to attend the Office of Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens", course code "CBIO." Anyone who has not previously attended can enroll at http://hrweb.berkeley.edu/ice/home/. An online course will be available in the future for Professor Harris to attend;
- Ensure that laboratory personnel read the following publications:
  - Picornaviruses IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p 511-521. (copy provided November 2004)
  - Chen LH, Wilson ME. Nosocomial dengue by mucocutaneous transmission. *Emerg Infect Dis* 2005 May;11(5):775
  - Wahlfors JJ, Zullo SA, Loimas S, Nelson DM, Morgan RA. (2000) Evaluation of recombinant alphaviruses as vectors in gene therapy. *Gene Therapy* 7:472-480. (replication-competent rates for Sindbis vectors, copy provided November 2004)
  - Health Canada MSDS for dengue virus, influenza virus, rhinovirus, Sindbis virus, and CDC's Biosafety in Microbiological and Biomedical Laboratories agent

summaries for dengue virus, poliovirus, influenza virus, Sindbis virus. (Copies provided November 2004)
- Health Canada MSDS for coxsackievirus

b. BUA No. 123 PI: [redacted]
Agent(s): *Toxoplasma gondii, Listeria monocytogenes*

This BUA amendment proposed the use of in vitro and in vivo use of *Listeria monocytogenes*. The Committee has previously approved work with *Toxoplasma gondii*, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:
- correct items noted during the October 12th laboratory inspection;
- complete the Transgenic Animal page;
- verify no human cell lines are being used in the laboratory;
- identify the location of the FACS machine, and whether cells are fixed prior to sorting
- purchase centrifuge safety cups for the table top Sorvall in 475;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens", course code "CBIO." Anyone who has not previously attended can enroll at http://hrweb.berkeley.edu/ice/home/. An online course will be available in the future for Professor [redacted] to attend;
- Ensure that laboratory personnel read the following publications:
  - Kuticic V., Wikerhauser T. Studies of the effect of various treatments on the viability of *Toxoplasma gondii* tissue cysts and oocysts. *Curr Top Microbiol Immunol* 1996; 219:261-5
  - Have all personnel read the Health Canada MSDS and the agent summary in CDC's Biosafety in Microbiological and Biomedical Laboratories for *L. monocytogenes* and *T. gondii*;
- consider the use of scalpels with engineered sharps injury protection for animal necropsies (e.g. Becton-Dickinson Bard-Parker Protected Blade System for stainless steel or disposable handles, Fisher Scientific disposable #02-688-78);

c. BUA No. 131 PI: [redacted]
Agent(s): *Salmonella enteritidis, S. typhimurium*

This BUA amendment proposed an additional in vivo experiment with *Salmonella enteritidis* in order to study the pathogenesis of Salmonella spp. The Committee has previously approved in vitro and in vivo work with non-typhi *Salmonella spp.*, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:
- use filter top tubes when growing Salmonella spp. in the shaker incubator;
- use tubes with screw top caps and o-rings for centrifugation;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens", course code "CBIO." Anyone who has not previously attended can enroll at http://hrweb.berkeley.edu/ice/home/. An online course will be available in the future for Professor [redacted] to attend;
- ensure that laboratory personnel read the following publications:

- Salmonella section, Enterobacteriaceae IN: Murray, Patrick R.; Rosenthal, Ken S.; Kobayashi, George S; Pfaller, Michael A. Medical Microbiology, Fourth Edition. Mosby: St. Louis, 2002, p 266-268, 273-275.
- Health Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for non-typhi *Salmonella spp.*;

- consider the use of scalpels with engineered sharps injury protection for animal necropsies;

d. BUA No. 131 PI: Fletcher

Agent(s): *Giardia intestinalis, Spiroplasma mirum, Mycoplasma mobile,* human blood and cell lines

This BUA amendment proposed in vitro work with *Spiroplasma mirum* and *Mycoplasma mobile* in order to study their biophysics and attachment mechanisms. The Committee has previously approved in vitro work with *Giardia intestinalis* and human blood/cell lines, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:

- move the eating location in the laboratory to the enclosed conference room;
- ensure that laboratory personnel read the following publications:
  - *Giardia lamblia* IN: Lumen-Dwelling Protozoa IN: Markell EK, John DT, Krotoski, WA. Markell and Voge's Medical Parasitology. WB Saunders, Philadelphia, 1999. p56-62 ;
  - Health Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for *Giardia lamblia.*

e. BUA No. 51 PI: [redacted]

Agent(s): *Bacillus anthracis* – attenuated vaccine candidates, *Listeria monocytogenes*

This BUA amendment proposed the in vitro use of pXO2+ attenuated strains of *Bacillus anthracis* as potential vaccine candidates. The laboratory will be growing quantities <5ml. The Committee has previously approved in vitro work with pXO2- strains, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:

- CDC registration is required prior to the use of these strains;
- The BUA does not cover in vivo work;
- Maintain concentrations below 1 x 10e9/ml
- When the new centrifuge is ordered for the laboratory, order centrifuge safety cups
- When the table top autoclave is ordered for the laboratory, order one with a thermistor and plan for spore checks to validate sterilization

f. BUA No. 37 PI: [redacted]

Agent(s): *Listeria monocytogenes, Bacillus anthracis* – attenuated vaccine candidates

This BUA amendment proposed the in vitro use of pXO2- attenuated strains of *Bacillus anthracis* as potential vaccine candidates. The Committee has previously approved in vitro and in vivo work with *Listeria monocytogenes*, but did review the work to renew the BUA.

The committee approved the protocol subject to the following conditions:

- Provide updated language for the potential antibiotic resistance in *Listeria monocytogenes*
- Use filter top flasks for shaker containment.
- Use centrifuge tubes with screw top caps and o-rings for centrifuging Sterne, or move the microfuge into the biological safety cabinet (as long as the centrifuge is not fan-cooled, which would disrupt the cabinet's airflow)
- All personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." Anyone who has not previously attended can enroll at http://hrweb.berkeley.edu/ice/home/. An online course will be available in the future for Professor [redacted] to attend.
- Ensure that laboratory personnel read the following publication excerpts noting that while the Sterne strain has been used as a vaccine, the strain retains residual virulence for certain animal species (included in November 4, 2004, letter).
  - Turnball PCB. Anthrax. p14-vaccines paragraph. IN: Palmer SR, Soulsby L, and Simpson DIH. Zoonoses: Biology, Clinical Practice, and Public Health Control. Oxford University Press: Oxford, 1998.
  - Pezard C, Berche P, Mock M. Contribution of individual toxin components to virulence of *Bacillus anthracis. Infect Immun* 1991 59(10):3472.
  - Welkos SL, Keener TJ, Gibbs PH. Differences in susceptibility of inbred mice to *Bacillus anthracis. Infect Immun* 1981 51(3):795-800 (abstract only).
- Personnel read the following reviews on the intact organism:
  - Turnbull PC. Introduction: anthrax history, disease and ecology. *Curr Top Microbiol Immunol.* 2002;271:1-19.
  - Dixon TC, Meselson M, Guillemin J, Hanna PC. Anthrax. *N Engl J Med.* 1999 Sep 9;341(11):815-26.
  - Health Canada MSDS.
- The tissue culture room has inward directional airflow from the hallway and the main laboratory by a minimum of 0.05" Wg. If the differential pressure cannot be made to achieve 0.05" Wg, the pressure must be acceptable to the Biosafety Officer.
- The laboratory tests each unique batch of every strain for pXO2 before use.
- The laboratory maintains pXO2 plasmid, obtained for testing purposes, in a lock-box.
- Consider the use of scalpels with engineered sharps injury protection for animal necropsies;

3. Discussion items

a. Shipping training for Department of Transportation (DOT)-exempt transports

The Committee discussed whether we would require some form of shipping training for the transport of materials that are exempt from DOT regulations, and therefore also exempt from DOT-compliant shipping training. Given was the example of the transport of an infectious agent from UCB to UCSF by a university employee for non-commercial research purposes.

The California Highway Patrol regulates ground transport of hazardous materials as well. Requirements for the example above would be labeling with the biohazard symbol visible from external to the vehicle, and attaching a complete description of the material and a copy of the BUA door sign.

The Committee decided that training would be required, but that the format should be a one page instructional document.

b. Biosafety Officer-level BUA approvals

The committee agreed that the Biosafety Officer can approve BUAs that solely involve the use of known positive human source materials, as all use of these materials should occur as if they were positive for HIV, HBV, or HCV.

c. BUA application

The Committee decided that:

- The Biosafety Officer should ask during the laboratory inspection how laboratories handle reusable glassware at Biosafety Level 2;
- The NIH Guidelines for Research Involving Recombinant DNA Molecules defines a transgenic animal as an "(animal) in which the animal's genome has been altered by stable introduction of recombinant DNA, or DNA derived therefrom, into the germ-line." Knock-out animals do not meet this definition and therefore, will not be reviewed on BUAs.
- The Committee would like the Biosafety Officer to complete transport requirements for each infectious agent, regardless of whether the PI has checked the transport boxes. Therefore, if the PI wishes to ship materials in the future, they are prepared for the possible requirements.

d. The Committee discussed language to be used in the final BUA cover letter and door sign.

- The Committee recommended adding the following language to the final BUA cover letter: "Please notify the Biosafety Officer beforehand if personnel begin work with agents or materials not currently listed for them in the "Authorized Users" section, or ensure that occupational health precautions are in place."
- The Occupational Health Physician recommended adding the following language to the final BUA cover letter for laboratories that work with agents that could have a detrimental effect during pregnancy: "Personnel who are pregnant or considering becoming pregnant (or whose partner is considering this) should consult with their personal obstetrician regarding a safe pregnancy. If there are concerns regarding specific reproductive hazards in the laboratory, the Occupational Health Physician is available for consultation with the physician at 510-642-6891."

4. Next meeting

The November 3rd meeting is scheduled for 2:00 – 3:00 PM and will be a conference call. Beginning in December, conference call meetings will be scheduled for 10:00 – 11:00 AM the first Thursday of every month.

Deferred to the next meeting:

- Barton BUA review
- Swiss recombinant DNA risk assessment document
- Toxin reviews

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
September 1, 2005

2:00 -3:00 PM 370 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D.	Chemical Engineering
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Jennifer Hsia, M.P.H.	California Department of Health Services
Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Hiroshi Nikaido, M.D., D.Med.Sc.	Molecular and Cell Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology

1. Administrative

Attendance at this meeting was either in-person or by telephone via a conference call.

The May 2005 meeting minutes were approved. The August 2005 meeting minutes were approved with one change: as indicated by email, the cover letter for Professor [redacted]'s Biohazard Use Authorization (BUA) required a correction to the extrapolated LD_{50} of homobatrachotoxin for humans.

2. Biohazard Use Authorization review

a. BUA No. 88 PI: Chan
Agent(s): *Escherichia coli*

This BUA amendment proposed the growth of up to 200 liters of *E. coli* BL21(DE3) expressing a bacteriophage coat protein (MS2) in the Molecular & Cell Biology Fermentation Facility for Assistant Professor, Matthew Francis, Chemistry.

Based on an interpretation by the United Kingdom's Advisory Committee on Genetic Modification published November 2001, large-scale growth of this strain was determined to be Good Large Scale Practice by this committee in July 2004.

The committee approved the protocol.

b. BUA No. 80 PI: Harland
Agent(s): Adenovirus vector

This new BUA, a revision of a previously expired BUA, proposed using an adenovirus vector expressing antagonist proteins of bone morphogenetic proteins.

The committee approved the location change subject to the following conditions:
- Professor Terry Machen, responsible for 234A LSA, must correct items noted during the August 18th laboratory inspection;
- all personnel listed on the BUA are required to attend the Environment, Health & Safety (EH&S) class "Biosafety for Human, Animal, and Plant Pathogens." Anyone who has not previously attended can enroll at http://hrweb.berkeley.edu/ice/home/. An online course will be available in the future for Professor Harland to attend;
- laboratory personnel are to read the Material Safety Data Sheet for "adenovirus" from Health Canada as part of their training;
- centrifuge containment is verified as available in the laboratory.

3. Discussion items

a. Hantavirus guidelines

EH&S asked the committee to review the revised "Guidelines for Handling Animal Reservoirs of Hantaviruses, Recommended Field Research Practices for Employees of the University of California, Berkeley" before publication.

The committee requested a single change. On page 5, under "Recovery and Transport of Traps Holding Live Animals", second bullet, the committee requested a change to the following phrases "Put the trap into double plastic bags and tie the bags closed. Ensure that the bags are large enough—and leave enough of an air gap—to provide a sufficient air supply for the animals." The "air gap" could be easily misinterpreted to mean a gap in the bag's closure.

A suggested correction would be "Select plastic bags large enough to ensure an adequate reservoir of air for the animal and thick enough to ensure the trap does not rip a hole in the bag. Carefully place the trap into a bag, close the bag at the top to maximize the air reservoir for the animal, and tie the bag closed. Repeat the procedure with a second bag." These phrases are in accordance with the US Department of Health Services 1995 document "Methods for Trapping & Sampling Small Mammals for Virologic Testing."

b. [redacted] Animal Use Protocol

The Office of Laboratory Animal Care (OLAC) requested the committee's input on a proposed animal use protocol for a graduate class on rodent trapping techniques. The species anticipated include *Peromyscus* spp. (including *P. maniculatus*) and *Neotoma* spp.

The committee suggested that:
- the class instructor wear Personal Protective Equipment (PPE) in accordance with the revised "Guidelines for Handling Animal Reservoirs of Hantaviruses, Recommended Field Research Practices for Employees of the University of California, Berkeley" when removing animals from traps, which is part of the class;

- before showing the species to the students, the instructor will carefully place the animals into a sufficiently thick plastic bag as described in the guidelines (a single bag is acceptable for the purposes of this class), tie the bag closed, and spray the tied end of the bag with disinfectant, ensuring contact of the former inner aspect of the bag with disinfectant;
- the instructor must wear PPE as described in the guidelines when the bag is opened to release the animal.

c. BUA application modifications

The Biosafety Officer requested the committee's approval of the following modifications to the BUA application:

- additional language in the "Agents – Characterization and Handling" pages, provided by the Chair, that requests information on whether work is planned that deviates from standard practice in the field of study;
- added additional checkboxes to garner information about imports and transport permits.

The committee approved the request.

The committee also requested the following:

- on page 2, under the regulatory section, have a separate checkbox for "human cell lines" to differentiate these lower risk materials from the higher risk primary samples;
- as the new form requires little narrative, the committee would like additional information to gauge the experience of new PIs/BUAs. The committee requested that new PIs/BUAs submit:
  1) a list of common protocols to be used;
  2) a statement of experience for the most experienced person for each biohazard.

d. *Peromyscus maniculatus* [redacted] Animal Facility [redacted] procedures

Professor [redacted]'s laboratory will be refreshing their colony of *Peromyscus maniculatus* in the [redacted]. They will be bringing wild-caught mice into the BL3. OLAC has informed the laboratory that the mice will be tested for hantavirus and other pathogens as EH&S advises. Dr. Rosenberger solicited the committee for their opinion.

The committee would like to know what the current procedures are before making a decision.

e. [redacted] BUA

This anticipated BUA amendment involves the use of recombinant non-typhi *Salmonella* species in chickens. This BUA amendment was postponed from the prior meeting pending information on how OLAC proposed to house the chickens. The chickens, which will be less than 35 days old, will be held in standard poultry caging/racks with wire floors and trays for droppings underneath each cage.

The committee decided that:

- the animals do not have to be housed in the BL2 facility, but close by would be desirable due to the proximity to the cage wash and waste area;
- an effective disinfectant must be sprayed on bedding prior to bedding changes to reduce dry aerosol generation. Bedding is to be scraped into a biohazard bag for disposal as medical waste. If outside contamination of the bag occurs, the bag would be placed inside another bag or sprayed with disinfectant prior to removal from the room;
- the wire floors and bedding trays are to be sprayed with disinfectant prior to removing caging/racks from the room for cage wash;
- full-face protection is to be worn during cage changes to minimize inadvertent eye or mouth exposure;
- at a minimum, gloves and booties are to be worn in the room and disposed on leaving. If contamination of clothing could also occur, dedicated disposable gowns or coveralls are to be available in the room (could be reused);
- inward directional airflow into the room is assumed.

4. Next meeting

Due to the volume of protocols anticipated for October, the November in-person meeting will be rescheduled for October. The date/time is to be determined.

Due to changes in committee member schedules, conference call meetings will be scheduled for 10:00 – 11:00 AM the first Thursday of every month.

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
August 4, 2005

10:00 A.M.--11:00.A.M. 370 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia, M.P.H.	California Department of Health Services
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D.	Chemical Engineering
Richard Stephens, Ph.D., M.S.P.H	Chair, School of Public Health-Infectious Diseases

Members Absent

Roberta Johnson, B.A.	Richard–Allan Scientific Corporation
Hiroshi Nikaido, M.D., D.Med.Sc.	Molecular and Cell Biology

Guest

[redacted]	Graduate student, [redacted] BUA

1. **Structure**
   Attendance at this meeting was either in-person or by telephone via a conference call.

2. **New Chair**
   The committee welcomed Professor Richard Stephens as its new Chair.

3. **Biohazard Use Authorization (BUA) review**

   a. BUA No. 146 PI: [redacted]
   Agent(s): Homobatrachotoxin

   This new BUA proposed the study of the taxonomic range and evolution of avian resistance to an avian defense toxin. The proposed locations are at field sites in California and Papua New Guinea.

   This is the committee's first toxin proposal. The committee discussed, in detail, the low LD_{50} of the proposed toxin, medical care in a remote field location, containment and security. Mr. [redacted] has previous hands-on experience with Pitohui species and in performing procedures similar to those in the protocol.

The cover letter for Professor [redacted]'s Biohazard Use Authorization (BUA) required a correction to the extrapolated LD_{50} of homobatrachotoxin for humans. The value should have read 1.7 ug, not 1.7 ug/kg.

The committee approved the protocol in Papua New Guinea subject to the following conditions:

- Consult with the Biosafety Officer to determine if engineered sharps injury protection devices may decrease the risk of a sharps injury.
- Evaluate the puncture resistance and dexterity of Turtleskin™ products for the arm to be holding birds during injections (Full Coverage Aramid Plus gloves, 11" Protective Sleeve).
- Wear full coverage clothing and insect repellant to reduce the likelihood of insect bites. Open wounds may increase risk of cutaneous exposure to toxin while working with birds or toxin.
- When reconstituting dry toxin, reconstitute the smallest amount needed. Since a fume hood is not available at the field location, use a glove bag (Spilfyter® Hands-in-Bag atmospheric chamber, Fisher Scientific #19-066-547) for containment.
- When filling syringes, minimize the amount of aerosols produced by minimizing pressurization of the toxin vial. Use a glove bag for containment.
- Have an additional person present at all times when toxin is handled. This person must be prepared to contact medical personnel in case of an exposure or other medical emergency. This person must be prepared to be able to arrange evacuation to an appropriate medical facility. Consideration of transfer to a state of the art medical facility in Australia is recommended.
- Carry on your person, and have visibly posted in the research facility, medical information in case of exposure to the toxin.
- Keep the toxin secured in a locked container when not in use.
- Arrange for the correct disposal of all waste materials locally.

As additional transport precautions will be required in California, the committee did not yet review nor approve work in California. The Biosafety Officer is reviewing, in conjunction with the shipping subject matter expert in EH&S, the necessary requirements for transporting toxin in California.

b. BUA No. 63 PI: Schaffer

Agent(s): Attenuated Human Immunodeficiency Virus

This existing BUA, previously approved by committee last November, proposed developing RNA interference strategies to inhibit HIV propagation for therapeutic potential. The proposal before committee involved changing the location from Barker Hall to Dr. Schaffer's laboratory in Tan Hall.

Dr. Schaffer, as a member of this committee, did not vote on this protocol.

The committee approved the location change subject to the following conditions:

- Add a door to the tissue culture room to separate the tissue culture room from the adjacent office space, specifics to be determined in consultation with the Fire Marshall.
- Insert 0.22u hydrophobic filters in the vacuum lines.
- Ensure there's inward directional airflow after the door has been installed.

- As the eyewash requires two doors to access, have a portable eyewash inside the tissue culture laboratory.
- Even though this is a nef- and vpr-deleted mutant, because permissive human cells will be used in culture, keep in mind the theoretical risk of replication-competent retrovirus formation.
- Retain personal protective equipment used in the laboratory, and use disposables whenever possible.
- Autoclave waste prior to disposal as medical waste. Whenever possible, chemically disinfect materials before disposal as medical waste.
- Conduct an informational meeting with all laboratory staff prior to starting work.

c. BUA No. 28 PI: [redacted]

Agent(s): Self-inactivating Human Immunodeficiency Virus (HIV)-based vector

This BUA amendment 1) proposed using a self-inactivating HIV-based viral vector in *in vitro* and *in vivo* studies exploring gene therapies for human retinal diseases, and 2) involved a location change for the entire BUA as the laboratory has moved from [redacted] Hall to [redacted] Hall.

The committee approved the proposed amendments subject to the following conditions:

- Have all new and existing personnel listed in the BUA attend the EH&S class "Biosafety for Human, Animal, and Plant Pathogens." Personnel can enroll at http://hrweb.berkeley.edu/ice/home/.
- Ensure that laboratory personnel read the following publications as part of their training:
  1) Segall H., Sutton RE (2003) Detection of Replication-Competent Lentiviral Particles. *Methods in Molecular Biology* 229: 87-94.
  2) Delenda C, Audit M, Danos O. (2002) Biosafety issues in lentivirus production. *Current Topics in Microbiology and Immunology* 261: 123-141.
  3) Kappes JC, Wu X. (2001) Safety considerations in vector development. *Somatic Cell and Molecular Genetics* 26(1/6): 147-158.
  4) Health Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for HIV.
- Report to CLEB any generation of replication-competent virus.
- Provide Lab Contact's name, telephone number, and emergency contact information.
- Provide PI's emergency contact information.

d. BUA No. 145 PI: Kramer

Agent(s): Self-inactivating Human Immunodeficiency Virus-based vector, Adeno-associated virus vector

This new BUA proposed the in vitro use of viral vectors to express marker proteins or a voltage-gated potassium channel. The proposed location is in the Life Sciences Addition.

The committee approved the protocol subject to the following conditions:

- Have Professor Kramer attend the online EH&S class "Biosafety for Human, Animal, and Plant Pathogens" when it is available.

- Ensure that laboratory personnel read the following publications as part of their training:
  1) Delenda C, Audit M, Danos O. (2002) Biosafety issues in lentivirus production. *Current Topics in Microbiology and Immunology* 261: 123-141.
  2) Health Canada MSDS and CDC's Biosafety in Microbiological and Biomedical Laboratories agent summary for HIV.
- Recertify the biological safety cabinet prior to performing Biosafety Level 2 work.
- Insert a 0.22u hydrophobic inline filter in the vacuum line.

4. Discussion items

a. [redacted] Standard Operating Procedure (SOP)

The Office of Laboratory Animal Care (OLAC) requested approval for a unique protocol in the [redacted] Animal Facility [redacted] Biosafety Level 2 facility. The SOP involved use of a dedicated room in the facility to perform a non-biohazardous experiment, followed removal of live animals for subsequent terminal experiments elsewhere on campus.

The committee approved the request subject to the following conditions:
- Have personnel attend the EH&S course that reviews procedures for the [redacted] Biocontainment Facility.
- Perform a surface disinfection for infection control, using a chemical disinfectant effective for the agents previously present, of all room surfaces prior to start of the experiment.
- Ensure that a dedicated person transports live animals to the laboratory in a university vehicle.
- Clearly specify the color of 1) the transport bag mentioned in 2.a., and 2) the autoclave bag in 2.c.
- Clearly specify who will be transporting bags in 2.c. to the [redacted].
- Delete the line in 2.d. "(t)he mice themselves pose no hazard". If this statement were accurate, performance of terminal experiments would not require a fume hood.

b. [redacted] BUA

This BUA amendment involved the use of recombinant non-typhi *Salmonella* species in chickens. This BUA amendment was postponed until the next meeting pending information on how OLAC proposes to house the chickens.

c. BUA application modifications

The Biosafety Officer requested the committee's approval of the following modifications to the BUA application:
- Condense the "Agents – Characterization and Handling" pages for each agent from three pages to two, for legibility in the final BUA.
- Add a checkbox to determine if genes that encode antibiotics, antivirals, or pharmaceutical resistance will be inserted.

The committee approved the request.

The Chair also agreed to provide an additional statement requesting information on whether work is planned that deviates from standard practice in the field of study.

5. Next meeting

Future teleconference meetings will follow the same format with a choice of attendance - either in-person attendance in 370 University Hall or by teleconference (contact information to be determined before each meeting, dependent on a quorum). The meetings have been scheduled for 2:00pm – 3:00pm the first Thursday of every month.

In-person meetings will continue to occur in May and November.

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
May 27, 2005

1:00 P.M. – 3:00 P.M. 714 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Roberta Johnson	Richard–Allan Scientific (by telephone)
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D.	Chemical Engineering

Members Absent

Jennifer Hsia	School of Public Health
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology

Guests

Brandon DeFrancisci, M.P.H.	Office of Environment, Health & Safety

1. **Minutes**
   The minutes of the November 2004 and March 2005 meetings were approved.

2. **Membership deletions and Community members**
   Drs. Poki Namkung and Maryann Montandon have withdrawn from the Committee secondary, respectively, to a job change and retirement. Jennifer Hsia, who has now graduated and will be assuming a full-time position at the California Department of Health Services, will be our second community member. A third community member would be welcome, and Dr. Buehring suggested contacting recent graduates from the Masters in Public Health-Infectious Diseases program.

3. **Upcoming Chair change**
   We anticipate that Professor Richard Stephens, Public Health–Infectious Diseases, will assume the Chair's role on July 1st.

4. **Annual** [redacted]
   The Office of Environment, Health & Safety submitted UC Berkeley's annual [redacted] in February. [redacted] were reported.

5. **Shipping vendor contract**
   UC Berkeley's shipping consultant, The Safety Company, has terminated shipping hazardous materials. The search for a new vendor is ongoing.

6. **BL3 recertification progress**

Earlier in the month, Dr. Rosenberger and Elizabeth Ignacio, Research Safety Specialist, Office of Environment, Health & Safety (EH&S), provided refresher training on Biosafety Level 3 (BL3) laboratory entry to personnel from Physical Plant-Campus Services (PP-CS.) In addition, PP-CS has decided to provide their personnel with Positive Air Purifying Respirators (PAPR), facilitating BL3 entry and their assistance with the recertification process.

7. **New trashcan label for laboratories**

Dr. Rosenberger demonstrated a copy of the new trashcan label for laboratories. This label, provided by EH&S, will be applied to trash cans in laboratories and remind researchers that chemicals, radioactive materials, sharps, batteries, and biohazards cannot be disposed of in the trash.

8. **"No food or drink" labels for laboratory microwaves**

As a follow up to our March meeting, EH&S will be providing UC Berkeley-specific "no food or drink" labels that include both wording and a logo.

9. **NIH interpretations on Institutional Biosafety Committee meetings**

The National Institutes of Health's (NIH) Office of Biotechnology Activities has indicated the following information was in prior communications (see Q&A letter from the May 2004 meeting), however, Dr. Rosenberger does not see this information specifically mentioned, nor has it been included in a prior institutional biosafety committee (IBC) training seminar given in February 2003.

In March of this year, Dr. Rosenberger attended a seminar titled "IBC Basics: An Introduction to the NIH Guidelines and the oversight of Recombinant DNA Research" at a Public Responsibility in Medicine and Research meeting. At the seminar, the NIH Office of Biotechnology Activities public relations personnel mentioned that all protocol approvals should be conducted at an in-person meeting for two reasons: 1) engender discussion and 2) have protocol reviews be accessible to the public outside of our community members. At that time, NIH indicated that our current email listserve may meet this requirement. However, in speaking with the same NIH personnel at an April meeting of the University of California biosafety officers, NIH's decision was that only in-person meetings or teleconferences were acceptable for protocol approvals. NIH reasoned that not all members of the public may have access to a computer, and therefore, could not participate in our protocol reviews over the listserve.

The Committee decided to hold a monthly conference call to approve Biological Use Authorizations (BUAs) subject to the NIH Guidelines for Research Involving Recombinant DNA Molecules. We will continue to meet in-person twice a year.

The Committee will continue approving BUAs for work exempt from the NIH Guidelines for Research Involving Recombinant DNA Molecules by listserve.

10. Changes to the BUA application

Dr. Rosenberger reviewed the changes that have been made to the BUA application after additional review and suggestions from the UC biosafety officers and the Office of Laboratory Animal Care (OLAC.)

The following significant changes have been made:

a. Include instructions for "storage only" status, following up on the CLEB decision from 2002.

b. Require a project-specific Standard Operating Procedure (SOP) based on CLEB recommendations for when laboratory staff will be performing husbandry procedures in an animal facility. The SOP requires approval from OLAC and EH&S approximately two weeks prior to starting work.

c. Clarify two bullets in the biosecurity section that involve altering vector competence and the host range of a pathogen to exclude routine viral vectors.

11. Biosafety Level of replication-defective HIV-based viral vectors in animals

The Committee considered the biosafety level of confirmed replication-competent retrovirus (RCR)-free retroviral vectors used in animals. Provided the vectors deliver a gene of interest that is neither toxic nor an oncogene, animals treated with laboratory verified RCR retroviral vectors may be housed at Animal Biosafety Level 1. Biosafety Level 2 work practices will be used for vector delivery.

12. BUA amendment for Professor Richard Stephens

Professor Richard Stephens has requested an amendment to his BUA for the growth of *Listeria monocytogenes* at Biosafety Level 2. The strain is listeriolysin defective and will be procured from Professor Daniel Portnoy. No further recombinant modifications will be made. The Committee approved the amendment.

13. Proposed human brain work for Professor Bentley

Assistant Professor George Bentley, Integrative Biology, has consulted the Committee regarding containment conditions for 'normal' human brain samples procured from the Harvard Brain Tissue Resource Center. Cal/OSHA's Bloodborne Pathogens standard covers non-fixed samples. Formaldehyde-fixed samples are not covered by the standard, and therefore do not require a BUA.

The Committee requested Biosafety Level 2 conditions for formaldehyde-fixed samples as formaldehyde does not inactivate prions. In addition, the Committee requested the following: the use of a biological safety cabinet with plastic-backed absorbent on the work surface while dissecting tissue, use of disposable equipment whenever possible, disposal of medical waste and disposables as 'pathology waste', and the use of a disinfectant effective for prions if chemical disinfection is needed (Vesphene LpH if documented formulation has been approved for use in California, otherwise 20% solution of household bleach for 1 hour.)

If Dr. Bentley uses non-fixed samples in the future, or procedures involving aerosols and fixed samples, a BUA is required.

14. Proposed online biosafety training for Principal Investigators

Dr. Rosenberger presented the concept and a draft version of online biosafety training for Principal Investigators (PI) to meet the BUA training requirement. The training has been adapted from the EH&S course "Biosafety for human, animal, and plant pathogens" and focuses on PI responsibilities under the biosafety program. Consistent with other online EH&S trainings currently in development, the training will be restricted to CalNet access and will include a quiz. The Committee was in favor of the proposal as presented.

15. Biosafety References guide

Dr. Rosenberger presented a draft document "Biosafety Purchasing References," which is a reference guide for materials and containment equipment that can be used to meet biosafety level and Committee biocontainment requirements. The Committee thought the document would be helpful to laboratories using biohazards. Dr. Rosenberger requested Committee input on additional materials and containment equipment to include in the guide.

16. Upcoming online biological safety cabinet training

Dr. Rosenberger notified the Committee that EH&S has purchased a networkable CD training, Eagleson Institute's "Biological Safety Cabinets: A Web-Based Training Program." The training will be accessible online, but will require CalNet access. The training will be optional and will: 1) supplement information given in EH&S's biosafety course, 2) provide biological safety cabinet training to personnel in advance of biosafety course offerings, and 3) assist PIs in annual training refreshers.

17. EH&S Compliance Training Initiative

Mr. DeFrancisci gave a presentation on the Office of Environment, Health & Safety's Compliance Training Program Development initiative (handout attached.) The campus's Human Resources Management System (HRMS) is being adapted to include a job-based questionnaire to help employees determine which compliance trainings are required, and will collect training data on all employees and visiting scholars. In addition, EH&S is developing online trainings to meet those requirements, where applicable.

The Committee supported the initiative and had the following suggestions:

a. Include undergraduates and volunteers

b. General safety training for undergraduates

c. CD version(s) of online trainings for presentation at laboratory safety meetings – online quiz by individuals would still apply

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—For public distribution 4/26/06
March 7, 2005

9:30 A.M. – 10:45 A.M. 370 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia	School of Public Health
Roberta Johnson	Richard–Allan Scientific Corporation
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D. (by telephone)	Chemical Engineering

Members Absent

Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Maryann Montandon, DR.P.H.	California Department of Health Services
Poki Namkung, M.D., M.P.H.	City of Berkeley
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology

1. **Purpose**

   This meeting was called to discuss issues that need resolution prior to our regularly scheduled meeting in May 2005. The minutes of the November 2004 meeting will be approved at the May meeting.

2. **Membership deletions**

   Dr. Montandon will be retiring effective March 11, 2005. We are hoping to procure another member from the California Department of Health Services with her expertise.

3. **New Biohazard Use Authorization (BUA) form review**

   The committee reviewed the proposed new BUA form.

   Goals

   a. Simplify authorization process for Principal Investigators (PI) who work with biological materials
      - Have a single form for Principal Investigators (PIs) to describe their research with recombinant DNA covered by the NIH Guidelines for Research Involving Recombinant DNA Molecules, Biosafety Level 2 and 3 agents, and bloodborne pathogens (human blood and other potentially infectious materials).
      - Minimize the time required to ready a protocol for CLEB review by asking specific questions required for CLEB to make risk determinations.

- Minimize the time required to complete the form by providing check-boxes where possible.
- Minimize the time required for the laboratory to develop a lab-specific biosafety manual or written Bloodborne Pathogen Exposure Control Plan by including that document in the BUA.

b. Improve information provided to personnel working with biological materials that could impact health
   - Include agents not currently reviewed formally – nonhuman primate blood and other potentially infectious materials, toxins, inactivated select agents, and inactivated agents that when viable, are handled at Biosafety Level 3.
   - Ask specific questions so that all work practices and safety equipment required are listed and explained.
   - Have a lab-specific biosafety manual or written Bloodborne Pathogen Exposure Control Plan that consolidates policy, work practices, and safety equipment information from all regulatory sources and campus biosafety policy.

c. Improve information provided on the door sign
   - Represent clearly which personal protective equipment, vaccines, and special precautions are required for biologicals in use.
   - List which agents individual personnel work with.
   - List when personnel have attended training.

d. Provide an expiration date
   - Although not a regulatory requirement for materials other than bloodborne pathogens, consistent with other UC campuses, BUAs will expire.
   - Annual updates are required, and BUAs will expire after three years.

Additional changes:

a. Agent section(s)
   - Include check-box for "not applicable" under "Disinfection...Animal facility" in the Agent section(s).

b. Human Source Materials section
   - Clarify that HIV, HBV, and HCV testing of "Human Source Materials" (bloodborne pathogens) is not required.
   - Include "other body fluids" in "blood, serum, or plasma".

c. General Exposure Control Methods section(s)
   - If there are designated food areas inside the laboratory, personnel do not perform any open bench top work with Biosafety Level 2 agents. Open bench top work includes vortexing and pipetting, but does not include the use of agents in containment (e.g. centrifuging with containment devices).
   - Laboratory microwaves will be labeled so that they are not used with food (include pictures).
   - Give definitions for medical waste categories
   - Change "non-sharp, solid medical waste" to "solid, non-sharp medical waste".

4. Undergraduates in Biosafety Level 3 Laboratories discussion

The Committee decided that undergraduates will not be approved to work in Biosafety Level 3 laboratories.

5. Material Transfer Agreement for Carolyn Bertozzi

Carolyn Bertozzi's laboratory has requested lipids derived from *Mycobacteria tuberculosis* from the Colorado State Tuberculosis reagent program. The question was posed to the Committee by listserve whether or not the laboratory would need to verify no growth as would be required for the whole inactivated organism. As there were conflicting opinions, the Committee discussed the issue. After reviewing the inactivation and extraction procedures performed to isolate the lipids, the Committee agreed that no whole organism would survive the procedures. The laboratory does not need to culture the lipids for *M. tuberculosis* after UC Berkeley receives the lipids.

cc: Mark Freiberg, Director—EH&S
Brandon DeFrancisci, Associate Director, Health & Safety—EH&S

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
November 1, 2004

10:00 A.m. – 12:00 P.M. 2515 Tolman Hall

Members in Attendance

Jennifer Hsia	School of Public Health
Roberta Johnson	Richard–Allan Scientific
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Maryann Montandon, DR.P.H.	California Department of Health Services
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety

Members Absent

Gertrude Buehring, Ph.D.	School of Public Health
Poki Namkung, M.D., M.P.H.	City of Berkeley
David Schaffer, Ph.D.	Chemical Engineering

Guests

[redacted], Ph.D.	Molecular and Cell Biology
[redacted], Ph.D.	Molecular and Cell Biology

1. **Minutes**
   The minutes of the May 2004 meeting were approved.

2. **Membership deletions**
   Drs. Daniel Portnoy and Scott Dawson have withdrawn from the Committee.

3. **Select Agent registration application progress**
   Drs. [redacted] and [redacted] updated the Committee on the proposed work with candidate vaccine strains of a select agent bacteria. While initial work does not require registration, future work will involve vaccine candidates that will most likely require registration with CDC or USDA.

4. **Environment, Health & Safety upcoming Shipping Fact Sheet**
   The Office of Environment, Health & Safety (EH&S) continues to work on a Shipping Fact Sheet. A final version is expected in the upcoming months and distribution will be preceded by a communication to the Deans and Directors.

5. **Report of September's NIH Symposium on Safety Considerations in Recombinant DNA Research with Pathogenic Viruses and "dual use" discussion**

In September, the National Institutes of Health (NIH) held a symposium on safety considerations in recombinant DNA research involving coronaviruses and avian flu viruses.

During the symposium, the NIH reported that they may perform site visits to review the composition of Institutional Biosafety Committees. In particular, the NIH may visit the University of California as early as February 2005.

The Committee on Research Standards and Practices to Prevent Destructive Application of Biotechnology has developed a book "Biotechnology Research in an Age of Terrorism" that was published by The National Academies Press this year. The following seven criteria are given that Institutional Biosafety Committees must take into consideration when reviewing experiments:

a. Would the experiment demonstrate how to render a vaccine ineffective? This would apply to both human and animal vaccines. Creation of a vaccine-resistant smallpox virus would fall into this class of experiments.

b. Would the experiment confer resistance to therapeutically useful antibiotics or antiviral agents? This would apply to therapeutic agents that are used to control disease agents in humans, animals or crops. Introduction of ciprofloxacin resistance in *Bacillus anthracis* would fall into this class.

c. Would the experiment enhance the virulence of a pathogen or render a non-pathogen virulent? This would apply to plant, animal and human pathogens. Introduction of cereolysin toxin gene into *Bacillus anthracis* would fall into this class.

d. Would the experiment increase transmissibility of a pathogen? This would include enhancing transmission within or between species. Altering vector competence to enhance disease transmission would also fall into this class.

e. Would the experiment alter the host range of a pathogen? This would include making nonzoonotics into zoonotic agents. Altering the tropism of viruses would fit into this class.

f. Would the experiment enable the evasion of diagnostic / detection modalities? This could include microencapsulation to avoid antibody-based detection and / or the alteration of gene sequences to avoid detection by established molecular methods.

g. Would the experiment enable the weaponization of a biological agent or toxin? This would include the environmental stabilization of pathogens. Synthesis of smallpox virus would fall into this class of experiments.

Dr. Rosenberger will add these criteria to the new BUA form in development.

6. **National Institutional Biosafety Committee 'transparency' report**

With the agenda, the Committee received a copy of the Sunshine Project's report "Mandate for Failure: The State of Institutional Biosafety Committees in an Age of Biological Weapons Research, Results and Recommendations of the Sunshine Project Survey of Institutional Biosafety Committees" published in October. In response to

the Sunshine Project's Freedom of Information Act request, the Committee had supplied the project with the minutes from two previous meetings (May and November, 2003) in May 2004.

According to the report, the Sunshine Project evaluated Institutional Biosafety Committee minutes qualitatively with regard to research descriptions, detail of minutes, scope of minutes, and demeanor. All of the University of California campuses received the same score and were given a transparency rating of "Failed." The Sunshine Project noted that the rating was "not a judgment of the research that the committee reviews (or does not review), nor (was) it a direct evaluation of biosafety at the institution." Based on the transparency criteria, Dr. Rosenberger surmised that our 'failure' rating was due to the practice of reviewing protocols by mail, the redaction of committee member and Principal Investigator names, and the redaction of areas where *in vivo* research is conducted.

The report also included an inaccuracy regarding the Biosafety Officer for the University of California, Berkeley (UCB). Dr. Rosenberger attended a meeting of the University of California, Davis (UCD) shortly after changing positions from UCD to UCB in order to provide a completed project. The Sunshine Project reported, inaccurately, that UCD listed the UCB Biosafety Officer as one of its non-affiliated members, and that the UCB Biosafety Officer was also a current employee of the Chiron Corporation. Dr. Rosenberger has not worked for Chiron since 2002.

7. **Incident Reports**

A long-term staff member sustained a splash to the face with *Borrelia burgdorferi* while closing a partially closed tube outside the biological safety cabinet. The incident occurred while the employee was traveling to a nearby bench to use a vortex. In order to prevent future incidents, the vortex has been moved inside the biological safety cabinet.

A refuse worker sustained a needlestick from a needle that was incorrectly disposed of in the trash. The needle was not contaminated with a hazardous material. In order to prevent future incidents, EH&S is developing a Lessons Learned document to distribute to all departments with laboratories. In addition, labels are being devised to place on all trashcans. The Committee suggested that the Lessons Learned document be incorporated into the Injury and Illness Prevention Program for departments with laboratories.

8. [redacted] **greenhouse inspections**

Dr. Rosenberger inspected both the [redacted] and [redacted] greenhouses within the preceding months. [redacted], coordinator of both facilities, has requested our assistance in developing a general guide for identifying what recombinant research can be performed in each greenhouse. This guide will help plan research locations well before the Committee approves the work.

9. **New council – Research Administrative Compliance Council**

The Office of Research Administration and Compliance has developed the Research Administrative Compliance Council composed of the administrators on campus responsible for the oversight of regulatory compliance. The Council's purpose is to foster communications and assist the administrators in seeking solutions to issues

that involve many areas across the campus. Dr. Rosenberger represents the Committee for Laboratory and Environmental Biosafety.

10. American Biological Safety Association annual conference

The annual conference of the American Biological Safety Association was held in October. Dr. Rosenberger gave an overview of the following presentations:

a. "Case Report: Transmission of Lymphocytic Choriomeningitis Virus from Laboratory Mice to an Animal Technician." Lymphocytic Choriomeningitis Virus had been introduced into the animal colony by a contaminated cell line.

b. Julia Hilliard, Ph.D. presented the first reactivation case of *Herpesvirus simiae.*

c. "Changes in the Regulations for the Classification and Transportation of Clinical and Diagnostic Samples." Multiple changes affecting the transport of infectious substances and diagnostic specimens by air will take effect in 2005. The Department of Transportation has yet to adopt the changes, but when they do, EH&S will update the Committee and the Fact Sheet.

11. Cal/OSHA Airborne Infectious Disease Advisory Meeting

The California Occupational Safety and Health Administration will hold the second in a series of meetings on November 5, 2004, to discuss proposing regulation to cover the transmission of airborne infectious diseases in the workplace, including laboratories. Dr. Rosenberger will attend the meeting, which is open to the public.

12. Review action items from prior meetings

The Committee aided Dr. Rosenberger in reviewing the status of prior action items. With this information, Dr. Rosenberger will concentrate on action items of current relevance.

13. Discuss campus biosafety training

The Committee reviewed the September version of the EH&S course "Biosafety for Human, Animal, and Plant Pathogens." Dr. Rosenberger has taught three classes, and the feedback has been positive. The Committee decided that all personnel seeking to obtain or renew a Biological Use Authorization (BUA) will be required to attend the class. Rotating first-year graduate students are included and will be added to BUAs as they rotate through laboratories. In order to meet this new requirement, Dr. Rosenberger will offer the course monthly in 2005.

14. Discuss [redacted] BL3 recertification and Training Manual

Dr. Riley's documents are currently under revision, and the Committee will review the new documents once they are completed. Annual revision will be part of annual BL3 laboratory certification.

15. Discuss personal protective equipment for *Neotoma fuscipes*

The Committee revisited the August request regarding personal protective equipment for a controlled colony of *Neotoma fuscipes.* Routine clothing for rodent handlers at the field station includes dedicated clothing and either latex or nitrile gloves. As indicated in the August request, routine clothing does not include eye protection. Due to the adequacy of existing personal protective equipment (consistent with practices on campus and existing injury information for this

employee population), the Committee concurred that routine clothing at the station could be used for this controlled colony as well.

16. **Discuss testing procedure when receiving "inactive" select agents or agents normally manipulated at BL3**

    All inactivated 1) select agents and 2) agents manipulated at BL3 on campus will be tested for viability upon receipt. The testing method will vary with the agent and will be determined in a BUA. All inactive 1) select agents and 2) agents manipulated at BL3 will require a BUA.

17. **Discuss NIH publication regarding Institutional Biosafety Committee meeting minutes**

    In May, the NIH Office of Biotechnology Activities published a Questions and Answers document regarding minutes for Institutional Biosafety Committees (IBCs). The Committee received a copy with the agenda for this meeting. Note that "IBCs are required to make rosters and biographical sketches that have been submitted to NIH available to the public upon request," however, IBCs are allowed to redact "private information" such as "home telephone numbers and home addresses of IBC members."

    When the Committee responded to the public request for minutes by the Sunshine Project in January, the Committee decided to redact Committee member names (but not affiliations nor degrees conferred) due to security and privacy concerns.

18. **Decontamination of cages used with *Listeria monocytogenes***

    The Office of Laboratory Animal Care requested an alternative to autoclaving for decontamination of some cages used with *L. monocytogenes* due to the harshness of the autoclave on the cages. A disinfectant already used in the facility, Steris Process NPD, has been tested effective for *L. monocytogenes*. Cages will be emptied in a biological safety cabinet and the bedding will be autoclaved. Cages will be surface disinfected with Process NPD in accordance with manufacturer's recommendations and then washed in the cage wash. The cage wash cycle maintains 180°F for 4.5 minutes and will kill any residual *L. monocytogenes* that may have survived surface disinfection.

cc: Mark Freiberg, Director—EH&S
Michael Wisherop, Associate Director, Health & Safety—EH&S

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
May 13, 2004

9:30 A.M. – 11:30 A.M. 2515 Tolman Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Jennifer Hsia	School of Public Health
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Maryann Montandon, DR.P.H.	California Department of Health Services
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Sonia Rosenberger, D.V.M.	Biosafety Officer, Office of Environment, Health & Safety
David Schaffer, Ph.D.	Chemical Engineering

Members Absent

Scott Dawson, Ph.D.	Molecular and Cell Biology
Roberta Johnson	Richard–Allan Scientific Corporation
Poki Namkung, M.D., M.P.H.	City of Berkeley
Daniel Portnoy, Ph.D.	Molecular and Cellular Biology-Immunology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology

Guests

Laurie Goldman	Office of Vice Chancellor for Research
Lee Riley, M.D.	School of Public Health

1. **Minutes**
   The November 2003 minutes were approved by email in January.

2. **Membership additions**
   The Committee welcomed its new student member, Jennifer Hsia.

3. **Freedom of Information Act request**
   In January as part of a national survey, the Sunshine Project requested from each University of California (UC) campus the minutes from the last two meetings of this Committee and information on whether or not the campus was registered to use select agents. With consultation from the Office of the President, each campus supplied our minutes in compliance with the NIH Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines). The University of California, Berkeley redacted committee member names, locations of animal work, and selected agents for privacy and security purposes. Each campus responded to the request for our select agent status by requesting the purpose of gathering this information. In

response to these submissions, the Sunshine Project asked the UC to substantiate any redactions and why further information was requested before disclosing select agent status. The Office of the President is in the process of responding to this last request.

4. **Select agent registration application**
   The campus will be submitting a select agent application for Drs. [redacted] and [redacted] to the Centers for Disease Control and Prevention pending approval from the Provost.

5. **Annual [redacted] submitted**
   The Office of Environment, Health and Safety submitted UC Berkeley's annual [redacted]. A copy was available at the meeting for the Committee's review. [redacted]

6. **Shipping vendor contract**
   UC Berkeley has hired a shipping consultant, The Safety Company, to aid in shipping hazardous materials from campus. Dr. Rosenberger briefed the Committee on the Department of Commerce's export regulations for 'human and zoonotic pathogens and toxins' and [redacted].
   The Office of the Vice Chancellor for Research is currently drafting a quick reference guide for shipping materials to include a review of the export regulations.

7. **Fenyong Liu's HIV laboratory renovation progress**
   The project nears completion. In compliance with CalOSHA's Bloodborne Pathogen Standard for HIV, HBV, and HCV Research and Production Facilities, Dr. Rosenberger requested the installation of an eyewash in the HIV laboratory room or anteroom. The other requirements this Committee specified for the laboratory are progressing with the exception of a High Efficiency Particulate Air filter on the exhaust ventilation (removed by the former Biosafety Officer) that is not required for this work. In addition, Dr. Rosenberger requested negative airflow into the cell sorter suite in this laboratory.

8. ***Mycobacteria tuberculosis* – Lee Riley**
   Dr. Riley requested clarification on undergraduate access in Biosafety Level 3 laboratories. He reviewed the current work being performed and the training procedures for new personnel. The Committee will discuss what the role for undergraduates will be in Biosafety Level 3 laboratories and come to a unanimous consensus before responding to Dr. Riley.

   Dr. Riley also answered questions regarding the generation of an acutely lethal form (in mice) of *M. tuberculosis* which was reported in the literature and press in December. The mce1 mutant was an attempt at attenuation, and the generation of an acutely lethal form was not anticipated.

9. **Review action items from prior meetings**
   This item was tabled until the next meeting.

10. Update bylaws

The Committee reviewed the proposed 1995 revision of the bylaws. The following changes were proposed:

a. Change "Environmental, Health and Safety Policy Committee" to "Research Compliance Advisory Committee".

b. Verify current format for the annual report to the Research Compliance Advisory Committee.

c. Include procedures for biohazard protocol approval. Biohazard Use Authorizations (BUAs) will be approved when a quorum of the Committee (half the voting members plus one) approves the protocol.

d. New policies will be approved once the voting members are in unanimous agreement.

e. All BUAs will be reviewed annually by the Committee. A full BUA application will be submitted every three years. Amendment forms will be submitted annually.

f. Include selected sections of Stanford University's Charge to the Administrative Panel on Biosafety.

Dr. Rosenberger will generate draft bylaws and submit them to the Committee for review.

11. Review rDNA registration procedures

There are two recombinant DNA application forms – one each for work in animals and plants. The animal recombinant DNA application will be merged into the new BUA application. The plant recombinant DNA application will be updated.

12. Update Infectious Agent Application form

The Infectious Agent Application will be consolidated in the new BUA application and will include specific sections (e.g. laboratory procedures and medical surveillance) and assurances for the Principal Investigator to sign. Dr. Rosenberger will generate a draft and submit it to the Committee for review.

13. Discuss Biosafety Manual revision

The updated Laboratory and Environmental Biosafety Manual is still in draft form. Prior Committee recommendations were to generate a document that could be a work practice manual to be adopted by laboratories, include information on retroviruses (and vectors), include information on specific genes that could be toxic or infective, and include language regarding employee responsibility. Dr. Rosenberger will generate a draft and submit it to the Committee for review.

14. Discuss viral vector safety

The Committee discussed the handouts included with the agenda – "Biosafety Tips" on lentiviral vectors from the Applied Biosafety vol. 7 (2002) and "Safety Considerations for Retroviral Vectors: A Short Review" by Donald E. Mosier, The Scripps Research Institute. The Committee agreed that when using lentiviral vectors (and other vectors) that the Principal investigator shall provide information on whether the vector is infectious to humans, whether it contains a gene of interest that codes for a toxic molecule, and whether or not replication-competent virus is formed.

Dr. Rosenberger will add these items to the new BUA application, will generate a draft guideline for lentiviral use, and will submit the guideline to the Committee for review.

15. Discuss BL3 design/recertification

Dr. Rosenberger distributed documents she developed at the University of California, Davis for certifying Biosafety Level 3 laboratories. She will be certifying laboratories here annually in accordance with CDC/NIH's (National Institutes of Health) Biosafety in Microbiological and Biomedical Laboratories, 4th edition. The certification process proposed is more extensive than an annual inspection and includes a detailed list of documentation and facility requirements (see handout). The facility review includes testing the laboratory's systems which would occur during an annual shutdown.

16. Discuss transport/handling restrictions for *Neotoma* spp.

This issue has been resolved. *Neotoma* spp. brought into the [redacted] Animal Facility from the field will be handled using the procedures for *Peromyscus* spp.

17. Discuss BUA status reporting

The Committee has generally received an annual report of BUA status on campus. As the Committee will now be reviewing protocols every year, it will not be necessary to generate this status report. A modified version will be generated for University Health Services.

18. Discuss meeting scheduling

The Committee currently meets semi-annually, and meetings are generally scheduled in the month before the meeting. The Committee decided to have one meeting per semester and schedule the meetings well in advance to increase member availability.

19. Campus biosafety training

The Committee reviewed the proposed biosafety training developed by Dr. Rosenberger. This training will be required for all new BUA personnel and will be offered quarterly. As this will be a new requirement, existing BUA personnel will also be required to attend this year.

20. Institutional Biosafety Committee training

In compliance with the NIH Guidelines (section IV-B-1-h), the Committee received training handouts from two lectures presented at the 2003 NIH professional Development Conference and Training Session "The Future Face of institutional Biosafety Committees: Evolving Roles and Responsibilities, Upcoming Challenges and Opportunities". The lectures were "Survey of Institutional Biosafety Committees" by Raymond Hackney and "Ethical and Safety Issues in Gene Therapy" by David Weber.

Also included was "Biosafety considerations in lab design – a brief overview" developed by Dr. Rosenberger and presented to the campus's Capital Projects group in April.

Attachments (meeting handouts):
Biosafety Level 3 Certification – Executive Summary

cc: Mark Freiberg, Director—EH&S
Michael Wisherop, Associate Director, Health & Safety—EH&S

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
November 13, 2003

10:00 A.M.-12:00P.M. 714 University Hall

Members in Attendance

Gertrude Buehring, Ph.D.	School of Public Health
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M.	Biosafety Officer, Office of Environment, Health & Safety

Members Absent

Scott Dawson, Ph.D.	Molecular and Cell Biology
Roberta Johnson	Richard–Allan Scientific Corporation
Maryann Montandon, DR.P.H.	California Department of Health Services
Poki Namkung, M.D., M.P.H.	City of Berkeley
David Schaffer, Ph.D.	Chemical Engineering

Guests

Elizabeth Ignacio, R.E.H.S.	Office of Environment, Health & Safety
Michael Wisherop, C.S.P., C.I.H.	Office of Environment, Health & Safety

1. **Approval of Minutes**

   Dr. Rosenberger asked to defer approval of the May 8, 2003 meeting minutes.

2. **Introduction of new Biosafety Officer**

   Mr. Wisherop introduced Dr. Rosenberger, the new Biosafety Officer.

3. **Biohazard Use Authorizations (BUAs) status**

   Ms. Ignacio reported that there are currently 52 active BUAs, an increase from previous years.

   Drs. Nikaido and Rosenberger solicited comments on the current BUA review process. The Committee prefers to review BUAs in hard copy format and approve them by mail. Committee questions are routed to the Biosafety Officer who then works with the Principal Investigator (PI) to provide sufficient answers and amend the BUA, if needed. Protocols that require extended discussion are discussed at the semi-annual meetings, and PIs may be invited to attend.

   The Committee agreed that the current two-week turnaround time for BUA review/approval is sufficient. Currently, approval is assumed if the Biosafety Officer does not hear a response from the Committee member. The Committee decided that a response is necessary to assure a quorum approves a protocol.

4. **AAALAC Site Inspection – Preliminary Results** (*Elizabeth Ignacio*)

   Ms. Ignacio reported the positive response from the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) during their site inspection. The final report is expected at the beginning of the year.

5. **Discussion**

   Ms. Ignacio reported that Dr. [redacted]'s animal work with *Toxoplasma gondii* will occur in the [redacted] Animal Facility's Biohazard Containment Facility.

   Dr. Liu gave an update on the previously-reported *Schistosoma mansoni* exposure of two researchers. An incident report has been completed by EH&S. Both personnel continue to have negative titers, and therefore, did not develop infection.

Attachments (meeting handouts – not for general distribution):
Summary of BUAs as of 11/13/03
Incident report (previously emailed to CLEB members 07/18/03)

cc: Mark Freiberg, Director—EH&S
Michael Wisherop, Associate Director, Health & Safety—EH&S

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
May 8, 2003

1:30 P.M. 2515 Tolman Hall

Members in Attendance

Chris Carlson, M.P.H., C.B.S.P.	Biosafety Officer, Office of Environment, Health & Safety
Scott Dawson, Ph.D.	Molecular and Cell Biology
Diane Liu, M.D., M.P.H.	University Health Services
Maryann Montandon, DR.P.H.	California Department of Health Services
Hiroshi Nikaido, M.D., D.Med.Sc.	Molecular and Cell Biology
Daniel Portnoy, Ph.D.	Chair, Molecular and Cell Biology
David Schaffer, Ph.D.	Chemical Engineering

Members Absent

Gertrude Buehring, Ph.D.	School of Public Health
Amanda Jamieson	Molecular and Cell Biology
Roberta Johnson	Richard–Allan Scientific Corporation
Steven Lindow, Ph.D.	Plant and Microbial Biology
Poki Namkung, M.D., M.P.H.	City of Berkeley
Ellen Robey, Ph.D.	Molecular and Cell Biology—Immunology

Guests

Elizabeth Ignacio, R.E.H.S.	Office of Environment, Health & Safety

1. Approval of Minutes

The minutes of October 2, 2002 were approved as is.

2. Introduction of Elizabeth Ignacio

Ms. Carlson introduced Ms. Ignacio, a Health and Safety Specialist at the Office of Environment, Health & Safety (EH&S), who will be assisting with the administrative aspect of the Biosafety Office while [redacted] is on maternity leave. Ms. Ignacio functions as the Safety Officer at the [redacted] Animal Facility [redacted], is responsible for Field Research Safety, and performs industrial hygiene investigations.

3. Biohazard Use Authorizations (BUAs) status (*Chris Carlson*)

All BUAs are current and have been reviewed/approved by the Committee.

Current BUA approval process:
For BUA applications involving a new agent or Principal Investigator (PI), the PI completes a BUA application, the Biosafety Officer completes a laboratory inspection, and then the BUA, the laboratory inspection results (including any additional requirements the Biosafety Officer has for the work), and any supportive scientific literature are sent to the Committee for review.

Subsequent laboratory inspections are performed annually and results are sent to Committee for review (every year for the first three years of a new protocol, every three years thereafter).

If the scope of work changes at any time, a PI completes a BUA application for Committee review.

For all BUAs, if no special issues require convening a meeting, the Committee's review/approval is performed by mail.

Bloodborne Pathogen work does not require Committee review, and is reviewed/approved by the Biosafety Officer.

4. **Select Agent Program status** (*Chris Carlson*)

EH&S has developed a template should a PI be interested in registering work under the new select agent regulations.

5. **Bloodborne Pathogens (BBPs) training** (*Chris Carlson*)

Ms. Khatib and Ms. Carlson recently completed BBP training sessions for laboratory staff and selected Physical Plant-Campus Services (PP-CS) personnel trained to clean up blood spills. Awareness training was also given to custodial staff whose job duties do not include cleaning up blood spills. Bloodborne Pathogen training is required on an annual basis.

6. [redacted] **Animal Facility** [redacted]

Dr. Portnoy reported that he had discussed housekeeping and other issues with the other PIs sharing room [redacted] in the [redacted] BL2.

The [redacted] BL2 is exploring installing an additional hand-washing facility in the airlock which would allow alterations in entry/exit procedures.

Ms. Carlson and Ms. Ignacio will be inspecting the [redacted] BL3 lab. CLEB members who are fit-tested for N-95 respirators are encouraged to participate.

7. **Discussion**

[redacted] (PI) proposed performing animal work with *Toxoplasma gondii* in the [redacted] building rather than the [redacted] Biohazard Containment Facility (BCF). The Committee decided that the work would occur in the [redacted] BCF.

Bioengineering submitted a BUA for BCG (*Mycobacterium bovis*, a vaccine strain of tuberculosis). The Committee determined that BL3 containment is required if this work is to proceed.

Dr. Portnoy announced that, as of July 1, 2003, he will be on sabbatical and therefore, unable to chair the Committee. A new Chair will need to be approved. Vice Chancellor Burnside will be announcing new committee members for the upcoming academic year.

Dr. Liu reported that one researcher on campus was ill and had a slightly elevated *Chlamydia* titer. It is unknown at this point whether the illness is laboratory-acquired.

Attachments (meeting handouts – not for general distribution):
Status of Select Agents on Campus as of 3/12/03

Select Agent Possession on Campus as of 9/10/02 (CONFIDENTIAL)
Summary of BUAs as of 5/8/03

cc: Mark Freiberg, Director—EH&S
Michael Wisherop, Associate Director, Health & Safety—EH&S

UNIVERSITY OF CALIFORNIA, BERKELEY

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OFFICE OF ENVIRONMENT, HEALTH AND SAFETY
UNIVERSITY HALL, 3rd FLOOR

BERKELEY, CALIFORNIA 94720-1150

August 23, 2006

Edward H. Hammond
Director
The Sunshine Project
PO Box 41987
Austin, TX 78704

Re: IBC Minutes

Dear Mr. Hammond:

Thank you for your correspondence of March 15, 2006. As you requested, on April 26, 2006, we sent copies of the minutes for the University of California, Berkeley's Institutional Biosafety Committee ("IBC") meetings held after May 1, 2003 (approved copies of minutes were available for the inclusive dates May 8, 2003 to February 2, 2006.)

There is a possibility that the November 1, 2004 minutes were not included in April; therefore, I am sending them again.

In accordance with the National Institutes of Health (NIH) Guidelines on Research Involving Recombinant DNA Molecules, the NIH guidance document "Minutes of Institutional Biosafety Committees" dated May 14, 2004, and the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the University has made certain redactions on the copies of the IBC minutes provided. Specifically, we have redacted information necessary to protect the privacy and security interests of the affected parties.

In answer to your question regarding the National Academies of Science's report "Biotechnology Research in an Age of Terrorism" published by the National Academies Press in 2004, please refer to the IBC's discussion of that topic in the minutes dated November 1, 2004.

If you have any questions, feel free to contact me at (510) 643-6562 or srosen@berkeley.edu.

Sincerely,

Sonia Rosenberger, DVM
Biosafety Officer

Committee on Laboratory & Environmental Biosafety
Meeting Minutes—Redacted for public distribution 4/26/06
November 1, 2004

10:00 A.m. – 12:00 P.M. 2515 Tolman Hall

Members in Attendance

Jennifer Hsia	School of Public Health
Roberta Johnson	Richard–Allan Scientific
Steven Lindow, Ph.D.	Plant and Microbial Biology
Diane Liu, M.D., M.P.H.	University Health Services
Maryann Montandon, DR.P.H.	California Department of Health Services
Hiroshi Nikaido, M.D., D.Med.Sc.	Acting Chair, Molecular and Cell Biology
Ellen Robey, Ph.D.	Molecular and Cellular Biology-Immunology
Sonia Rosenberger, D.V.M., M.S.O.H.	Biosafety Officer, Office of Environment, Health & Safety

Members Absent

Gertrude Buehring, Ph.D.	School of Public Health
Poki Namkung, M.D., M.P.H.	City of Berkeley
David Schaffer, Ph.D.	Chemical Engineering

Guests

[redacted], Ph.D.	Molecular and Cell Biology
[redacted], Ph.D.	Molecular and Cell Biology

1. **Minutes**
   The minutes of the May 2004 meeting were approved.

2. **Membership deletions**
   Drs. Daniel Portnoy and Scott Dawson have withdrawn from the Committee.

3. **Select Agent registration application progress**
   Drs. [redacted] and [redacted] updated the Committee on the proposed work with candidate vaccine strains of a select agent bacteria. While initial work does not require registration, future work will involve vaccine candidates that will most likely require registration with CDC or USDA.

4. **Environment, Health & Safety upcoming Shipping Fact Sheet**
   The Office of Environment, Health & Safety (EH&S) continues to work on a Shipping Fact Sheet. A final version is expected in the upcoming months and distribution will be preceded by a communication to the Deans and Directors.

5. **Report of September's NIH Symposium on Safety Considerations in Recombinant DNA Research with Pathogenic Viruses and "dual use" discussion**

   In September, the National Institutes of Health (NIH) held a symposium on safety considerations in recombinant DNA research involving coronaviruses and avian flu viruses.

   During the symposium, the NIH reported that they may perform site visits to review the composition of Institutional Biosafety Committees. In particular, the NIH may visit the University of California as early as February 2005.

   The Committee on Research Standards and Practices to Prevent Destructive Application of Biotechnology has developed a book "Biotechnology Research in an Age of Terrorism" that was published by The National Academies Press this year. The following seven criteria are given that Institutional Biosafety Committees must take into consideration when reviewing experiments:

   a. Would the experiment demonstrate how to render a vaccine ineffective? This would apply to both human and animal vaccines. Creation of a vaccine-resistant smallpox virus would fall into this class of experiments.

   b. Would the experiment confer resistance to therapeutically useful antibiotics or antiviral agents? This would apply to therapeutic agents that are used to control disease agents in humans, animals or crops. Introduction of ciprofloxacin resistance in *Bacillus anthracis* would fall into this class.

   c. Would the experiment enhance the virulence of a pathogen or render a non-pathogen virulent? This would apply to plant, animal and human pathogens. Introduction of cereolysin toxin gene into *Bacillus anthracis* would fall into this class.

   d. Would the experiment increase transmissibility of a pathogen? This would include enhancing transmission within or between species. Altering vector competence to enhance disease transmission would also fall into this class.

   e. Would the experiment alter the host range of a pathogen? This would include making nonzoonotics into zoonotic agents. Altering the tropism of viruses would fit into this class.

   f. Would the experiment enable the evasion of diagnostic / detection modalities? This could include microencapsulation to avoid antibody-based detection and / or the alteration of gene sequences to avoid detection by established molecular methods.

   g. Would the experiment enable the weaponization of a biological agent or toxin? This would include the environmental stabilization of pathogens. Synthesis of smallpox virus would fall into this class of experiments.

   Dr. Rosenberger will add these criteria to the new BUA form in development.

6. **National Institutional Biosafety Committee 'transparency' report**

   With the agenda, the Committee received a copy of the Sunshine Project's report "Mandate for Failure: The State of Institutional Biosafety Committees in an Age of Biological Weapons Research, Results and Recommendations of the Sunshine Project Survey of Institutional Biosafety Committees" published in October. In response to

the Sunshine Project's Freedom of Information Act request, the Committee had supplied the project with the minutes from two previous meetings (May and November, 2003) in May 2004.

According to the report, the Sunshine Project evaluated Institutional Biosafety Committee minutes qualitatively with regard to research descriptions, detail of minutes, scope of minutes, and demeanor. All of the University of California campuses received the same score and were given a transparency rating of "Failed." The Sunshine Project noted that the rating was "not a judgment of the research that the committee reviews (or does not review), nor (was) it a direct evaluation of biosafety at the institution." Based on the transparency criteria, Dr. Rosenberger surmised that our 'failure' rating was due to the practice of reviewing protocols by mail, the redaction of committee member and Principal Investigator names, and the redaction of areas where *in vivo* research is conducted.

The report also included an inaccuracy regarding the Biosafety Officer for the University of California, Berkeley (UCB). Dr. Rosenberger attended a meeting of the University of California, Davis (UCD) shortly after changing positions from UCD to UCB in order to provide a completed project. The Sunshine Project reported, inaccurately, that UCD listed the UCB Biosafety Officer as one of its non-affiliated members, and that the UCB Biosafety Officer was also a current employee of the Chiron Corporation. Dr. Rosenberger has not worked for Chiron since 2002.

7. **Incident Reports**

A long-term staff member sustained a splash to the face with *Borrelia burgdorferi* while closing a partially closed tube outside the biological safety cabinet. The incident occurred while the employee was traveling to a nearby bench to use a vortex. In order to prevent future incidents, the vortex has been moved inside the biological safety cabinet.

A refuse worker sustained a needlestick from a needle that was incorrectly disposed of in the trash. The needle was not contaminated with a hazardous material. In order to prevent future incidents, EH&S is developing a Lessons Learned document to distribute to all departments with laboratories. In addition, labels are being devised to place on all trashcans. The Committee suggested that the Lessons Learned document be incorporated into the Injury and Illness Prevention Program for departments with laboratories.

8. [redacted] **greenhouse inspections**

Dr. Rosenberger inspected both the [redacted] and [redacted] greenhouses within the preceding months. [redacted], coordinator of both facilities, has requested our assistance in developing a general guide for identifying what recombinant research can be performed in each greenhouse. This guide will help plan research locations well before the Committee approves the work.

9. **New council – Research Administrative Compliance Council**

The Office of Research Administration and Compliance has developed the Research Administrative Compliance Council composed of the administrators on campus responsible for the oversight of regulatory compliance. The Council's purpose is to foster communications and assist the administrators in seeking solutions to issues

that involve many areas across the campus. Dr. Rosenberger represents the Committee for Laboratory and Environmental Biosafety.

10. American Biological Safety Association annual conference

The annual conference of the American Biological Safety Association was held in October. Dr. Rosenberger gave an overview of the following presentations:

a. "Case Report: Transmission of Lymphocytic Choriomeningitis Virus from Laboratory Mice to an Animal Technician." Lymphocytic Choriomeningitis Virus had been introduced into the animal colony by a contaminated cell line.

b. Julia Hilliard, Ph.D. presented the first reactivation case of *Herpesvirus simiae.*

c. "Changes in the Regulations for the Classification and Transportation of Clinical and Diagnostic Samples." Multiple changes affecting the transport of infectious substances and diagnostic specimens by air will take effect in 2005. The Department of Transportation has yet to adopt the changes, but when they do, EH&S will update the Committee and the Fact Sheet.

11. Cal/OSHA Airborne Infectious Disease Advisory Meeting

The California Occupational Safety and Health Administration will hold the second in a series of meetings on November 5, 2004, to discuss proposing regulation to cover the transmission of airborne infectious diseases in the workplace, including laboratories. Dr. Rosenberger will attend the meeting, which is open to the public.

12. Review action items from prior meetings

The Committee aided Dr. Rosenberger in reviewing the status of prior action items. With this information, Dr. Rosenberger will concentrate on action items of current relevance.

13. Discuss campus biosafety training

The Committee reviewed the September version of the EH&S course "Biosafety for Human, Animal, and Plant Pathogens." Dr. Rosenberger has taught three classes, and the feedback has been positive. The Committee decided that all personnel seeking to obtain or renew a Biological Use Authorization (BUA) will be required to attend the class. Rotating first-year graduate students are included and will be added to BUAs as they rotate through laboratories. In order to meet this new requirement, Dr. Rosenberger will offer the course monthly in 2005.

14. Discuss [redacted] BL3 recertification and Training Manual

Dr. Riley's documents are currently under revision, and the Committee will review the new documents once they are completed. Annual revision will be part of annual BL3 laboratory certification.

15. Discuss personal protective equipment for *Neotoma fuscipes*

The Committee revisited the August request regarding personal protective equipment for a controlled colony of *Neotoma fuscipes.* Routine clothing for rodent handlers at the field station includes dedicated clothing and either latex or nitrile gloves. As indicated in the August request, routine clothing does not include eye protection. Due to the adequacy of existing personal protective equipment (consistent with practices on campus and existing injury information for this

employee population), the Committee concurred that routine clothing at the station could be used for this controlled colony as well.

16. **Discuss testing procedure when receiving "inactive" select agents or agents normally manipulated at BL3**

    All inactivated 1) select agents and 2) agents manipulated at BL3 on campus will be tested for viability upon receipt. The testing method will vary with the agent and will be determined in a BUA. All inactive 1) select agents and 2) agents manipulated at BL3 will require a BUA.

17. **Discuss NIH publication regarding Institutional Biosafety Committee meeting minutes**

    In May, the NIH Office of Biotechnology Activities published a Questions and Answers document regarding minutes for Institutional Biosafety Committees (IBCs). The Committee received a copy with the agenda for this meeting. Note that "IBCs are required to make rosters and biographical sketches that have been submitted to NIH available to the public upon request," however, IBCs are allowed to redact "private information" such as "home telephone numbers and home addresses of IBC members."

    When the Committee responded to the public request for minutes by the Sunshine Project in January, the Committee decided to redact Committee member names (but not affiliations nor degrees conferred) due to security and privacy concerns.

18. **Decontamination of cages used with *Listeria monocytogenes***

    The Office of Laboratory Animal Care requested an alternative to autoclaving for decontamination of some cages used with *L. monocytogenes* due to the harshness of the autoclave on the cages. A disinfectant already used in the facility, Steris Process NPD, has been tested effective for *L. monocytogenes.* Cages will be emptied in a biological safety cabinet and the bedding will be autoclaved. Cages will be surface disinfected with Process NPD in accordance with manufacturer's recommendations and then washed in the cage wash. The cage wash cycle maintains 180°F for 4.5 minutes and will kill any residual *L. monocytogenes* that may have survived surface disinfection.

cc: Mark Freiberg, Director—EH&S
Michael Wisherop, Associate Director, Health & Safety—EH&S